



Rubber Interlaboratory Testing Program

Summary Report #202- 4th Qtr 2019

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

[Key for Web Summary Report](#)

| Analysis | Analysis Name | Analysis | Analysis Name |
|---------------------|--|---------------------|---|
| 605 | Tensile Strength: Precured Rubber Samples | 690 | RPA Rheological Properties: Part A - G' at 20Hz |
| 606 | Ultimate Elongation: Precured Rubber Samples | 691 | RPA Rheological Properties: Part A - G'' at 20Hz |
| 607 | Stress at 300% Elongation: Precured Samples | 695 | RPA Rheological Properties: Part B - G' at 1.0Hz |
| 608 | Stress at 100% Elongation: Precured Samples | 696 | RPA Rheological Properties: Part B - G'' at 1.0Hz |
| 620 | Hardness (Type A): Precured Rubber Samples | | |
| 621 | Density: Precured Rubber Samples @ 25C | | |
| 625 | Hardness (Shore D/Type D) | | |
| 630 | Tensile Strength: Participant-Cured Rubber | | |
| 631 | Ultimate Elongation: Participant-Cured Samples | | |
| 632 | Tensile Stress at 300% Elongation: Lab-Cured | | |
| 633 | Tensile Stress at 100% Elongation: Lab-Cured | | |
| 635 | Compression Set | | |
| 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)

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|--------|----------------|----------------------|--------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 3,358.0 | 48.5 | 0.31 | 3,380.0 | 87.3 | 0.57 |
| 2374MJ | | 3,166.5 | -143.0 | -0.91 | 3,211.0 | -81.7 | -0.53 |
| 2UC46K | X | 83,597.6 | 80,288.1 | 513.08 | 82,101.5 | 78,808.8 | 515.65 |
| 2XD3MQ | | 3,316.3 | 6.8 | 0.04 | 3,273.5 | -19.1 | -0.13 |
| 38DC8L | | 3,218.0 | -91.5 | -0.58 | 3,111.5 | -181.2 | -1.19 |
| 394BLJ | | 3,334.4 | 24.9 | 0.16 | 3,330.7 | 38.0 | 0.25 |
| 3HVXBU | | 2,978.0 | -331.5 | -2.12 | 2,993.5 | -299.2 | -1.96 |
| 3NHJLM | | 3,395.0 | 85.5 | 0.55 | 3,326.5 | 33.8 | 0.22 |
| 3ZTYKF | | 3,543.7 | 234.2 | 1.50 | 3,489.0 | 196.3 | 1.28 |
| 43UVD3 | | 3,214.0 | -95.5 | -0.61 | 3,219.0 | -73.7 | -0.48 |
| 4DCZFC | X | 2,710.0 | -599.5 | -3.83 | 2,795.0 | -497.7 | -3.26 |
| 4H7X64 | | 3,240.1 | -69.4 | -0.44 | 3,253.9 | -38.7 | -0.25 |
| 4LPNYZ | X | 4,272.1 | 962.7 | 6.15 | 4,145.9 | 853.3 | 5.58 |
| 6A9RN8 | | 3,291.5 | -18.0 | -0.11 | 3,350.0 | 57.3 | 0.38 |
| 6QHFZM | | 3,342.3 | 32.8 | 0.21 | 3,305.2 | 12.5 | 0.08 |
| 6QJ4MT | | 3,034.0 | -275.5 | -1.76 | 3,035.0 | -257.7 | -1.69 |
| 76XWLJ | | 3,334.0 | 24.5 | 0.16 | 3,352.0 | 59.3 | 0.39 |
| 7BZ32L | | 3,337.6 | 28.1 | 0.18 | 3,294.1 | 1.4 | 0.01 |
| 7W4N2R | X | 1,640.0 | -1,669.5 | -10.67 | 1,684.5 | -1,608.2 | -10.52 |
| 8AHDBE | | 3,406.1 | 96.6 | 0.62 | 3,306.4 | 13.7 | 0.09 |
| 8C9EG3 | | 3,413.5 | 104.0 | 0.66 | 3,466.0 | 173.3 | 1.13 |
| 8CV4KH | | 3,427.0 | 117.5 | 0.75 | 3,426.0 | 133.3 | 0.87 |
| 8N3V74 | | 3,309.0 | -0.5 | 0.00 | 3,353.4 | 60.7 | 0.40 |
| 8ZX6QR | | 3,254.8 | -54.7 | -0.35 | 3,226.2 | -66.4 | -0.43 |
| 9ECPQB | | 3,275.0 | -34.5 | -0.22 | 3,199.6 | -93.1 | -0.61 |
| 9M7UJC | | 3,493.0 | 183.5 | 1.17 | 3,411.0 | 118.3 | 0.77 |
| 9MPGHU | | 3,042.3 | -267.2 | -1.71 | 3,125.3 | -167.4 | -1.10 |
| 9NK6WJ | * | 2,907.7 | -401.8 | -2.57 | 2,933.1 | -359.6 | -2.35 |
| 9UNMZW | | 3,235.1 | -74.4 | -0.48 | 3,242.3 | -50.3 | -0.33 |
| 9VG46J | | 3,198.1 | -111.4 | -0.71 | 3,198.1 | -94.6 | -0.62 |
| 9XLPWQ | | 3,390.0 | 80.5 | 0.51 | 3,466.5 | 173.8 | 1.14 |
| AJYYBT | | 3,133.6 | -175.9 | -1.12 | 3,162.6 | -130.1 | -0.85 |
| AM2V39 | | 3,277.2 | -32.3 | -0.21 | 3,354.0 | 61.4 | 0.40 |
| AXKBM3 | | 3,417.2 | 107.7 | 0.69 | 3,382.4 | 89.7 | 0.59 |
| AYCB4L | | 3,267.5 | -42.0 | -0.27 | 3,357.5 | 64.8 | 0.42 |
| AYEGB4 | | 3,525.5 | 216.1 | 1.38 | 3,544.8 | 252.1 | 1.65 |
| B8QEUL | | 3,417.5 | 108.0 | 0.69 | 3,357.0 | 64.3 | 0.42 |
| BXX4G6 | | 3,175.0 | -134.5 | -0.86 | 3,252.0 | -40.7 | -0.27 |



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Analysis 605
Tensile Strength (psi)

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| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| C3M8J8 | | 3,141.5 | -168.0 | -1.07 | 3,085.2 | -207.5 | -1.36 |
| CHYHC2 | | 3,353.0 | 43.5 | 0.28 | 3,420.9 | 128.2 | 0.84 |
| CMV68B | | 3,571.0 | 261.5 | 1.67 | 3,516.5 | 223.8 | 1.46 |
| CPZXYN | | 3,397.5 | 88.1 | 0.56 | 3,453.4 | 160.7 | 1.05 |
| D4YYEA | | 3,372.0 | 62.5 | 0.40 | 3,310.5 | 17.8 | 0.12 |
| D6UMTY | | 3,384.0 | 74.5 | 0.48 | 3,358.3 | 65.6 | 0.43 |
| DKHWDF | | 3,380.0 | 70.5 | 0.45 | 3,348.0 | 55.3 | 0.36 |
| DPJT8G | | 3,139.0 | -170.5 | -1.09 | 3,127.5 | -165.2 | -1.08 |
| DUABGM | | 3,327.0 | 17.5 | 0.11 | 3,206.5 | -86.2 | -0.56 |
| DXEYZH | * | 3,337.5 | 28.0 | 0.18 | 3,133.0 | -159.7 | -1.04 |
| E4VRPM | | 3,147.3 | -162.1 | -1.04 | 3,118.3 | -174.3 | -1.14 |
| EGH9AE | | 3,422.9 | 113.4 | 0.72 | 3,433.8 | 141.1 | 0.92 |
| EWCNHK | | 3,233.5 | -76.0 | -0.49 | 3,274.0 | -18.7 | -0.12 |
| EX8BWA | | 3,463.5 | 154.0 | 0.98 | 3,484.0 | 191.3 | 1.25 |
| EZVJKD | | 3,328.6 | 19.2 | 0.12 | 3,248.9 | -43.8 | -0.29 |
| F2KF44 | X | 2,731.5 | -578.0 | -3.69 | 2,663.0 | -629.7 | -4.12 |
| FDKFKA | | 3,244.5 | -65.0 | -0.42 | 3,207.5 | -85.2 | -0.56 |
| FF6V83 | | 3,499.1 | 189.6 | 1.21 | 3,473.6 | 180.9 | 1.18 |
| G6Y78D | | 3,048.5 | -261.0 | -1.67 | 3,133.0 | -159.7 | -1.04 |
| GLLQMX | | 3,457.7 | 148.2 | 0.95 | 3,406.2 | 113.5 | 0.74 |
| GWP4LC | | 3,399.5 | 90.0 | 0.58 | 3,354.4 | 61.7 | 0.40 |
| H38THR | | 3,304.4 | -5.1 | -0.03 | 3,328.2 | 35.5 | 0.23 |
| HR84Y6 | | 3,096.3 | -213.1 | -1.36 | 3,045.7 | -246.9 | -1.62 |
| HV6KEK | | 3,634.0 | 324.5 | 2.07 | 3,605.7 | 313.0 | 2.05 |
| HXB646 | | 3,222.0 | -87.5 | -0.56 | 3,200.0 | -92.7 | -0.61 |
| JEUDHE | * | 3,678.5 | 369.0 | 2.36 | 3,529.9 | 237.2 | 1.55 |
| JFQX6E | | 2,967.5 | -342.0 | -2.19 | 3,030.0 | -262.7 | -1.72 |
| JY8Z79 | | 3,388.5 | 79.0 | 0.51 | 3,336.5 | 43.8 | 0.29 |
| K6M3MA | * | 3,367.3 | 57.8 | 0.37 | 3,499.6 | 206.9 | 1.35 |
| KF3U9X | | 3,355.0 | 45.5 | 0.29 | 3,305.0 | 12.3 | 0.08 |
| KX82MZ | | 3,150.0 | -159.5 | -1.02 | 3,110.5 | -182.2 | -1.19 |
| KYWTCB | | 3,265.5 | -44.0 | -0.28 | 3,268.0 | -24.7 | -0.16 |
| LJZVNK | | 3,488.2 | 178.7 | 1.14 | 3,509.9 | 217.3 | 1.42 |
| LLQWT9 | X | 3,867.0 | 557.5 | 3.56 | 3,830.7 | 538.0 | 3.52 |
| LWDU22 | | 3,245.0 | -64.5 | -0.41 | 3,114.2 | -178.5 | -1.17 |
| LXNVMZ | | 3,208.0 | -101.5 | -0.65 | 3,215.5 | -77.2 | -0.50 |
| MCHLX4 | | 3,449.5 | 140.0 | 0.89 | 3,344.0 | 51.3 | 0.34 |



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| MGAW82 | | 3,561.0 | 251.5 | 1.61 | 3,492.0 | 199.3 | 1.30 |
| MNRDLW | | 3,457.9 | 148.4 | 0.95 | 3,371.6 | 78.9 | 0.52 |
| NJWQN3 | | 3,436.5 | 127.0 | 0.81 | 3,368.5 | 75.8 | 0.50 |
| NUVJYE | | 3,231.5 | -78.0 | -0.50 | 3,290.9 | -1.7 | -0.01 |
| P3J2N8 | X | 3,874.7 | 565.2 | 3.61 | 3,922.5 | 629.8 | 4.12 |
| PBEWQC | | 2,971.0 | -338.5 | -2.16 | 2,948.5 | -344.2 | -2.25 |
| PRJ9DV | | 3,350.4 | 40.9 | 0.26 | 3,451.9 | 159.3 | 1.04 |
| PZ2G4C | | 3,245.2 | -64.2 | -0.41 | 3,253.9 | -38.7 | -0.25 |
| QPGMAV | | 3,530.8 | 221.4 | 1.41 | 3,613.2 | 320.5 | 2.10 |
| QRF4FX | | 3,528.2 | 218.7 | 1.40 | 3,403.5 | 110.8 | 0.72 |
| QRLF29 | | 3,383.7 | 74.2 | 0.47 | 3,323.6 | 30.9 | 0.20 |
| R3CDJX | | 3,372.2 | 62.7 | 0.40 | 3,437.4 | 144.8 | 0.95 |
| RF33J4 | | 3,360.0 | 50.5 | 0.32 | 3,285.0 | -7.7 | -0.05 |
| RLNBMU | | 3,338.5 | 29.0 | 0.19 | 3,263.0 | -29.7 | -0.19 |
| RNY3UQ | | 3,314.1 | 4.7 | 0.03 | 3,285.1 | -7.5 | -0.05 |
| RUMLET | | 3,430.0 | 120.5 | 0.77 | 3,390.0 | 97.3 | 0.64 |
| T3BRQQ | | 3,249.5 | -60.0 | -0.38 | 3,256.0 | -36.7 | -0.24 |
| TB49WM | | 3,160.1 | -149.4 | -0.95 | 3,250.6 | -42.1 | -0.28 |
| TCGXZY | | 3,218.3 | -91.2 | -0.58 | 3,185.2 | -107.5 | -0.70 |
| TRU9Q8 | | 3,203.5 | -105.9 | -0.68 | 3,170.9 | -121.8 | -0.80 |
| UTFHBT | | 3,335.1 | 25.6 | 0.16 | 3,272.0 | -20.7 | -0.14 |
| UUY2HK | | 3,485.3 | 175.8 | 1.12 | 3,386.7 | 94.0 | 0.62 |
| UZ34ML | | 3,657.0 | 347.5 | 2.22 | 3,630.5 | 337.8 | 2.21 |
| VHHWNL | | 3,190.4 | -119.1 | -0.76 | 3,200.2 | -92.5 | -0.61 |
| VYM43W | | 2,989.4 | -320.1 | -2.05 | 2,925.1 | -367.5 | -2.40 |
| W28CLW | | 3,339.1 | 29.7 | 0.19 | 3,308.4 | 15.7 | 0.10 |
| W6PW8C | | 3,175.6 | -133.8 | -0.86 | 3,171.3 | -121.4 | -0.79 |
| XPQ8R6 | | 3,340.2 | 30.8 | 0.20 | 3,298.9 | 6.2 | 0.04 |
| Y8PHGU | | 3,286.6 | -22.9 | -0.15 | 3,298.9 | 6.2 | 0.04 |
| YQFVPQ | * | 3,051.9 | -257.6 | -1.65 | 2,923.6 | -369.1 | -2.41 |

| Summary Statistics | |
|--|--------------|
| Grand Means | 3,309.47 psi |
| Std Dev Btwn Labs | 156.48 psi |
| | 3,292.67 psi |
| | 152.83 psi |
| Statistics based on 98 of 105 reporting participants | |



Rubber Interlaboratory Testing Program
Analysis 605
Tensile Strength (psi)

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4th Qtr 2019

| | | Summary Statistics in SI Units | |
|--|------------|--------------------------------|-----------|
| Grand Means | 22.818 MPa | | 22.70 MPa |
| Stnd Dev Btwn Labs | 1.079 MPa | | 1.05 MPa |
| Statistics based on 98 of 105 reporting participants | | | |

Samples D91-D92: Polyisoprene compound, batch #1 & D93-D94: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #605

- 2UC46K (X) - Extreme Data.
- 4DCZFC (X) - Data for all samples are low. Possible Systematic Error.
- 4LPNYZ (X) - Data for all samples are high. Possible Systematic Error.
- 7W4N2R (X) - Extreme Data.
- F2KF44 (X) - Data for all samples are low. Possible Systematic Error.
- LLQWT9 (X) - Data for all samples are high. Possible Systematic Error.
- P3J2N8 (X) - Data for all samples are high. Possible Systematic Error.

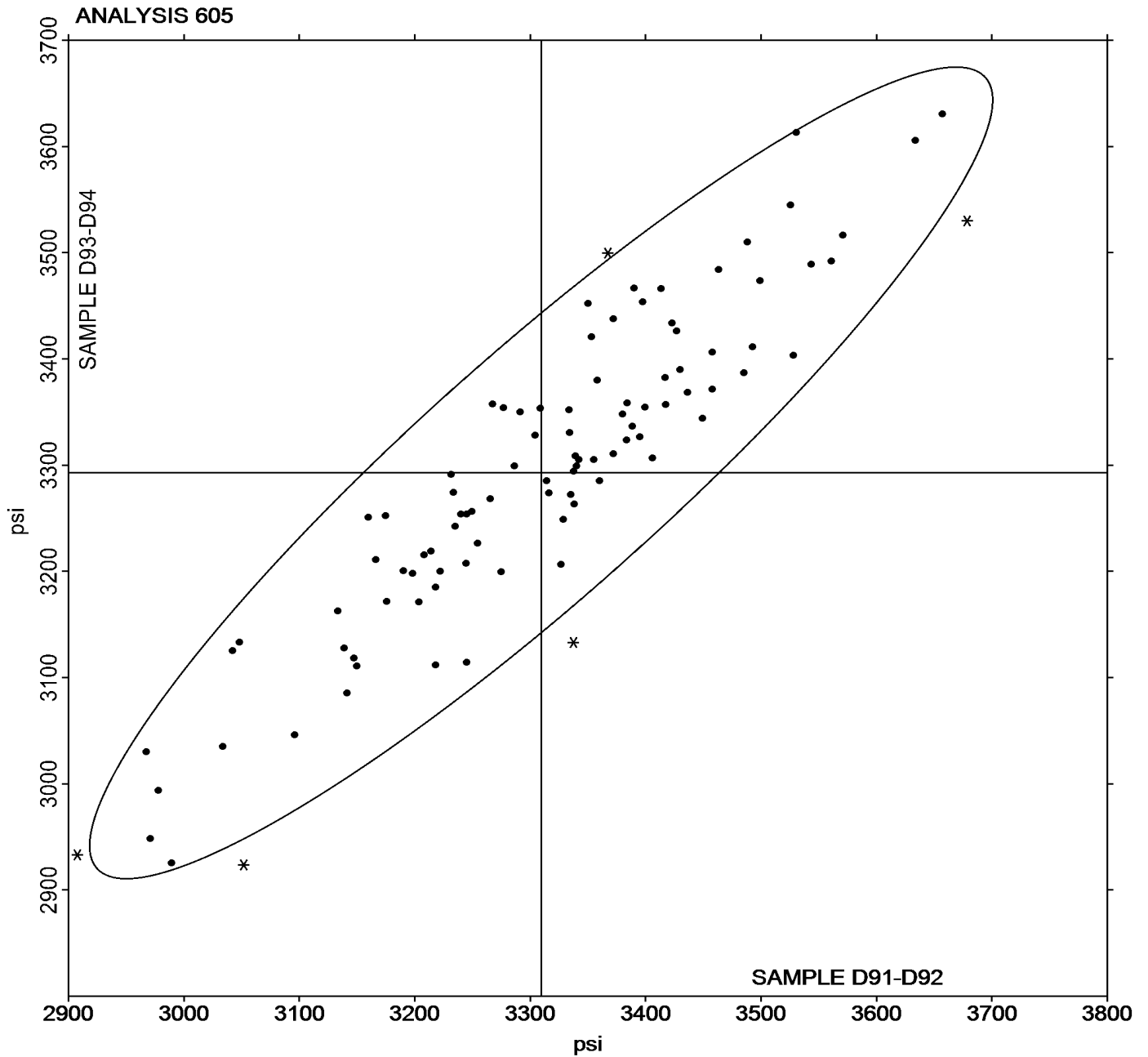


Rubber Interlaboratory Testing Program
Analysis 605
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Grand Mean Sample **D91-D92** = 3,309.47 psi

Grand Mean Sample **D93-D94** = 3,292.67 psi





Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 633.0 | -6.8 | -0.23 | 639.0 | 2.8 | 0.09 |
| 2374MJ | | 643.8 | 4.0 | 0.13 | 641.1 | 4.9 | 0.16 |
| 2UC46K | X | 735.8 | 96.0 | 3.23 | 889.2 | 253.1 | 8.21 |
| 2XD3MQ | | 643.5 | 3.7 | 0.12 | 626.5 | -9.7 | -0.31 |
| 38DC8L | | 577.0 | -62.8 | -2.12 | 574.0 | -62.2 | -2.02 |
| 394BLJ | | 632.5 | -7.3 | -0.25 | 634.4 | -1.8 | -0.06 |
| 3HVXBU | | 585.0 | -54.8 | -1.85 | 579.0 | -57.2 | -1.85 |
| 3NHJLM | | 595.5 | -44.3 | -1.49 | 596.5 | -39.7 | -1.29 |
| 3ZTYKF | | 688.8 | 49.0 | 1.65 | 680.2 | 44.0 | 1.43 |
| 43UVD3 | | 679.5 | 39.7 | 1.34 | 665.5 | 29.3 | 0.95 |
| 4DCZFC | | 595.5 | -44.3 | -1.49 | 603.5 | -32.7 | -1.06 |
| 4H7X64 | | 625.5 | -14.3 | -0.48 | 623.7 | -12.5 | -0.40 |
| 4LPNYZ | X | 851.2 | 211.4 | 7.12 | 843.3 | 207.1 | 6.72 |
| 6A9RN8 | | 618.0 | -21.8 | -0.73 | 623.5 | -12.7 | -0.41 |
| 6QHFZM | | 637.0 | -2.8 | -0.09 | 638.4 | 2.2 | 0.07 |
| 6QJ4MT | | 587.0 | -52.8 | -1.78 | 584.5 | -51.7 | -1.68 |
| 76XWLJ | | 619.0 | -20.8 | -0.70 | 624.0 | -12.2 | -0.39 |
| 7BZ32L | | 625.1 | -14.7 | -0.50 | 624.4 | -11.8 | -0.38 |
| 7W4N2R | X | 772.5 | 132.7 | 4.47 | 770.0 | 133.8 | 4.34 |
| 8AHDBE | | 656.9 | 17.1 | 0.57 | 652.1 | 15.9 | 0.52 |
| 8C9EG3 | | 658.0 | 18.2 | 0.61 | 653.0 | 16.8 | 0.55 |
| 8CV4KH | | 646.5 | 6.7 | 0.23 | 644.5 | 8.3 | 0.27 |
| 8N3V74 | | 690.3 | 50.4 | 1.70 | 700.3 | 64.1 | 2.08 |
| 8ZX6QR | X | 1,575.0 | 935.2 | 31.50 | 1,610.0 | 973.8 | 31.61 |
| 9ECPQB | X | 738.5 | 98.7 | 3.32 | 815.5 | 179.3 | 5.82 |
| 9M7UJC | | 673.5 | 33.7 | 1.13 | 678.5 | 42.3 | 1.37 |
| 9MPGHU | | 606.8 | -33.1 | -1.11 | 619.3 | -16.9 | -0.55 |
| 9NK6WJ | | 597.0 | -42.8 | -1.44 | 596.5 | -39.7 | -1.29 |
| 9UNMZW | | 657.1 | 17.3 | 0.58 | 640.4 | 4.2 | 0.14 |
| 9VG46J | | 668.0 | 28.2 | 0.95 | 658.0 | 21.8 | 0.71 |
| 9XLPWQ | X | 715.0 | 75.2 | 2.53 | 736.5 | 100.3 | 3.26 |
| AM2V39 | | 678.5 | 38.7 | 1.30 | 673.5 | 37.3 | 1.21 |
| AXKBM3 | | 667.5 | 27.7 | 0.93 | 664.7 | 28.5 | 0.93 |
| AYCB4L | | 616.5 | -23.3 | -0.79 | 616.5 | -19.7 | -0.64 |
| AYEGB4 | X | 750.0 | 110.2 | 3.71 | 755.0 | 118.8 | 3.86 |
| B8QEUL | | 647.0 | 7.2 | 0.24 | 640.0 | 3.8 | 0.12 |
| BXX4G6 | | 607.0 | -32.8 | -1.11 | 613.5 | -22.7 | -0.74 |
| C3M8J8 | | 611.8 | -28.0 | -0.94 | 596.7 | -39.4 | -1.28 |



Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| CHYHC2 | | 670.0 | 30.2 | 1.02 | 667.5 | 31.3 | 1.02 |
| CMV68B | | 688.0 | 48.2 | 1.62 | 689.5 | 53.3 | 1.73 |
| CPZXYN | | 637.6 | -2.2 | -0.08 | 631.1 | -5.0 | -0.16 |
| D4YYEA | | 654.0 | 14.2 | 0.48 | 661.0 | 24.8 | 0.81 |
| DKHWDF | * | 666.0 | 26.2 | 0.88 | 630.5 | -5.7 | -0.18 |
| DPJT8G | * | 586.5 | -53.3 | -1.80 | 557.5 | -78.7 | -2.55 |
| DUABGM | | 660.5 | 20.7 | 0.70 | 641.5 | 5.3 | 0.17 |
| DXEYZH | | 641.0 | 1.2 | 0.04 | 620.0 | -16.2 | -0.52 |
| E4VRPM | | 625.5 | -14.4 | -0.48 | 633.6 | -2.6 | -0.08 |
| EGH9AE | | 694.5 | 54.7 | 1.84 | 671.5 | 35.3 | 1.15 |
| EWCNHK | | 630.0 | -9.8 | -0.33 | 624.0 | -12.2 | -0.39 |
| EX8BWA | | 659.5 | 19.7 | 0.66 | 671.0 | 34.8 | 1.13 |
| EZVJKD | | 648.5 | 8.6 | 0.29 | 653.0 | 16.8 | 0.55 |
| F2KF44 | | 596.5 | -43.3 | -1.46 | 588.5 | -47.7 | -1.55 |
| FDKFFA | X | 576.0 | -63.8 | -2.15 | 617.5 | -18.7 | -0.61 |
| FF6V83 | | 646.1 | 6.3 | 0.21 | 625.8 | -10.4 | -0.34 |
| G6Y78D | | 602.6 | -37.3 | -1.26 | 590.1 | -46.1 | -1.50 |
| GLLQMX | | 643.0 | 3.2 | 0.11 | 638.7 | 2.5 | 0.08 |
| GWP4LC | | 662.5 | 22.7 | 0.76 | 663.5 | 27.3 | 0.89 |
| H38THR | | 657.0 | 17.2 | 0.58 | 653.0 | 16.8 | 0.55 |
| HR84Y6 | | 597.4 | -42.5 | -1.43 | 591.1 | -45.1 | -1.46 |
| HV6KEK | | 619.5 | -20.3 | -0.68 | 596.5 | -39.7 | -1.29 |
| HXB646 | | 643.5 | 3.7 | 0.12 | 641.5 | 5.3 | 0.17 |
| JEUDHE | | 672.3 | 32.5 | 1.09 | 664.3 | 28.1 | 0.91 |
| JFQX6E | | 584.0 | -55.8 | -1.88 | 572.0 | -64.2 | -2.08 |
| JY8Z79 | | 621.5 | -18.3 | -0.62 | 630.5 | -5.7 | -0.18 |
| K6M3MA | | 630.2 | -9.6 | -0.32 | 634.5 | -1.7 | -0.05 |
| KX82MZ | | 619.0 | -20.8 | -0.70 | 612.5 | -23.7 | -0.77 |
| KYWTCB | | 691.5 | 51.7 | 1.74 | 695.0 | 58.8 | 1.91 |
| LJZVNK | | 644.0 | 4.2 | 0.14 | 642.0 | 5.8 | 0.19 |
| LLQWT9 | | 601.1 | -38.7 | -1.30 | 594.5 | -41.6 | -1.35 |
| LWDU22 | | 660.0 | 20.2 | 0.68 | 675.0 | 38.8 | 1.26 |
| LXNVMZ | | 612.0 | -27.8 | -0.94 | 611.0 | -25.2 | -0.82 |
| MCHLX4 | | 620.0 | -19.8 | -0.67 | 603.5 | -32.7 | -1.06 |
| MGAW82 | | 696.5 | 56.7 | 1.91 | 691.5 | 55.3 | 1.80 |
| MNRDLW | | 656.7 | 16.9 | 0.57 | 651.3 | 15.1 | 0.49 |
| NJWQN3 | | 658.5 | 18.7 | 0.63 | 649.0 | 12.8 | 0.42 |



Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| NUVJYE | | 638.3 | -1.6 | -0.05 | 632.9 | -3.3 | -0.11 |
| P3J2N8 | | 581.5 | -58.3 | -1.96 | 579.8 | -56.3 | -1.83 |
| PBEWQC | | 661.5 | 21.7 | 0.73 | 651.5 | 15.3 | 0.50 |
| PRJ9DV | | 672.1 | 32.3 | 1.09 | 670.8 | 34.6 | 1.12 |
| QPGMAV | | 667.3 | 27.4 | 0.92 | 674.9 | 38.7 | 1.26 |
| QRF4FX | | 693.9 | 54.1 | 1.82 | 678.4 | 42.2 | 1.37 |
| QRLF29 | | 646.5 | 6.7 | 0.23 | 639.5 | 3.3 | 0.11 |
| R3CDJX | | 635.0 | -4.8 | -0.16 | 632.5 | -3.7 | -0.12 |
| RF33J4 | | 628.0 | -11.8 | -0.40 | 615.0 | -21.2 | -0.69 |
| RLNBMU | | 637.0 | -2.8 | -0.09 | 629.5 | -6.7 | -0.22 |
| RUMLET | | 675.5 | 35.7 | 1.20 | 674.5 | 38.3 | 1.24 |
| T3BRQQ | | 672.0 | 32.2 | 1.08 | 669.0 | 32.8 | 1.07 |
| TB49WM | | 610.7 | -29.1 | -0.98 | 629.4 | -6.8 | -0.22 |
| TCGXZY | | 636.0 | -3.8 | -0.13 | 639.7 | 3.5 | 0.11 |
| TRU9Q8 | * | 614.1 | -25.7 | -0.87 | 636.9 | 0.8 | 0.03 |
| UTFHBT | | 655.1 | 15.3 | 0.51 | 646.1 | 10.0 | 0.32 |
| UUY2HK | | 662.0 | 22.2 | 0.75 | 669.5 | 33.3 | 1.08 |
| UZ34ML | | 642.0 | 2.2 | 0.07 | 655.0 | 18.8 | 0.61 |
| VHHWNU | | 634.6 | -5.2 | -0.17 | 605.5 | -30.6 | -0.99 |
| W28CLW | | 627.0 | -12.8 | -0.43 | 611.0 | -25.2 | -0.82 |
| W6PW8C | | 660.5 | 20.7 | 0.70 | 650.5 | 14.3 | 0.47 |
| XPQ8R6 | | 629.0 | -10.8 | -0.36 | 641.5 | 5.3 | 0.17 |
| Y8PHGU | | 638.5 | -1.3 | -0.04 | 648.0 | 11.8 | 0.38 |
| YQFVPQ | X | 716.0 | 76.2 | 2.57 | 657.4 | 21.2 | 0.69 |

| Summary Statistics | |
|---|--|
| Grand Means | 639.81 percent 636.15 percent |
| Std Dev Btwn Labs | 29.69 percent 30.81 percent |
| Statistics based on 90 of 99 reporting participants | |

Samples D91-D92: Polyisoprene compound, batch #1 & D93-D94: Polyisoprene compound, batch #2



Comments on Assigned Data Flags for Test #606

- 2UC46K (X) - Data for all samples are high. Possible Systematic Error. Inconsistent within the determinations of sample group D91-D92.
- 4LPNYZ (X) - Data for all samples are high. Possible Systematic Error.
- 7W4N2R (X) - Data for all samples are high. Possible Systematic Error.
- 8ZX6QR (X) - Extreme Data.
- 9ECPQB (X) - Data for all samples are high. Possible Systematic Error. Inconsistent within the determinations of sample group D93-D94.
- 9XLPWQ (X) - Data for sample group D93-D94 are high.
- AYEGB4 (X) - Data for all samples are high. Possible Systematic Error.
- FDKFA (X) - Inconsistent in testing between samples.
- YQFVPQ (X) - Inconsistent in testing between samples.

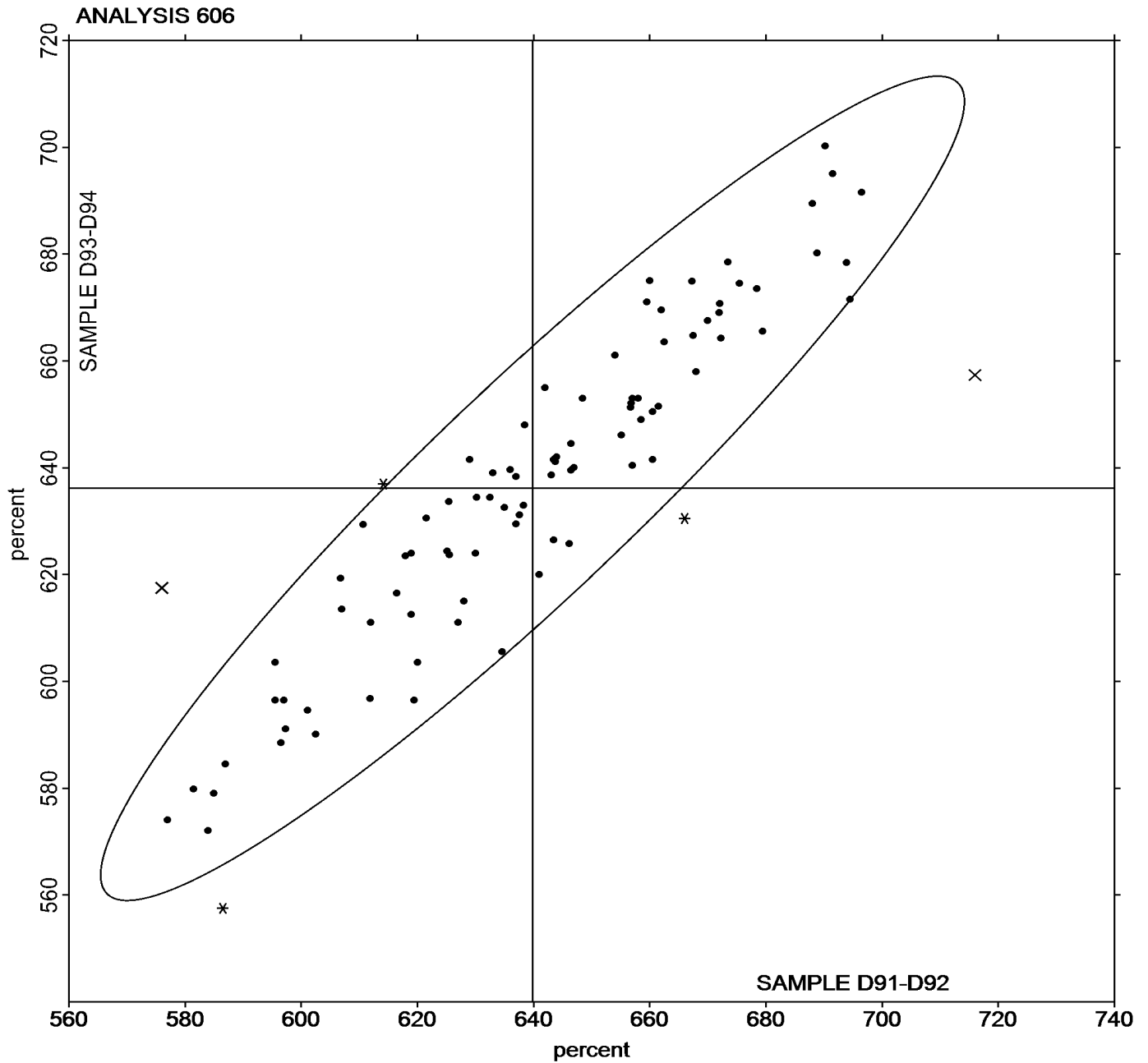


Rubber Interlaboratory Testing Program
Analysis 606
Ultimate Elongation (percent)

Report #202
4th Qtr 2019

Grand Mean Sample D91-D92 = 639.81 percent

Grand Mean Sample D93-D94 = 636.15 percent





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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|--------|----------------|----------------------|--------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 879.0 | 30.5 | 0.43 | 883.0 | 31.5 | 0.41 |
| 2374MJ | | 860.0 | 11.5 | 0.16 | 888.5 | 37.0 | 0.49 |
| 2UC46K | X | 17,812.2 | 16,963.6 | 239.48 | 13,029.1 | 12,177.6 | 160.26 |
| 2XD3MQ | | 881.8 | 33.3 | 0.47 | 910.8 | 59.3 | 0.78 |
| 38DC8L | | 1,010.0 | 161.5 | 2.28 | 1,007.5 | 156.0 | 2.05 |
| 394BLJ | X | 197.6 | -650.9 | -9.19 | 196.9 | -654.7 | -8.62 |
| 3HVXBU | | 881.5 | 33.0 | 0.47 | 912.0 | 60.5 | 0.80 |
| 3NHJLM | | 952.8 | 104.2 | 1.47 | 918.7 | 67.2 | 0.88 |
| 3ZTYKF | * | 1,052.1 | 203.6 | 2.87 | 1,045.8 | 194.3 | 2.56 |
| 43UVD3 | | 742.0 | -106.5 | -1.50 | 773.0 | -78.5 | -1.03 |
| 4DCZFC | | 836.5 | -12.0 | -0.17 | 790.0 | -61.5 | -0.81 |
| 4H7X64 | | 920.2 | 71.7 | 1.01 | 937.7 | 86.2 | 1.13 |
| 4LPNYZ | | 692.6 | -156.0 | -2.20 | 670.8 | -180.7 | -2.38 |
| 6A9RN8 | | 911.0 | 62.5 | 0.88 | 948.0 | 96.5 | 1.27 |
| 6QHFZM | | 789.6 | -58.9 | -0.83 | 770.8 | -80.7 | -1.06 |
| 76XWLJ | | 866.5 | 18.0 | 0.25 | 896.0 | 44.5 | 0.59 |
| 7BZ32L | | 976.7 | 128.1 | 1.81 | 946.4 | 94.9 | 1.25 |
| 7W4N2R | X | 347.0 | -501.5 | -7.08 | 372.5 | -479.0 | -6.30 |
| 8AHDBE | | 823.1 | -25.4 | -0.36 | 781.8 | -69.8 | -0.92 |
| 8C9EG3 | | 875.5 | 27.0 | 0.38 | 875.5 | 24.0 | 0.32 |
| 8CV4KH | | 892.0 | 43.5 | 0.61 | 883.0 | 31.5 | 0.41 |
| 8N3V74 | | 780.1 | -68.4 | -0.97 | 748.8 | -102.8 | -1.35 |
| 8ZX6QR | X | 1,018.5 | 169.9 | 2.40 | 937.8 | 86.2 | 1.13 |
| 9ECPQB | | 693.3 | -155.3 | -2.19 | 699.8 | -151.7 | -2.00 |
| 9M7UJC | | 823.0 | -25.5 | -0.36 | 811.0 | -40.5 | -0.53 |
| 9MPGHU | | 828.3 | -20.3 | -0.29 | 826.5 | -25.0 | -0.33 |
| 9NK6WJ | | 873.4 | 24.8 | 0.35 | 871.0 | 19.5 | 0.26 |
| 9UNMZW | | 836.9 | -11.7 | -0.16 | 894.9 | 43.4 | 0.57 |
| 9VG46J | | 772.3 | -76.2 | -1.08 | 802.1 | -49.5 | -0.65 |
| 9XLPWQ | | 736.5 | -112.0 | -1.58 | 705.5 | -146.0 | -1.92 |
| AM2V39 | | 755.7 | -92.9 | -1.31 | 786.1 | -65.4 | -0.86 |
| AXKBM3 | | 791.3 | -57.3 | -0.81 | 802.2 | -49.4 | -0.65 |
| AYCB4L | | 816.0 | -32.5 | -0.46 | 854.5 | 3.0 | 0.04 |
| AYGB4 | | 704.2 | -144.4 | -2.04 | 703.4 | -148.1 | -1.95 |
| B8QEUL | | 867.0 | 18.5 | 0.26 | 846.5 | -5.0 | -0.07 |
| BXX4G6 | | 915.0 | 66.5 | 0.94 | 926.0 | 74.5 | 0.98 |
| C3M8J8 | | 899.5 | 51.0 | 0.72 | 885.5 | 34.0 | 0.45 |



Rubber Interlaboratory Testing Program

Report #202

Analysis 607

4th Qtr 2019

Stress at 300% Elongation (psi)

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| CHYHC2 | | 817.7 | -30.8 | -0.44 | 823.1 | -28.5 | -0.37 |
| CMV68B | | 823.0 | -25.5 | -0.36 | 835.5 | -16.0 | -0.21 |
| D4YYEA | | 856.0 | 7.5 | 0.11 | 798.5 | -53.0 | -0.70 |
| DKHWDF | * | 802.5 | -46.0 | -0.65 | 895.0 | 43.5 | 0.57 |
| DUABGM | | 834.0 | -14.5 | -0.21 | 852.5 | 1.0 | 0.01 |
| DXEYZH | | 821.0 | -27.5 | -0.39 | 817.5 | -34.0 | -0.45 |
| E4VRPM | | 817.3 | -31.2 | -0.44 | 840.5 | -11.0 | -0.14 |
| EGH9AE | * | 770.2 | -78.4 | -1.11 | 855.7 | 4.2 | 0.06 |
| EX8BWA | | 864.0 | 15.5 | 0.22 | 862.0 | 10.5 | 0.14 |
| EZVJKD | | 826.7 | -21.8 | -0.31 | 818.0 | -33.5 | -0.44 |
| F2KF44 | | 782.5 | -66.0 | -0.93 | 807.5 | -44.0 | -0.58 |
| FDKFFA | X | 1,024.5 | 176.0 | 2.48 | 912.0 | 60.5 | 0.80 |
| FF6V83 | | 854.8 | 6.2 | 0.09 | 913.0 | 61.5 | 0.81 |
| G6Y78D | | 796.4 | -52.1 | -0.74 | 850.9 | -0.7 | -0.01 |
| GLLQMX | | 872.0 | 23.4 | 0.33 | 849.3 | -2.2 | -0.03 |
| GWP4LC | | 817.0 | -31.5 | -0.45 | 799.9 | -51.6 | -0.68 |
| H38THR | | 772.5 | -76.0 | -1.07 | 772.0 | -79.5 | -1.05 |
| HR84Y6 | | 871.2 | 22.7 | 0.32 | 903.9 | 52.4 | 0.69 |
| HV6KEK | * | 1,031.2 | 182.7 | 2.58 | 1,077.6 | 226.1 | 2.98 |
| HXB646 | | 937.5 | 89.0 | 1.26 | 907.0 | 55.5 | 0.73 |
| JEUDHE | | 873.2 | 24.6 | 0.35 | 869.5 | 18.0 | 0.24 |
| JFQX6E | | 879.0 | 30.5 | 0.43 | 911.0 | 59.5 | 0.78 |
| JY8Z79 | | 904.5 | 56.0 | 0.79 | 887.0 | 35.5 | 0.47 |
| K6M3MA | | 868.3 | 19.8 | 0.28 | 897.4 | 45.8 | 0.60 |
| KX82MZ | | 884.5 | 36.0 | 0.51 | 868.0 | 16.5 | 0.22 |
| KYWTCB | | 763.5 | -85.0 | -1.20 | 740.0 | -111.5 | -1.47 |
| LJZVNK | | 884.7 | 36.2 | 0.51 | 913.7 | 62.2 | 0.82 |
| LLQWT9 | X | 1,180.8 | 332.3 | 4.69 | 1,190.4 | 338.9 | 4.46 |
| LWDU22 | | 743.0 | -105.5 | -1.49 | 723.5 | -128.0 | -1.68 |
| LXNVMZ | | 898.0 | 49.5 | 0.70 | 913.0 | 61.5 | 0.81 |
| MCHLX4 | | 928.5 | 80.0 | 1.13 | 950.5 | 99.0 | 1.30 |
| MGAW82 | | 816.0 | -32.5 | -0.46 | 795.0 | -56.5 | -0.74 |
| MNRDLW | | 853.7 | 5.1 | 0.07 | 870.6 | 19.0 | 0.25 |
| NJWQN3 | | 826.0 | -22.5 | -0.32 | 856.0 | 4.5 | 0.06 |
| NUVJYE | | 819.0 | -29.6 | -0.42 | 856.5 | 4.9 | 0.07 |
| P3J2N8 | X | 1,251.1 | 402.6 | 5.68 | 1,247.6 | 396.1 | 5.21 |
| PBEWQC | | 749.0 | -99.5 | -1.41 | 735.5 | -116.0 | -1.53 |
| PRJ9DV | | 840.5 | -8.0 | -0.11 | 859.4 | 7.8 | 0.10 |



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| QPGMAV | | 883.9 | 35.4 | 0.50 | 863.7 | 12.2 | 0.16 |
| QRF4FX | | 784.8 | -63.8 | -0.90 | 789.5 | -62.0 | -0.82 |
| QRLF29 | | 852.9 | 4.4 | 0.06 | 854.2 | 2.7 | 0.04 |
| R3CDJX | | 878.2 | 29.7 | 0.42 | 865.9 | 14.4 | 0.19 |
| RF33J4 | | 924.5 | 76.0 | 1.07 | 952.5 | 101.0 | 1.33 |
| RLNBMU | | 867.0 | 18.5 | 0.26 | 843.5 | -8.0 | -0.11 |
| RUMLET | | 820.5 | -28.0 | -0.40 | 793.0 | -58.5 | -0.77 |
| T3BRQQ | | 759.5 | -89.0 | -1.26 | 762.0 | -89.5 | -1.18 |
| TB49WM | | 899.6 | 51.0 | 0.72 | 887.5 | 36.0 | 0.47 |
| TCGXZY | | 869.8 | 21.2 | 0.30 | 868.3 | 16.7 | 0.22 |
| TRU9Q8 | | 885.8 | 37.3 | 0.53 | 824.9 | -26.6 | -0.35 |
| UTFHBT | | 862.2 | 13.7 | 0.19 | 823.8 | -27.7 | -0.36 |
| UUY2HK | | 852.8 | 4.3 | 0.06 | 821.6 | -29.9 | -0.39 |
| UZ34ML | | 943.0 | 94.5 | 1.33 | 947.5 | 96.0 | 1.26 |
| VHHWNL | | 974.9 | 126.3 | 1.78 | 1,000.1 | 148.6 | 1.96 |
| W28CLW | | 918.7 | 70.2 | 0.99 | 875.9 | 24.4 | 0.32 |
| W6PW8C | | 834.0 | -14.6 | -0.21 | 851.4 | -0.1 | 0.00 |
| XPQ8R6 | | 910.1 | 61.6 | 0.87 | 906.5 | 55.0 | 0.72 |
| Y8PHGU | | 804.2 | -44.3 | -0.63 | 778.1 | -73.4 | -0.97 |
| YQFVPQ | | 711.4 | -137.2 | -1.94 | 694.5 | -157.1 | -2.07 |

| Summary Statistics | | | |
|---|------------|------------|--|
| Grand Means | 848.54 psi | 851.52 psi | |
| Std Dev Btwn Labs | 70.83 psi | 75.99 psi | |
| Statistics based on 88 of 95 reporting participants | | | |

| Summary Statistics in SI Units | | | |
|---|------------|----------|--|
| Grand Means | 5.8505 MPa | 5.87 MPa | |
| Std Dev Btwn Labs | 0.4884 MPa | 0.52 MPa | |
| Statistics based on 88 of 95 reporting participants | | | |

Samples D91-D92: Polyisoprene compound, batch #1 & D93-D94: Polyisoprene compound, batch #2



Comments on Assigned Data Flags for Test #607

2UC46K (X) - Extreme Data.

394BLJ (X) - Extreme Data.

7W4N2R (X) - Extreme data.

8ZX6QR (X) - Inconsistent in testing between samples.

FDKFA (X) - Inconsistent in testing between samples.

LLQWT9 (X) - Data for all samples are high. Possible Systematic Error. Inconsistent within the determinations of sample group D93-D94.

P3J2N8 (X) - Data for all samples are high. Possible Systematic Error.

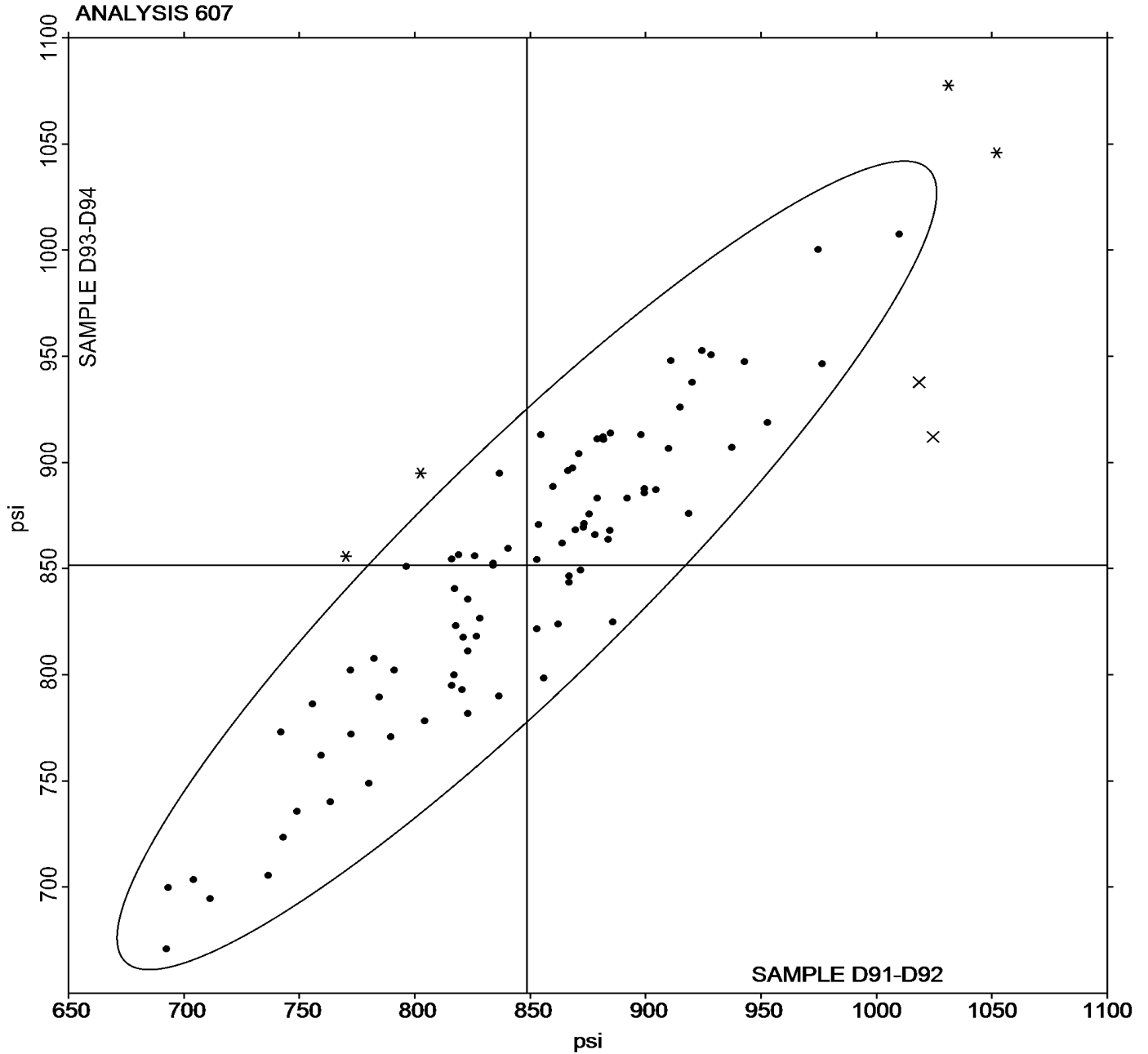


Rubber Interlaboratory Testing Program
Analysis 607
Stress at 300% Elongation (psi)

Report #202
4th Qtr 2019

Grand Mean Sample **D91-D92** = 848.54 psi

Grand Mean Sample **D93-D94** = 851.52 psi





Rubber Interlaboratory Testing Program

Report #202

Analysis 608

4th Qtr 2019

Stress at 100% Elongation (psi)

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|--------|----------------|----------------------|--------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 196.0 | 3.2 | 0.30 | 200.5 | 8.1 | 0.68 |
| 2374MJ | | 198.0 | 5.2 | 0.48 | 203.5 | 11.1 | 0.94 |
| 2UC46K | X | 4,371.8 | 4,178.9 | 392.76 | 3,781.0 | 3,588.6 | 303.86 |
| 2XD3MQ | | 202.3 | 9.5 | 0.89 | 203.1 | 10.6 | 0.90 |
| 38DC8L | | 196.5 | 3.7 | 0.34 | 192.5 | 0.1 | 0.01 |
| 394BLJ | X | 893.2 | 700.3 | 65.82 | 875.0 | 682.6 | 57.80 |
| 3HVXBU | | 184.5 | -8.3 | -0.78 | 189.5 | -2.9 | -0.25 |
| 3NHJLM | | 203.4 | 10.5 | 0.99 | 197.3 | 4.9 | 0.41 |
| 3ZTYKF | | 212.4 | 19.5 | 1.83 | 215.8 | 23.4 | 1.98 |
| 43UVD3 | | 176.5 | -16.3 | -1.54 | 182.5 | -9.9 | -0.84 |
| 4DCZFC | | 186.2 | -6.6 | -0.62 | 178.8 | -13.6 | -1.15 |
| 4H7X64 | | 206.9 | 14.1 | 1.33 | 211.6 | 19.2 | 1.62 |
| 4LPNYZ | | 178.4 | -14.4 | -1.36 | 174.0 | -18.4 | -1.56 |
| 6A9RN8 | * | 213.5 | 20.7 | 1.94 | 225.5 | 33.1 | 2.80 |
| 6QHfZM | | 177.8 | -15.0 | -1.41 | 174.8 | -17.6 | -1.49 |
| 76XWLJ | | 189.5 | -3.3 | -0.31 | 193.0 | 0.6 | 0.05 |
| 7BZ32L | | 218.4 | 25.6 | 2.40 | 214.0 | 21.5 | 1.82 |
| 7W4N2R | X | 91.5 | -101.3 | -9.52 | 97.5 | -94.9 | -8.04 |
| 8AHDBE | | 184.2 | -8.6 | -0.81 | 178.4 | -14.0 | -1.19 |
| 8C9EG3 | | 195.5 | 2.7 | 0.25 | 196.5 | 4.1 | 0.35 |
| 8CV4KH | | 197.5 | 4.7 | 0.44 | 197.5 | 5.1 | 0.43 |
| 8N3V74 | | 188.9 | -4.0 | -0.38 | 183.4 | -9.1 | -0.77 |
| 8ZX6QR | * | 214.3 | 21.5 | 2.02 | 202.1 | 9.7 | 0.82 |
| 9ECPQB | | 173.3 | -19.5 | -1.83 | 176.2 | -16.2 | -1.37 |
| 9M7UJC | | 185.0 | -7.8 | -0.74 | 184.5 | -7.9 | -0.67 |
| 9MPGHU | | 191.8 | -1.1 | -0.10 | 191.5 | -0.9 | -0.08 |
| 9NK6WJ | | 195.4 | 2.6 | 0.24 | 201.9 | 9.5 | 0.80 |
| 9UNMZW | | 191.5 | -1.4 | -0.13 | 200.9 | 8.5 | 0.72 |
| 9VG46J | | 180.6 | -12.3 | -1.15 | 182.0 | -10.4 | -0.88 |
| 9XLPWQ | | 179.5 | -13.3 | -1.25 | 173.0 | -19.4 | -1.64 |
| AM2V39 | | 181.3 | -11.5 | -1.08 | 188.6 | -3.9 | -0.33 |
| AXKBM3 | | 179.3 | -13.5 | -1.27 | 183.9 | -8.5 | -0.72 |
| AYCB4L | X | 161.0 | -31.8 | -2.99 | 173.5 | -18.9 | -1.60 |
| AYGB4 | | 180.6 | -12.3 | -1.15 | 178.4 | -14.0 | -1.19 |
| B8QEUL | | 191.5 | -1.3 | -0.13 | 191.5 | -0.9 | -0.08 |
| BXX4G6 | | 202.0 | 9.2 | 0.86 | 201.5 | 9.1 | 0.77 |
| C3M8J8 | | 199.8 | 7.0 | 0.66 | 199.3 | 6.8 | 0.58 |



Rubber Interlaboratory Testing Program

Report #202

Analysis 608

4th Qtr 2019

Stress at 100% Elongation (psi)

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| CHYHC2 | | 192.7 | -0.1 | -0.01 | 186.0 | -6.5 | -0.55 |
| CMV68B | | 199.0 | 6.2 | 0.58 | 196.5 | 4.1 | 0.35 |
| D4YYEA | | 191.5 | -1.3 | -0.13 | 177.0 | -15.4 | -1.31 |
| DKHWDF | | 187.5 | -5.3 | -0.50 | 201.5 | 9.1 | 0.77 |
| DUABGM | | 197.5 | 4.7 | 0.44 | 199.5 | 7.1 | 0.60 |
| DXEYZH | | 188.5 | -4.3 | -0.41 | 187.5 | -4.9 | -0.42 |
| E4VRPM | | 180.6 | -12.3 | -1.15 | 184.9 | -7.5 | -0.63 |
| EGH9AE | X | 184.9 | -7.9 | -0.74 | 210.3 | 17.9 | 1.51 |
| EWCNHK | | 198.5 | 5.7 | 0.53 | 203.0 | 10.6 | 0.90 |
| EX8BWA | | 192.5 | -0.3 | -0.03 | 193.0 | 0.6 | 0.05 |
| EZVJKD | | 189.3 | -3.6 | -0.34 | 186.4 | -6.0 | -0.51 |
| F2KF44 | | 189.5 | -3.3 | -0.31 | 192.0 | -0.4 | -0.04 |
| FDKFFA | * | 215.0 | 22.2 | 2.08 | 203.0 | 10.6 | 0.90 |
| FF6V83 | | 189.6 | -3.3 | -0.31 | 186.4 | -6.1 | -0.51 |
| G6Y78D | X | 157.2 | -35.6 | -3.35 | 164.6 | -27.9 | -2.36 |
| GLLQMX | | 199.1 | 6.2 | 0.58 | 191.6 | -0.8 | -0.07 |
| GWP4LC | | 181.3 | -11.6 | -1.09 | 176.9 | -15.5 | -1.32 |
| H38THR | | 178.0 | -14.8 | -1.39 | 177.0 | -15.4 | -1.31 |
| HR84Y6 | | 187.6 | -5.2 | -0.49 | 189.0 | -3.4 | -0.29 |
| HV6KEK | * | 215.4 | 22.5 | 2.12 | 224.1 | 31.7 | 2.68 |
| HXB646 | X | 240.5 | 47.7 | 4.48 | 230.5 | 38.1 | 3.22 |
| JEUDHE | | 197.0 | 4.2 | 0.39 | 198.2 | 5.8 | 0.49 |
| JFQX6E | | 191.5 | -1.3 | -0.13 | 193.5 | 1.1 | 0.09 |
| JY8Z79 | | 185.0 | -7.8 | -0.74 | 188.0 | -4.4 | -0.37 |
| K6M3MA | | 199.7 | 6.8 | 0.64 | 201.9 | 9.5 | 0.80 |
| KX82MZ | | 201.0 | 8.2 | 0.77 | 195.0 | 2.6 | 0.22 |
| KYWTCB | | 175.5 | -17.3 | -1.63 | 172.0 | -20.4 | -1.73 |
| LJZVNK | | 203.1 | 10.2 | 0.96 | 210.3 | 17.9 | 1.51 |
| LLQWT9 | X | 266.5 | 73.6 | 6.92 | 289.9 | 97.5 | 8.26 |
| LWDU22 | | 175.0 | -17.8 | -1.68 | 182.0 | -10.4 | -0.88 |
| LXNVMZ | | 204.5 | 11.7 | 1.10 | 204.5 | 12.1 | 1.02 |
| MCHLX4 | | 204.0 | 11.2 | 1.05 | 211.0 | 18.6 | 1.57 |
| MGAW82 | | 190.5 | -2.3 | -0.22 | 188.0 | -4.4 | -0.37 |
| MNRDLW | | 187.5 | -5.4 | -0.51 | 192.6 | 0.1 | 0.01 |
| NJWQN3 | | 191.0 | -1.8 | -0.17 | 197.5 | 5.1 | 0.43 |
| NUVJYE | | 190.4 | -2.4 | -0.23 | 199.0 | 6.6 | 0.56 |
| P3J2N8 | X | 265.4 | 72.5 | 6.82 | 281.4 | 89.0 | 7.53 |
| PBEWQC | | 182.0 | -10.8 | -1.02 | 182.5 | -9.9 | -0.84 |



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| PRJ9DV | | 184.9 | -7.9 | -0.74 | 187.1 | -5.3 | -0.45 |
| QPGMAV | | 203.0 | 10.1 | 0.95 | 195.9 | 3.5 | 0.30 |
| QRF4FX | | 180.9 | -11.9 | -1.12 | 184.9 | -7.5 | -0.64 |
| QRLF29 | | 193.8 | 1.0 | 0.09 | 192.5 | 0.0 | 0.00 |
| R3CDJX | | 191.5 | -1.4 | -0.13 | 191.5 | -1.0 | -0.08 |
| RF33J4 | X | 224.5 | 31.7 | 2.98 | 236.5 | 44.1 | 3.73 |
| RLNBMU | | 197.5 | 4.7 | 0.44 | 188.5 | -3.9 | -0.33 |
| RUMLET | * | 191.5 | -1.3 | -0.13 | 175.0 | -17.4 | -1.48 |
| T3BRQQ | | 178.5 | -14.3 | -1.35 | 181.5 | -10.9 | -0.92 |
| TB49WM | | 206.5 | 13.6 | 1.28 | 202.1 | 9.6 | 0.82 |
| TCGXZY | | 195.3 | 2.4 | 0.23 | 190.7 | -1.7 | -0.14 |
| TRU9Q8 | | 179.8 | -13.0 | -1.22 | 171.1 | -21.3 | -1.80 |
| UTFHBT | | 197.8 | 4.9 | 0.46 | 190.2 | -2.2 | -0.19 |
| UUY2HK | | 198.0 | 5.1 | 0.48 | 192.9 | 0.5 | 0.04 |
| UZ34ML | | 191.0 | -1.8 | -0.17 | 188.0 | -4.4 | -0.37 |
| VHHWNL | | 208.4 | 15.6 | 1.47 | 212.5 | 20.1 | 1.70 |
| W28CLW | | 205.2 | 12.4 | 1.16 | 198.4 | 6.0 | 0.51 |
| W6PW8C | | 203.8 | 10.9 | 1.03 | 204.5 | 12.1 | 1.02 |
| XPQ8R6 | | 206.7 | 13.8 | 1.30 | 206.7 | 14.3 | 1.21 |
| Y8PHGU | | 185.6 | -7.2 | -0.68 | 181.3 | -11.1 | -0.94 |
| YQFVPQ | | 181.7 | -11.1 | -1.05 | 174.6 | -17.9 | -1.51 |

| Summary Statistics | | | |
|---|------------|------------|--|
| Grand Means | 192.84 psi | 192.42 psi | |
| Std Dev Btwn Labs | 10.64 psi | 11.81 psi | |
| Statistics based on 86 of 96 reporting participants | | | |

| Summary Statistics in SI Units | | | |
|---|------------|----------|--|
| Grand Means | 1.3296 MPa | 1.33 MPa | |
| Std Dev Btwn Labs | 0.0734 MPa | 0.08 MPa | |
| Statistics based on 86 of 96 reporting participants | | | |

Samples D91-D92: Polyisoprene compound, batch #1 & D93-D94: Polyisoprene compound, batch #2



Comments on Assigned Data Flags for Test #608

2UC46K (X) - Extreme Data.

394BLJ (X) - Extreme Data.

7W4N2R (X) - Extreme Data.

AYCB4L (X) - Data for sample group D91-D92 are low.

EGH9AE (X) - Inconsistent in testing between samples.

G6Y78D (X) - Data for sample group D91-D92 are low.

HXB646 (X) - Data for all samples are high. Possible Systematic Error.

LLQWT9 (X) - Data for all samples are high. Possible Systematic Error. Inconsistent within the determinations of sample group D93-D94.

P3J2N8 (X) - Data for all samples are high. Possible Systematic Error. Inconsistent within the determinations of both sample groups.

RF33J4 (X) - Data for all samples are high. Possible Systematic Error.



Rubber Interlaboratory Testing Program

Analysis 608

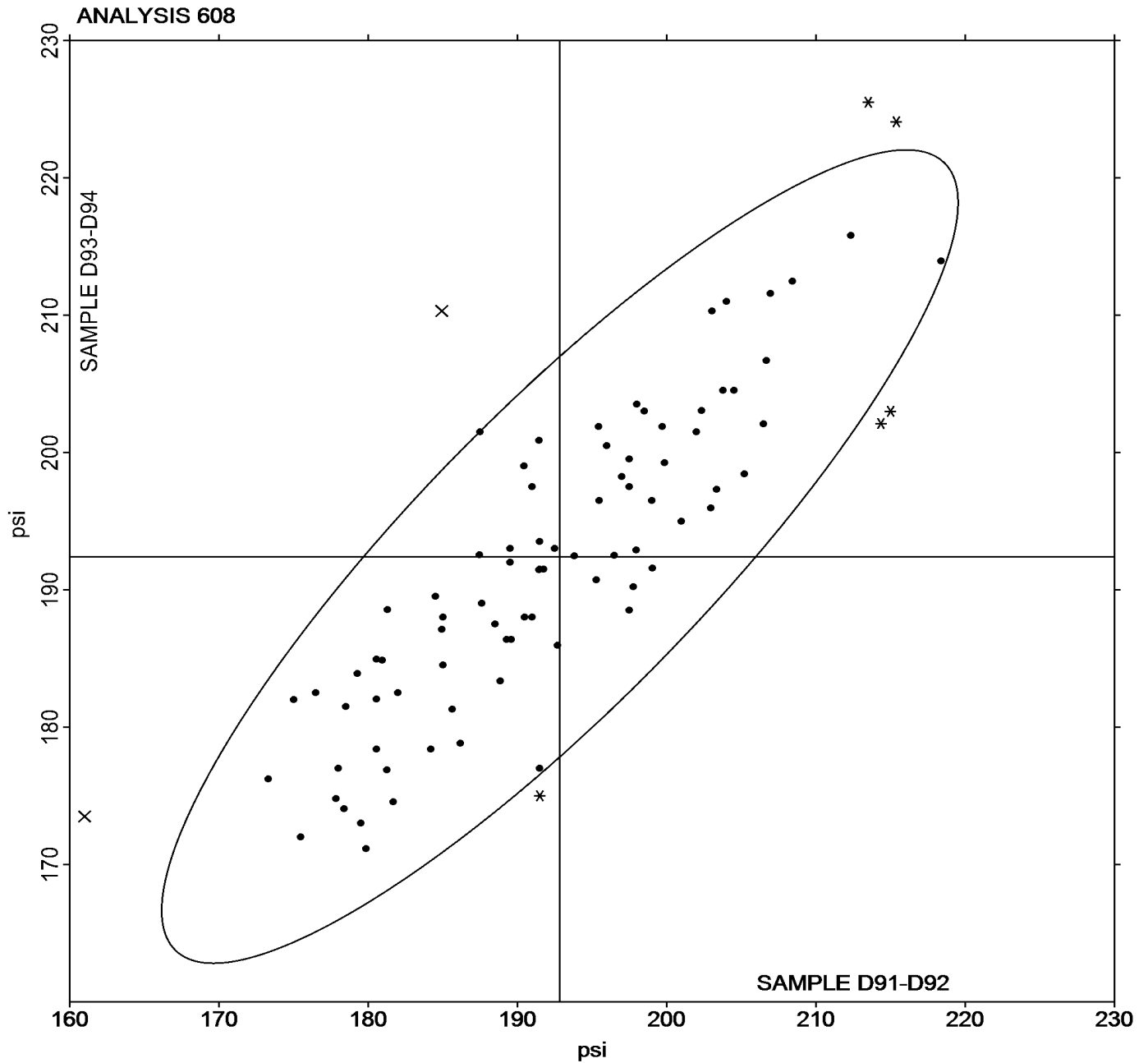
Stress at 100% Elongation (psi)

Report #202

4th Qtr 2019

Grand Mean Sample **D91-D92** = 192.84 psi

Grand Mean Sample **D93-D94** = 192.42 psi





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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 232R29 | | 47.00 | -0.89 | -0.57 | 47.50 | -0.42 | -0.27 | BT |
| 2374MJ | | 48.60 | 0.71 | 0.45 | 48.50 | 0.58 | 0.38 | BT |
| 2UC46K | | 46.50 | -1.39 | -0.89 | 46.75 | -1.17 | -0.76 | BT |
| 2XD3MQ | | 45.15 | -2.74 | -1.75 | 45.95 | -1.97 | -1.28 | BT |
| 38DC8L | | 45.00 | -2.89 | -1.85 | 45.50 | -2.42 | -1.57 | BT |
| 394BLJ | | 49.95 | 2.06 | 1.31 | 49.50 | 1.58 | 1.02 | BT |
| 3HVXBU | | 47.50 | -0.39 | -0.25 | 47.00 | -0.92 | -0.60 | BT |
| 3NHJLM | | 48.35 | 0.46 | 0.29 | 48.75 | 0.83 | 0.54 | BT |
| 3ZTYKF | | 48.50 | 0.61 | 0.39 | 47.75 | -0.17 | -0.11 | HH |
| 43UVD3 | | 47.65 | -0.24 | -0.16 | 47.80 | -0.12 | -0.08 | BT |
| 4DCZFC | | 47.50 | -0.39 | -0.25 | 47.00 | -0.92 | -0.60 | BT |
| 4H7X64 | | 49.50 | 1.61 | 1.03 | 50.25 | 2.33 | 1.51 | BT |
| 4LPNYZ | | 48.00 | 0.11 | 0.07 | 48.00 | 0.08 | 0.05 | BT |
| 6A9RN8 | | 47.20 | -0.69 | -0.44 | 46.85 | -1.07 | -0.69 | BT |
| 6QHFZM | | 48.25 | 0.36 | 0.23 | 48.25 | 0.33 | 0.21 | BT |
| 6QJ4MT | | 49.50 | 1.61 | 1.03 | 49.50 | 1.58 | 1.02 | HH |
| 76XWLJ | | 45.50 | -2.39 | -1.53 | 46.50 | -1.42 | -0.92 | BT |
| 7BZ32L | | 48.10 | 0.21 | 0.13 | 47.80 | -0.12 | -0.08 | XX |
| 7W4N2R | | 46.00 | -1.89 | -1.21 | 47.00 | -0.92 | -0.60 | BT |
| 8AHDBE | | 47.80 | -0.09 | -0.06 | 47.30 | -0.62 | -0.40 | BT |
| 8C9EG3 | | 48.65 | 0.76 | 0.48 | 48.70 | 0.78 | 0.51 | BT |
| 8CV4KH | | 46.50 | -1.39 | -0.89 | 46.50 | -1.42 | -0.92 | BT |
| 8N3V74 | | 49.00 | 1.11 | 0.71 | 48.60 | 0.68 | 0.44 | BT |
| 8ZX6QR | | 48.00 | 0.11 | 0.07 | 48.00 | 0.08 | 0.05 | HH |
| 9ECPQB | | 47.30 | -0.59 | -0.38 | 47.40 | -0.52 | -0.34 | BT |
| 9M7UJC | | 47.70 | -0.19 | -0.12 | 47.85 | -0.07 | -0.05 | BT |
| 9MPGHU | | 49.00 | 1.11 | 0.71 | 49.00 | 1.08 | 0.70 | HH |
| 9NK6WJ | | 48.00 | 0.11 | 0.07 | 48.50 | 0.58 | 0.38 | BT |
| 9UNMZW | | 47.50 | -0.39 | -0.25 | 47.25 | -0.67 | -0.43 | BT |
| 9VG46J | | 47.80 | -0.09 | -0.06 | 47.80 | -0.12 | -0.08 | BT |
| 9XLPWQ | | 48.25 | 0.36 | 0.23 | 48.05 | 0.13 | 0.08 | BT |
| AJYYBT | | 45.00 | -2.89 | -1.85 | 44.50 | -3.42 | -2.22 | BT |
| AM2V39 | | 47.50 | -0.39 | -0.25 | 48.00 | 0.08 | 0.05 | BT |
| AXKBM3 | * | 44.00 | -3.89 | -2.48 | 45.00 | -2.92 | -1.89 | BT |
| AYCB4L | | 47.50 | -0.39 | -0.25 | 48.50 | 0.58 | 0.38 | BT |
| AYEGB4 | | 49.95 | 2.06 | 1.31 | 50.05 | 2.13 | 1.38 | BT |
| B8QEUL | | 46.20 | -1.69 | -1.08 | 46.25 | -1.67 | -1.08 | BT |
| BXX4G6 | | 49.00 | 1.11 | 0.71 | 49.50 | 1.58 | 1.02 | HH |



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| C3M8J8 | | 47.50 | -0.39 | -0.25 | 48.00 | 0.08 | 0.05 | HH |
| CHYHC2 | | 48.10 | 0.21 | 0.13 | 47.20 | -0.72 | -0.47 | BT |
| CMV68B | | 48.00 | 0.11 | 0.07 | 48.35 | 0.43 | 0.28 | BT |
| CPZXYN | | 48.00 | 0.11 | 0.07 | 48.00 | 0.08 | 0.05 | XX |
| D4YYEA | | 48.00 | 0.11 | 0.07 | 47.00 | -0.92 | -0.60 | BT |
| D6UMTY | | 47.55 | -0.34 | -0.22 | 47.45 | -0.47 | -0.30 | BT |
| DAPDYB | X | 42.50 | -5.39 | -3.44 | 42.00 | -5.92 | -3.83 | BT |
| DPJT8G | | 47.50 | -0.39 | -0.25 | 47.00 | -0.92 | -0.60 | BT |
| DUABGM | | 50.45 | 2.56 | 1.63 | 49.60 | 1.68 | 1.09 | XX |
| DXEYZH | | 46.50 | -1.39 | -0.89 | 46.00 | -1.92 | -1.24 | BT |
| E4VRPM | | 48.65 | 0.76 | 0.48 | 48.30 | 0.38 | 0.25 | BT |
| EGH9AE | | 47.50 | -0.39 | -0.25 | 47.50 | -0.42 | -0.27 | BT |
| EWCNHK | | 48.00 | 0.11 | 0.07 | 48.00 | 0.08 | 0.05 | BT |
| EX8BWA | | 47.00 | -0.89 | -0.57 | 47.00 | -0.92 | -0.60 | BT |
| EZVJKD | | 48.50 | 0.61 | 0.39 | 49.50 | 1.58 | 1.02 | HH |
| F2KF44 | | 49.00 | 1.11 | 0.71 | 49.00 | 1.08 | 0.70 | HH |
| FDKFFA | | 50.00 | 2.11 | 1.34 | 50.00 | 2.08 | 1.35 | HH |
| FF6V83 | | 45.50 | -2.39 | -1.53 | 45.50 | -2.42 | -1.57 | HH |
| FX2LZB | | 46.50 | -1.39 | -0.89 | 46.50 | -1.42 | -0.92 | HH |
| G6Y78D | | 45.00 | -2.89 | -1.85 | 45.50 | -2.42 | -1.57 | BT |
| GLLQMX | | 49.95 | 2.06 | 1.31 | 49.40 | 1.48 | 0.96 | BT |
| GWP4LC | | 46.35 | -1.54 | -0.98 | 46.10 | -1.82 | -1.18 | BT |
| H38THR | | 51.00 | 3.11 | 1.98 | 51.00 | 3.08 | 2.00 | HH |
| HR84Y6 | | 47.10 | -0.79 | -0.51 | 47.05 | -0.87 | -0.56 | BT |
| HV6KEK | | 48.50 | 0.61 | 0.39 | 48.00 | 0.08 | 0.05 | HH |
| HXB646 | | 50.00 | 2.11 | 1.34 | 50.50 | 2.58 | 1.67 | HH |
| JEUDHE | | 48.10 | 0.21 | 0.13 | 47.90 | -0.02 | -0.01 | BT |
| JFQX6E | | 46.05 | -1.84 | -1.18 | 46.45 | -1.47 | -0.95 | BT |
| JY8Z79 | | 45.50 | -2.39 | -1.53 | 45.50 | -2.42 | -1.57 | BT |
| K6M3MA | | 50.30 | 2.41 | 1.54 | 50.90 | 2.98 | 1.93 | BT |
| KF3U9X | | 45.50 | -2.39 | -1.53 | 45.50 | -2.42 | -1.57 | BT |
| KX82MZ | | 48.75 | 0.86 | 0.55 | 49.00 | 1.08 | 0.70 | HH |
| KYWTCB | | 47.50 | -0.39 | -0.25 | 48.00 | 0.08 | 0.05 | BT |
| LJZVNK | | 45.85 | -2.04 | -1.30 | 45.70 | -2.22 | -1.44 | BT |
| LLQWT9 | | 51.00 | 3.11 | 1.98 | 51.00 | 3.08 | 2.00 | HH |
| LWDU22 | | 48.95 | 1.06 | 0.67 | 49.05 | 1.13 | 0.73 | BT |
| LXNVMZ | X | 47.00 | -0.89 | -0.57 | 43.00 | -4.92 | -3.19 | BT |



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | | Instr Code |
|---------|-----------|----------------|----------------------|--------|----------------|----------------------|--------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| MCHLX4 | | 47.00 | -0.89 | -0.57 | 47.50 | -0.42 | -0.27 | BT |
| MGAW82 | | 47.00 | -0.89 | -0.57 | 47.00 | -0.92 | -0.60 | BT |
| MNRDLW | | 49.50 | 1.61 | 1.03 | 49.00 | 1.08 | 0.70 | HH |
| NJWQN3 | | 47.50 | -0.39 | -0.25 | 48.40 | 0.48 | 0.31 | BT |
| NUVJYE | | 46.00 | -1.89 | -1.21 | 45.95 | -1.97 | -1.28 | BT |
| P3J2N8 | | 51.00 | 3.11 | 1.98 | 51.00 | 3.08 | 2.00 | HH |
| PBEWQC | | 48.00 | 0.11 | 0.07 | 48.00 | 0.08 | 0.05 | BT |
| PRJ9DV | * | 47.05 | -0.84 | -0.54 | 45.75 | -2.17 | -1.41 | BT |
| QPGMAV | | 46.65 | -1.24 | -0.79 | 46.70 | -1.22 | -0.79 | BT |
| QRF4FX | | 44.50 | -3.39 | -2.17 | 45.00 | -2.92 | -1.89 | BT |
| QRLF29 | | 47.15 | -0.74 | -0.47 | 48.45 | 0.53 | 0.34 | BT |
| R3CDJX | | 46.25 | -1.64 | -1.05 | 46.50 | -1.42 | -0.92 | BT |
| RF33J4 | | 49.50 | 1.61 | 1.03 | 50.00 | 2.08 | 1.35 | BT |
| RLNBMU | X | 1.13 | -46.76 | -29.85 | 1.13 | -46.79 | -30.31 | HH |
| RUMLET | | 47.50 | -0.39 | -0.25 | 48.00 | 0.08 | 0.05 | HH |
| T3BRQQ | | 48.75 | 0.86 | 0.55 | 48.90 | 0.98 | 0.63 | BT |
| TB49WM | | 50.06 | 2.17 | 1.38 | 50.05 | 2.13 | 1.38 | BT |
| TCGXZY | | 48.55 | 0.66 | 0.42 | 48.40 | 0.48 | 0.31 | XX |
| TRU9Q8 | | 48.00 | 0.11 | 0.07 | 47.50 | -0.42 | -0.27 | BT |
| UTFHBT | | 47.50 | -0.39 | -0.25 | 47.00 | -0.92 | -0.60 | BT |
| UUY2HK | | 48.45 | 0.56 | 0.36 | 48.00 | 0.08 | 0.05 | BT |
| UZ34ML | | 50.25 | 2.36 | 1.50 | 49.50 | 1.58 | 1.02 | HH |
| VC9FE7 | | 47.50 | -0.39 | -0.25 | 47.50 | -0.42 | -0.27 | HH |
| VHHWNL | | 50.00 | 2.11 | 1.34 | 50.00 | 2.08 | 1.35 | BT |
| VYM43W | * | 45.00 | -2.89 | -1.85 | 44.00 | -3.92 | -2.54 | BT |
| W28CLW | | 50.55 | 2.66 | 1.70 | 50.15 | 2.23 | 1.44 | BT |
| W6PW8C | * | 48.00 | 0.11 | 0.07 | 49.50 | 1.58 | 1.02 | HH |
| X3WZJH | | 49.00 | 1.11 | 0.71 | 50.00 | 2.08 | 1.35 | BT |
| XJ3HDM | | 51.00 | 3.11 | 1.98 | 50.50 | 2.58 | 1.67 | HH |
| XPQ8R6 | | 50.00 | 2.11 | 1.34 | 49.00 | 1.08 | 0.70 | HH |
| Y8PHGU | | 49.00 | 1.11 | 0.71 | 49.00 | 1.08 | 0.70 | BT |
| YQFVPQ | | 47.50 | -0.39 | -0.25 | 47.00 | -0.92 | -0.60 | HH |
| ZMCEVU | | 49.00 | 1.11 | 0.71 | 49.00 | 1.08 | 0.70 | BT |

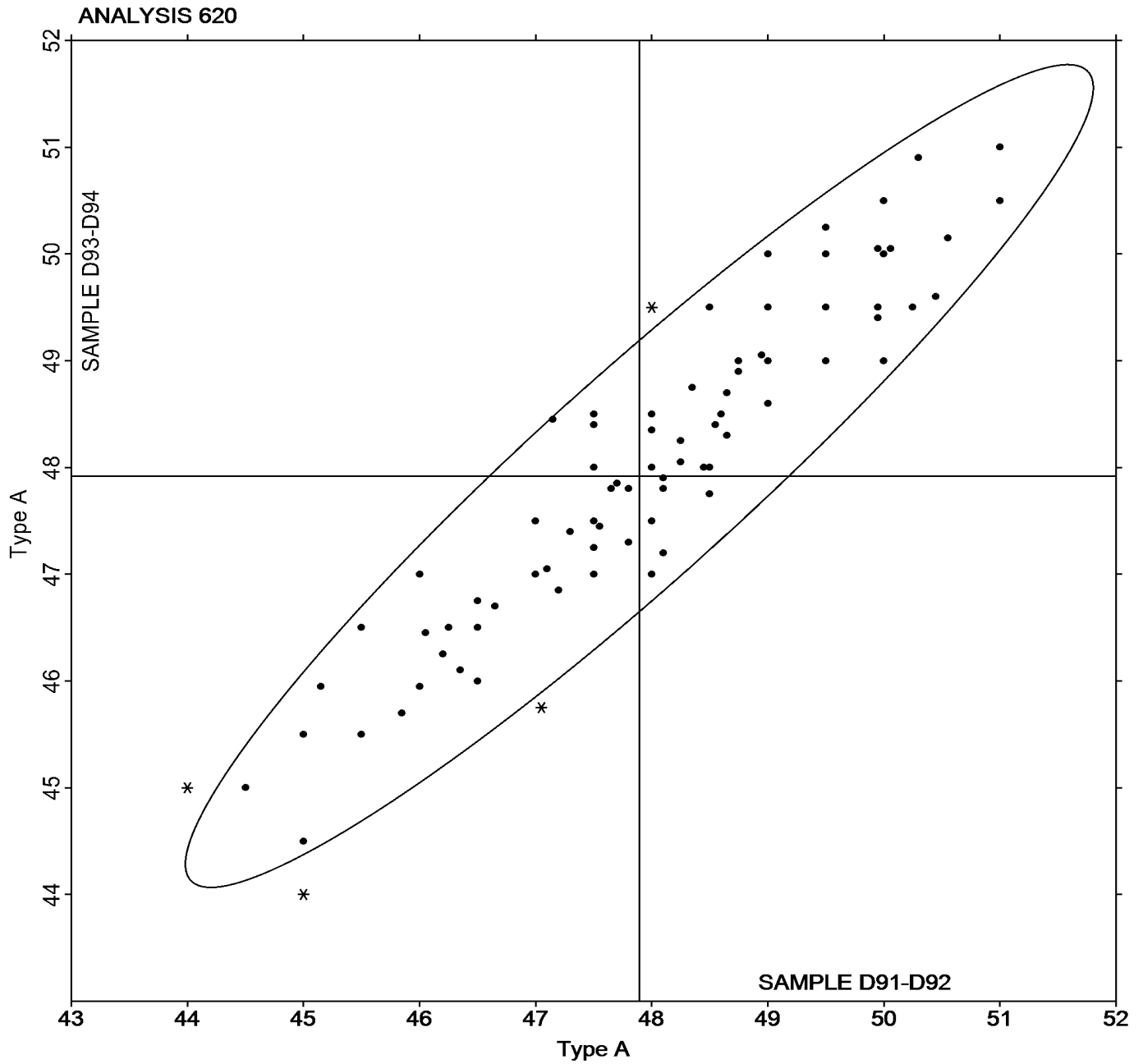


Rubber Interlaboratory Testing Program
Analysis 620
Hardness (Shore A/Type A)

Report #202
4th Qtr 2019

Grand Mean Sample **D91-D92** = 47.893 Type A

Grand Mean Sample **D93-D94** = 47.920 Type A





Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|----------|----------------|----------------------|----------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 1.134 | 0.001 | 0.32 | 1.135 | 0.002 | 0.61 |
| 2374MJ | | 1.138 | 0.005 | 1.71 | 1.138 | 0.005 | 1.62 |
| 2UC46K | | 1.136 | 0.003 | 0.91 | 1.138 | 0.004 | 1.44 |
| 2XD3MQ | | 1.133 | 0.000 | -0.03 | 1.132 | -0.001 | -0.37 |
| 38DC8L | | 1.132 | -0.001 | -0.51 | 1.133 | 0.000 | -0.16 |
| 394BLJ | | 1.131 | -0.003 | -0.89 | 1.132 | -0.001 | -0.28 |
| 3HVXBU | X | 1.122 | -0.012 | -4.01 | 1.123 | -0.011 | -3.46 |
| 3NHJLM | | 1.132 | -0.001 | -0.48 | 1.132 | -0.001 | -0.38 |
| 3ZTYKF | | 1.136 | 0.003 | 0.87 | 1.138 | 0.005 | 1.47 |
| 43UVD3 | | 1.132 | -0.001 | -0.29 | 1.133 | 0.000 | 0.06 |
| 4H7X64 | | 1.137 | 0.004 | 1.22 | 1.137 | 0.004 | 1.15 |
| 4LPNYZ | X | 1.138 | 0.004 | 1.53 | 1.143 | 0.009 | 3.05 |
| 6QHFZM | | 1.140 | 0.007 | 2.40 | 1.140 | 0.007 | 2.24 |
| 76XWLJ | * | 1.129 | -0.005 | -1.58 | 1.132 | -0.001 | -0.37 |
| 7W4N2R | X | 7.525 | 6.392 | 2,213.15 | 7.522 | 6.389 | 2,080.91 |
| 8AHDBE | | 1.137 | 0.003 | 1.19 | 1.134 | 0.001 | 0.30 |
| 8C9EG3 | | 1.132 | -0.001 | -0.46 | 1.130 | -0.004 | -1.18 |
| 8N3V74 | | 1.132 | -0.001 | -0.32 | 1.133 | 0.000 | 0.07 |
| 8ZX6QR | X | 1.141 | 0.008 | 2.66 | 1.147 | 0.014 | 4.50 |
| 9M7UJC | | 1.133 | 0.000 | 0.13 | 1.133 | -0.001 | -0.20 |
| 9MPGHU | | 1.136 | 0.003 | 1.01 | 1.136 | 0.003 | 0.82 |
| 9UNMZW | X | 1.124 | -0.009 | -3.14 | 1.129 | -0.004 | -1.34 |
| 9VG46J | * | 1.127 | -0.006 | -1.96 | 1.125 | -0.008 | -2.68 |
| 9XLPWQ | | 1.135 | 0.002 | 0.67 | 1.135 | 0.002 | 0.61 |
| AXKBM3 | | 1.133 | -0.001 | -0.20 | 1.133 | 0.000 | -0.04 |
| AYCB4L | | 1.138 | 0.005 | 1.71 | 1.139 | 0.005 | 1.75 |
| AYEGB4 | | 1.132 | -0.001 | -0.37 | 1.131 | -0.002 | -0.69 |
| B8QEUL | | 1.136 | 0.002 | 0.84 | 1.135 | 0.002 | 0.61 |
| BXX4G6 | | 1.135 | 0.002 | 0.82 | 1.135 | 0.002 | 0.64 |
| CHYHC2 | | 1.133 | 0.000 | 0.08 | 1.133 | -0.001 | -0.19 |
| CPZXYN | | 1.140 | 0.006 | 2.22 | 1.139 | 0.006 | 1.91 |
| D4YYEA | | 1.134 | 0.001 | 0.32 | 1.133 | -0.001 | -0.20 |
| D6UMTY | | 1.135 | 0.002 | 0.60 | 1.134 | 0.001 | 0.33 |
| DPJT8G | | 1.135 | 0.001 | 0.49 | 1.135 | 0.002 | 0.61 |
| DUABGM | | 1.128 | -0.005 | -1.76 | 1.127 | -0.007 | -2.16 |
| EGH9AE | | 1.134 | 0.001 | 0.22 | 1.135 | 0.002 | 0.71 |
| EWCNHK | | 1.133 | 0.000 | 0.12 | 1.131 | -0.002 | -0.59 |



Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-----------|----------------|----------------------|---------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| EX8BWA | | 1.134 | 0.001 | 0.27 | 1.135 | 0.001 | 0.48 |
| F2KF44 | | 1.132 | -0.002 | -0.55 | 1.132 | -0.001 | -0.37 |
| FDKFA | | 1.134 | 0.000 | 0.15 | 1.135 | 0.002 | 0.61 |
| FF6V83 | | 1.129 | -0.005 | -1.58 | 1.128 | -0.005 | -1.67 |
| G6Y78D | | 1.129 | -0.004 | -1.41 | 1.127 | -0.007 | -2.16 |
| GLLQMX | | 1.127 | -0.006 | -2.19 | 1.128 | -0.005 | -1.54 |
| GWP4LC | | 1.135 | 0.002 | 0.67 | 1.134 | 0.000 | 0.12 |
| H38THR | | 1.126 | -0.007 | -2.45 | 1.126 | -0.007 | -2.39 |
| HR84Y6 | | 1.135 | 0.002 | 0.56 | 1.134 | 0.001 | 0.25 |
| HXB646 | | 1.133 | 0.000 | 0.03 | 1.131 | -0.002 | -0.56 |
| JEUDHE | | 1.133 | 0.000 | -0.03 | 1.131 | -0.002 | -0.69 |
| JFQX6E | | 1.132 | -0.001 | -0.37 | 1.133 | 0.000 | -0.04 |
| K6M3MA | | 1.134 | 0.001 | 0.32 | 1.134 | 0.001 | 0.28 |
| KX82MZ | | 1.130 | -0.003 | -1.10 | 1.131 | -0.002 | -0.61 |
| KYWTCB | | 1.138 | 0.004 | 1.53 | 1.138 | 0.005 | 1.59 |
| LLQWT9 | | 1.133 | 0.000 | -0.11 | 1.133 | -0.001 | -0.20 |
| LWDU22 | | 1.129 | -0.004 | -1.38 | 1.131 | -0.002 | -0.74 |
| LXNVMZ | | 1.135 | 0.002 | 0.67 | 1.134 | 0.001 | 0.28 |
| MGAW82 | | 1.132 | -0.002 | -0.55 | 1.133 | 0.000 | -0.04 |
| MNRDLW | | 1.131 | -0.003 | -0.89 | 1.129 | -0.004 | -1.30 |
| NJWQN3 | | 1.134 | 0.001 | 0.41 | 1.134 | 0.001 | 0.38 |
| P3J2N8 | | 1.131 | -0.002 | -0.65 | 1.132 | -0.001 | -0.43 |
| PBEWQC | | 1.132 | -0.001 | -0.27 | 1.133 | 0.000 | -0.09 |
| PRJ9DV | | 1.134 | 0.001 | 0.27 | 1.133 | 0.000 | -0.04 |
| QPGMAV | | 1.133 | 0.000 | 0.03 | 1.137 | 0.004 | 1.15 |
| QRF4FX | | 1.133 | -0.001 | -0.20 | 1.133 | -0.001 | -0.20 |
| QRLF29 | | 1.137 | 0.004 | 1.31 | 1.139 | 0.005 | 1.75 |
| R3CDJX | | 1.133 | -0.001 | -0.20 | 1.133 | 0.000 | -0.04 |
| RF33J4 | | 1.132 | -0.001 | -0.37 | 1.133 | 0.000 | -0.09 |
| RLNBMU | X | 46.000 | 44.867 | 15,534.41 | 46.500 | 45.36714 | ,776.64 |
| RUMLET | | 1.138 | 0.005 | 1.71 | 1.137 | 0.003 | 1.10 |
| T3BRQQ | | 1.135 | 0.002 | 0.67 | 1.135 | 0.001 | 0.45 |
| TB49WM | | 1.130 | -0.003 | -1.08 | 1.128 | -0.006 | -1.83 |
| TCGXZY | | 1.133 | 0.000 | -0.06 | 1.133 | 0.000 | -0.16 |
| TRU9Q8 | | 1.130 | -0.003 | -1.06 | 1.132 | -0.002 | -0.53 |
| UTFHBT | | 1.131 | -0.002 | -0.65 | 1.131 | -0.002 | -0.56 |
| UUY2HK | | 1.130 | -0.003 | -1.06 | 1.132 | -0.001 | -0.29 |
| VC9FE7 | | 1.132 | -0.001 | -0.39 | 1.133 | 0.000 | -0.14 |



Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample D91-D92 | | | Sample D93-D94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| W28CLW | | 1.135 | 0.002 | 0.77 | 1.137 | 0.004 | 1.15 |
| Y8PHGU | | 1.133 | -0.001 | -0.20 | 1.133 | -0.001 | -0.20 |
| YQFVPQ | | 1.131 | -0.002 | -0.63 | 1.133 | 0.000 | -0.01 |
| ZMCEVU | * | 1.136 | 0.003 | 1.10 | 1.133 | 0.000 | -0.11 |

| Summary Statistics | | | |
|---|--------|--|---|
| Grand Means | 1.1331 | g/cm ³ (Mg/m ³) | 1.1331 g/cm ³ (Mg/m ³) |
| Stnd Dev Btwn Labs | 0.0029 | g/cm ³ (Mg/m ³) | 0.0031 g/cm ³ (Mg/m ³) |
| Statistics based on 73 of 79 reporting participants | | | |

Samples D91-D92: Polyisoprene compound, batch #1 & D93-D94: Polyisoprene compound, batch #2

Comments on Assigned Data Flags for Test #621

- 3HVXBU (X) - Data for all samples are low. Possible Systematic Error. Inconsistent within the determinations of sample group D91-D92.
- 4LPNYZ (X) - Data for sample group D93-D94 are high.
- 7W4N2R (X) - Extreme Data.
- 8ZX6QR (X) - Data for sample group D93-D94 are high. Inconsistent within the determinations of sample group D91-D92.
- 9UNMZW (X) - Data for sample group D91-D92 are low. Inconsistent within the determinations of sample group D91-D92.
- RLNBMU (X) - Extreme Data.

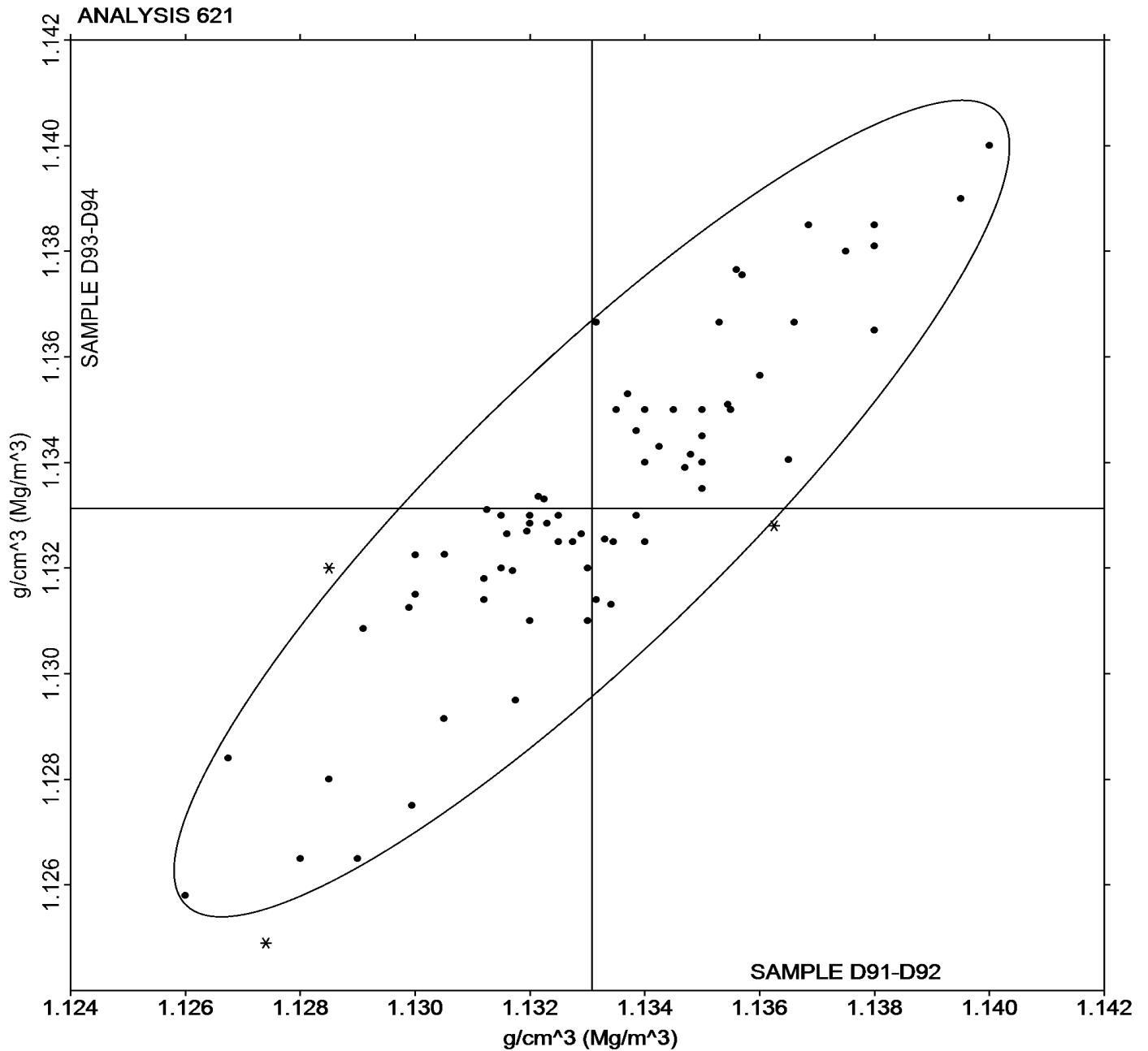


Rubber Interlaboratory Testing Program
Analysis 621
Density

Report #202
4th Qtr 2019

Grand Mean Sample **D91-D92** = 1.1331 g/cm³
(Mg/m³)

Grand Mean Sample **D93-D94** = 1.1331 g/cm³
(Mg/m³)





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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample HD91-HD92 | | | Sample HD93-HD94 | | | Instr Code |
|---------|-----------|------------------|----------------------|-------|------------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2MBR9N | | 56.30 | 2.40 | 0.83 | 69.25 | 1.10 | 0.50 | BT |
| 4H884A | | 54.00 | 0.10 | 0.03 | 71.00 | 2.85 | 1.29 | BT |
| 63CM4J | | 55.50 | 1.60 | 0.55 | 70.00 | 1.85 | 0.83 | BT |
| 6DE94Q | | 55.25 | 1.35 | 0.47 | 67.75 | -0.40 | -0.18 | HH |
| 8BK2YJ | | 56.00 | 2.10 | 0.73 | 70.00 | 1.85 | 0.83 | HH |
| 93YKJF | | 51.50 | -2.40 | -0.83 | 68.50 | 0.35 | 0.16 | BT |
| CH4XN2 | | 46.50 | -7.40 | -2.57 | 62.00 | -6.15 | -2.78 | BT |
| E4VRPM | | 52.15 | -1.75 | -0.61 | 67.15 | -1.00 | -0.45 | BT |
| HXB646 | | 57.50 | 3.60 | 1.25 | 69.00 | 0.85 | 0.38 | HH |
| L88C8U | | 55.50 | 1.60 | 0.55 | 69.00 | 0.85 | 0.38 | HH |
| LJZVNK | | 49.80 | -4.10 | -1.42 | 64.90 | -3.25 | -1.47 | BT |
| LVEVHT | | 53.00 | -0.90 | -0.31 | 69.00 | 0.85 | 0.38 | XX |
| QRLF29 | | 52.35 | -1.55 | -0.54 | 67.15 | -1.00 | -0.45 | BT |
| TBLDDZ | | 56.60 | 2.70 | 0.94 | 69.75 | 1.60 | 0.72 | HH |
| VHHWNL | | 55.50 | 1.60 | 0.55 | 69.00 | 0.85 | 0.38 | XX |
| ZHJFFD | | 55.00 | 1.10 | 0.38 | 67.00 | -1.15 | -0.52 | BT |

| Grand Means | | Summary Statistics | |
|---|---------------|--------------------|---------------|
| | 53.903 Type D | | 68.153 Type D |
| Std Dev Btwn Labs | 2.884 Type D | | 2.215 Type D |
| Statistics based on 16 of 16 reporting participants | | | |

Samples HD91-HD92: Hardness disc, batch #1 & HD93-HD94: Hardness disc, batch #2

Key to Instrument Codes Reported by Participants

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



Rubber Interlaboratory Testing Program

Report #202

Analysis 630

4th Qtr 2019

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

| WebCode | Data Flag | Sample D91-D92 | | | Sample M91-M92 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 3,358.0 | 14.1 | 0.11 | 2,922.5 | -13.8 | -0.08 |
| 2374MJ | | 3,166.5 | -177.4 | -1.38 | 2,869.5 | -66.8 | -0.39 |
| 2XD3MQ | | 3,316.3 | -27.5 | -0.21 | 3,098.0 | 161.7 | 0.94 |
| 3ZTYKF | | 3,543.7 | 199.8 | 1.55 | 2,941.6 | 5.3 | 0.03 |
| 43UVD3 | | 3,214.0 | -129.9 | -1.01 | 2,874.5 | -61.8 | -0.36 |
| 76XWLJ | | 3,334.0 | -9.9 | -0.08 | 2,773.0 | -163.3 | -0.95 |
| 7BZ32L | | 3,337.6 | -6.3 | -0.05 | 2,970.5 | 34.2 | 0.20 |
| 8N3V74 | | 3,309.0 | -34.9 | -0.27 | 2,871.5 | -64.8 | -0.38 |
| 8ZX6QR | | 3,254.8 | -89.1 | -0.69 | 3,152.0 | 215.7 | 1.25 |
| 9M7UJC | | 3,493.0 | 149.1 | 1.16 | 2,920.5 | -15.8 | -0.09 |
| 9VG46J | | 3,198.1 | -145.7 | -1.13 | 2,908.0 | -28.3 | -0.16 |
| 9XLPWQ | | 3,390.0 | 46.1 | 0.36 | 3,032.5 | 96.2 | 0.56 |
| AXKBM3 | | 3,417.2 | 73.3 | 0.57 | 2,990.9 | 54.6 | 0.32 |
| CHYHC2 | | 3,353.0 | 9.1 | 0.07 | 2,703.9 | -232.4 | -1.35 |
| DUABGM | | 3,327.0 | -16.9 | -0.13 | 2,783.0 | -153.3 | -0.89 |
| E4VRPM | | 3,147.3 | -196.5 | -1.53 | 2,922.5 | -13.8 | -0.08 |
| F2KF44 | X | 2,731.5 | -612.4 | -4.76 | 2,601.0 | -335.3 | -1.94 |
| FF6V83 | | 3,499.1 | 155.2 | 1.21 | 3,109.9 | 173.6 | 1.01 |
| G6Y78D | | 3,048.5 | -295.4 | -2.30 | 2,849.8 | -86.5 | -0.50 |
| GLLQMX | * | 3,457.7 | 113.8 | 0.88 | 2,605.8 | -330.5 | -1.92 |
| H38THR | | 3,304.4 | -39.5 | -0.31 | 2,799.7 | -136.6 | -0.79 |
| LXNVMZ | | 3,208.0 | -135.9 | -1.06 | 2,690.0 | -246.3 | -1.43 |
| MCHLX4 | | 3,449.5 | 105.6 | 0.82 | 3,091.0 | 154.7 | 0.90 |
| MNRDLW | | 3,457.9 | 114.0 | 0.89 | 3,015.7 | 79.4 | 0.46 |
| QPGMAV | | 3,530.8 | 187.0 | 1.45 | 3,277.4 | 341.1 | 1.98 |
| QRF4FX | | 3,528.2 | 184.3 | 1.43 | 3,148.5 | 212.2 | 1.23 |
| QRLF29 | | 3,383.7 | 39.8 | 0.31 | 3,113.3 | 177.0 | 1.03 |
| RUMLET | | 3,430.0 | 86.1 | 0.67 | 3,115.0 | 178.7 | 1.04 |
| UTFHBT | X | 3,335.1 | -8.8 | -0.07 | 1,892.7 | -1,043.6 | -6.05 |
| W28CLW | | 3,339.1 | -4.7 | -0.04 | 3,036.6 | 100.3 | 0.58 |
| W6PW8C | | 3,175.6 | -168.2 | -1.31 | 2,565.7 | -370.6 | -2.15 |

Summary Statistics

Grand Means

3,343.86 psi

2,936.30 psi

Std Dev Btwn Labs

128.62 psi

172.44 psi

Statistics based on 29 of 31 reporting participants



Rubber Interlaboratory Testing Program
Analysis 630
Tensile Strength: Precured vs. Lab-Cured Samples (psi)

Report #202
4th Qtr 2019

| | | Summary Statistics in SI Units | |
|---|------------|--------------------------------|-----|
| Grand Means | 23.055 MPa | 20.24 | MPa |
| Stnd Dev Btwn Labs | 0.887 MPa | 1.19 | MPa |
| Statistics based on 29 of 31 reporting participants | | | |

Samples D91-D92: Polyisoprene compound, batch #1 & M91-M92: Polyisoprene compound, batch #1

Comments on Assigned Data Flags for Test #630

F2KF44 (X) - Data for sample group D91-D92 are low.

UTFHBT (X) - Data for sample group M91-M92 are low.

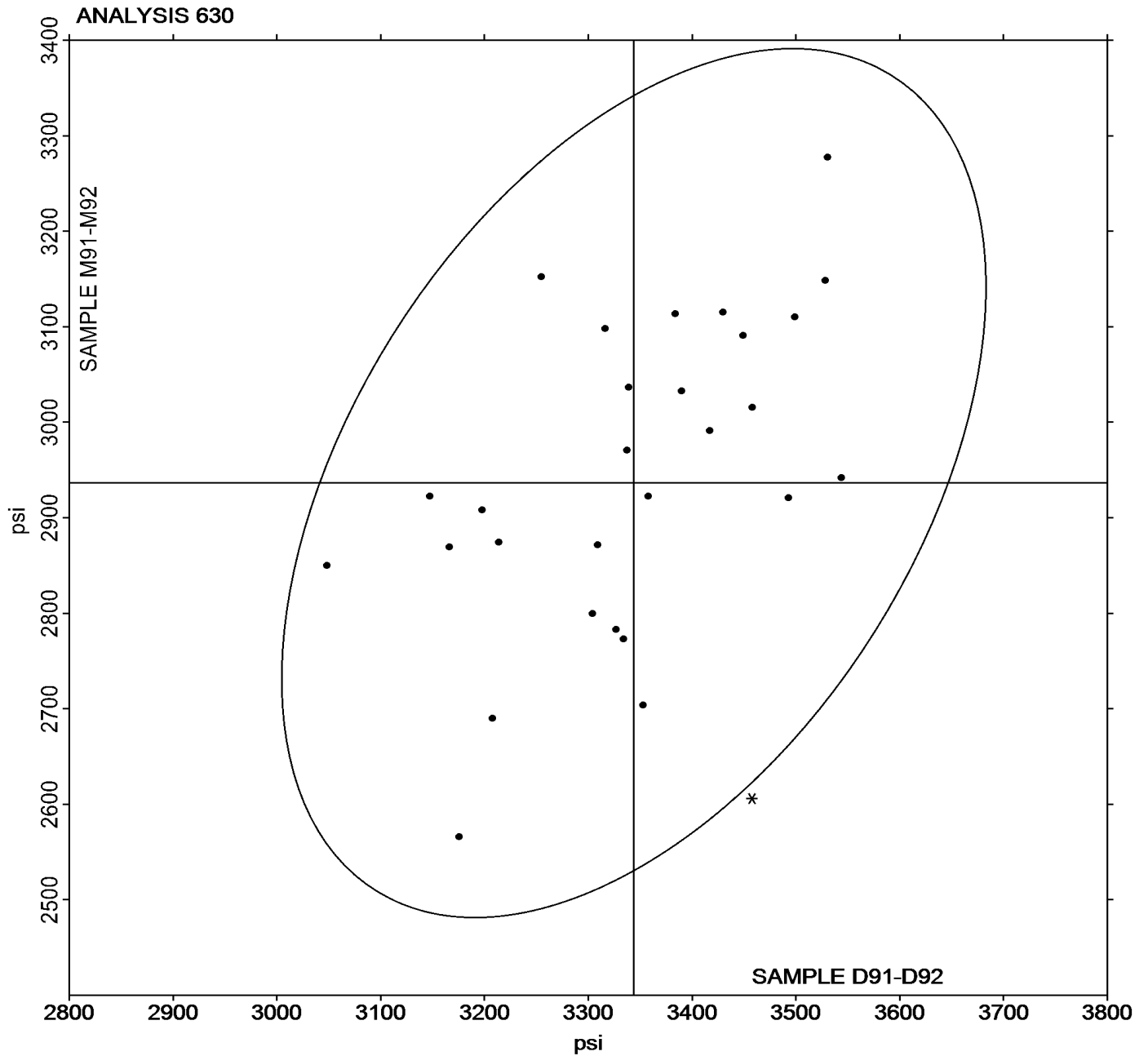


Rubber Interlaboratory Testing Program
Analysis 630
Tensile Strength: Precured vs. Lab-Cured Samples (psi)

Report #202
4th Qtr 2019

Grand Mean Sample **D91-D92** = 3,343.86 psi

Grand Mean Sample **M91-M92** = 2,936.30 psi





Rubber Interlaboratory Testing Program

Report #202

Analysis 631

4th Qtr 2019

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

| WebCode | Data Flag | Sample D91-D92 | | | Sample M91-M92 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 633.0 | -17.6 | -0.63 | 536.0 | -28.3 | -1.00 |
| 2374MJ | | 643.8 | -6.8 | -0.25 | 543.6 | -20.7 | -0.73 |
| 2XD3MQ | | 643.5 | -7.1 | -0.26 | 563.5 | -0.8 | -0.03 |
| 3ZTYKF | | 688.8 | 38.2 | 1.37 | 582.6 | 18.3 | 0.65 |
| 43UVD3 | * | 679.5 | 28.9 | 1.04 | 538.0 | -26.3 | -0.93 |
| 76XWLJ | | 619.0 | -31.6 | -1.14 | 539.5 | -24.8 | -0.88 |
| 7BZ32L | | 625.1 | -25.5 | -0.92 | 550.5 | -13.9 | -0.49 |
| 8N3V74 | | 690.3 | 39.6 | 1.42 | 593.6 | 29.3 | 1.04 |
| 8ZX6QR | X | 1,575.0 | 924.4 | 33.21 | 1,580.0 | 1,015.7 | 35.93 |
| 9M7UJC | | 673.5 | 22.9 | 0.82 | 598.5 | 34.2 | 1.21 |
| 9VG46J | | 668.0 | 17.4 | 0.62 | 581.5 | 17.2 | 0.61 |
| 9XLPWQ | | 715.0 | 64.4 | 2.31 | 627.5 | 63.2 | 2.24 |
| AXKBM3 | | 667.5 | 16.9 | 0.61 | 577.8 | 13.4 | 0.48 |
| CHYHC2 | | 670.0 | 19.4 | 0.70 | 607.0 | 42.7 | 1.51 |
| DUABGM | | 660.5 | 9.9 | 0.35 | 565.0 | 0.7 | 0.02 |
| E4VRPM | | 625.5 | -25.2 | -0.91 | 555.8 | -8.5 | -0.30 |
| F2KF44 | * | 596.5 | -54.1 | -1.95 | 555.5 | -8.8 | -0.31 |
| FF6V83 | | 646.1 | -4.5 | -0.16 | 592.3 | 28.0 | 0.99 |
| G6Y78D | | 602.6 | -48.1 | -1.73 | 502.3 | -62.0 | -2.19 |
| GLLQMX | | 643.0 | -7.6 | -0.27 | 570.4 | 6.1 | 0.21 |
| H38THR | | 657.0 | 6.4 | 0.23 | 567.0 | 2.7 | 0.10 |
| LXNVMZ | | 612.0 | -38.6 | -1.39 | 496.5 | -67.8 | -2.40 |
| MCHLX4 | | 620.0 | -30.6 | -1.10 | 547.0 | -17.3 | -0.61 |
| MNRDLW | | 656.7 | 6.1 | 0.22 | 560.2 | -4.1 | -0.15 |
| QPGMAV | | 667.3 | 16.6 | 0.60 | 588.9 | 24.6 | 0.87 |
| QRF4FX | X | 693.9 | 43.2 | 1.55 | 678.4 | 114.1 | 4.04 |
| QRLF29 | | 646.5 | -4.1 | -0.15 | 565.5 | 1.2 | 0.04 |
| RUMLET | | 675.5 | 24.9 | 0.89 | 584.0 | 19.7 | 0.70 |
| UTFHBT | | 655.1 | 4.4 | 0.16 | 551.3 | -13.0 | -0.46 |
| W28CLW | | 627.0 | -23.6 | -0.85 | 555.5 | -8.8 | -0.31 |
| W6PW8C | | 660.5 | 9.9 | 0.35 | 568.0 | 3.7 | 0.13 |



Rubber Interlaboratory Testing Program

Report #202

Analysis 631

4th Qtr 2019

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

| | | Summary Statistics | |
|---|----------------|--------------------|--|
| Grand Means | 650.64 percent | 564.30 percent | |
| Stnd Dev Btwn Labs | 27.84 percent | 28.27 percent | |
| Statistics based on 29 of 31 reporting participants | | | |

Samples D91-D92: Polyisoprene compound, batch #1 & M91-M92: Polyisoprene compound, batch #1

Comments on Assigned Data Flags for Test #631

8ZX6QR (X) - Extreme Data.

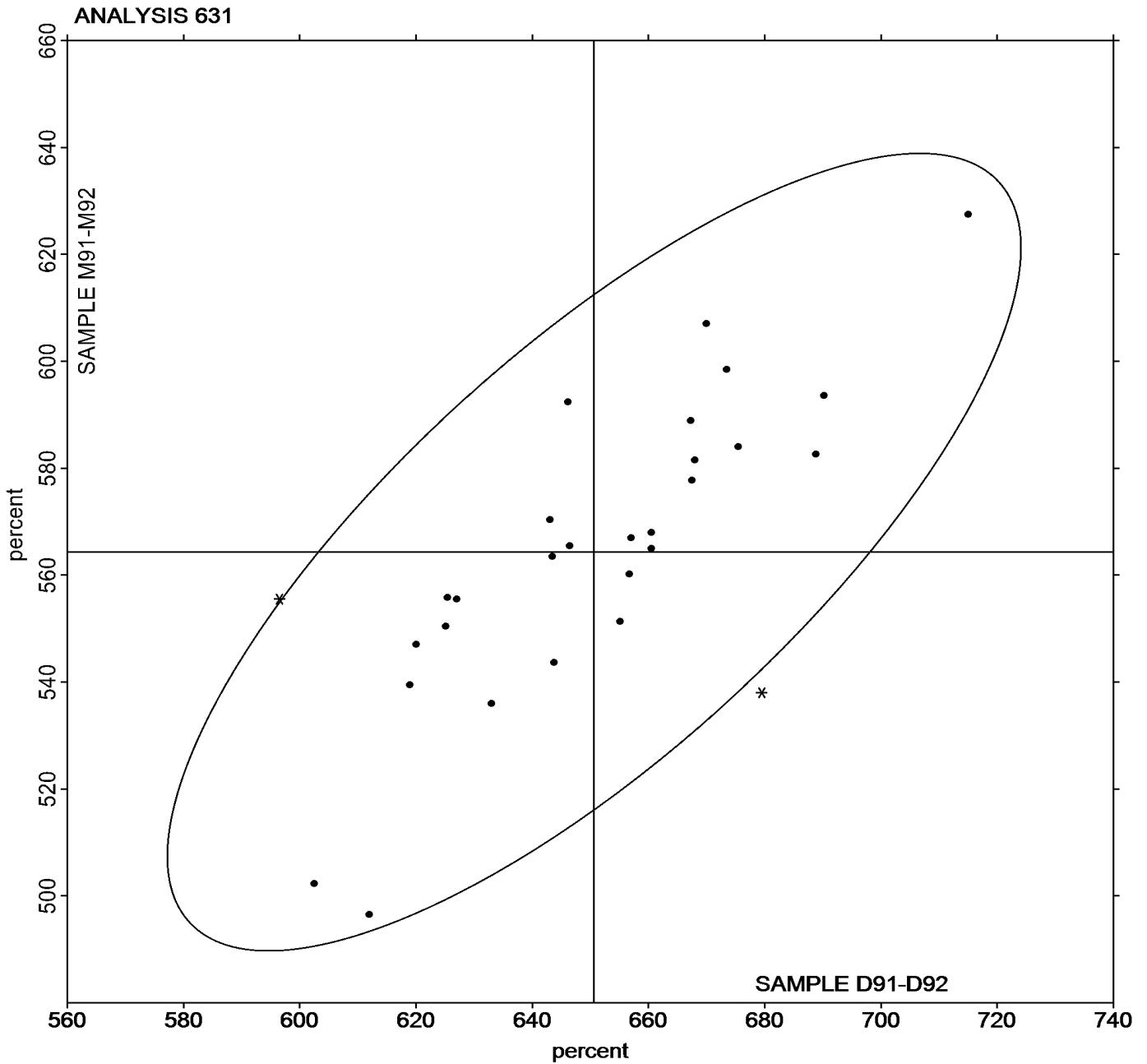
QRF4FX (X) - Data for sample group M91-M92 are high.



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

Grand Mean Sample D91-D92 = 650.64 percent

Grand Mean Sample M91-M92 = 564.30 percent





Rubber Interlaboratory Testing Program

Report #202

Analysis 632

4th Qtr 2019

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

| WebCode | Data Flag | Sample D91-D92 | | | Sample M91-M92 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 879.0 | 28.5 | 0.39 | 1,166.5 | 137.1 | 1.06 |
| 2374MJ | | 860.0 | 9.5 | 0.13 | 1,144.0 | 114.6 | 0.89 |
| 2XD3MQ | | 881.8 | 31.4 | 0.43 | 1,172.6 | 143.2 | 1.11 |
| 3ZTYKF | * | 1,052.1 | 201.7 | 2.73 | 1,009.5 | -19.9 | -0.15 |
| 43UVD3 | | 742.0 | -108.5 | -1.47 | 1,135.5 | 106.1 | 0.82 |
| 76XWLJ | | 866.5 | 16.0 | 0.22 | 1,074.5 | 45.1 | 0.35 |
| 7BZ32L | | 976.7 | 126.2 | 1.71 | 1,179.5 | 150.1 | 1.16 |
| 8N3V74 | | 780.1 | -70.4 | -0.95 | 969.5 | -60.0 | -0.46 |
| 8ZX6QR | | 1,018.5 | 168.0 | 2.28 | 952.6 | -76.8 | -0.59 |
| 9M7UJC | | 823.0 | -27.5 | -0.37 | 966.0 | -63.4 | -0.49 |
| 9VG46J | | 772.3 | -78.1 | -1.06 | 998.6 | -30.8 | -0.24 |
| 9XLPWQ | | 736.5 | -114.0 | -1.54 | 857.0 | -172.4 | -1.34 |
| AXKBM3 | | 791.3 | -59.2 | -0.80 | 1,035.5 | 6.0 | 0.05 |
| CHYHC2 | | 817.7 | -32.8 | -0.44 | 903.6 | -125.8 | -0.98 |
| DUABGM | | 834.0 | -16.5 | -0.22 | 963.0 | -66.4 | -0.51 |
| E4VRPM | | 817.3 | -33.2 | -0.45 | 1,094.3 | 64.9 | 0.50 |
| F2KF44 | | 782.5 | -68.0 | -0.92 | 946.5 | -82.9 | -0.64 |
| FF6V83 | | 854.8 | 4.3 | 0.06 | 1,069.6 | 40.2 | 0.31 |
| G6Y78D | | 796.4 | -54.1 | -0.73 | 1,213.3 | 183.9 | 1.43 |
| GLLQMX | | 872.0 | 21.5 | 0.29 | 886.7 | -142.7 | -1.11 |
| H38THR | | 772.5 | -78.0 | -1.06 | 945.0 | -84.4 | -0.65 |
| LXNVMZ | | 898.0 | 47.5 | 0.64 | 1,210.0 | 180.6 | 1.40 |
| MCHLX4 | | 928.5 | 78.0 | 1.06 | 1,117.5 | 88.1 | 0.68 |
| MNRDLW | | 853.7 | 3.2 | 0.04 | 1,069.2 | 39.8 | 0.31 |
| QPGMAV | | 883.9 | 33.5 | 0.45 | 1,127.5 | 98.1 | 0.76 |
| QRF4FX | | 784.8 | -65.7 | -0.89 | 840.5 | -188.9 | -1.46 |
| QRLF29 | | 852.9 | 2.4 | 0.03 | 1,136.9 | 107.4 | 0.83 |
| RUMLET | | 820.5 | -30.0 | -0.41 | 1,089.5 | 60.1 | 0.47 |
| UTFHBT | * | 862.2 | 11.7 | 0.16 | 651.6 | -377.8 | -2.93 |
| W28CLW | | 918.7 | 68.3 | 0.93 | 1,103.0 | 73.6 | 0.57 |
| W6PW8C | | 834.0 | -16.5 | -0.22 | 882.6 | -146.8 | -1.14 |

| Grand Means | | Summary Statistics | |
|---|------------|--------------------|--------------|
| | 850.45 psi | | 1,029.40 psi |
| Std Dev Btwn Labs | 73.79 psi | | 129.01 psi |
| Statistics based on 31 of 31 reporting participants | | | |



Rubber Interlaboratory Testing Program

Report #202

Analysis 632

4th Qtr 2019

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

Summary Statistics in SI Units

Grand Means

5.8636 MPa

7.10 MPa

Std Dev Btwn Labs

0.5087 MPa

0.89 MPa

Statistics based on 31 of 31 reporting participants

Samples D91-D92: Polyisoprene compound, batch #1 & M91-M92: Polyisoprene compound, batch #1



Rubber Interlaboratory Testing Program

Report #202

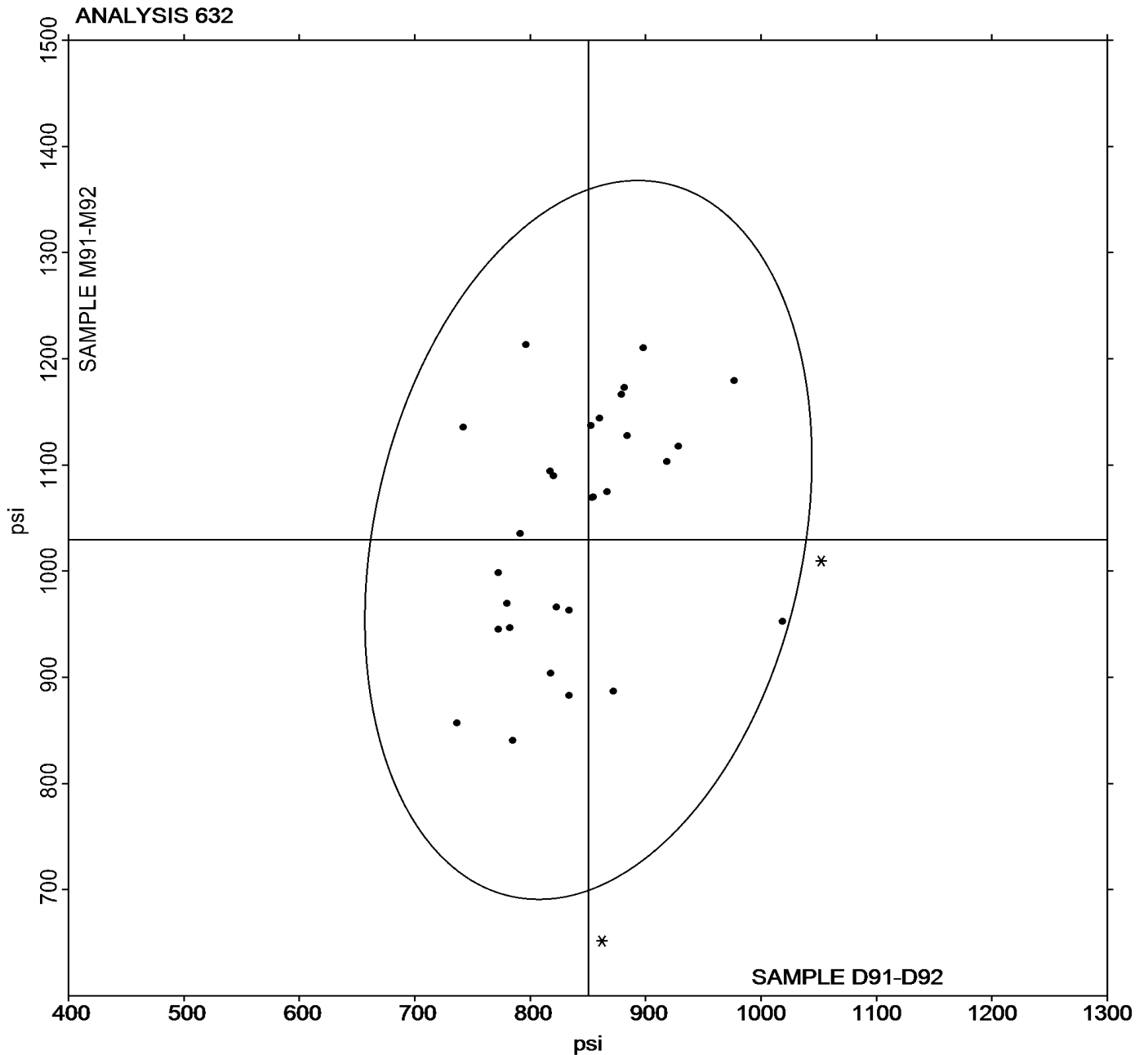
Analysis 632

4th Qtr 2019

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

Grand Mean Sample **D91-D92** = 850.45 psi

Grand Mean Sample **M91-M92** = 1,029.40 psi





Rubber Interlaboratory Testing Program

Report #202

Analysis 633

4th Qtr 2019

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

| WebCode | Data Flag | Sample D91-D92 | | | Sample M91-M92 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 196.0 | 3.2 | 0.25 | 272.0 | 36.3 | 1.41 |
| 2374MJ | | 198.0 | 5.2 | 0.40 | 254.0 | 18.3 | 0.71 |
| 2XD3MQ | | 202.3 | 9.5 | 0.73 | 278.5 | 42.8 | 1.66 |
| 3ZTYKF | | 212.4 | 19.6 | 1.51 | 241.0 | 5.3 | 0.20 |
| 43UVD3 | | 176.5 | -16.3 | -1.26 | 239.5 | 3.8 | 0.15 |
| 76XWLJ | | 189.5 | -3.3 | -0.25 | 235.0 | -0.7 | -0.03 |
| 7BZ32L | | 218.4 | 25.6 | 1.97 | 275.5 | 39.8 | 1.54 |
| 8N3V74 | | 188.9 | -3.9 | -0.30 | 240.0 | 4.3 | 0.17 |
| 8ZX6QR | | 214.3 | 21.6 | 1.66 | 199.3 | -36.4 | -1.41 |
| 9M7UJC | | 185.0 | -7.8 | -0.60 | 222.5 | -13.2 | -0.51 |
| 9VG46J | | 180.6 | -12.2 | -0.94 | 235.0 | -0.7 | -0.03 |
| 9XLPWQ | | 179.5 | -13.3 | -1.03 | 214.0 | -21.7 | -0.84 |
| AXKBM3 | | 179.3 | -13.5 | -1.04 | 234.1 | -1.6 | -0.06 |
| CHYHC2 | | 192.7 | -0.1 | -0.01 | 212.3 | -23.4 | -0.91 |
| DUABGM | | 197.5 | 4.7 | 0.36 | 232.0 | -3.7 | -0.14 |
| E4VRPM | | 180.6 | -12.2 | -0.94 | 246.6 | 10.9 | 0.42 |
| F2KF44 | | 189.5 | -3.3 | -0.25 | 225.0 | -10.7 | -0.41 |
| FF6V83 | | 189.6 | -3.2 | -0.25 | 246.0 | 10.4 | 0.40 |
| G6Y78D | * | 157.2 | -35.6 | -2.74 | 234.7 | -1.0 | -0.04 |
| GLLQMX | | 199.1 | 6.3 | 0.48 | 188.3 | -47.4 | -1.84 |
| H38THR | | 178.0 | -14.8 | -1.14 | 214.0 | -21.7 | -0.84 |
| LXNVMZ | | 204.5 | 11.7 | 0.90 | 259.0 | 23.3 | 0.90 |
| MCHLX4 | | 204.0 | 11.2 | 0.86 | 256.0 | 20.3 | 0.79 |
| MNRDLW | | 187.5 | -5.3 | -0.41 | 239.4 | 3.7 | 0.14 |
| QPGMAV | | 203.0 | 10.2 | 0.79 | 255.1 | 19.4 | 0.75 |
| QRF4FX | | 180.9 | -11.9 | -0.91 | 214.3 | -21.4 | -0.83 |
| QRLF29 | | 193.8 | 1.0 | 0.08 | 263.0 | 27.3 | 1.06 |
| RUMLET | | 191.5 | -1.3 | -0.10 | 254.0 | 18.3 | 0.71 |
| UTFHBT | * | 197.8 | 5.0 | 0.38 | 161.0 | -74.7 | -2.90 |
| W28CLW | | 205.2 | 12.4 | 0.96 | 252.0 | 16.3 | 0.63 |
| W6PW8C | | 203.8 | 11.0 | 0.85 | 213.2 | -22.5 | -0.87 |

| Grand Means | | Summary Statistics | |
|---|------------|--------------------|------------|
| | 192.80 psi | | 235.67 psi |
| Std Dev Btwn Labs | 12.97 psi | | 25.79 psi |
| Statistics based on 31 of 31 reporting participants | | | |



Rubber Interlaboratory Testing Program

Report #202

Analysis 633

4th Qtr 2019

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

Summary Statistics in SI Units

Grand Means

1.3293 MPa

1.62 MPa

Std Dev Btwn Labs

0.0894 MPa

0.18 MPa

Statistics based on 31 of 31 reporting participants

Samples D91-D92: Polyisoprene compound, batch #1 & M91-M92: Polyisoprene compound, batch #1



Rubber Interlaboratory Testing Program

Report #202

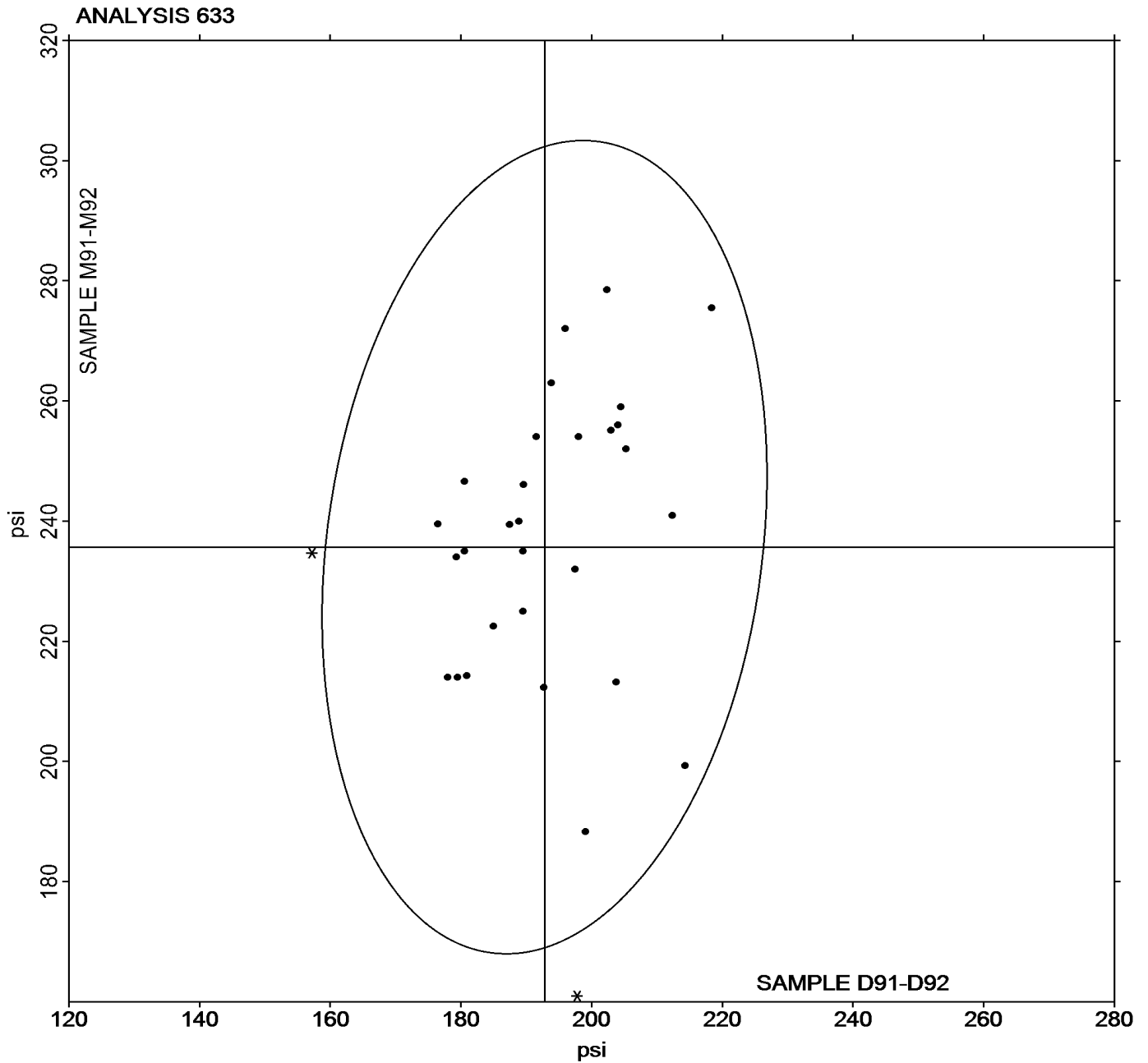
Analysis 633

4th Qtr 2019

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

Grand Mean Sample **D91-D92** = 192.80 psi

Grand Mean Sample **M91-M92** = 235.67 psi





Rubber Interlaboratory Testing Program
Analysis 635
Compression Set Method B

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample Q91 | | | Sample Q92 | | |
|---------|-----------|------------|----------------------|-------|------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 232R29 | | 32.33 | 3.04 | 0.92 | 31.00 | 1.77 | 0.56 |
| 38DC8L | | 25.00 | -4.30 | -1.30 | 25.00 | -4.23 | -1.33 |
| 3NHJLM | | 29.13 | -0.16 | -0.05 | 29.30 | 0.07 | 0.02 |
| 3ZTYKF | | 29.20 | -0.10 | -0.03 | 27.63 | -1.60 | -0.50 |
| 43UVD3 | | 28.00 | -1.30 | -0.39 | 29.33 | 0.10 | 0.03 |
| 7BZ32L | | 28.50 | -0.80 | -0.24 | 28.53 | -0.70 | -0.22 |
| 8AHDBE | | 29.29 | -0.01 | 0.00 | 28.54 | -0.69 | -0.22 |
| 8C9EG3 | | 26.23 | -3.07 | -0.92 | 23.98 | -5.25 | -1.65 |
| 8N3V74 | | 28.33 | -0.96 | -0.29 | 28.57 | -0.66 | -0.21 |
| AM2V39 | | 30.67 | 1.37 | 0.41 | 30.67 | 1.44 | 0.45 |
| BXX4G6 | * | 21.40 | -7.90 | -2.38 | 20.73 | -8.50 | -2.68 |
| CHYHC2 | | 28.50 | -0.80 | -0.24 | 27.50 | -1.73 | -0.54 |
| EWCNHK | | 30.13 | 0.83 | 0.25 | 30.83 | 1.60 | 0.50 |
| EX8BWA | | 26.00 | -3.30 | -0.99 | 27.67 | -1.56 | -0.49 |
| GLLQMX | | 29.03 | -0.26 | -0.08 | 29.93 | 0.70 | 0.22 |
| H38THR | | 33.36 | 4.06 | 1.22 | 32.27 | 3.04 | 0.96 |
| HCBYGZ | | 34.79 | 5.49 | 1.66 | 34.12 | 4.89 | 1.54 |
| HR84Y6 | | 29.47 | 0.17 | 0.05 | 27.90 | -1.33 | -0.42 |
| KX82MZ | | 25.67 | -3.63 | -1.09 | 29.33 | 0.10 | 0.03 |
| LJZVNK | | 36.97 | 7.67 | 2.31 | 35.67 | 6.44 | 2.03 |
| M4NG43 | | 32.52 | 3.23 | 0.97 | 29.81 | 0.58 | 0.18 |
| NJWQN3 | | 26.00 | -3.30 | -0.99 | 27.67 | -1.56 | -0.49 |
| NUVJYE | | 29.67 | 0.37 | 0.11 | 29.90 | 0.67 | 0.21 |
| QRLF29 | | 31.48 | 2.18 | 0.66 | 34.26 | 5.03 | 1.58 |
| YQFVPQ | | 30.77 | 1.47 | 0.44 | 30.60 | 1.37 | 0.43 |

| Grand Means | | Summary Statistics | |
|---|----------------------|--------------------|----------------------|
| | 29.297 % Compression | | 29.230 % Compression |
| Std Dev Btwn Labs | | | |
| | 3.316 % Compression | | 3.176 % Compression |
| Statistics based on 25 of 25 reporting participants | | | |

Samples Q91: EPDM compound, batch #1 & Q92: EPDM compound, batch #2

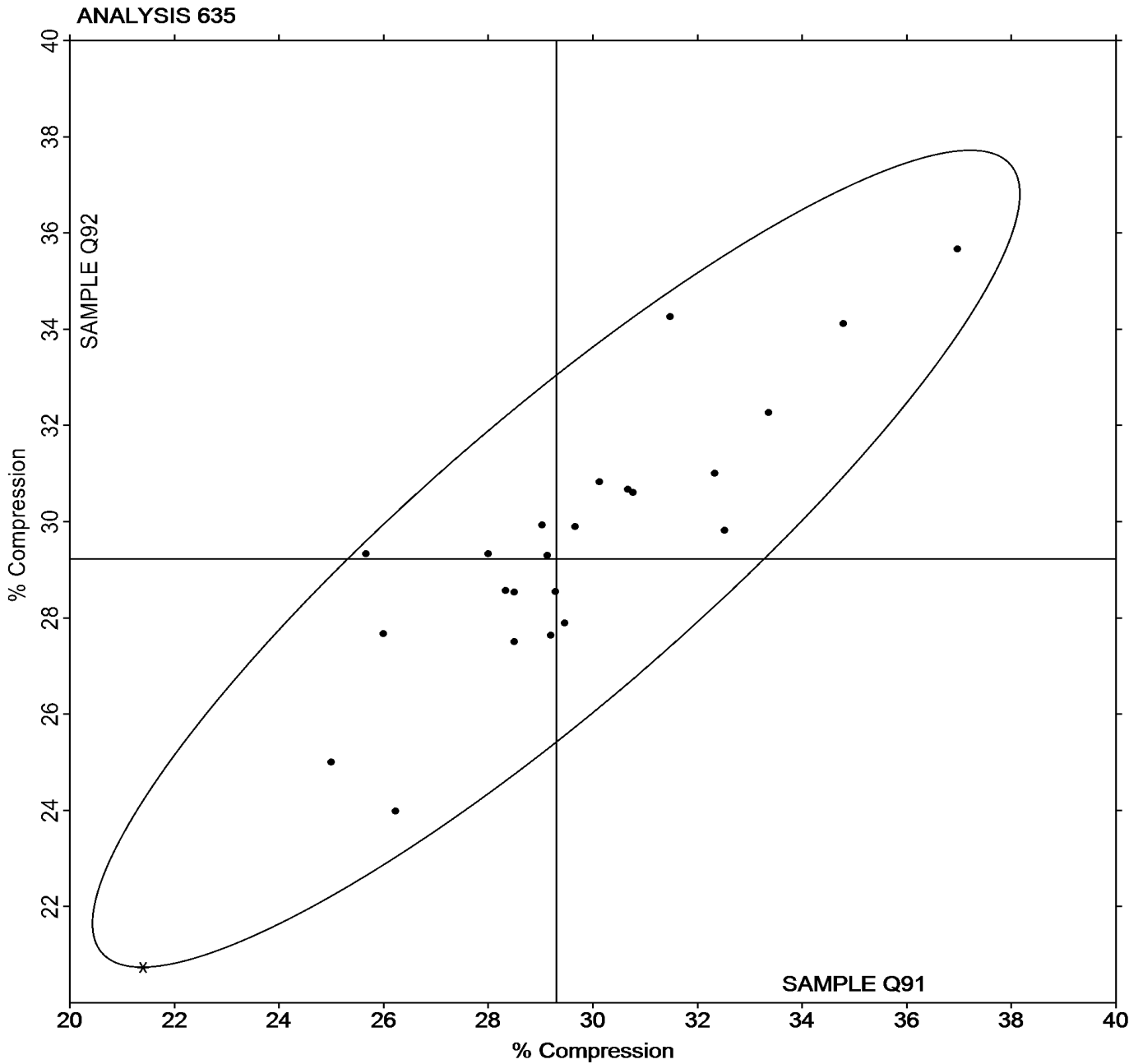


Rubber Interlaboratory Testing Program
Analysis 635
Compression Set Method B

Report #202
4th Qtr 2019

Grand Mean Sample Q91 = 29.297 % Compression

Grand Mean Sample Q92 = 29.230 % Compression





Rubber Interlaboratory Testing Program

Report #202

Analysis 660

4th Qtr 2019

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

| WebCode | Data Flag | Sample V91-V92 | | | Sample V93-V94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2XD3MQ | | 44.35 | 0.34 | 0.32 | 54.48 | 0.38 | 0.39 | MR |
| 43UVD3 | | 42.87 | -1.14 | -1.07 | 53.53 | -0.57 | -0.60 | MV |
| 4H7X64 | X | 53.32 | 9.31 | 8.70 | 54.22 | 0.11 | 0.11 | MR |
| 76XWLJ | | 44.00 | -0.01 | -0.01 | 53.98 | -0.12 | -0.13 | ML |
| 8N3V74 | | 44.33 | 0.33 | 0.30 | 54.77 | 0.66 | 0.69 | MR |
| 8ZX6QR | * | 47.00 | 2.99 | 2.80 | 56.33 | 2.23 | 2.32 | MV |
| 9EW77D | | 43.30 | -0.71 | -0.66 | 54.35 | 0.24 | 0.25 | MR |
| 9FRUK3 | | 44.42 | 0.42 | 0.39 | 54.75 | 0.64 | 0.66 | MV |
| 9M7UJC | | 44.08 | 0.08 | 0.07 | 53.60 | -0.51 | -0.53 | MR |
| 9XLPWQ | | 44.50 | 0.49 | 0.46 | 54.33 | 0.23 | 0.23 | MV |
| ABAD6V | | 43.32 | -0.69 | -0.65 | 54.17 | 0.06 | 0.06 | MR |
| AJ4EQE | * | 41.03 | -2.98 | -2.79 | 51.86 | -2.25 | -2.35 | XX |
| CMV68B | | 42.40 | -1.61 | -1.50 | 52.02 | -2.09 | -2.18 | MR |
| CNPTLY | | 44.23 | 0.23 | 0.21 | 54.45 | 0.34 | 0.36 | MR |
| DUABGM | | 43.83 | -0.17 | -0.16 | 53.08 | -1.02 | -1.07 | XX |
| E4VRPM | | 42.72 | -1.29 | -1.21 | 53.07 | -1.04 | -1.09 | MR |
| EQ63PG | | 44.93 | 0.93 | 0.87 | 54.58 | 0.48 | 0.50 | MR |
| H38THR | | 44.52 | 0.51 | 0.47 | 54.77 | 0.66 | 0.69 | ML |
| HCBYGZ | | 43.90 | -0.11 | -0.10 | 53.67 | -0.44 | -0.46 | MP |
| KVWMTY | | 43.43 | -0.57 | -0.54 | 54.23 | 0.13 | 0.13 | MR |
| L49D2Q | | 46.08 | 2.07 | 1.94 | 54.88 | 0.77 | 0.80 | TV |
| LXNVMZ | * | 43.82 | -0.19 | -0.18 | 56.06 | 1.96 | 2.04 | MV |
| MCHLX4 | | 43.50 | -0.51 | -0.47 | 54.13 | 0.03 | 0.03 | MR |
| PBEWQC | | 45.82 | 1.81 | 1.70 | 54.51 | 0.40 | 0.42 | MR |
| PRJ9DV | | 43.78 | -0.23 | -0.21 | 53.60 | -0.51 | -0.53 | TA |
| QPGMAV | | 44.08 | 0.07 | 0.06 | 54.20 | 0.10 | 0.10 | MV |
| QRF4FX | | 44.30 | 0.29 | 0.27 | 53.83 | -0.27 | -0.29 | MR |
| RLNBMU | | 43.08 | -0.93 | -0.87 | 54.54 | 0.44 | 0.45 | MR |
| RUMLET | | 43.50 | -0.51 | -0.47 | 53.47 | -0.64 | -0.67 | MR |
| TB49WM | | 45.05 | 1.05 | 0.98 | 54.69 | 0.58 | 0.60 | MR |
| UTFHBT | | 44.32 | 0.31 | 0.29 | 53.55 | -0.56 | -0.59 | TV |
| VC9FE7 | | 42.93 | -1.07 | -1.00 | 52.42 | -1.69 | -1.76 | MR |
| W28CLW | | 43.58 | -0.42 | -0.40 | 52.93 | -1.17 | -1.22 | MR |
| W6PW8C | | 45.20 | 1.19 | 1.11 | 54.81 | 0.71 | 0.74 | MV |
| WPWXM4 | | 45.03 | 1.03 | 0.96 | 54.85 | 0.74 | 0.77 | MR |
| XJ3HDM | | 43.88 | -0.13 | -0.12 | 55.65 | 1.54 | 1.61 | MR |
| XW7Q9J | | 43.82 | -0.19 | -0.18 | 53.97 | -0.14 | -0.15 | MR |
| ZR7GVM | | 43.35 | -0.66 | -0.61 | 53.88 | -0.22 | -0.23 | MR |



Rubber Interlaboratory Testing Program

Report #202

Analysis 660

4th Qtr 2019

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

| WebCode | Data Flag | Sample V91-V92 | | | Sample V93-V94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-----|----------------|----------------------|-----|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |

| Grand Means | | Summary Statistics | |
|---|-----------------|--------------------|-----------------|
| | 44.007 ML 1 + 4 | | 54.108 ML 1 + 4 |
| Stnd Dev Btwn Labs | 1.070 ML 1 + 4 | | 0.959 ML 1 + 4 |
| Statistics based on 37 of 38 reporting participants | | | |

Samples V91-V92: NBR & V93-V94: Butyl

Comments on Assigned Data Flags for Test #660

4H7X64 (X) - Data for sample group V91-V92 are high.

Key to Instrument Codes Reported by Participants

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

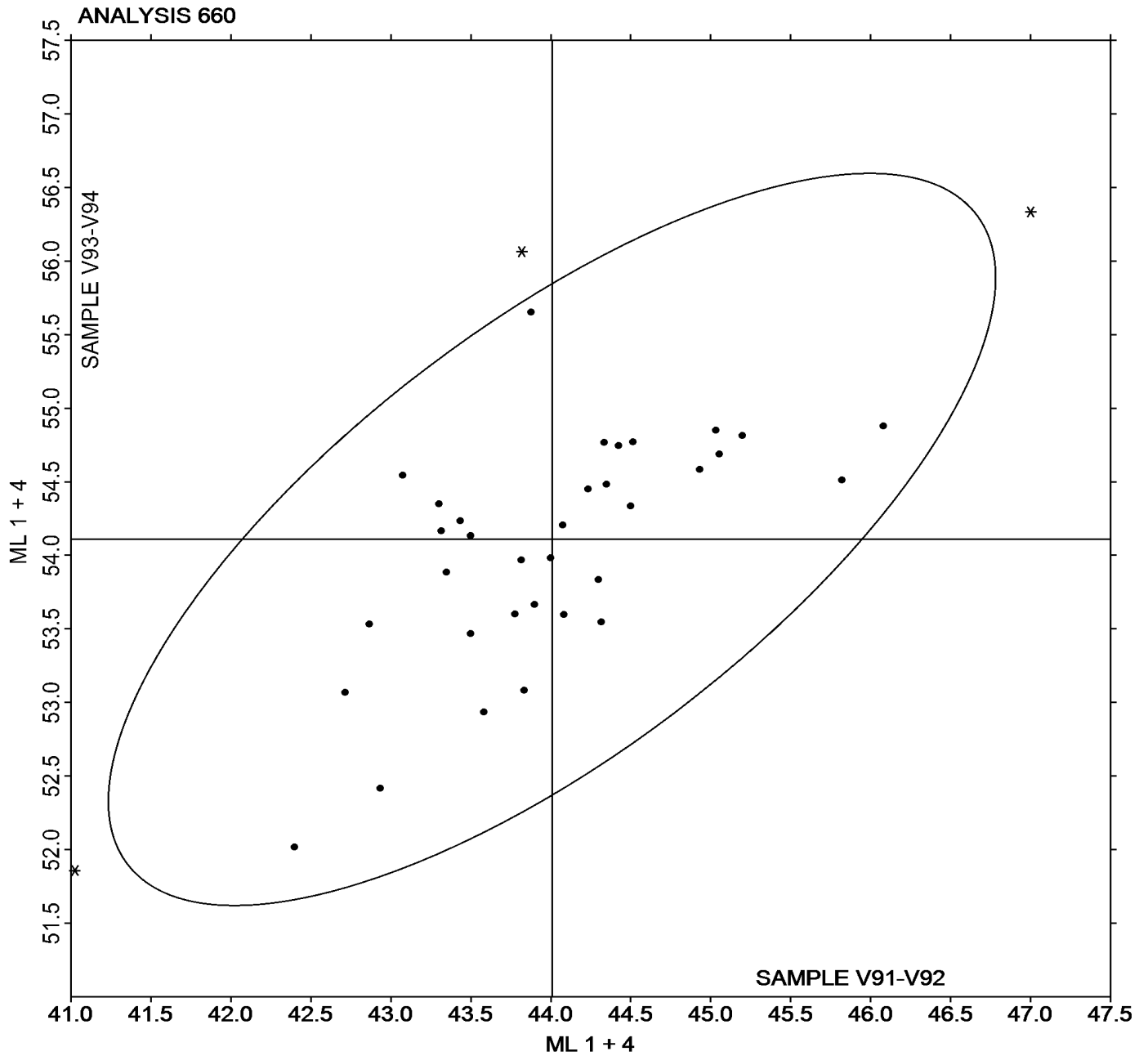


Rubber Interlaboratory Testing Program
Analysis 660
Mooney Viscosity: 4-minute readings (ML 1 + 4)

Report #202
4th Qtr 2019

Grand Mean Sample V91-V92 = 44.007 ML 1 + 4

Grand Mean Sample V93-V94 = 54.108 ML 1 + 4





Rubber Interlaboratory Testing Program

Report #202

Analysis 661

4th Qtr 2019

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

| WebCode | Data Flag | Sample V91-V92 | | | Sample V93-V94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2XD3MQ | | 44.35 | 0.22 | 0.22 | 51.82 | 0.25 | 0.27 | MR |
| 43UVD3 | | 42.87 | -1.26 | -1.27 | 51.13 | -0.43 | -0.45 | MV |
| 4H7X64 | X | 53.32 | 9.19 | 9.28 | 52.42 | 0.85 | 0.90 | XX |
| 76XWLJ | | 44.00 | -0.13 | -0.13 | 50.00 | -1.56 | -1.65 | ML |
| 8N3V74 | | 44.33 | 0.21 | 0.21 | 52.48 | 0.92 | 0.97 | MR |
| 8ZX6QR | * | 47.00 | 2.87 | 2.90 | 53.17 | 1.61 | 1.69 | MV |
| 9EW77D | | 43.30 | -0.83 | -0.84 | 51.27 | -0.30 | -0.31 | MR |
| 9FRUK3 | | 44.42 | 0.30 | 0.30 | 52.69 | 1.12 | 1.18 | MV |
| 9M7UJC | | 44.08 | -0.04 | -0.05 | 51.07 | -0.49 | -0.52 | MR |
| 9XLPWQ | | 44.50 | 0.37 | 0.38 | 52.17 | 0.60 | 0.64 | MV |
| ABAD6V | | 43.32 | -0.81 | -0.82 | 51.83 | 0.27 | 0.28 | MR |
| CMV68B | | 42.40 | -1.73 | -1.74 | 49.70 | -1.86 | -1.96 | MR |
| CNPTLY | | 44.23 | 0.11 | 0.11 | 52.60 | 1.04 | 1.09 | MR |
| DUABGM | | 43.83 | -0.29 | -0.30 | 50.70 | -0.86 | -0.91 | XX |
| E4VRPM | | 42.72 | -1.41 | -1.42 | 50.87 | -0.70 | -0.73 | MR |
| EQ63PG | | 44.93 | 0.81 | 0.81 | 53.02 | 1.45 | 1.53 | MR |
| H38THR | | 44.52 | 0.39 | 0.39 | 51.94 | 0.38 | 0.40 | ML |
| HCBYGZ | | 43.90 | -0.23 | -0.23 | 50.70 | -0.87 | -0.92 | MP |
| L49D2Q | | 46.08 | 1.95 | 1.97 | 51.85 | 0.28 | 0.30 | TV |
| LXNVMZ | | 43.82 | -0.31 | -0.31 | 52.78 | 1.21 | 1.28 | MV |
| MCHLX4 | | 43.50 | -0.63 | -0.63 | 51.78 | 0.22 | 0.23 | MR |
| PBEWQC | | 45.82 | 1.69 | 1.71 | 51.27 | -0.30 | -0.31 | MR |
| QPGMAV | | 44.08 | -0.05 | -0.05 | 51.43 | -0.13 | -0.14 | MV |
| QRF4FX | | 44.30 | 0.17 | 0.17 | 51.63 | 0.07 | 0.07 | MR |
| RLNBMU | | 43.08 | -1.05 | -1.06 | 51.48 | -0.08 | -0.08 | MR |
| RUMLET | | 43.50 | -0.63 | -0.63 | 50.81 | -0.76 | -0.80 | MP |
| TB49WM | | 45.05 | 0.93 | 0.93 | 52.36 | 0.80 | 0.84 | MR |
| UTFHBT | | 44.32 | 0.19 | 0.19 | 50.58 | -0.99 | -1.04 | TV |
| VC9FE7 | | 42.93 | -1.19 | -1.21 | 50.17 | -1.40 | -1.47 | MR |
| W28CLW | | 43.58 | -0.54 | -0.55 | 50.03 | -1.53 | -1.61 | MR |
| W6PW8C | | 45.20 | 1.07 | 1.08 | 52.67 | 1.11 | 1.17 | MV |
| WPWXM4 | | 45.03 | 0.91 | 0.91 | 52.72 | 1.15 | 1.22 | MR |
| XJ3HDM | | 43.88 | -0.25 | -0.25 | 52.18 | 0.62 | 0.65 | MR |
| ZR7GVM | | 43.35 | -0.78 | -0.79 | 50.70 | -0.86 | -0.91 | MR |



Rubber Interlaboratory Testing Program

Report #202

Analysis 661

4th Qtr 2019

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

| | | Summary Statistics | |
|---|-----------------|--------------------|--|
| Grand Means | 44.128 ML 1 + 8 | 51.563 ML 1 + 8 | |
| Stnd Dev Btwn Labs | 0.991 ML 1 + 8 | 0.949 ML 1 + 8 | |
| Statistics based on 33 of 34 reporting participants | | | |

Samples V91-V92: NBR & V93-V94: Butyl

Comments on Assigned Data Flags for Test #661

4H7X64 (X) - Extreme Data for sample group V91-V92.

Key to Instrument Codes Reported by Participants

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



Rubber Interlaboratory Testing Program

Analysis 661

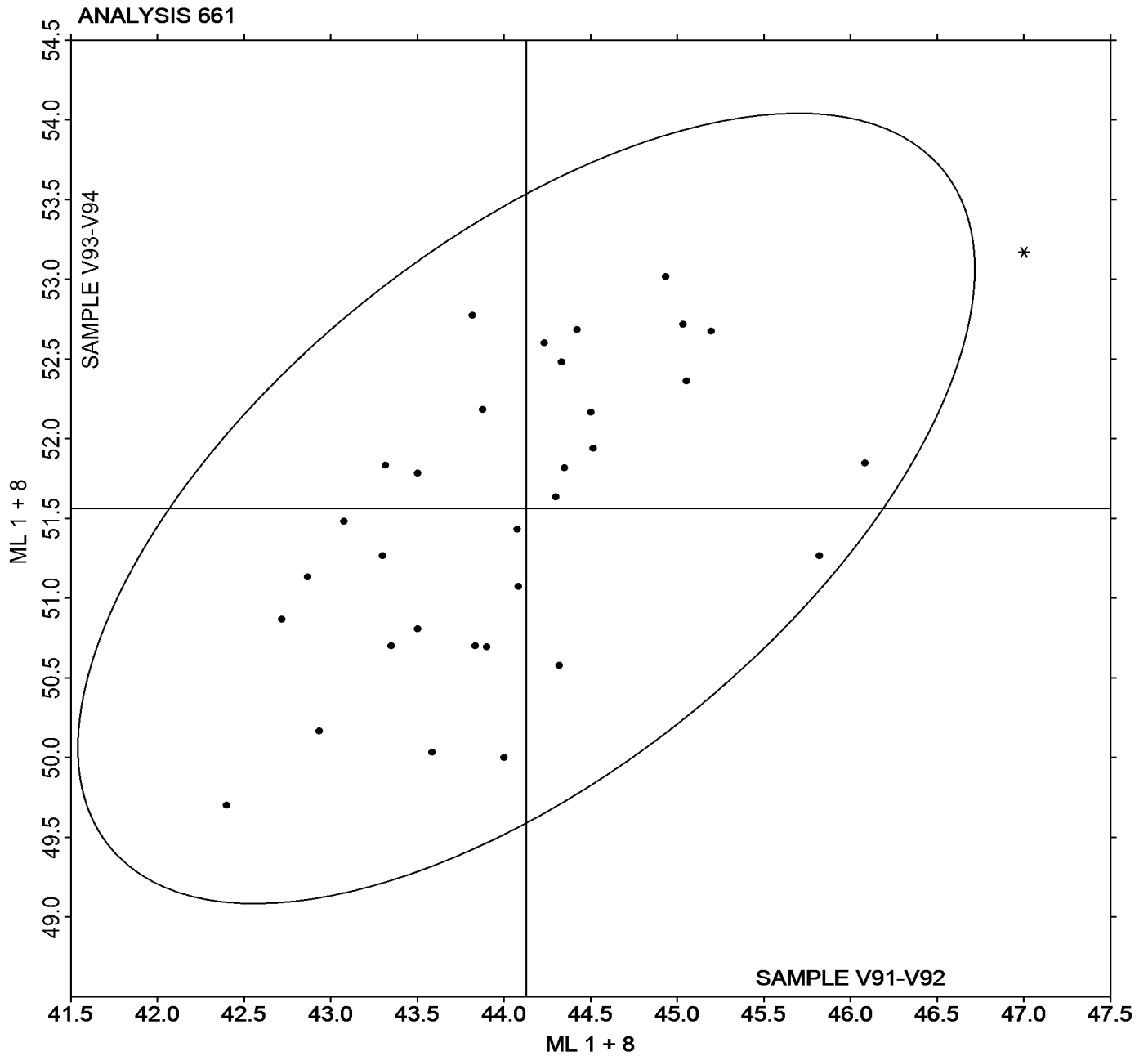
Report #202

4th Qtr 2019

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

Grand Mean Sample V91-V92 = 44.128 ML 1 + 8

Grand Mean Sample V93-V94 = 51.563 ML 1 + 8





Rubber Interlaboratory Testing Program

Report #202

Analysis 662

4th Qtr 2019

Mooney Stress Relaxation: t80 (seconds)

| WebCode | Data Flag | Sample V91-V92 | | | Sample V93-V94 | | | Instr Code |
|---------|-----------|----------------|----------------------|--------|----------------|----------------------|--------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2XD3MQ | | 4.575 | 0.284 | 0.38 | 7.332 | 0.292 | 0.29 | MR |
| 43UVD3 | | 2.800 | -1.491 | -2.00 | 5.067 | -1.973 | -1.93 | MV |
| 8N3V74 | | 4.880 | 0.589 | 0.79 | 7.637 | 0.597 | 0.59 | MR |
| 9XLPWQ | | 3.167 | -1.124 | -1.51 | 5.533 | -1.506 | -1.48 | MV |
| ABAD6V | | 3.800 | -0.491 | -0.66 | 7.483 | 0.444 | 0.44 | MR |
| DUABGM | | 4.567 | 0.276 | 0.37 | 7.133 | 0.094 | 0.09 | XX |
| E4VRPM | | 4.860 | 0.569 | 0.77 | 7.370 | 0.331 | 0.32 | MR |
| H38THR | X | 304.500 | 300.209 | 403.62 | 547.200 | 540.161 | 529.42 | ML |
| LXNVMZ | | 3.367 | -0.924 | -1.24 | 6.000 | -1.039 | -1.02 | MV |
| MCHLX4 | | 4.723 | 0.433 | 0.58 | 7.270 | 0.231 | 0.23 | MR |
| PRJ9DV | | 5.017 | 0.726 | 0.98 | 8.767 | 1.727 | 1.69 | TA |
| QPGMAV | X | 305.000 | 300.709 | 404.29 | 310.167 | 303.127 | 297.10 | MV |
| UTFHBT | X | 663.600 | 659.309 | 886.42 | 667.200 | 660.161 | 647.04 | TV |
| VC9FE7 | | 3.797 | -0.494 | -0.66 | 6.203 | -0.836 | -0.82 | MR |
| W28CLW | | 4.907 | 0.616 | 0.83 | 6.877 | -0.163 | -0.16 | MR |
| W6PW8C | | 4.000 | -0.291 | -0.39 | 6.600 | -0.439 | -0.43 | MV |
| XW7Q9J | | 4.800 | 0.509 | 0.68 | 8.400 | 1.361 | 1.33 | MR |
| ZR7GVM | | 5.100 | 0.809 | 1.09 | 7.917 | 0.877 | 0.86 | MR |

| Grand Means | | Summary Statistics | |
|---|----------------|--------------------|----------------|
| | 4.2906 seconds | | 7.0392 seconds |
| Std Dev Btwn Labs | | | |
| | 0.7438 seconds | | 1.0203 seconds |
| Statistics based on 15 of 18 reporting participants | | | |

Samples V91-V92: NBR & V93-V94: Butyl

Comments on Assigned Data Flags for Test #662

H38THR (X) - Extreme Data.

QPGMAV (X) - Extreme Data.

UTFHBT (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

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

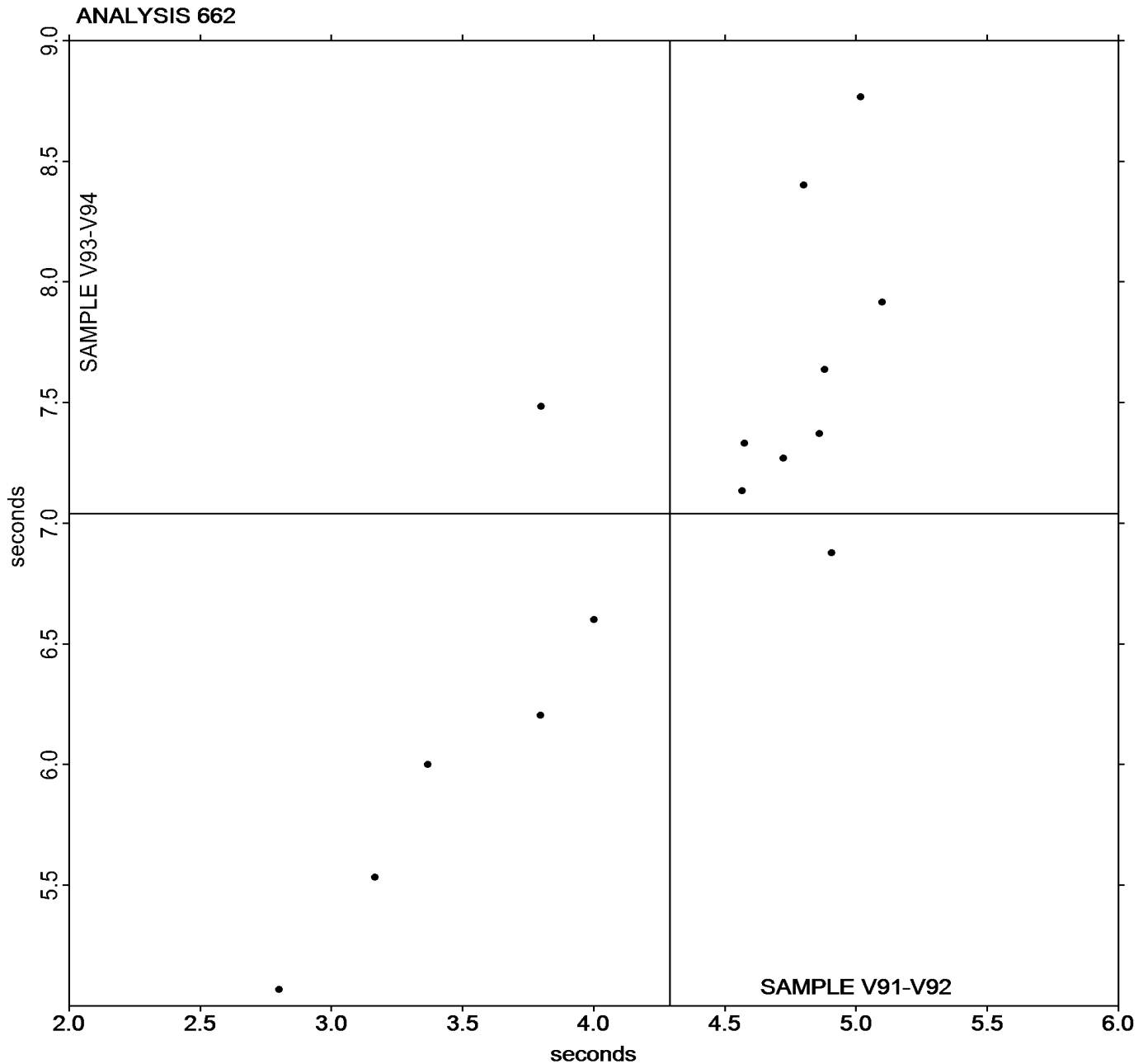


Rubber Interlaboratory Testing Program
Analysis 662
Mooney Stress Relaxation: t80 (seconds)

Report #202
4th Qtr 2019

Grand Mean Sample **V91-V92** = 4.2906 seconds

Grand Mean Sample **V93-V94** = 7.0392 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

Report #202

Analysis 663

4th Qtr 2019

Mooney Stress Relaxation: X30 (percent)

| WebCode | Data Flag | Sample V91-V92 | | | Sample V93-V94 | | | Instr Code |
|---------|-----------|----------------|----------------------|--------|----------------|----------------------|--------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2XD3MQ | | 91.78 | -1.28 | -0.70 | 92.14 | -0.82 | -0.44 | MR |
| 43UVD3 | | 96.40 | 3.34 | 1.83 | 96.40 | 3.44 | 1.84 | MV |
| 8N3V74 | | 91.20 | -1.85 | -1.01 | 91.94 | -1.03 | -0.55 | MR |
| 8ZX6QR | | 94.01 | 0.96 | 0.52 | 93.09 | 0.13 | 0.07 | MZ |
| 9XLPWQ | | 95.84 | 2.78 | 1.52 | 95.84 | 2.88 | 1.54 | MV |
| ABAD6V | | 92.07 | -0.99 | -0.54 | 89.73 | -3.23 | -1.73 | MR |
| DUABGM | X | 8.18 | -84.87 | -46.37 | 7.43 | -85.53 | -45.88 | XX |
| E4VRPM | | 92.16 | -0.90 | -0.49 | 92.89 | -0.07 | -0.04 | MR |
| H38THR | | 91.65 | -1.41 | -0.77 | 92.46 | -0.50 | -0.27 | ML |
| LXNVMZ | | 94.53 | 1.48 | 0.81 | 94.31 | 1.35 | 0.72 | MV |
| MCHLX4 | | 91.26 | -1.80 | -0.98 | 92.06 | -0.91 | -0.49 | MR |
| PRJ9DV | | 91.22 | -1.84 | -1.01 | 90.33 | -2.63 | -1.41 | TA |
| QPGMAV | | 95.60 | 2.54 | 1.39 | 95.02 | 2.05 | 1.10 | MV |
| UTFHBT | | 93.42 | 0.36 | 0.20 | 92.64 | -0.32 | -0.17 | TV |
| VC9FE7 | X | 5.62 | -87.44 | -47.77 | 5.18 | -87.79 | -47.10 | MR |
| W28CLW | X | 8.34 | -84.72 | -46.29 | 6.83 | -86.13 | -46.21 | MR |
| W6PW8C | | 93.33 | 0.28 | 0.15 | 93.83 | 0.87 | 0.47 | MV |
| ZR7GVM | | 91.40 | -1.66 | -0.91 | 91.75 | -1.21 | -0.65 | MR |

| Grand Means | | Summary Statistics | |
|---|----------------|--------------------|----------------|
| | 93.058 percent | | 92.961 percent |
| Std Dev Btwn Labs | 1.830 percent | | 1.864 percent |
| Statistics based on 15 of 18 reporting participants | | | |

Samples V91-V92: NBR & V93-V94: Butyl

Comments on Assigned Data Flags for Test #663

DUABGM (X) - Extreme Data.

VC9FE7 (X) - Extreme Data.

W28CLW (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

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

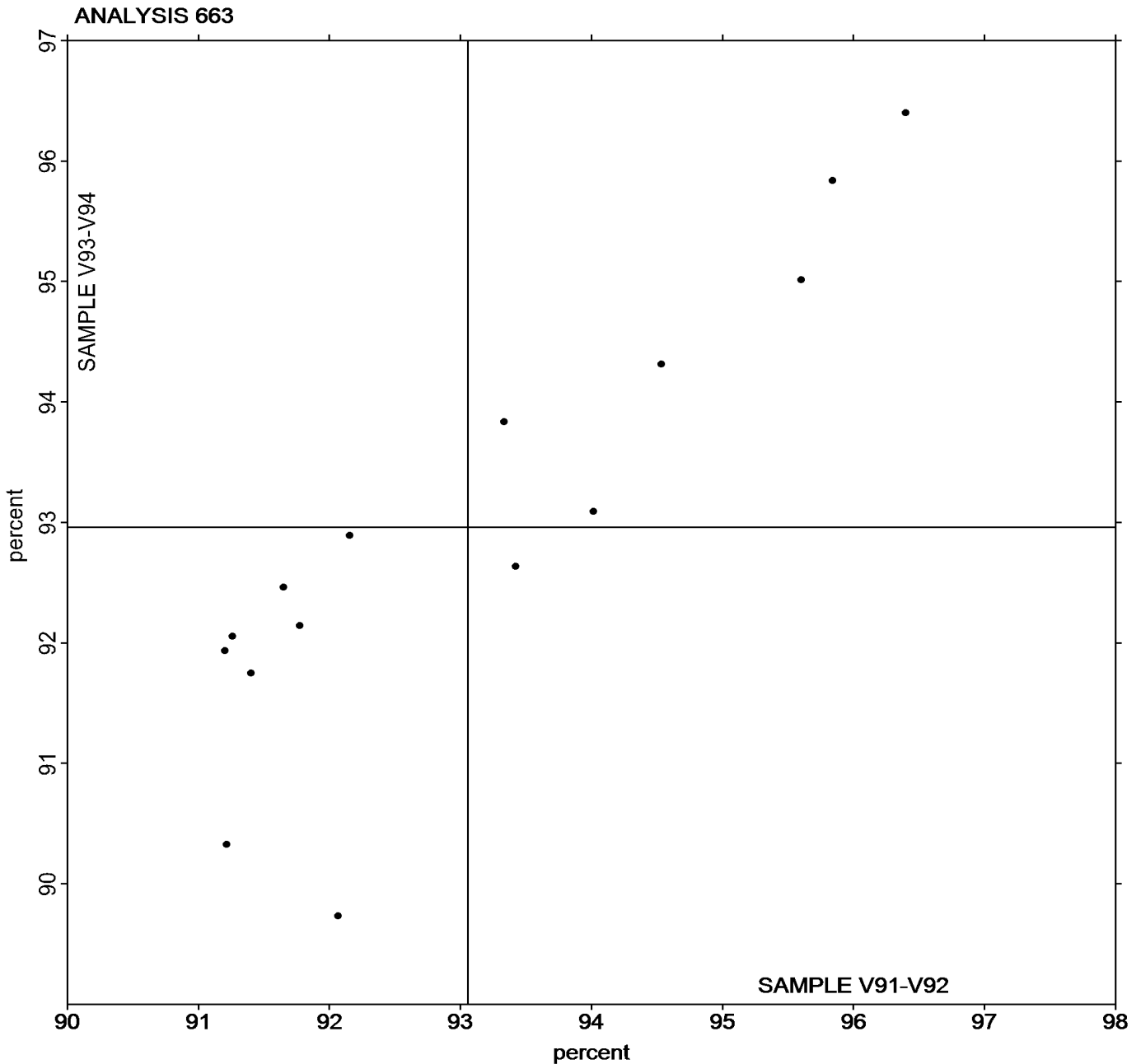


Rubber Interlaboratory Testing Program
Analysis 663
Mooney Stress Relaxation: X30 (percent)

Report #202
4th Qtr 2019

Grand Mean Sample V91-V92 = 93.058 percent

Grand Mean Sample V93-V94 = 92.961 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 #202

Analysis 664

4th Qtr 2019

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

| WebCode | Data Flag | Sample V91-V92 | | | Sample V93-V94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2XD3MQ | | 393.8 | 66.3 | 0.71 | 462.8 | 67.6 | 0.77 | MR |
| 43UVD3 | | 143.8 | -183.7 | -1.95 | 199.3 | -195.9 | -2.23 | MV |
| 8N3V74 | | 422.8 | 95.4 | 1.01 | 477.2 | 82.0 | 0.94 | MR |
| 8ZX6QR | | 272.0 | -55.4 | -0.59 | 410.2 | 15.1 | 0.17 | MZ |
| 9XLPWQ | | 173.0 | -154.4 | -1.64 | 224.5 | -170.6 | -1.95 | MV |
| ABAD6V | | 450.0 | 122.5 | 1.30 | 481.0 | 85.9 | 0.98 | MR |
| DUABGM | | 386.3 | 58.8 | 0.63 | 429.2 | 34.0 | 0.39 | XX |
| E4VRPM | | 362.5 | 35.0 | 0.37 | 416.5 | 21.4 | 0.24 | XX |
| H38THR | | 397.4 | 70.0 | 0.74 | 429.3 | 34.2 | 0.39 | ML |
| LXNVMZ | | 245.7 | -81.7 | -0.87 | 324.0 | -71.2 | -0.81 | MV |
| MCHLX4 | | 409.0 | 81.5 | 0.87 | 468.2 | 73.0 | 0.83 | MR |
| PRJ9DV | | 324.0 | -3.4 | -0.04 | 465.5 | 70.3 | 0.80 | TA |
| QPGMAV | | 189.1 | -138.4 | -1.47 | 282.5 | -112.7 | -1.28 | MV |
| UTFHBT | | 292.9 | -34.6 | -0.37 | 418.9 | 23.7 | 0.27 | TV |
| W28CLW | | 392.4 | 65.0 | 0.69 | 390.6 | -4.5 | -0.05 | MR |
| W6PW8C | | 317.3 | -10.2 | -0.11 | 373.5 | -21.6 | -0.25 | MV |
| ZR7GVM | | 394.7 | 67.2 | 0.72 | 464.3 | 69.2 | 0.79 | MR |

| Grand Means | | Summary Statistics | |
|---|------------|--------------------|------------|
| | 327.46 M-s | | 395.14 M-s |
| Std Dev Btwn Labs | 93.97 M-s | | 87.69 M-s |
| Statistics based on 17 of 17 reporting participants | | | |

Samples V91-V92: NBR & V93-V94: Butyl

Key to Instrument Codes Reported by Participants

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

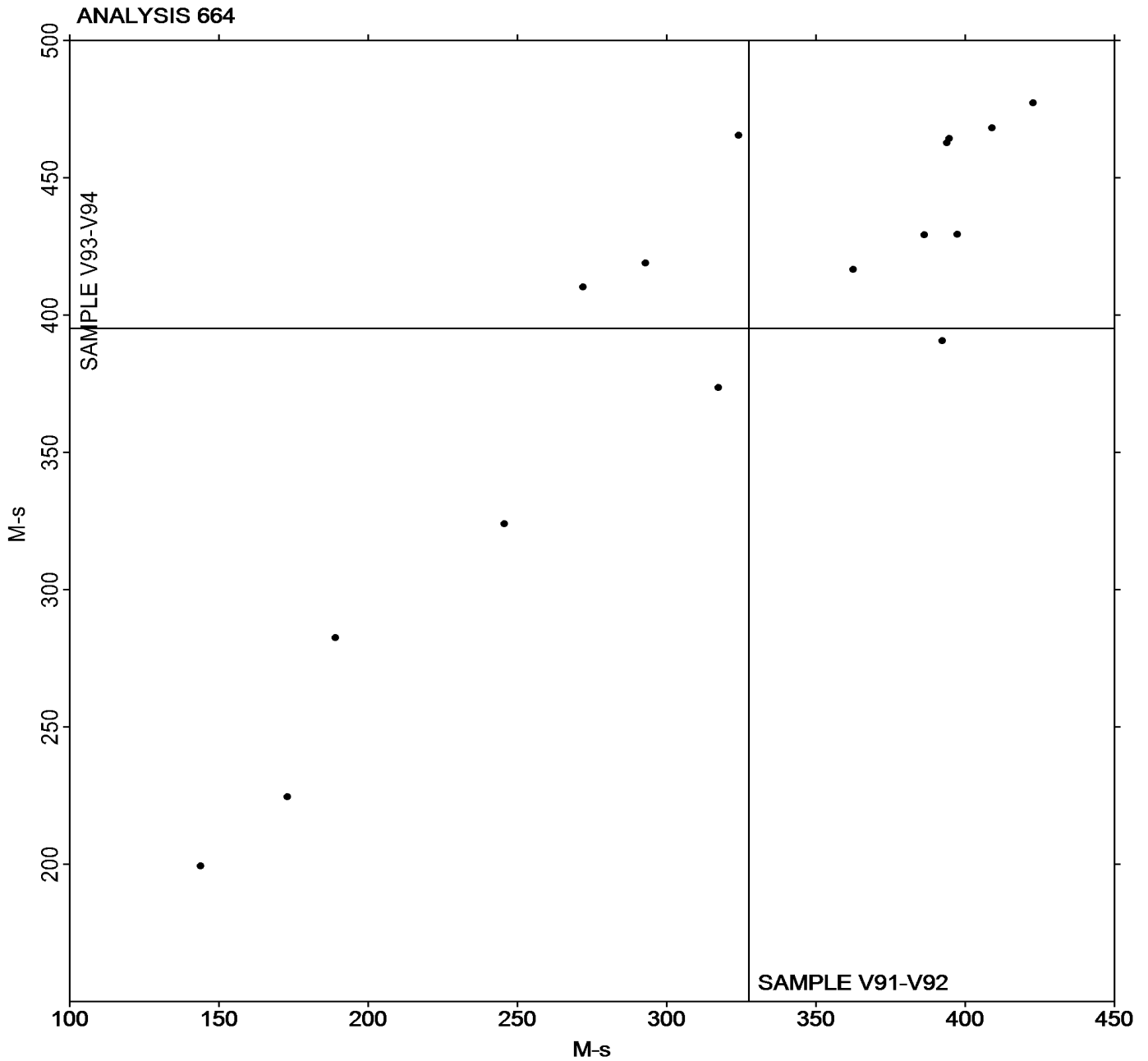


Rubber Interlaboratory Testing Program
Analysis 664
Mooney Stress Relaxation: Area under curve (M-s)

Report #202
4th Qtr 2019

Grand Mean Sample V91-V92 = 327.46 M-s

Grand Mean Sample V93-V94 = 395.14 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 #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z91-Z92 | | | Sample Z93-Z94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3HVXBU | | 1.542 | -0.086 | -0.60 | 3.805 | -0.263 | -0.66 |
| 43UVD3 | | 1.728 | 0.101 | 0.70 | 4.200 | 0.132 | 0.33 |
| CMV68B | | 1.798 | 0.171 | 1.19 | 4.288 | 0.221 | 0.55 |
| HCBYGZ | | 1.805 | 0.178 | 1.24 | 4.943 | 0.876 | 2.20 |
| LXNVMZ | | 1.415 | -0.212 | -1.48 | 3.668 | -0.399 | -1.00 |
| MGAW82 | | 1.677 | 0.049 | 0.34 | 4.273 | 0.206 | 0.52 |
| MNRDLW | | 1.558 | -0.069 | -0.48 | 3.438 | -0.629 | -1.58 |
| PBEWQC | | 1.488 | -0.139 | -0.97 | 3.865 | -0.203 | -0.51 |
| TB49WM | | 1.450 | -0.177 | -1.23 | 3.925 | -0.143 | -0.36 |
| UTFHBT | | 1.783 | 0.156 | 1.09 | 4.230 | 0.162 | 0.41 |
| XJ3HDM | | 1.655 | 0.028 | 0.19 | 4.107 | 0.039 | 0.10 |

| | | Summary Statistics | |
|---|--|--------------------|----------------|
| Grand Means | | 1.6273 minutes | 4.0676 minutes |
| Std Dev Btwn Labs | | 0.1437 minutes | 0.3986 minutes |
| Statistics based on 11 of 11 reporting participants | | | |

Samples Z91-Z92: EPDM compound #1 & Z93-Z94: EPDM compound #2

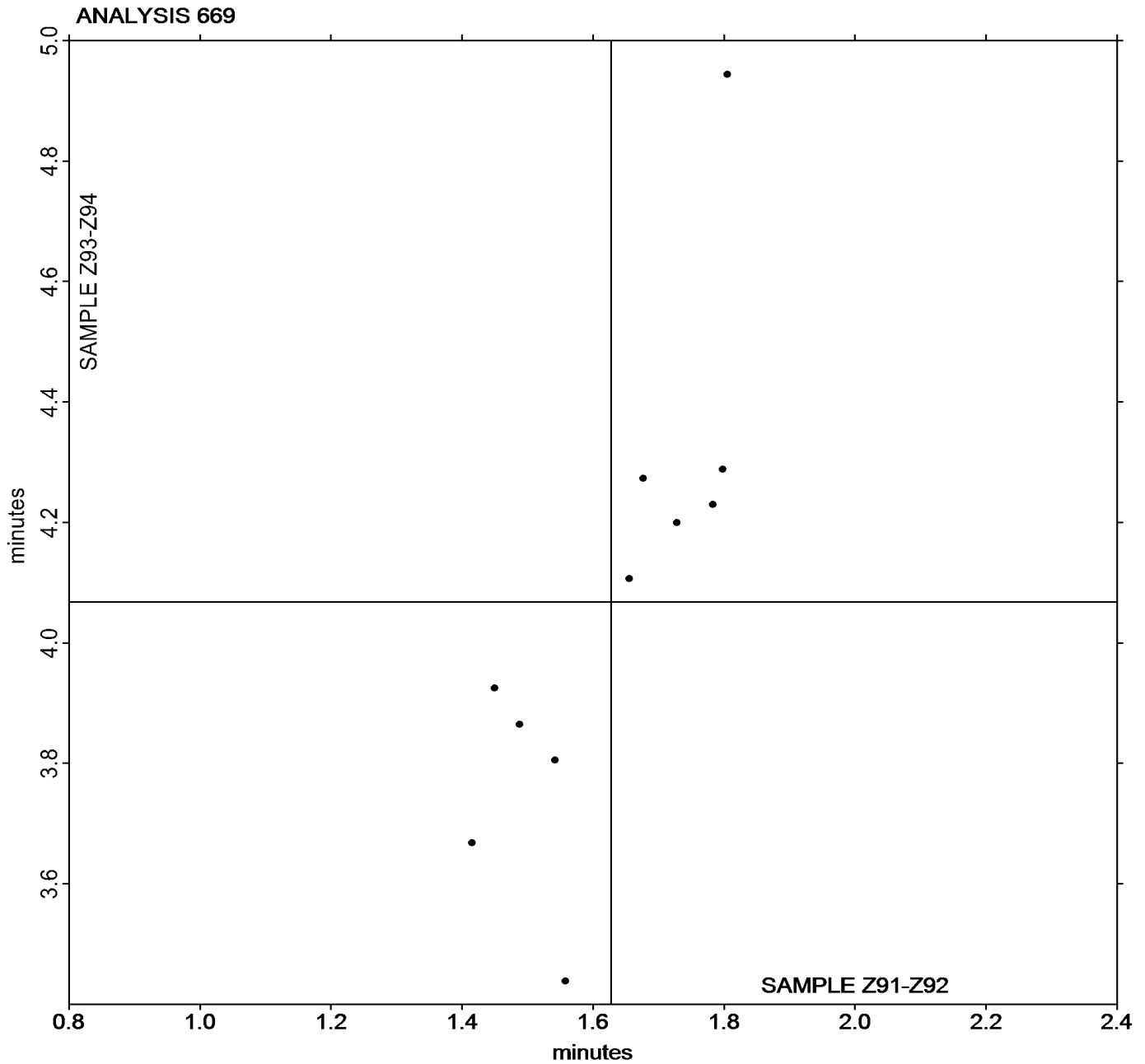


Rubber Interlaboratory Testing Program
Analysis 669
ODR Vulcanization-Cure Time 10% (minutes)

Report #202
4th Qtr 2019

Grand Mean Sample Z91-Z92 = 1.6273 minutes

Grand Mean Sample Z93-Z94 = 4.0676 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 #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z91-Z92 | | | Sample Z93-Z94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3HVXBU | | 1.097 | -0.084 | -0.59 | 2.952 | -0.075 | -0.14 |
| 43UVD3 | | 1.228 | 0.047 | 0.33 | 3.062 | 0.035 | 0.07 |
| CMV68B | | 1.353 | 0.172 | 1.20 | 3.222 | 0.195 | 0.37 |
| HCBYGZ | | 1.438 | 0.257 | 1.79 | 4.372 | 1.345 | 2.58 |
| LXNVMZ | | 1.007 | -0.174 | -1.21 | 2.680 | -0.347 | -0.67 |
| MGAW82 | | 1.158 | -0.023 | -0.16 | 2.988 | -0.039 | -0.07 |
| MNRDLW | | 1.122 | -0.059 | -0.41 | 2.327 | -0.700 | -1.34 |
| PBEWQC | | 1.052 | -0.129 | -0.90 | 2.622 | -0.405 | -0.78 |
| TB49WM | | 1.025 | -0.156 | -1.08 | 2.927 | -0.100 | -0.19 |
| UTFHBT | | 1.342 | 0.161 | 1.12 | 3.267 | 0.240 | 0.46 |
| XJ3HDM | | 1.168 | -0.013 | -0.09 | 2.880 | -0.147 | -0.28 |

| | | Summary Statistics | |
|---|--|--------------------|----------------|
| Grand Means | | 1.1809 minutes | 3.0270 minutes |
| Std Dev Btwn Labs | | 0.1438 minutes | 0.5214 minutes |
| Statistics based on 11 of 11 reporting participants | | | |

Samples Z91-Z92: EPDM compound #1 & Z93-Z94: EPDM compound #2

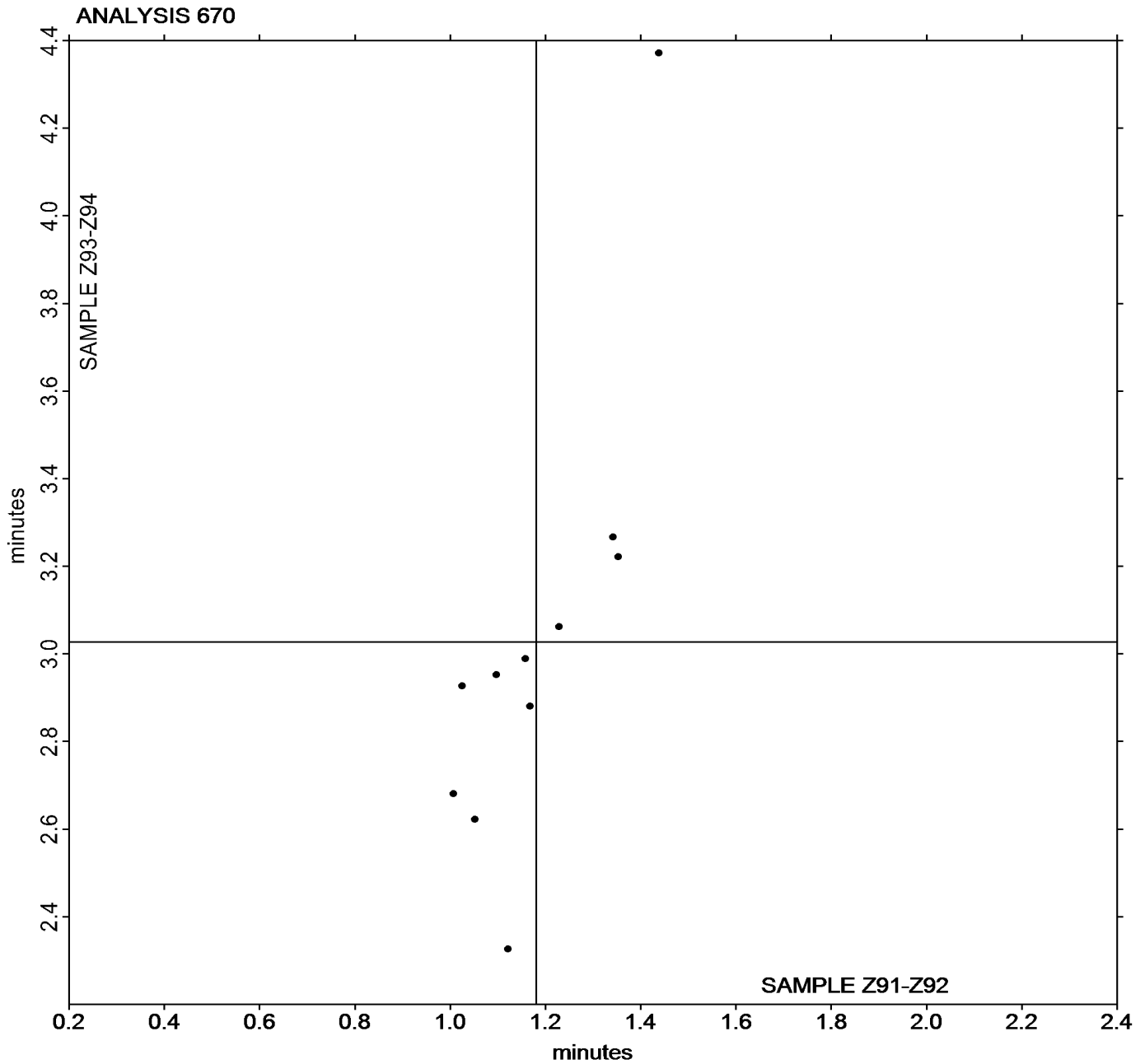


Rubber Interlaboratory Testing Program
Analysis 670
ODR Vulcanization-Scorch Time, Ts1 (minutes)

Report #202
4th Qtr 2019

Grand Mean Sample **Z91-Z92** = 1.1809 minutes

Grand Mean Sample **Z93-Z94** = 3.0270 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 #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z91-Z92 | | | Sample Z93-Z94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3HVXBU | | 2.985 | -0.167 | -0.72 | 7.012 | -0.538 | -1.42 |
| 43UVD3 | | 3.337 | 0.185 | 0.80 | 7.832 | 0.282 | 0.75 |
| CMV68B | | 3.328 | 0.177 | 0.76 | 7.725 | 0.176 | 0.47 |
| HCBYGZ | | 3.322 | 0.170 | 0.73 | 7.938 | 0.389 | 1.03 |
| LXNVMZ | | 2.722 | -0.430 | -1.85 | 6.797 | -0.753 | -1.99 |
| MGAW82 | | 3.210 | 0.058 | 0.25 | 7.890 | 0.341 | 0.90 |
| MNRDLW | | 3.057 | -0.095 | -0.41 | 7.553 | 0.004 | 0.01 |
| PBEWQC | | 2.960 | -0.192 | -0.83 | 7.460 | -0.089 | -0.24 |
| TB49WM | | 2.932 | -0.220 | -0.95 | 7.282 | -0.268 | -0.71 |
| UTFHBT | | 3.437 | 0.285 | 1.23 | 7.712 | 0.162 | 0.43 |
| XJ3HDM | | 3.380 | 0.228 | 0.98 | 7.843 | 0.294 | 0.78 |

| | | Summary Statistics | |
|---|--|--------------------|----------------|
| Grand Means | | 3.1517 minutes | 7.5494 minutes |
| Stnd Dev Btwn Labs | | 0.2319 minutes | 0.3776 minutes |
| Statistics based on 11 of 11 reporting participants | | | |

Samples Z91-Z92: EPDM compound #1 & Z93-Z94: EPDM compound #2



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z91-Z92 | | | Sample Z93-Z94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3HVXBU | | 13.08 | -1.21 | -0.98 | 15.68 | 0.31 | 0.17 |
| 43UVD3 | | 13.85 | -0.43 | -0.35 | 14.40 | -0.98 | -0.55 |
| CMV68B | | 14.29 | 0.00 | 0.00 | 15.74 | 0.36 | 0.21 |
| HCBYGZ | | 13.86 | -0.43 | -0.35 | 14.25 | -1.12 | -0.63 |
| LXNVMZ | | 12.24 | -2.05 | -1.66 | 13.62 | -1.75 | -0.99 |
| MGAW82 | | 14.72 | 0.44 | 0.36 | 13.61 | -1.77 | -1.00 |
| MNRDLW | | 13.76 | -0.52 | -0.42 | 14.97 | -0.41 | -0.23 |
| PBEWQC | | 13.67 | -0.62 | -0.50 | 15.95 | 0.57 | 0.32 |
| TB49WM | | 16.39 | 2.10 | 1.70 | 20.03 | 4.66 | 2.63 |
| UTFHBT | | 16.03 | 1.75 | 1.41 | 15.96 | 0.59 | 0.33 |
| XJ3HDM | | 15.24 | 0.96 | 0.78 | 14.92 | -0.46 | -0.26 |

| | | Summary Statistics | |
|---|--|--------------------|----------------|
| Grand Means | | 14.283 minutes | 15.374 minutes |
| Std Dev Btwn Labs | | 1.235 minutes | 1.771 minutes |
| Statistics based on 11 of 11 reporting participants | | | |

Samples Z91-Z92: EPDM compound #1 & Z93-Z94: EPDM compound #2

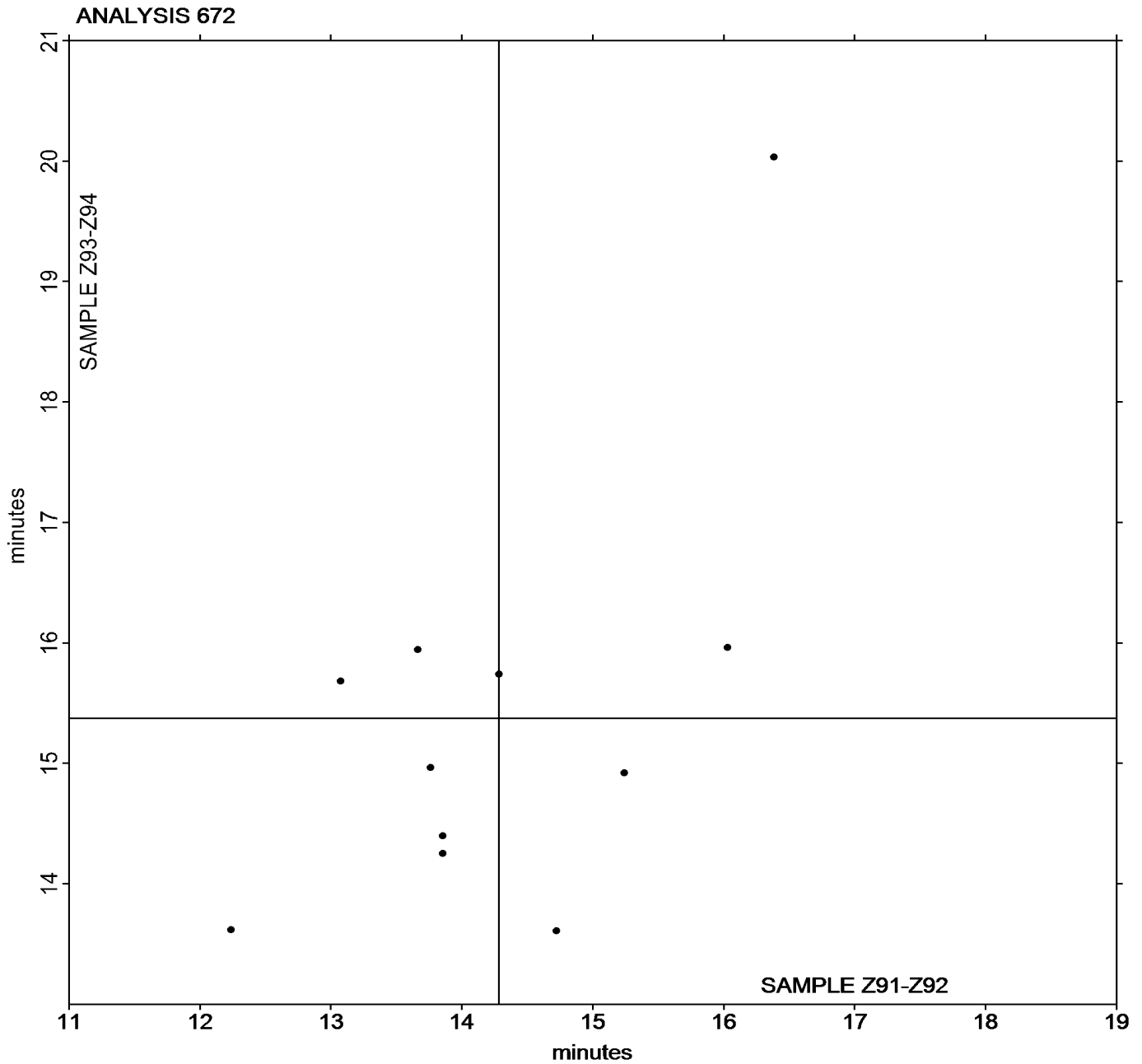


Rubber Interlaboratory Testing Program
Analysis 672
ODR Vulcanization-Cure Time 90% (minutes)

Report #202
4th Qtr 2019

Grand Mean Sample **Z91-Z92** = 14.283 minutes

Grand Mean Sample **Z93-Z94** = 15.374 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 #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z91-Z92 | | | Sample Z93-Z94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3HVXBU | | 8.183 | -0.650 | -0.58 | 10.237 | 0.761 | 0.44 |
| 43UVD3 | | 8.943 | 0.110 | 0.10 | 8.553 | -0.922 | -0.53 |
| CMV68B | | 10.348 | 1.515 | 1.35 | 8.693 | -0.782 | -0.45 |
| HCBYGZ | | 8.283 | -0.550 | -0.49 | 9.190 | -0.286 | -0.17 |
| LXNVMZ | | 9.750 | 0.917 | 0.81 | 9.977 | 0.501 | 0.29 |
| MGAW82 | | 9.238 | 0.405 | 0.36 | 9.113 | -0.362 | -0.21 |
| MNRDLW | | 10.897 | 2.063 | 1.83 | 13.413 | 3.938 | 2.28 |
| PBEWQC | | 8.035 | -0.798 | -0.71 | 7.700 | -1.776 | -1.03 |
| TB49WM | | 8.095 | -0.738 | -0.66 | 11.155 | 1.679 | 0.97 |
| UTFHBT | | 8.253 | -0.580 | -0.51 | 9.123 | -0.352 | -0.20 |
| XJ3HDM | | 7.138 | -1.695 | -1.50 | 7.078 | -2.397 | -1.39 |

| Summary Statistics | |
|---|---------------|
| Grand Means | 8.8332 lbf.in |
| Std Dev Btwn Labs | 1.1263 lbf.in |
| | 9.4758 lbf.in |
| | 1.7279 lbf.in |
| Statistics based on 11 of 11 reporting participants | |

| Summary Statistics in SI Units | |
|---|--------------|
| Grand Means | 9.9802 dN.m |
| Std Dev Btwn Labs | 1.2726 dN.m |
| | 10.7062 dN.m |
| | 1.9522 dN.m |
| Statistics based on 11 of 11 reporting participants | |

Samples Z91-Z92: EPDM compound #1 & Z93-Z94: EPDM compound #2

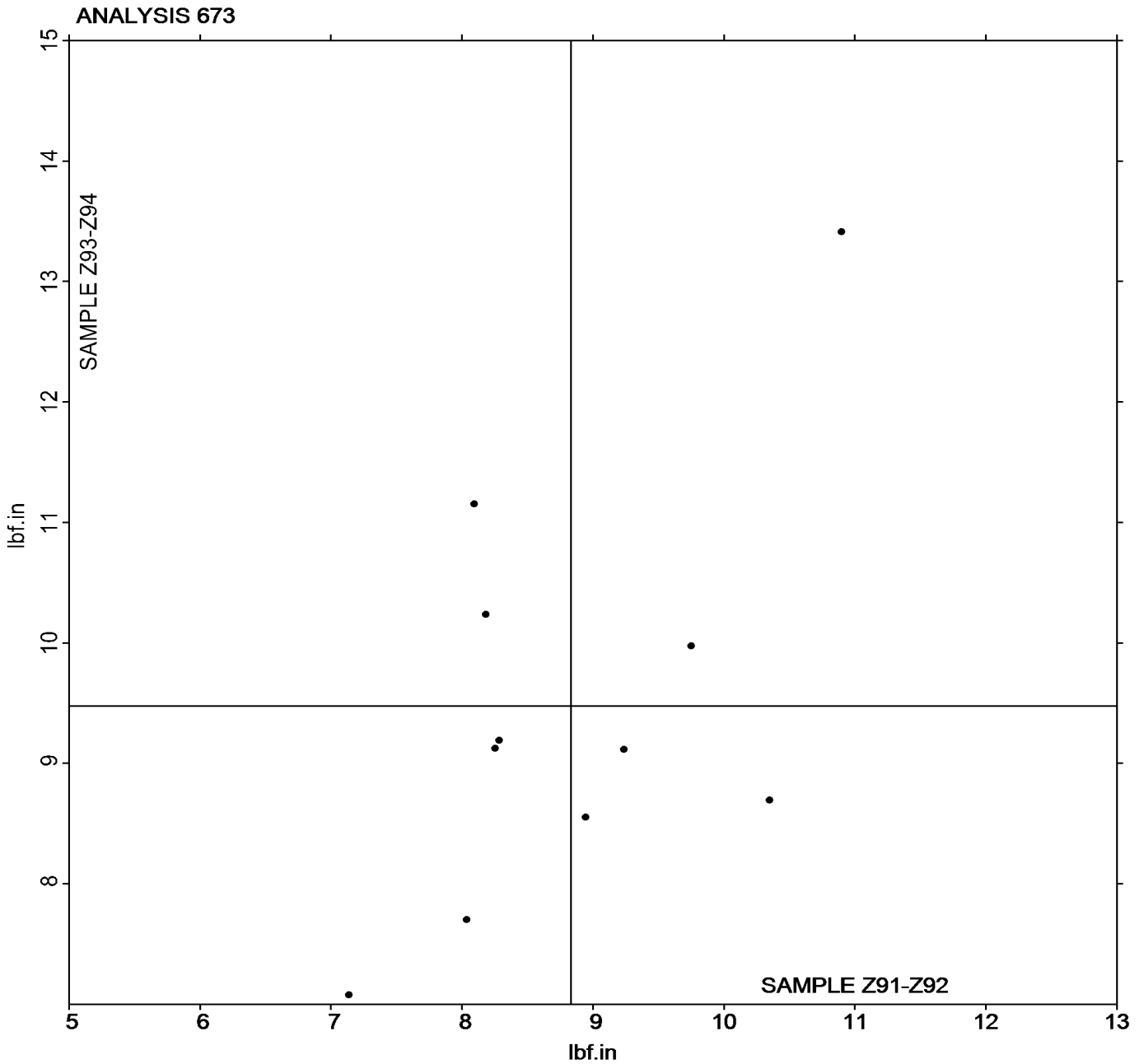


Rubber Interlaboratory Testing Program
Analysis 673
ODR Vulcanization: Minimum Torque (lbf.in)

Report #202
4th Qtr 2019

Grand Mean Sample **Z91-Z92** = 8.8332 lbf.in

Grand Mean Sample **Z93-Z94** = 9.4758 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 #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z91-Z92 | | | Sample Z93-Z94 | | |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3HVXBU | | 44.15 | -2.04 | -0.77 | 34.48 | -1.83 | -0.63 |
| 43UVD3 | | 48.58 | 2.39 | 0.91 | 36.22 | -0.10 | -0.03 |
| CMV68B | | 44.44 | -1.75 | -0.66 | 34.13 | -2.18 | -0.75 |
| HCBYGZ | | 43.55 | -2.63 | -1.00 | 32.71 | -3.61 | -1.24 |
| LXNVMZ | | 47.98 | 1.79 | 0.68 | 38.33 | 2.01 | 0.69 |
| MGAW82 | | 49.46 | 3.27 | 1.24 | 40.24 | 3.92 | 1.35 |
| MNRDLW | | 45.11 | -1.08 | -0.41 | 40.34 | 4.02 | 1.38 |
| PBEWQC | | 50.49 | 4.30 | 1.63 | 37.59 | 1.28 | 0.44 |
| TB49WM | | 46.44 | 0.26 | 0.10 | 38.87 | 2.55 | 0.88 |
| UTFHBT | | 42.21 | -3.98 | -1.51 | 34.06 | -2.26 | -0.78 |
| XJ3HDM | | 45.66 | -0.53 | -0.20 | 32.51 | -3.80 | -1.31 |

| | | Summary Statistics | |
|---|--|--------------------|---------------|
| Grand Means | | 46.187 lbf.in | 36.315 lbf.in |
| Std Dev Btwn Labs | | 2.639 lbf.in | 2.905 lbf.in |
| Statistics based on 11 of 11 reporting participants | | | |

| | | Summary Statistics in SI Units | |
|---|--|--------------------------------|-------------|
| Grand Means | | 52.185 dN.m | 41.031 dN.m |
| Std Dev Btwn Labs | | 2.982 dN.m | 3.283 dN.m |
| Statistics based on 11 of 11 reporting participants | | | |

Samples Z91-Z92: EPDM compound #1 & Z93-Z94: EPDM compound #2

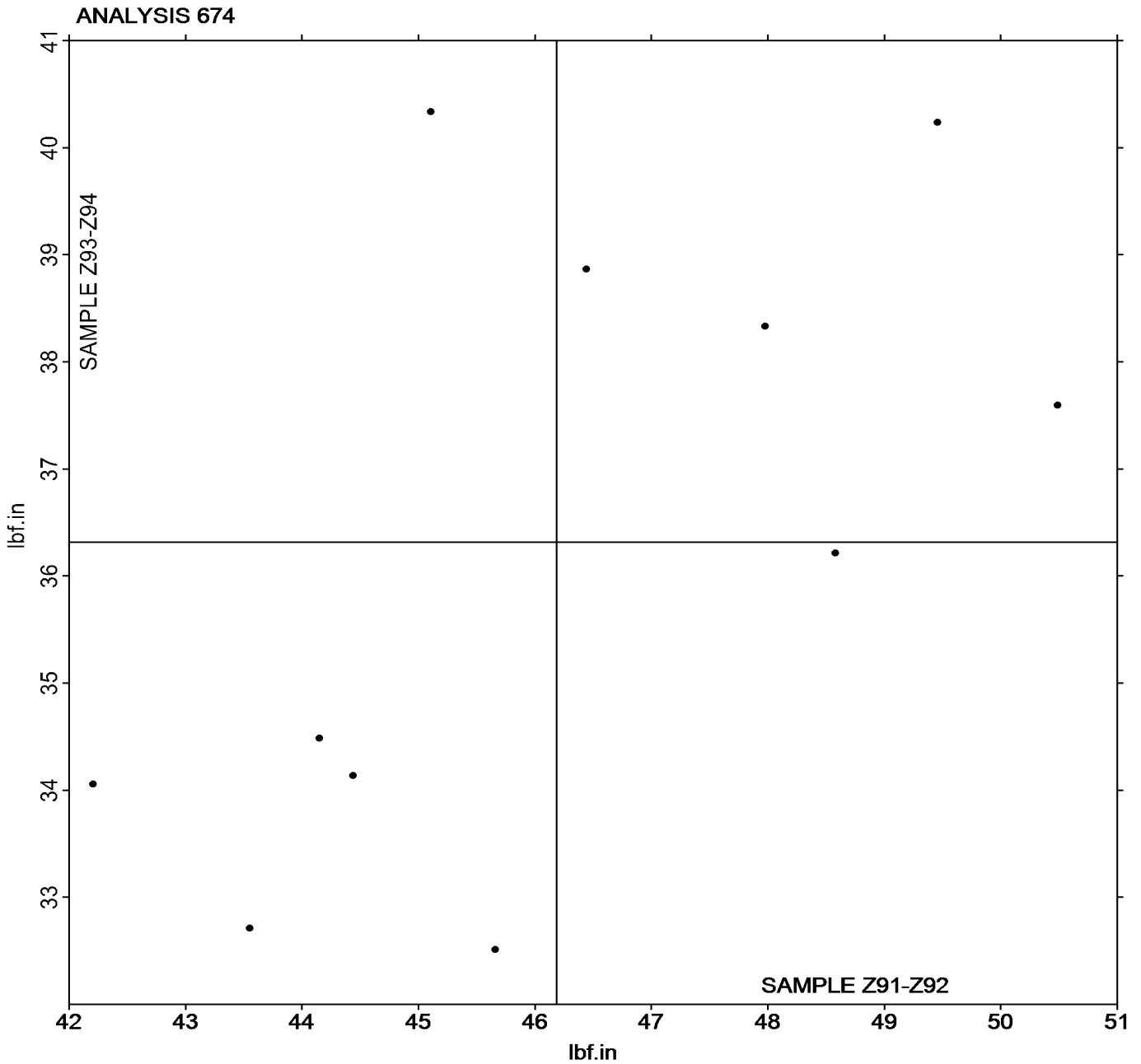


Rubber Interlaboratory Testing Program
Analysis 674
ODR Vulcanization: Maximum Torque (lbf.in)

Report #202
4th Qtr 2019

Grand Mean Sample Z91-Z92 = 46.187 lbf.in

Grand Mean Sample Z93-Z94 = 36.315 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 #202

Analysis 684

4th Qtr 2019

MDR Vulcanization-Cure Time 10% (minutes)

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 232R29 | | 2.925 | -0.028 | -0.21 | 3.000 | -0.084 | -0.51 | MC |
| 2XD3MQ | | 3.118 | 0.165 | 1.23 | 3.207 | 0.123 | 0.74 | MC |
| 3HVXBU | | 2.840 | -0.113 | -0.84 | 3.087 | 0.003 | 0.02 | MC |
| 43UVD3 | | 3.130 | 0.177 | 1.32 | 3.240 | 0.156 | 0.95 | MD |
| 4H7X64 | X | 3.022 | 0.069 | 0.52 | 1.552 | -1.532 | -9.28 | MC |
| 76XWLJ | | 3.185 | 0.232 | 1.73 | 3.450 | 0.366 | 2.22 | MC |
| 7BZ32L | | 2.745 | -0.208 | -1.55 | 2.675 | -0.409 | -2.48 | MC |
| 8N3V74 | | 2.913 | -0.040 | -0.30 | 2.965 | -0.119 | -0.72 | MD |
| 9FRUK3 | * | 2.677 | -0.276 | -2.06 | 3.012 | -0.072 | -0.44 | MC |
| 9M7UJC | | 2.908 | -0.045 | -0.33 | 3.098 | 0.015 | 0.09 | MC |
| 9VG46J | * | 3.267 | 0.314 | 2.34 | 3.600 | 0.516 | 3.13 | MC |
| 9XLPWQ | | 2.948 | -0.005 | -0.04 | 3.082 | -0.002 | -0.01 | MM |
| CHYHC2 | | 2.853 | -0.100 | -0.74 | 3.032 | -0.052 | -0.32 | ME |
| CMV68B | | 2.957 | 0.004 | 0.03 | 3.125 | 0.041 | 0.25 | MC |
| D6UMTY | | 2.943 | -0.010 | -0.07 | 3.053 | -0.030 | -0.18 | MC |
| DUABGM | | 2.925 | -0.028 | -0.21 | 3.013 | -0.070 | -0.43 | XX |
| F2KF44 | | 3.130 | 0.177 | 1.32 | 3.217 | 0.133 | 0.80 | TP |
| FEABJ4 | | 2.907 | -0.046 | -0.35 | 3.112 | 0.028 | 0.17 | ME |
| G6Y78D | | 2.877 | -0.076 | -0.57 | 3.047 | -0.037 | -0.23 | MC |
| GLLQMX | | 2.982 | 0.029 | 0.21 | 3.218 | 0.135 | 0.82 | ME |
| H38THR | | 2.878 | -0.075 | -0.56 | 2.885 | -0.199 | -1.20 | MM |
| KVWMTY | | 3.007 | 0.054 | 0.40 | 3.095 | 0.011 | 0.07 | MP |
| LXNVMZ | | 3.057 | 0.104 | 0.77 | 3.153 | 0.070 | 0.42 | XX |
| MCHLX4 | | 2.885 | -0.068 | -0.51 | 3.022 | -0.062 | -0.38 | MC |
| PBEWQC | | 3.048 | 0.095 | 0.71 | 3.190 | 0.106 | 0.64 | MC |
| QPGMAV | * | 2.597 | -0.356 | -2.66 | 2.802 | -0.282 | -1.71 | MR |
| QRF4FX | | 3.008 | 0.055 | 0.41 | 3.110 | 0.026 | 0.16 | MC |
| QRLF29 | | 2.983 | 0.030 | 0.23 | 3.078 | -0.005 | -0.03 | MC |
| RLNBMU | | 2.968 | 0.015 | 0.11 | 3.023 | -0.060 | -0.37 | MC |
| TB49WM | | 2.847 | -0.106 | -0.79 | 3.043 | -0.040 | -0.25 | MC |
| UUY2HK | | 2.950 | -0.003 | -0.02 | 2.935 | -0.149 | -0.90 | MC |
| VC9FE7 | | 2.897 | -0.056 | -0.42 | 3.085 | 0.001 | 0.01 | MC |
| W28CLW | | 2.987 | 0.034 | 0.25 | 2.923 | -0.160 | -0.97 | MC |
| W6PW8C | | 3.065 | 0.112 | 0.84 | 3.232 | 0.148 | 0.90 | MC |
| XW9FHM | | 2.997 | 0.044 | 0.33 | 3.042 | -0.042 | -0.26 | MM |



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

Report #202
4th Qtr 2019

| | | Summary Statistics | |
|---|----------------|--------------------|--|
| Grand Means | 2.9530 minutes | 3.0838 minutes | |
| Stnd Dev Btwn Labs | 0.1340 minutes | 0.1650 minutes | |
| Statistics based on 34 of 35 reporting participants | | | |

Samples Z95-Z96: EPDM compound #1 & Z97-Z98: EPDM compound #2

Comments on Assigned Data Flags for Test #684

4H7X64 (X) - Extreme Data for sample group Z97-Z98.

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 #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 232R29 | | 2.858 | -0.008 | -0.04 | 2.933 | -0.064 | -0.28 | MC |
| 2UC46K | | 2.987 | 0.120 | 0.60 | 3.152 | 0.154 | 0.66 | MC |
| 2XD3MQ | | 2.932 | 0.065 | 0.33 | 3.027 | 0.029 | 0.12 | MC |
| 3HVXBUB | | 2.722 | -0.145 | -0.73 | 2.912 | -0.086 | -0.37 | MC |
| 43UVD3 | | 3.025 | 0.158 | 0.80 | 3.207 | 0.209 | 0.90 | MD |
| 4H7X64 | X | 2.807 | -0.060 | -0.30 | 1.456 | -1.542 | -6.63 | XX |
| 76XWLJ | * | 3.267 | 0.400 | 2.02 | 3.592 | 0.594 | 2.55 | MC |
| 7BZ32L | * | 2.515 | -0.352 | -1.77 | 2.377 | -0.621 | -2.67 | MC |
| 8N3V74 | | 2.930 | 0.063 | 0.32 | 2.983 | -0.014 | -0.06 | MD |
| 8ZX6QR | | 2.848 | -0.019 | -0.09 | 3.082 | 0.084 | 0.36 | MM |
| 9FRUK3 | * | 2.472 | -0.395 | -1.99 | 2.782 | -0.216 | -0.93 | MC |
| 9M7UJC | | 2.935 | 0.068 | 0.34 | 3.107 | 0.109 | 0.47 | MC |
| 9VG46J | * | 3.242 | 0.375 | 1.89 | 3.586 | 0.588 | 2.53 | MC |
| 9XLPWQ | | 2.607 | -0.260 | -1.31 | 2.685 | -0.313 | -1.35 | MM |
| CHYHC2 | | 2.795 | -0.072 | -0.36 | 2.937 | -0.061 | -0.26 | ME |
| CMV68B | | 2.893 | 0.026 | 0.13 | 3.073 | 0.076 | 0.33 | MC |
| D6UMTY | | 2.862 | -0.005 | -0.03 | 2.973 | -0.024 | -0.11 | MC |
| DUABGM | | 2.710 | -0.157 | -0.79 | 2.810 | -0.188 | -0.81 | XX |
| E4VRPM | | 2.623 | -0.244 | -1.23 | 2.774 | -0.224 | -0.96 | MC |
| F2KF44 | * | 3.235 | 0.368 | 1.86 | 3.207 | 0.209 | 0.90 | TP |
| FEABJ4 | | 2.862 | -0.005 | -0.03 | 3.042 | 0.044 | 0.19 | ME |
| G6Y78D | | 2.767 | -0.100 | -0.51 | 2.965 | -0.033 | -0.14 | MC |
| GLLQMX | | 2.838 | -0.029 | -0.14 | 3.082 | 0.084 | 0.36 | ME |
| H38THR | | 2.808 | -0.059 | -0.30 | 2.800 | -0.198 | -0.85 | MM |
| KVWMTY | | 2.797 | -0.070 | -0.35 | 2.895 | -0.103 | -0.44 | MP |
| LXNVMZ | * | 3.387 | 0.520 | 2.62 | 3.522 | 0.524 | 2.25 | XX |
| MCHLX4 | | 2.847 | -0.020 | -0.10 | 2.975 | -0.023 | -0.10 | MC |
| PBEWQC | | 3.013 | 0.146 | 0.74 | 3.097 | 0.099 | 0.43 | MC |
| QPGMAV | | 2.487 | -0.380 | -1.92 | 2.708 | -0.289 | -1.24 | MR |
| QRF4FX | | 2.965 | 0.098 | 0.50 | 3.062 | 0.064 | 0.27 | MC |
| QRLF29 | | 2.835 | -0.032 | -0.16 | 2.995 | -0.003 | -0.01 | MC |
| RLNBMU | | 2.818 | -0.049 | -0.24 | 2.925 | -0.073 | -0.31 | MC |
| RUMLET | | 2.680 | -0.187 | -0.94 | 2.792 | -0.206 | -0.89 | MR |
| TB49WM | | 2.822 | -0.045 | -0.23 | 2.965 | -0.033 | -0.14 | MC |
| UUY2HK | | 2.780 | -0.087 | -0.44 | 2.820 | -0.178 | -0.76 | MC |
| VC9FE7 | | 2.857 | -0.010 | -0.05 | 3.070 | 0.072 | 0.31 | MC |
| W28CLW | | 2.897 | 0.030 | 0.15 | 2.807 | -0.191 | -0.82 | MC |



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|------|----------------|----------------------|------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| W6PW8C | | 2.990 | 0.123 | 0.62 | 3.177 | 0.179 | 0.77 | MC |
| XW7Q9J | | 2.985 | 0.118 | 0.60 | 3.020 | 0.022 | 0.10 | MC |
| XW9FHM | | 2.918 | 0.051 | 0.26 | 2.998 | 0.001 | 0.00 | MM |

| Summary Statistics | |
|--------------------|---|
| Grand Means | |
| | 2.8669 minutes |
| | 2.9977 minutes |
| Std Dev Btwn Labs | |
| | 0.1983 minutes |
| | 0.2325 minutes |
| | Statistics based on 39 of 40 reporting participants |

Samples Z95-Z96: EPDM compound #1 & Z97-Z98: EPDM compound #2

Comments on Assigned Data Flags for Test #685

4H7X64 (X) - Data for sample group Z97-Z98 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 |

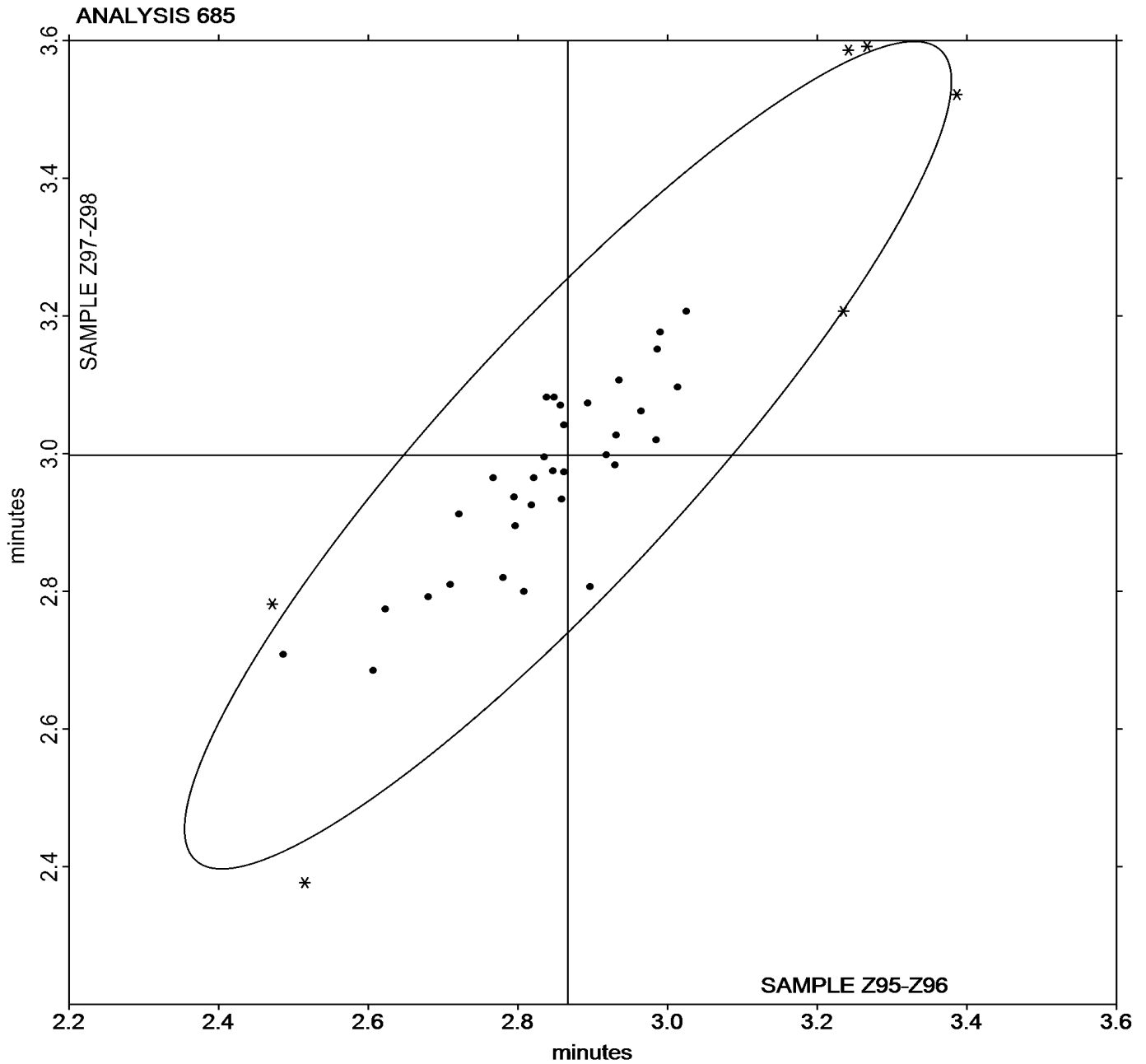


Rubber Interlaboratory Testing Program
Analysis 685
MDR Vulcanization-Scorch Time, Ts1 (minutes)

Report #202
4th Qtr 2019

Grand Mean Sample Z95-Z96 = 2.8669 minutes

Grand Mean Sample Z97-Z98 = 2.9977 minutes





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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|--------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 232R29 | | 6.553 | 0.144 | 0.51 | 6.461 | -0.108 | -0.43 | MC |
| 2UC46K | | 5.873 | -0.535 | -1.90 | 6.058 | -0.511 | -2.02 | MC |
| 2XD3MQ | | 6.842 | 0.433 | 1.54 | 6.682 | 0.112 | 0.44 | MC |
| 3HVXBU | | 5.928 | -0.480 | -1.71 | 6.388 | -0.181 | -0.72 | MC |
| 43UVD3 | | 6.965 | 0.557 | 1.98 | 7.112 | 0.542 | 2.14 | MX |
| 4H7X64 | X | 7.125 | 0.717 | 2.55 | 3.656 | -2.914 | -11.51 | MC |
| 76XWLJ | | 6.763 | 0.355 | 1.26 | 6.758 | 0.189 | 0.75 | MC |
| 7BZ32L | | 5.893 | -0.515 | -1.83 | 5.973 | -0.596 | -2.36 | MC |
| 8N3V74 | | 6.395 | -0.013 | -0.05 | 6.175 | -0.395 | -1.56 | MD |
| 8ZX6QR | | 6.353 | -0.055 | -0.20 | 6.760 | 0.190 | 0.75 | MM |
| 9FRUK3 | | 6.060 | -0.348 | -1.24 | 6.565 | -0.005 | -0.02 | MC |
| 9M7UJC | | 6.383 | -0.025 | -0.09 | 6.540 | -0.030 | -0.12 | MC |
| 9VG46J | | 6.889 | 0.481 | 1.71 | 7.103 | 0.533 | 2.11 | MC |
| 9XLPWQ | | 6.525 | 0.117 | 0.41 | 6.780 | 0.210 | 0.83 | MM |
| CHYHC2 | | 6.227 | -0.182 | -0.65 | 6.567 | -0.003 | -0.01 | ME |
| CMV68B | | 6.657 | 0.248 | 0.88 | 6.790 | 0.220 | 0.87 | MC |
| D6UMTY | | 6.383 | -0.025 | -0.09 | 6.383 | -0.186 | -0.74 | MC |
| DUABGM | | 5.983 | -0.425 | -1.51 | 6.038 | -0.531 | -2.10 | XX |
| E4VRPM | | 6.285 | -0.124 | -0.44 | 6.771 | 0.201 | 0.79 | MC |
| F2KF44 | | 6.672 | 0.263 | 0.94 | 6.537 | -0.033 | -0.13 | TP |
| FEABJ4 | | 6.263 | -0.145 | -0.52 | 6.497 | -0.073 | -0.29 | ME |
| G6Y78D | | 6.383 | -0.025 | -0.09 | 6.560 | -0.010 | -0.04 | MC |
| GLLQMX | | 6.490 | 0.082 | 0.29 | 6.778 | 0.209 | 0.82 | ME |
| H38THR | | 6.337 | -0.072 | -0.26 | 6.383 | -0.186 | -0.74 | MM |
| KVWMTY | | 6.482 | 0.073 | 0.26 | 6.517 | -0.053 | -0.21 | MC |
| LXNVMZ | | 6.532 | 0.123 | 0.44 | 6.715 | 0.145 | 0.57 | XX |
| MCHLX4 | | 5.950 | -0.458 | -1.63 | 6.345 | -0.225 | -0.89 | MC |
| PBEWQC | | 6.667 | 0.258 | 0.92 | 6.772 | 0.202 | 0.80 | MC |
| QPGMAV | | 6.028 | -0.380 | -1.35 | 6.387 | -0.183 | -0.72 | MR |
| QRF4FX | | 6.375 | -0.033 | -0.12 | 6.583 | 0.014 | 0.05 | MC |
| QRLF29 | | 6.455 | 0.047 | 0.17 | 6.585 | 0.015 | 0.06 | MC |
| RLNBMU | | 6.528 | 0.120 | 0.43 | 6.583 | 0.014 | 0.05 | MC |
| RUMLET | | 6.673 | 0.265 | 0.94 | 6.735 | 0.165 | 0.65 | MR |
| TB49WM | | 6.078 | -0.330 | -1.17 | 6.512 | -0.058 | -0.23 | MC |
| UUY2HK | | 6.365 | -0.043 | -0.15 | 6.450 | -0.120 | -0.47 | MC |
| VC9FE7 | | 6.383 | -0.025 | -0.09 | 6.700 | 0.130 | 0.51 | MC |
| W28CLW | | 6.373 | -0.035 | -0.12 | 6.595 | 0.025 | 0.10 | MC |



Rubber Interlaboratory Testing Program

Report #202

Analysis 686

4th Qtr 2019

MDR Vulcanization-Cure Time 50% (minutes)

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| W6PW8C | | 6.630 | 0.222 | 0.79 | 6.885 | 0.315 | 1.25 | MC |
| XW7Q9J | | 6.627 | 0.218 | 0.78 | 6.368 | -0.201 | -0.80 | MC |
| XW9FHM | | 6.678 | 0.270 | 0.96 | 6.828 | 0.259 | 1.02 | MM |

| Summary Statistics | |
|---|----------------|
| Grand Means | |
| | 6.4084 minutes |
| | 6.5697 minutes |
| Std Dev Btwn Labs | |
| | 0.2811 minutes |
| | 0.2531 minutes |
| Statistics based on 39 of 40 reporting participants | |

Samples Z95-Z96: EPDM compound #1 & Z97-Z98: EPDM compound #2

Comments on Assigned Data Flags for Test #686

4H7X64 (X) - Extreme Data for sample group Z97-Z98.

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

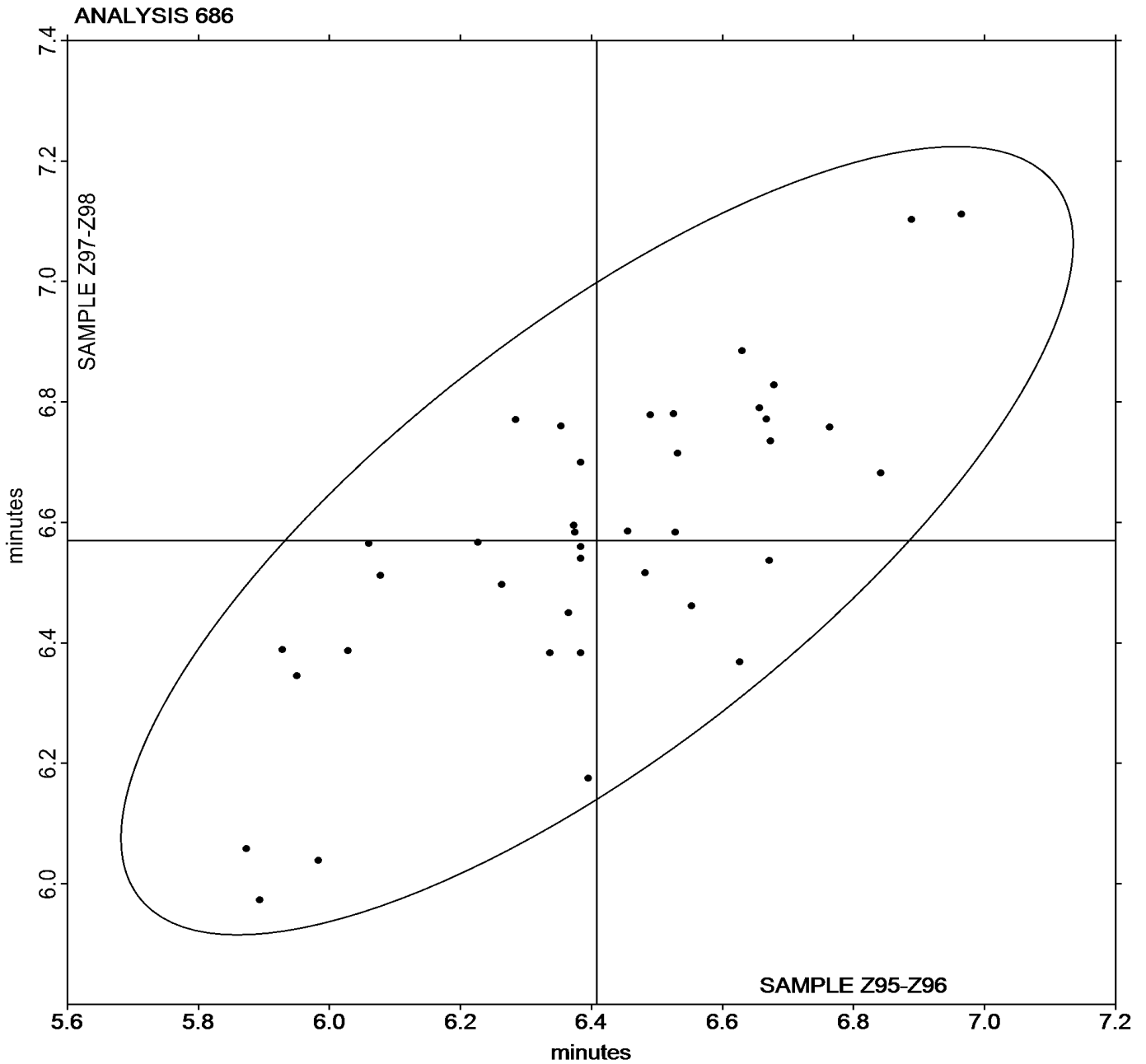


Rubber Interlaboratory Testing Program
Analysis 686
MDR Vulcanization-Cure Time 50% (minutes)

Report #202
4th Qtr 2019

Grand Mean Sample Z95-Z96 = 6.4084 minutes

Grand Mean Sample Z97-Z98 = 6.5697 minutes





Rubber Interlaboratory Testing Program

Report #202

Analysis 687

4th Qtr 2019

MDR Vulcanization-Cure Time 90% (minutes)

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|--------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 232R29 | | 10.76 | 0.17 | 0.48 | 10.56 | -0.16 | -0.48 | MC |
| 2UC46K | | 9.76 | -0.82 | -2.26 | 10.08 | -0.64 | -1.94 | MC |
| 2XD3MQ | | 10.88 | 0.29 | 0.80 | 10.76 | 0.04 | 0.11 | MC |
| 3HVXBU | | 9.98 | -0.61 | -1.68 | 10.54 | -0.18 | -0.55 | MC |
| 43UVD3 | | 11.38 | 0.79 | 2.17 | 11.43 | 0.71 | 2.16 | MX |
| 4H7X64 | X | 11.29 | 0.70 | 1.93 | 6.43 | -4.29 | -13.03 | MC |
| 76XWLJ | | 10.87 | 0.29 | 0.79 | 10.85 | 0.13 | 0.39 | MC |
| 7BZ32L | | 9.97 | -0.62 | -1.70 | 10.08 | -0.63 | -1.93 | MC |
| 8N3V74 | | 10.41 | -0.17 | -0.47 | 10.13 | -0.59 | -1.80 | MD |
| 8ZX6QR | | 10.44 | -0.15 | -0.41 | 10.82 | 0.10 | 0.30 | MM |
| 9FRUK3 | | 10.16 | -0.42 | -1.16 | 10.76 | 0.04 | 0.13 | MC |
| 9M7UJC | | 10.46 | -0.13 | -0.36 | 10.60 | -0.12 | -0.35 | MC |
| 9VG46J | | 11.12 | 0.54 | 1.48 | 11.26 | 0.54 | 1.63 | MC |
| 9XLPWQ | | 10.99 | 0.40 | 1.11 | 11.16 | 0.44 | 1.35 | MM |
| CHYHC2 | | 10.35 | -0.24 | -0.66 | 10.64 | -0.08 | -0.24 | ME |
| CMV68B | | 10.76 | 0.17 | 0.47 | 10.86 | 0.14 | 0.44 | MC |
| D6UMTY | | 10.24 | -0.35 | -0.95 | 10.30 | -0.42 | -1.26 | MC |
| DUABGM | | 10.51 | -0.07 | -0.20 | 10.50 | -0.22 | -0.66 | XX |
| E4VRPM | | 10.34 | -0.25 | -0.68 | 10.97 | 0.25 | 0.77 | MC |
| F2KF44 | | 10.63 | 0.05 | 0.13 | 10.47 | -0.25 | -0.76 | TP |
| FEABJ4 | | 10.20 | -0.39 | -1.07 | 10.59 | -0.13 | -0.40 | ME |
| G6Y78D | | 10.33 | -0.26 | -0.71 | 10.49 | -0.23 | -0.68 | MC |
| GLLQMX | | 10.67 | 0.08 | 0.23 | 10.87 | 0.15 | 0.44 | ME |
| H38THR | | 10.54 | -0.04 | -0.12 | 10.47 | -0.25 | -0.76 | MM |
| KVWMTY | | 10.59 | 0.00 | 0.00 | 10.58 | -0.14 | -0.42 | MP |
| LXNVMZ | | 10.87 | 0.28 | 0.78 | 11.10 | 0.38 | 1.17 | XX |
| MCHLX4 | | 10.06 | -0.53 | -1.46 | 10.44 | -0.28 | -0.86 | MC |
| PBEWQC | | 10.82 | 0.23 | 0.64 | 10.92 | 0.20 | 0.62 | MC |
| QPGMAV | | 10.12 | -0.47 | -1.29 | 10.46 | -0.26 | -0.78 | MR |
| QRF4FX | | 10.44 | -0.14 | -0.40 | 10.67 | -0.05 | -0.16 | MC |
| QRLF29 | | 10.52 | -0.07 | -0.20 | 10.58 | -0.14 | -0.42 | MC |
| RLNBMU | | 10.65 | 0.06 | 0.17 | 10.57 | -0.15 | -0.46 | MC |
| RUMLET | | 11.07 | 0.48 | 1.32 | 11.06 | 0.34 | 1.03 | MR |
| TB49WM | | 10.93 | 0.35 | 0.96 | 11.42 | 0.70 | 2.12 | MC |
| UUY2HK | | 10.70 | 0.11 | 0.30 | 10.50 | -0.22 | -0.68 | MC |
| VC9FE7 | | 10.77 | 0.18 | 0.50 | 10.94 | 0.22 | 0.68 | MC |
| W28CLW | | 10.65 | 0.06 | 0.16 | 10.88 | 0.16 | 0.48 | MC |



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| W6PW8C | | 10.98 | 0.39 | 1.08 | 11.14 | 0.42 | 1.29 | MC |
| XW7Q9J | | 11.11 | 0.53 | 1.45 | 10.70 | -0.02 | -0.06 | MC |
| XW9FHM | | 10.86 | 0.27 | 0.75 | 10.90 | 0.18 | 0.55 | MM |

| Grand Means | | Summary Statistics | |
|---|----------------|--------------------|----------------|
| | 10.586 minutes | | 10.719 minutes |
| Std Dev Btwn Labs | 0.363 minutes | | 0.329 minutes |
| Statistics based on 39 of 40 reporting participants | | | |

Samples Z95-Z96: EPDM compound #1 & Z97-Z98: EPDM compound #2

Comments on Assigned Data Flags for Test #687

4H7X64 (X) - Extreme Data for sample group Z97-Z98.

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 |
| MX | Rebuilt MonTech Alpha | TP | Tech Pro MDR model MDPT |
| XX | Instrument model not specified by lab | | |

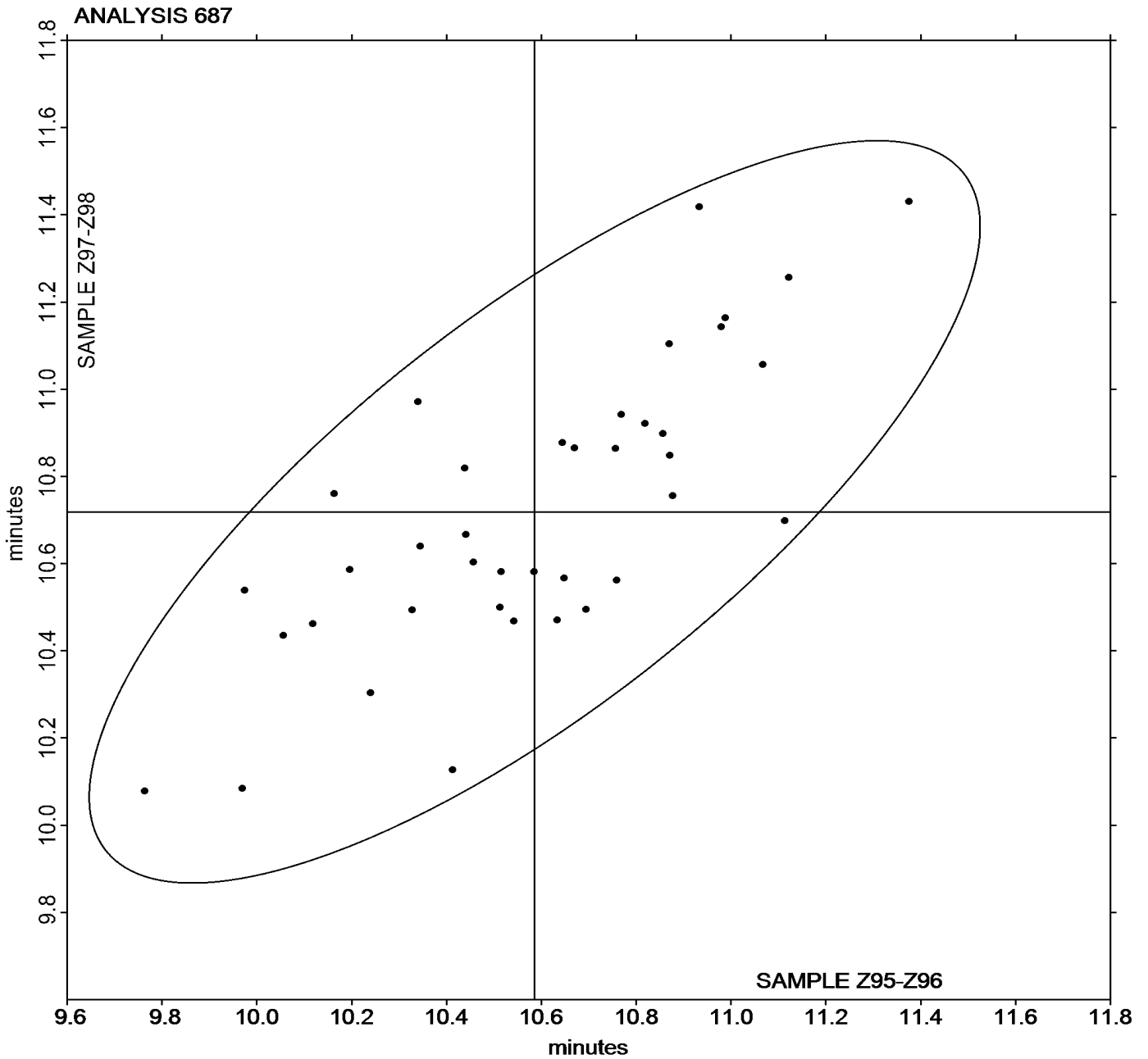


Rubber Interlaboratory Testing Program
Analysis 687
MDR Vulcanization-Cure Time 90% (minutes)

Report #202
4th Qtr 2019

Grand Mean Sample **Z95-Z96** = 10.586 minutes

Grand Mean Sample **Z97-Z98** = 10.719 minutes





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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 232R29 | | 2.162 | -0.129 | -0.51 | 2.985 | -0.190 | -0.65 | MC |
| 2UC46K | | 2.568 | 0.278 | 1.09 | 3.303 | 0.129 | 0.44 | MC |
| 2XD3MQ | | 2.282 | -0.009 | -0.03 | 3.427 | 0.252 | 0.87 | MC |
| 3HVXBUB | X | 3.330 | 1.039 | 4.08 | 4.345 | 1.170 | 4.02 | MC |
| 43UVD3 | | 1.758 | -0.532 | -2.09 | 2.509 | -0.666 | -2.29 | MX |
| 4H7X64 | X | 1.808 | -0.483 | -1.90 | 1.891 | -1.284 | -4.41 | XX |
| 76XWLJ | | 2.123 | -0.168 | -0.66 | 3.278 | 0.103 | 0.35 | MC |
| 7BZ32L | | 2.745 | 0.455 | 1.78 | 3.350 | 0.175 | 0.60 | MC |
| 8N3V74 | | 2.091 | -0.200 | -0.78 | 3.040 | -0.135 | -0.46 | MD |
| 8ZX6QR | | 1.763 | -0.527 | -2.07 | 2.493 | -0.681 | -2.34 | MM |
| 9FRUK3 | | 2.525 | 0.234 | 0.92 | 3.715 | 0.540 | 1.86 | MC |
| 9M7UJC | | 2.305 | 0.014 | 0.06 | 3.323 | 0.149 | 0.51 | MC |
| 9VG46J | | 2.382 | 0.091 | 0.36 | 3.732 | 0.557 | 1.91 | MC |
| 9XLPWQ | | 2.307 | 0.016 | 0.06 | 3.215 | 0.040 | 0.14 | MM |
| CHYHC2 | | 2.240 | -0.051 | -0.20 | 2.892 | -0.283 | -0.97 | ME |
| CMV68B | | 2.107 | -0.184 | -0.72 | 3.047 | -0.128 | -0.44 | MC |
| D6UMTY | | 2.226 | -0.065 | -0.25 | 3.087 | -0.087 | -0.30 | MC |
| DUABGM | | 2.602 | 0.311 | 1.22 | 3.555 | 0.380 | 1.31 | XX |
| E4VRPM | | 2.385 | 0.095 | 0.37 | 3.219 | 0.044 | 0.15 | MC |
| F2KF44 | | 2.153 | -0.137 | -0.54 | 3.428 | 0.254 | 0.87 | TP |
| FEABJ4 | | 2.290 | -0.001 | 0.00 | 3.280 | 0.105 | 0.36 | ME |
| G6Y78D | | 2.228 | -0.062 | -0.24 | 3.135 | -0.040 | -0.14 | MC |
| GLLQMX | | 2.157 | -0.134 | -0.53 | 3.129 | -0.046 | -0.16 | ME |
| H38THR | | 2.290 | -0.001 | 0.00 | 3.070 | -0.105 | -0.36 | MM |
| KVWMTY | | 2.306 | 0.015 | 0.06 | 3.214 | 0.040 | 0.14 | MP |
| LXNVMZ | | 2.010 | -0.281 | -1.10 | 2.637 | -0.538 | -1.85 | MM |
| MCHLX4 | * | 2.970 | 0.679 | 2.67 | 3.608 | 0.434 | 1.49 | MC |
| PBEWQC | | 2.090 | -0.201 | -0.79 | 3.028 | -0.146 | -0.50 | MC |
| QPGMAV | | 2.313 | 0.023 | 0.09 | 3.325 | 0.150 | 0.52 | MR |
| QRF4FX | | 2.573 | 0.283 | 1.11 | 3.340 | 0.165 | 0.57 | MC |
| QRLF29 | | 2.232 | -0.059 | -0.23 | 3.228 | 0.054 | 0.18 | MC |
| RLNBMU | | 2.200 | -0.091 | -0.36 | 3.150 | -0.025 | -0.08 | MC |
| RUMLET | | 2.508 | 0.218 | 0.85 | 3.395 | 0.220 | 0.76 | MR |
| TB49WM | | 2.733 | 0.443 | 1.74 | 3.348 | 0.174 | 0.60 | MC |
| UUY2HK | | 2.216 | -0.075 | -0.29 | 2.986 | -0.189 | -0.65 | MC |
| VC9FE7 | | 1.963 | -0.327 | -1.28 | 2.808 | -0.366 | -1.26 | MC |
| W28CLW | | 2.678 | 0.388 | 1.52 | 3.272 | 0.097 | 0.33 | MC |



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| W6PW8C | | 2.190 | -0.101 | -0.40 | 3.060 | -0.115 | -0.39 | MC |
| XW7Q9J | | 2.262 | -0.029 | -0.11 | 3.338 | 0.164 | 0.56 | MC |
| XW9FHM | | 2.113 | -0.177 | -0.70 | 2.690 | -0.485 | -1.66 | MM |

| | | Summary Statistics | |
|---|--|--------------------|---------------|
| Grand Means | | 2.2907 lbf.in | 3.1747 lbf.in |
| Std Dev Btwn Labs | | 0.2548 lbf.in | 0.2911 lbf.in |
| Statistics based on 38 of 40 reporting participants | | | |

| | | Summary Statistics in SI Units | |
|---|--|--------------------------------|-------------|
| Grand Means | | 2.5881 dN.m | 3.5870 dN.m |
| Std Dev Btwn Labs | | 0.2879 dN.m | 0.3289 dN.m |
| Statistics based on 38 of 40 reporting participants | | | |

Samples Z95-Z96: EPDM compound #1 & Z97-Z98: EPDM compound #2

Comments on Assigned Data Flags for Test #688

3HVXBU (X) - Data for all samples are high. Possible Systematic Error.

4H7X64 (X) - Data for sample group Z97-Z98 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 |
| MX | Rebuilt MonTech Alpha | TP | Tech Pro MDR model MDPT |
| XX | Instrument model not specified by lab | | |

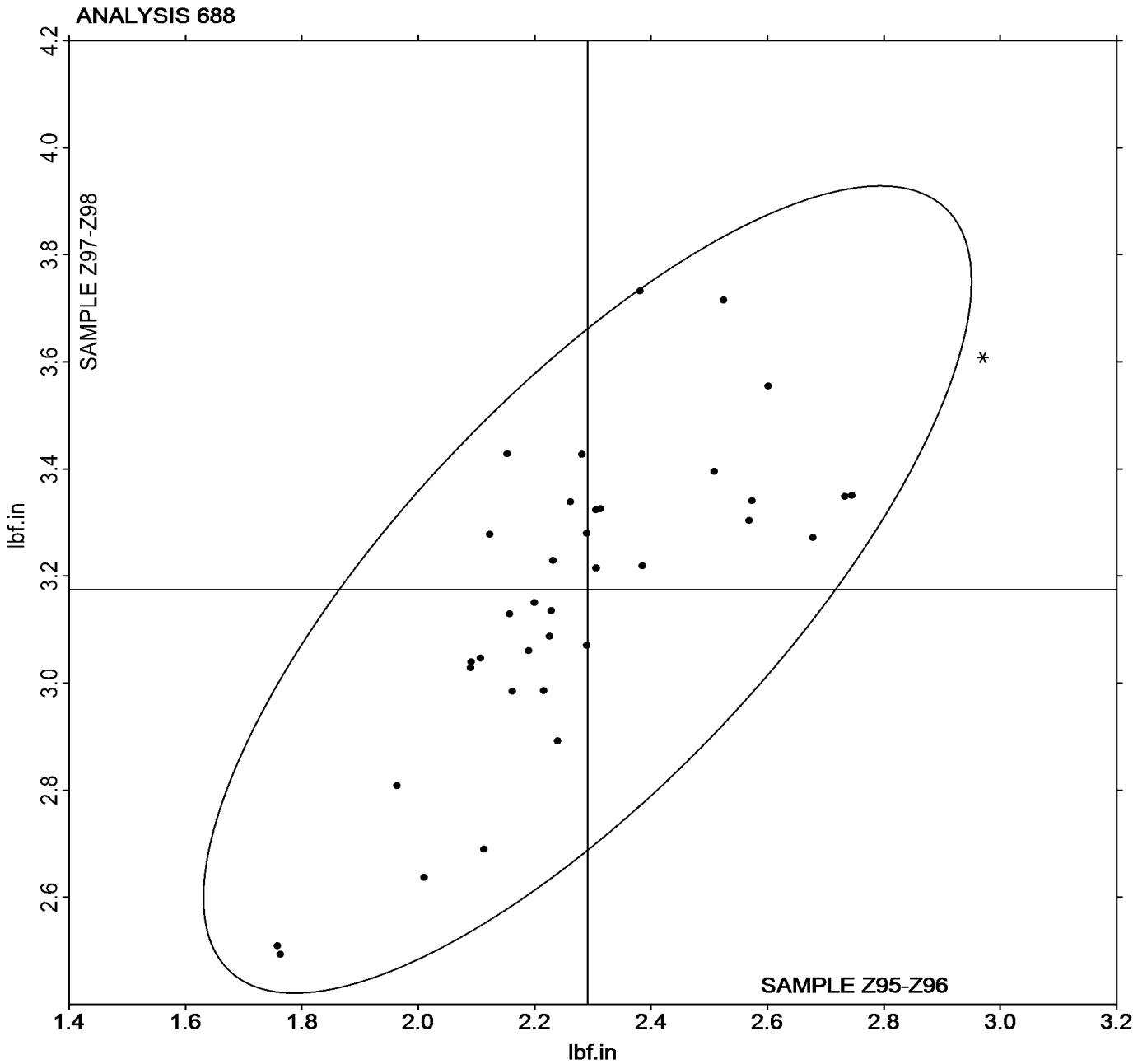


Rubber Interlaboratory Testing Program
Analysis 688
MDR Vulcanization: Minimum Torque (lbf.in)

Report #202
4th Qtr 2019

Grand Mean Sample **Z95-Z96** = 2.2907 lbf.in

Grand Mean Sample **Z97-Z98** = 3.1747 lbf.in





Rubber Interlaboratory Testing Program

Report #202

Analysis 689

4th Qtr 2019

MDR Vulcanization: Maximum Torque (lbf.in)

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 232R29 | | 12.67 | 0.07 | 0.08 | 13.43 | 0.02 | 0.02 | MC |
| 2UC46K | | 11.01 | -1.58 | -1.75 | 11.97 | -1.44 | -1.43 | MC |
| 2XD3MQ | | 12.26 | -0.34 | -0.37 | 13.54 | 0.13 | 0.13 | MC |
| 3HVXBU | | 14.37 | 1.77 | 1.95 | 15.70 | 2.29 | 2.27 | MC |
| 43UVD3 | | 11.17 | -1.43 | -1.58 | 11.51 | -1.90 | -1.89 | MX |
| 4H7X64 | * | 12.86 | 0.26 | 0.29 | 12.77 | -0.64 | -0.64 | MC |
| 76XWLJ | | 10.46 | -2.13 | -2.35 | 11.21 | -2.20 | -2.19 | MC |
| 7BZ32L | | 13.39 | 0.79 | 0.87 | 14.30 | 0.89 | 0.88 | MC |
| 8N3V74 | | 12.00 | -0.60 | -0.66 | 12.94 | -0.48 | -0.47 | MD |
| 8ZX6QR | | 10.72 | -1.88 | -2.07 | 11.48 | -1.93 | -1.92 | MM |
| 9FRUK3 | | 14.03 | 1.43 | 1.58 | 15.25 | 1.84 | 1.82 | MC |
| 9M7UJC | | 12.12 | -0.48 | -0.53 | 13.26 | -0.16 | -0.16 | MC |
| 9VG46J | | 12.56 | -0.04 | -0.04 | 13.77 | 0.35 | 0.35 | MC |
| 9XLPWQ | | 13.45 | 0.85 | 0.94 | 14.65 | 1.24 | 1.23 | MM |
| CHYHC2 | | 12.62 | 0.02 | 0.02 | 13.52 | 0.10 | 0.10 | ME |
| CMV68B | | 12.52 | -0.08 | -0.08 | 13.34 | -0.08 | -0.08 | MC |
| D6UMTY | | 11.63 | -0.97 | -1.07 | 12.51 | -0.90 | -0.90 | MC |
| DUABGM | | 14.45 | 1.86 | 2.05 | 15.25 | 1.84 | 1.82 | XX |
| E4VRPM | | 13.00 | 0.41 | 0.45 | 14.41 | 0.99 | 0.99 | MC |
| F2KF44 | X | 11.49 | -1.11 | -1.22 | 13.56 | 0.15 | 0.14 | TP |
| FEABJ4 | | 12.63 | 0.03 | 0.03 | 13.83 | 0.41 | 0.41 | ME |
| G6Y78D | | 13.01 | 0.42 | 0.46 | 13.69 | 0.28 | 0.28 | MC |
| GLLQMX | | 12.04 | -0.56 | -0.61 | 12.82 | -0.59 | -0.59 | ME |
| H38THR | | 12.79 | 0.19 | 0.21 | 13.66 | 0.25 | 0.25 | MM |
| KVWMTY | | 11.58 | -1.02 | -1.12 | 12.41 | -1.00 | -1.00 | MC |
| LXNVMZ | | 11.19 | -1.41 | -1.55 | 11.65 | -1.76 | -1.75 | MM |
| MCHLX4 | | 13.20 | 0.60 | 0.67 | 14.00 | 0.59 | 0.58 | MC |
| PBEWQC | | 12.38 | -0.22 | -0.24 | 13.65 | 0.24 | 0.24 | MC |
| QPGMAV | | 13.17 | 0.57 | 0.63 | 13.98 | 0.56 | 0.56 | MR |
| QRF4FX | | 12.94 | 0.34 | 0.38 | 13.68 | 0.27 | 0.27 | MC |
| QRLF29 | | 13.33 | 0.73 | 0.81 | 13.79 | 0.38 | 0.38 | MC |
| RLNBMU | | 13.16 | 0.57 | 0.63 | 13.83 | 0.41 | 0.41 | MC |
| RUMLET | | 13.46 | 0.86 | 0.95 | 13.83 | 0.42 | 0.41 | MR |
| TB49WM | | 12.92 | 0.33 | 0.36 | 13.91 | 0.50 | 0.50 | MC |
| UUY2HK | | 12.83 | 0.23 | 0.26 | 13.10 | -0.31 | -0.31 | MC |
| VC9FE7 | | 12.23 | -0.37 | -0.41 | 12.89 | -0.52 | -0.52 | MC |
| W28CLW | | 13.30 | 0.71 | 0.78 | 14.00 | 0.59 | 0.59 | MC |



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

Report #202
4th Qtr 2019

| WebCode | Data Flag | Sample Z95-Z96 | | | Sample Z97-Z98 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| W6PW8C | | 12.62 | 0.03 | 0.03 | 13.46 | 0.04 | 0.04 | MC |
| XW7Q9J | | 12.59 | -0.01 | -0.01 | 13.20 | -0.22 | -0.22 | MC |
| XW9FHM | | 12.61 | 0.01 | 0.01 | 12.94 | -0.47 | -0.47 | MM |

| Summary Statistics | | | |
|---|---------------|---------------|--|
| Grand Means | 12.595 lbf.in | 13.413 lbf.in | |
| Std Dev Btwn Labs | 0.907 lbf.in | 1.006 lbf.in | |
| Statistics based on 39 of 40 reporting participants | | | |

| Summary Statistics in SI Units | | | |
|---|-------------|-------------|--|
| Grand Means | 14.231 dN.m | 15.155 dN.m | |
| Std Dev Btwn Labs | 1.025 dN.m | 1.137 dN.m | |
| Statistics based on 39 of 40 reporting participants | | | |

Samples Z95-Z96: EPDM compound #1 & Z97-Z98: EPDM compound #2

Comments on Assigned Data Flags for Test #689

F2KF44 (X) - Inconsistent in testing between samples.

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

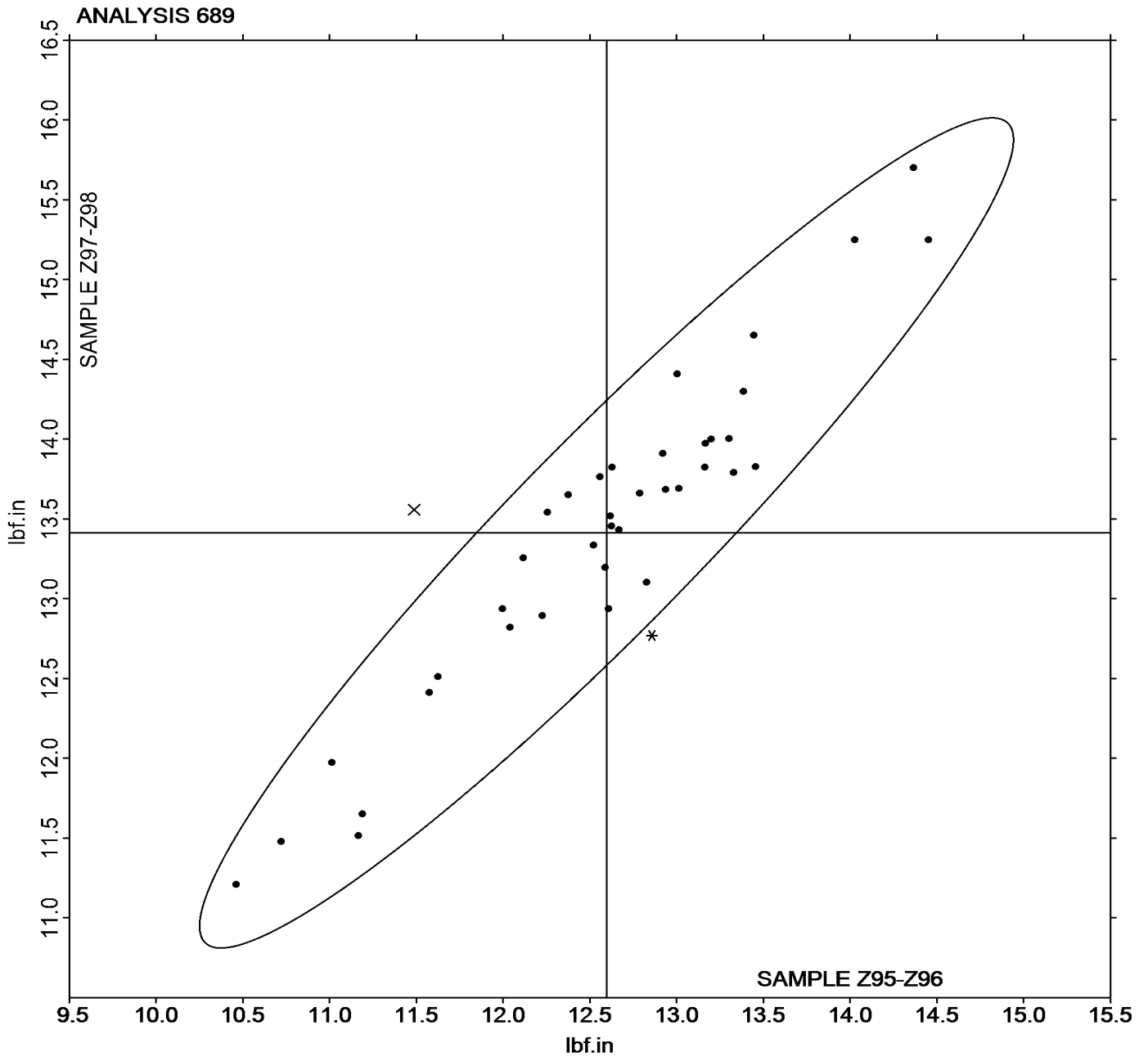


Rubber Interlaboratory Testing Program
Analysis 689
MDR Vulcanization: Maximum Torque (lbf.in)

Report #202
4th Qtr 2019

Grand Mean Sample **Z95-Z96** = 12.595 lbf.in

Grand Mean Sample **Z97-Z98** = 13.413 lbf.in





Rubber Interlaboratory Testing Program

Report #202

Analysis 690

4th Qtr 2019

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

| WebCode | Data Flag | Sample H91-H92 | | | Sample H93-H94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 43UVD3 | | 414.8 | -49.0 | -1.04 | 532.2 | -43.7 | -1.35 | RP |
| 7BZ32L | | 536.5 | 72.8 | 1.55 | 631.2 | 55.3 | 1.71 | RP |
| E4VRPM | | 473.5 | 9.7 | 0.21 | 573.5 | -2.4 | -0.07 | RP |
| F2KF44 | | 403.8 | -59.9 | -1.27 | 554.4 | -21.5 | -0.66 | XX |
| H38THR | | 504.3 | 40.5 | 0.86 | 602.0 | 26.1 | 0.81 | XX |
| QRLF29 | | 465.4 | 1.7 | 0.04 | 574.3 | -1.6 | -0.05 | PR |
| WPWXM4 | | 447.9 | -15.8 | -0.34 | 563.6 | -12.3 | -0.38 | RP |

| Summary Statistics | |
|---|------------|
| Grand Means | 463.75 kPa |
| Std Dev Btwn Labs | 47.04 kPa |
| | 575.88 kPa |
| | 32.33 kPa |
| Statistics based on 7 of 7 reporting participants | |

Samples H91-H92: EPDM compound #1 & H93-H94: EPDM compound #2

Key to Instrument Codes Reported by Participants

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

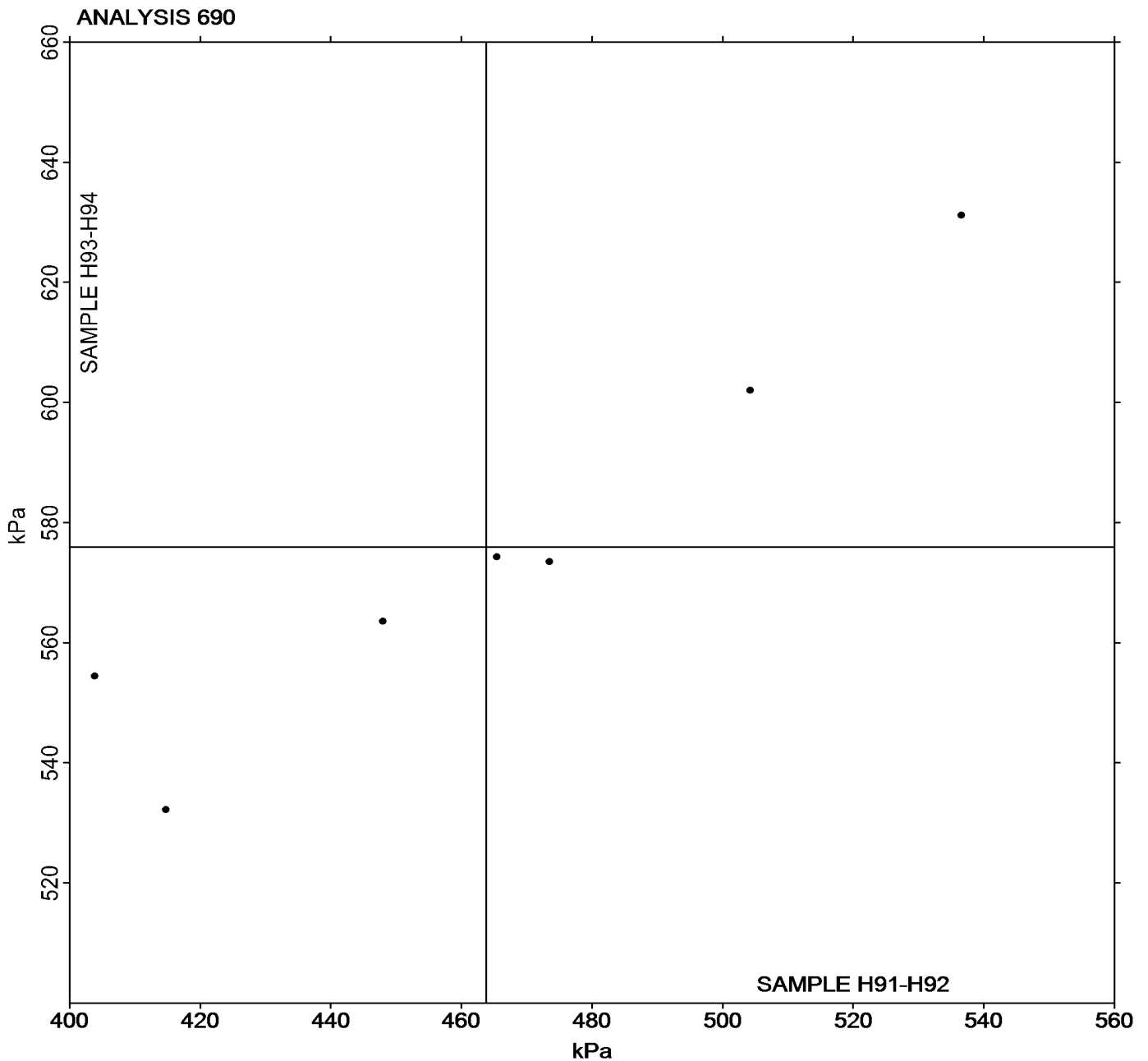


Rubber Interlaboratory Testing Program
Analysis 690
RPA Rheological Properties: Part A - G' at 20Hz (kPa)

Report #202
4th Qtr 2019

Grand Mean Sample H91-H92 = 463.75 kPa

Grand Mean Sample H93-H94 = 575.88 kPa



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



Rubber Interlaboratory Testing Program

Report #202

Analysis 691

4th Qtr 2019

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

| WebCode | Data Flag | Sample H91-H92 | | | Sample H93-H94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 43UVD3 | | 169.2 | -16.7 | -0.85 | 180.2 | -23.6 | -1.11 | RP |
| 7BZ32L | | 203.3 | 17.4 | 0.89 | 221.0 | 17.1 | 0.81 | RP |
| 8ZX6QR | | 196.8 | 10.9 | 0.56 | 205.5 | 1.6 | 0.08 | RP |
| E4VRPM | | 191.0 | 5.2 | 0.26 | 209.7 | 5.9 | 0.28 | RP |
| F2KF44 | | 164.0 | -21.9 | -1.11 | 202.0 | -1.8 | -0.09 | XX |
| H38THR | | 156.2 | -29.7 | -1.51 | 165.3 | -38.5 | -1.82 | XX |
| QRLF29 | | 204.8 | 19.0 | 0.97 | 223.9 | 20.1 | 0.95 | PR |
| WPWXM4 | | 201.6 | 15.7 | 0.80 | 223.1 | 19.3 | 0.91 | RP |

| Grand Means | | Summary Statistics | |
|---|------------|--------------------|------------|
| | 185.86 kPa | | 203.84 kPa |
| Std Dev Btwn Labs | 19.63 kPa | | 21.22 kPa |
| Statistics based on 8 of 8 reporting participants | | | |

Samples H91-H92: EPDM compound #1 & H93-H94: EPDM compound #2

Key to Instrument Codes Reported by Participants

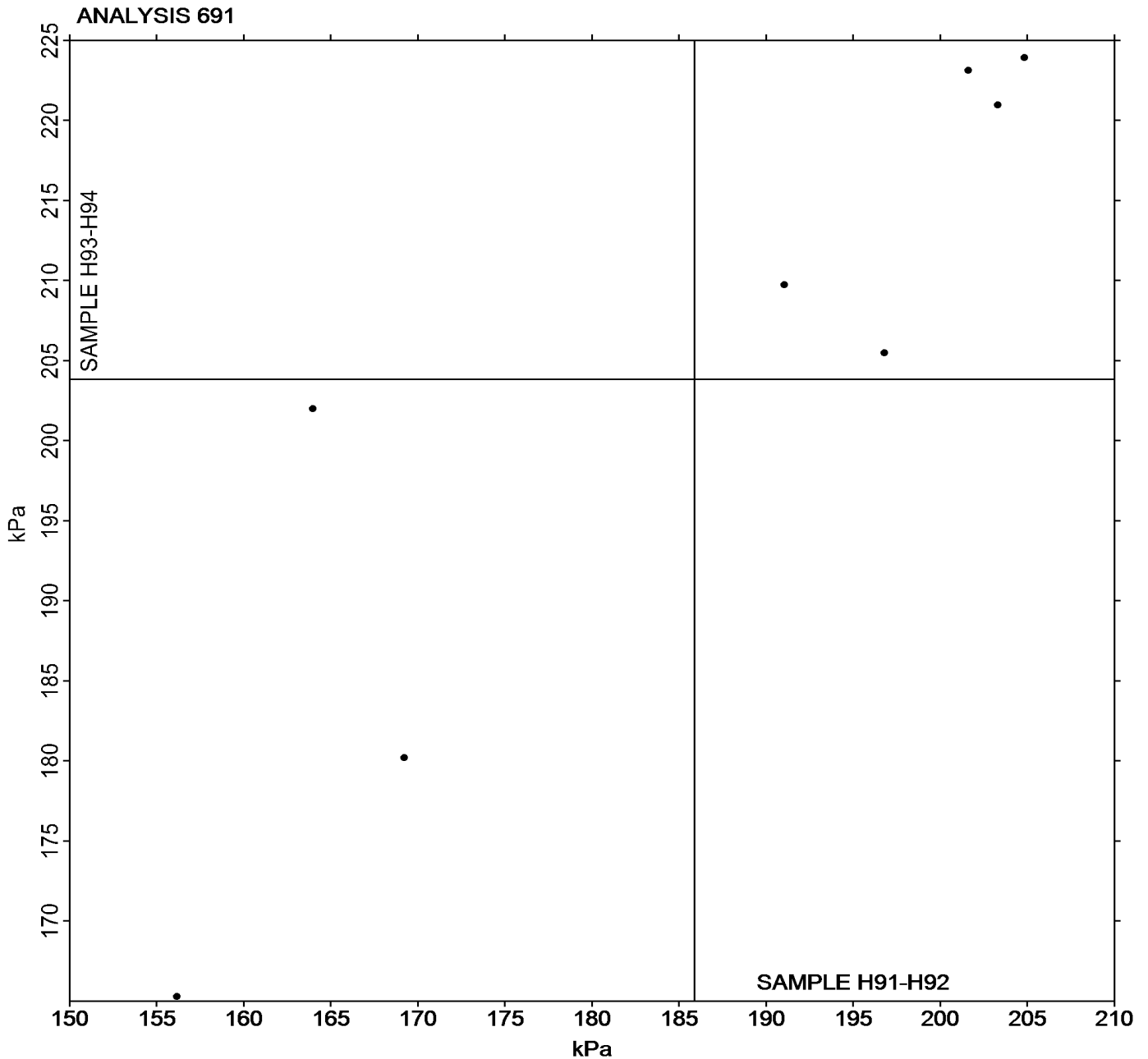
- PR PRPA 2000
- RP RPA 2000
- XX Instrument model not specified by lab



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

Grand Mean Sample H91-H92 = 185.86 kPa

Grand Mean Sample H93-H94 = 203.84 kPa



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



Rubber Interlaboratory Testing Program

Report #202

Analysis 695

4th Qtr 2019

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

| WebCode | Data Flag | Sample H91-H92 | | | Sample H93-H94 | | | Instr Code |
|--------------------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 43UVD3 | | 70.15 | -4.41 | -0.50 | 93.6 | -9.1 | -0.94 | RP |
| 7BZ32L | | 88.98 | 14.42 | 1.64 | 117.6 | 14.9 | 1.54 | RP |
| E4VRPM | | 72.65 | -1.91 | -0.22 | 99.9 | -2.8 | -0.29 | RP |
| H38THR | | 81.35 | 6.78 | 0.77 | 111.8 | 9.1 | 0.94 | XX |
| QRLF29 | | 66.88 | -7.68 | -0.87 | 97.1 | -5.6 | -0.58 | PR |
| WPWXM ⁴ | | 67.37 | -7.19 | -0.82 | 96.4 | -6.4 | -0.66 | RP |

| Summary Statistics | |
|---|------------|
| Grand Means | |
| | 74.563 kPa |
| | 102.73 kPa |
| Std Dev Btwn Labs | |
| | 8.805 kPa |
| | 9.66 kPa |
| Statistics based on 6 of 6 reporting participants | |

Samples H91-H92: EPDM compound #1 & H93-H94: EPDM compound #2

Key to Instrument Codes Reported by Participants

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

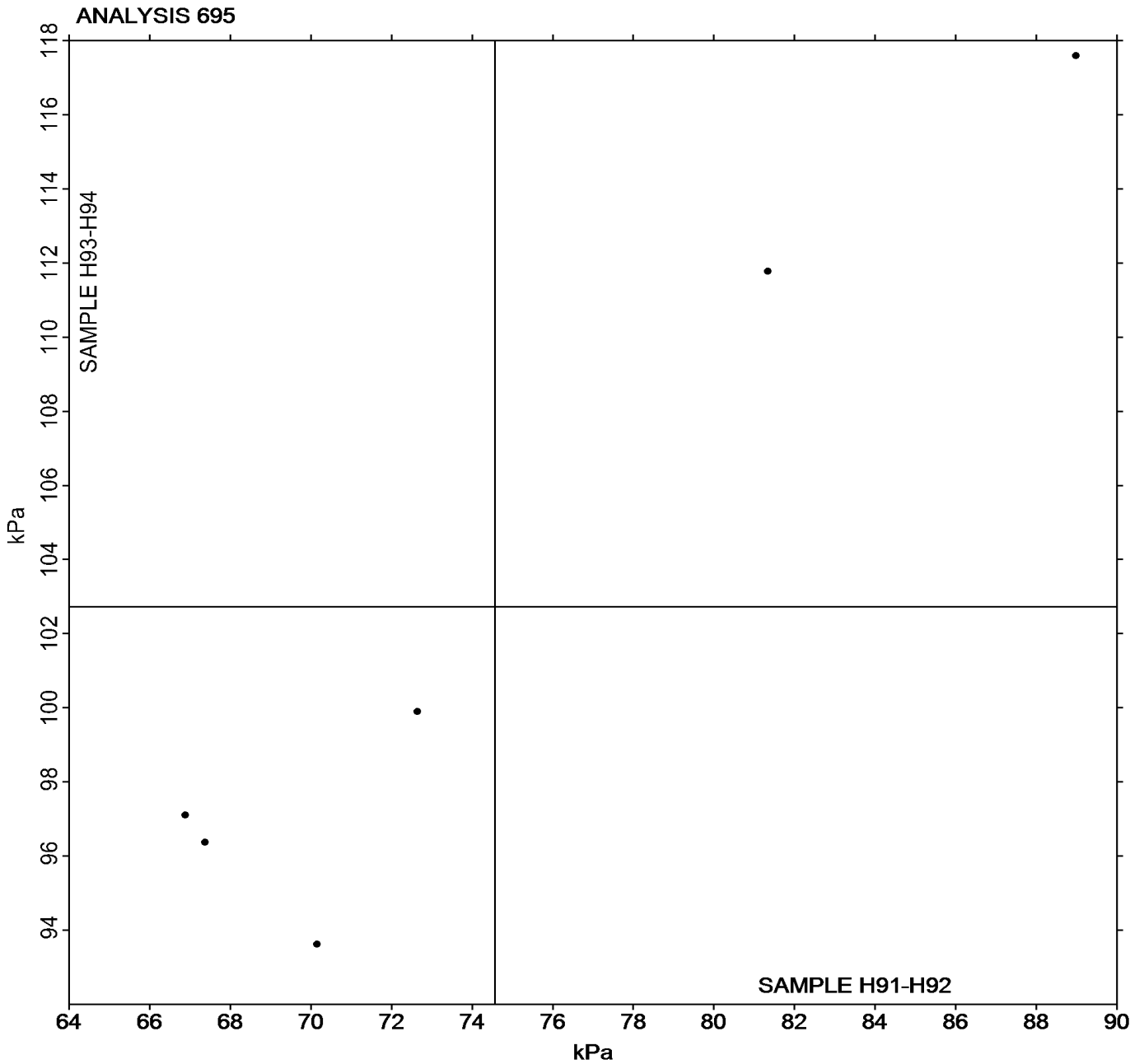


Rubber Interlaboratory Testing Program
Analysis 695
RPA Rheological Properties: Part B - G' at 1.0Hz (kPa)

Report #202
4th Qtr 2019

Grand Mean Sample H91-H92 = 74.563 kPa

Grand Mean Sample H93-H94 = 102.73 kPa



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



Rubber Interlaboratory Testing Program

Report #202

Analysis 696

4th Qtr 2019

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

| WebCode | Data Flag | Sample H91-H92 | | | Sample H93-H94 | | | Instr Code |
|---------|-----------|----------------|----------------------|-------|----------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 43UVD3 | | 58.02 | -6.91 | -1.48 | 62.87 | -9.66 | -1.88 | RP |
| 7BZ32L | | 71.50 | 6.57 | 1.41 | 77.80 | 5.27 | 1.03 | RP |
| E4VRPM | | 65.55 | 0.62 | 0.13 | 73.10 | 0.57 | 0.11 | RP |
| H38THR | | 68.07 | 3.14 | 0.67 | 75.43 | 2.91 | 0.57 | XX |
| QRLF29 | | 64.20 | -0.73 | -0.16 | 73.75 | 1.22 | 0.24 | PR |
| WPWXM4 | | 62.23 | -2.70 | -0.58 | 72.21 | -0.31 | -0.06 | XX |

| Summary Statistics | |
|--------------------|---|
| Grand Means | |
| | 64.929 kPa |
| | 72.525 kPa |
| Stnd Dev Btwn Labs | |
| | 4.668 kPa |
| | 5.128 kPa |
| | Statistics based on 6 of 6 reporting participants |

Samples H91-H92: EPDM compound #1 & H93-H94: EPDM compound #2

Key to Instrument Codes Reported by Participants

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



Rubber Interlaboratory Testing Program

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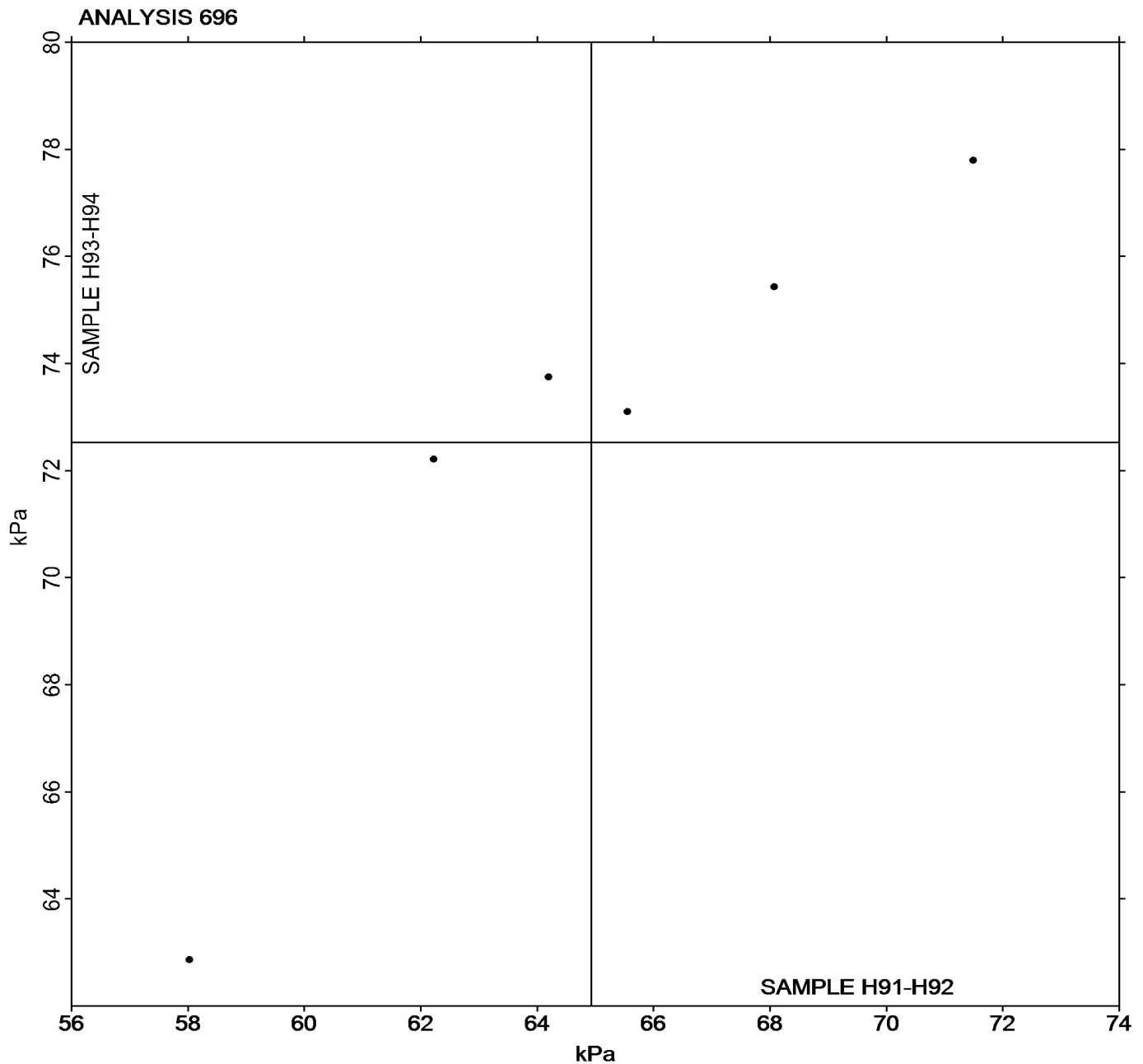
Analysis 696

4th Qtr 2019

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

Grand Mean Sample **H91-H92** = 64.929 kPa

Grand Mean Sample **H93-H94** = 72.525 kPa



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

-End of Report-