Collaborative Testing Services, Inc.

# Paper & Paperboard Interlaboratory Testing Program

## Summary Report #288S - May 2017



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| 310 | Bursting Strength - Packaging Papers |
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## The CTS Paper & Paperboard Interlaboratory Fiberboard Program

In 1969, the National Bureau of Standards (now designated the National Institute for Standards and Technology) and the Technical Association of the Pulp and Paper Industry (TAPPI) developed an interlaboratory program for paper and paperboard testing. Since 1971, Collaborative Testing Services has operated the Collaborative Reference Program for Paper and Paperboard. With hundreds of organizations from around the world participating in these tests, this program has become one of the largest of its kind. The program allows laboratories to compare the performance of their testing with that of other participating laboratories, and provides a realistic picture of the state of paper testing.

## About CTS

Founded in 1971, Collaborative Testing Services, Inc. (CTS) is a privately - owned company that specializes in interlaboratory tests for a variety of industrial sectors: rubber, plastics, fasteners and metals, CKPG, paper, color, and wine as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality assurance objectives. Labs from the U.S., as well as more than 80 countries, currently participate in CTS programs.

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# Key for Web Summary Reports (Page 1 of 2)

**WebCode** Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Paper Report published on the CTS web site. The WebCode for each analysis can be found in the Performance Analysis Report mailed to each participant. In addition, the WebCodes can be found on the data sheets.

**Lab Mean** The average of the values obtained for each sample 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** A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section), if instruments are tracked.

**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:

| DATA FLAG | STATISTICALLY INCLUDED/EXCLUDED | ACTION REQUIRED |
|---|---|---|
| * | 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. |

**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 on the previous page.

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**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 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.

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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.

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 305

## Bursting Strength - Printing Papers

## TAPPI Official Test Method T403

| WebCode | Data Flag | Sample SA43 Lab Mean | Sample SA43 Diff from Grand Mean | Sample SA43 CPV | Sample SA44 Lab Mean | Sample SA44 Diff from Grand Mean | Sample SA44 CPV |
|---|---|---|---|---|---|---|---|
| 36F4Q8 | * | 30.80 | 4.63 | 1.72 | 29.95 | 0.92 | 0.39 |
| 3F3VLC | | 25.98 | -0.19 | -0.07 | 29.09 | 0.06 | 0.03 |
| 3TTM7F | | 28.80 | 2.63 | 0.98 | 30.20 | 1.17 | 0.49 |
| 6V7872 | | 27.39 | 1.22 | 0.45 | 31.34 | 2.31 | 0.97 |
| 78CN73 | | 25.20 | -0.97 | -0.36 | 27.20 | -1.83 | -0.77 |
| 84TQFR | | 27.60 | 1.44 | 0.53 | 30.38 | 1.35 | 0.57 |
| 8TFKNX | | 28.15 | 1.98 | 0.74 | 31.01 | 1.98 | 0.83 |
| BRM88M | | 24.40 | -1.77 | -0.66 | 29.10 | 0.07 | 0.03 |
| CVK4B8 | | 27.00 | 0.83 | 0.31 | 27.40 | -1.63 | -0.69 |
| D4WGT3 | | 24.78 | -1.38 | -0.51 | 29.38 | 0.35 | 0.15 |
| D99A3G | | 22.27 | -3.90 | -1.45 | 25.98 | -3.05 | -1.28 |
| D9MR42 | * | 19.30 | -6.86 | -2.55 | 21.13 | -7.90 | -3.32 |
| DDGNTR | | 23.40 | -2.77 | -1.03 | 27.02 | -2.02 | -0.85 |
| DGEGFV | | 24.71 | -1.46 | -0.54 | 27.49 | -1.54 | -0.65 |
| DNKY4N | | 26.03 | -0.14 | -0.05 | 28.06 | -0.97 | -0.41 |
| DX6DZY | | 25.31 | -0.86 | -0.32 | 30.32 | 1.28 | 0.54 |
| EJJ6VK | | 25.50 | -0.67 | -0.25 | 29.49 | 0.45 | 0.19 |
| G4J6VG | | 30.60 | 4.43 | 1.65 | 31.20 | 2.17 | 0.91 |
| JKKJDM | | 29.60 | 3.43 | 1.27 | 31.89 | 2.86 | 1.20 |
| JX7YGL | | 22.75 | -3.42 | -1.27 | 25.98 | -3.05 | -1.28 |
| KC3URJ | | 25.15 | -1.02 | -0.38 | 29.10 | 0.06 | 0.03 |
| LFXQ8C | | 25.76 | -0.41 | -0.15 | 29.31 | 0.28 | 0.12 |
| QKEY7C | | 24.20 | -1.97 | -0.73 | 27.40 | -1.63 | -0.69 |
| UCA4XN | | 27.13 | 0.96 | 0.36 | 29.67 | 0.64 | 0.27 |
| X3QWNN | | 24.73 | -1.44 | -0.54 | 28.73 | -0.30 | -0.13 |
| X6DHC6 | | 26.62 | 0.45 | 0.17 | 30.04 | 1.01 | 0.42 |
| YDQU6W | | 30.85 | 4.68 | 1.74 | 33.45 | 4.42 | 1.86 |
| ZZ2A7K | | 28.73 | 2.56 | 0.95 | 31.60 | 2.57 | 1.08 |

### Summary Statistics

| | Sample SA43 | Sample SA44 |
|---|---|---|
| Grand Means | 26.169 psi | 29.033 psi |
| SD Btwn Labs | 2.692 psi | 2.380 psi |

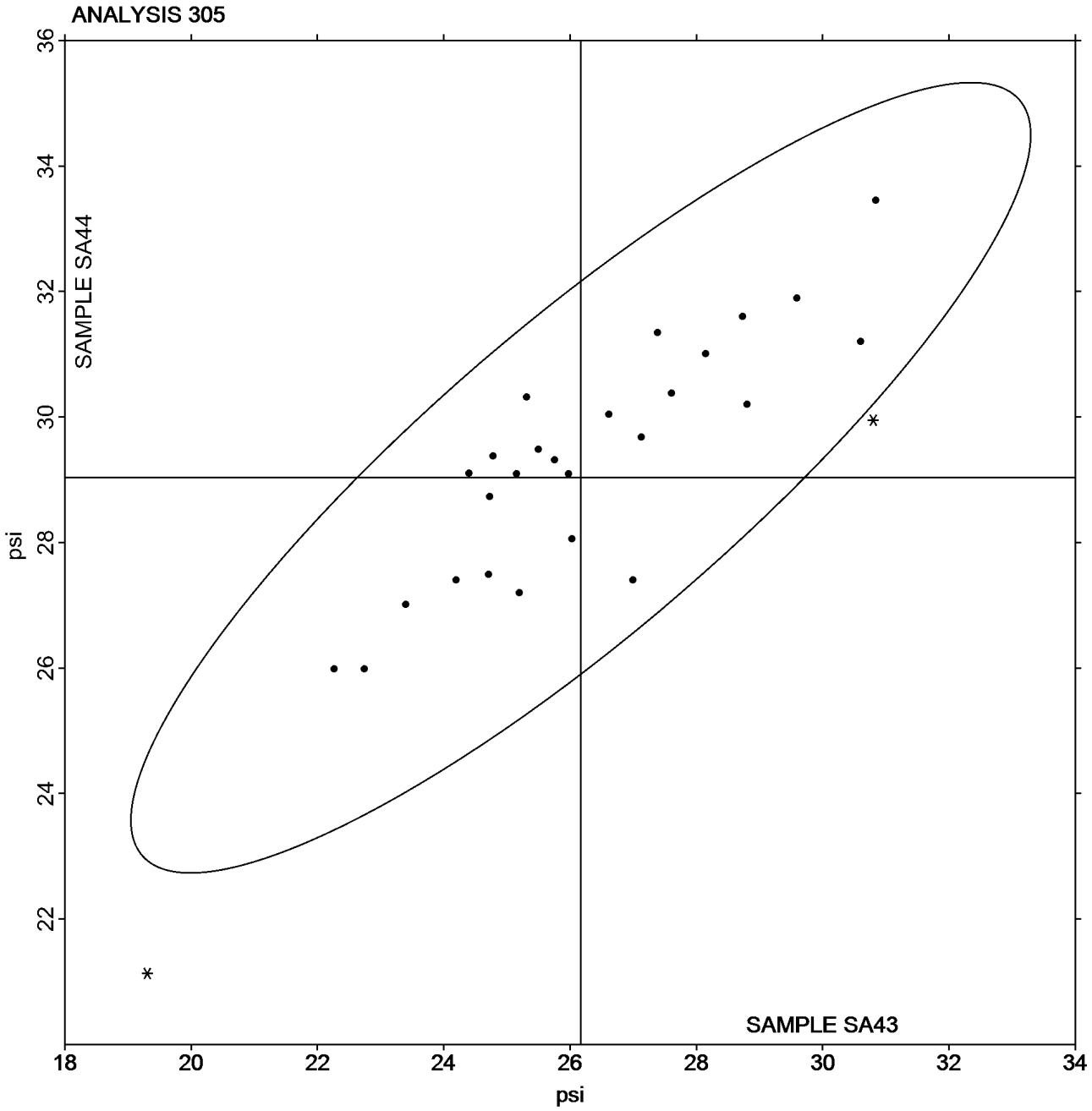
Statistics based on 28 of 28 reporting participants

**Analysis Notes:**

YDQU6W - Data appear to be reported as kPa, not psi as indicated on datasheet. Units changed by CTS.

Grand Mean Sample **SA43** = 26.169 psi

Grand Mean Sample **SA44** = 29.033 psi



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 310

## Bursting Strength - Packaging Papers

## TAPPI Official Test Method T403

| WebCode | Data Flag | Sample SB43 Lab Mean | Sample SB43 Diff from Grand Mean | Sample SB43 CPV | Sample SB44 Lab Mean | Sample SB44 Diff from Grand Mean | Sample SB44 CPV |
|---|---|---|---|---|---|---|---|
| 2ZUNMA | | 92.53 | -1.11 | -0.27 | 83.61 | -4.88 | -0.98 |
| 42EBGA | | 93.00 | -0.64 | -0.16 | 93.30 | 4.81 | 0.96 |
| 6ARJHB | | 91.10 | -2.54 | -0.62 | 86.78 | -1.72 | -0.34 |
| 6RAKCD | | 92.19 | -1.45 | -0.35 | 85.16 | -3.34 | -0.67 |
| 73KCFD | X | 114.14 | 20.50 | 4.98 | 107.85 | 19.36 | 3.87 |
| 78CN73 | | 99.64 | 6.00 | 1.46 | 95.26 | 6.77 | 1.35 |
| 83DRYM | | 91.87 | -1.77 | -0.43 | 81.63 | -6.87 | -1.37 |
| 84TQFR | | 93.82 | 0.18 | 0.04 | 86.49 | -2.00 | -0.40 |
| 8TFKNX | | 94.03 | 0.39 | 0.09 | 91.03 | 2.53 | 0.51 |
| ACGGX4 | | 98.70 | 5.06 | 1.23 | 93.61 | 5.12 | 1.02 |
| ACJ732 | | 103.36 | 9.72 | 2.36 | 99.12 | 10.62 | 2.12 |
| CU9BEJ | | 87.10 | -6.54 | -1.59 | 90.00 | 1.51 | 0.30 |
| H8FAPD | | 92.98 | -0.65 | -0.16 | 91.10 | 2.60 | 0.52 |
| JVHQNC | | 98.55 | 4.91 | 1.19 | 90.15 | 1.66 | 0.33 |
| JVZFBD | | 91.85 | -1.79 | -0.43 | 90.05 | 1.56 | 0.31 |
| LFJG3H | | 94.70 | 1.06 | 0.26 | 89.26 | 0.76 | 0.15 |
| M38FXC | | 90.60 | -3.04 | -0.74 | 87.10 | -1.39 | -0.28 |
| NAMAWE | | 97.28 | 3.64 | 0.89 | 87.42 | -1.07 | -0.21 |
| QMHKAB | | 93.55 | -0.09 | -0.02 | 87.75 | -0.75 | -0.15 |
| QQHTF8 | | 96.86 | 3.22 | 0.78 | 88.72 | 0.23 | 0.05 |
| RNR9N8 | | 98.70 | 5.06 | 1.23 | 88.50 | 0.01 | 0.00 |
| T3MNN2 | | 93.30 | -0.33 | -0.08 | 83.82 | -4.68 | -0.93 |
| T4ZKT7 | | 91.00 | -2.64 | -0.64 | 84.38 | -4.11 | -0.82 |
| X2F22W | | 96.04 | 2.40 | 0.58 | 92.43 | 3.94 | 0.79 |
| XD8TKE | | 90.46 | -3.18 | -0.77 | 90.95 | 2.46 | 0.49 |
| YDQU6W | | 98.42 | 4.78 | 1.16 | 91.55 | 3.05 | 0.61 |
| YKTY2M | | 86.37 | -7.27 | -1.77 | 84.74 | -3.75 | -0.75 |
| YMV4AZ | | 90.14 | -3.50 | -0.85 | 87.69 | -0.80 | -0.16 |
| Z4W2EH | | 91.38 | -2.25 | -0.55 | 92.86 | 4.36 | 0.87 |
| ZD4XXE | * | 86.00 | -7.64 | -1.86 | 71.90 | -16.59 | -3.32 |

### Summary Statistics

| | Sample SB43 | Sample SB44 |
|---|---|---|
| Grand Means | 93.638 psi | 88.494 psi |
| SD Btwn Labs | 4.115 psi | 5.003 psi |

Statistics based on 29 of 30 reporting participants

### Comments on Assigned Data Flags for Test #310

73KCFD (X) - Data for both samples are high.

**Analysis Notes:**

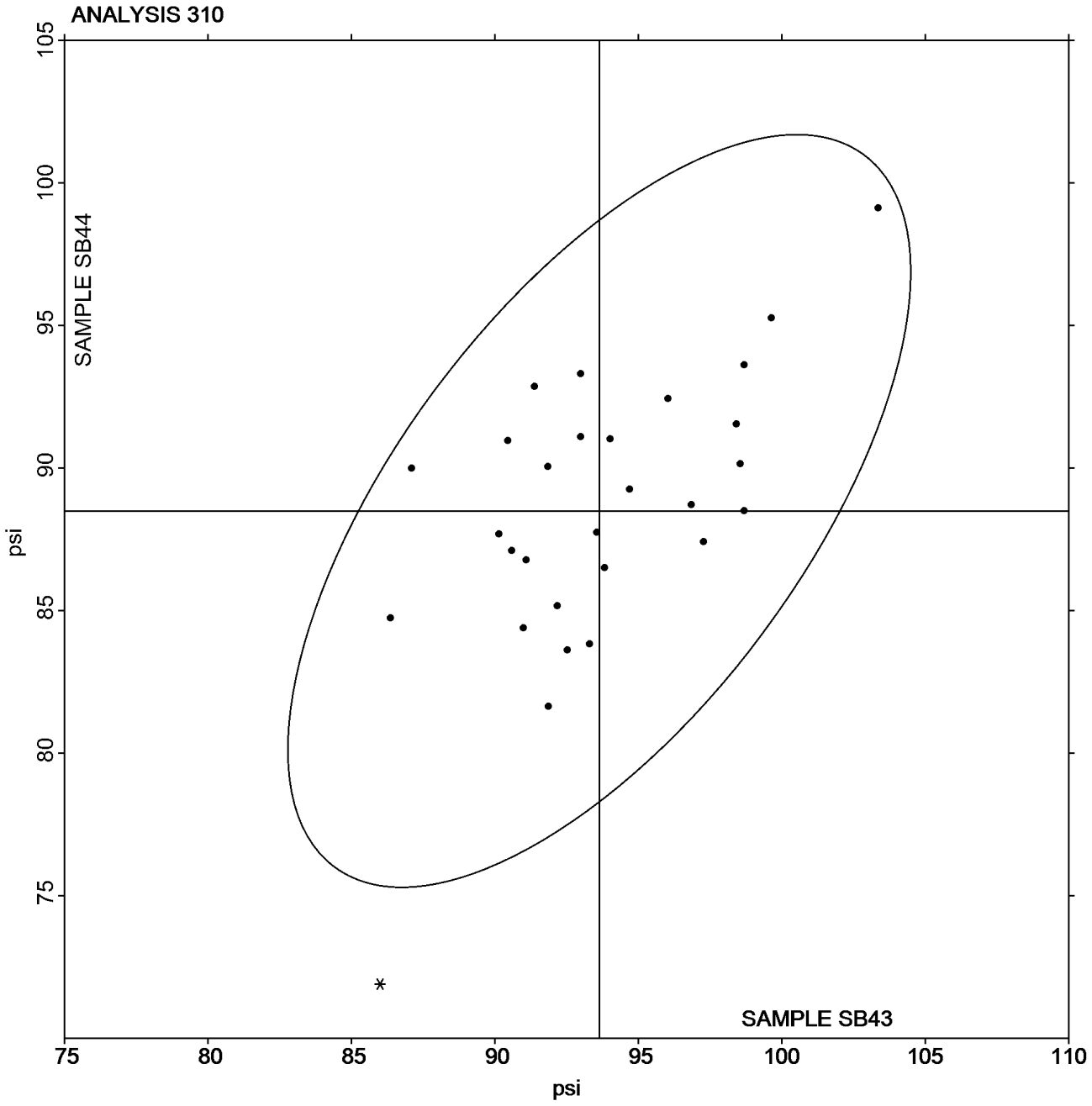
NAMAWE - Data appears to be transposed between samples. Data Switched by CTS.

YDQU6W - Data appear to be reported as kPa, not psi as indicated on datasheet. Units changed by CTS.

Grand Mean Sample **SB43** = 93.638 psi

Grand Mean Sample **SB44** = 88.494 psi



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 311
## Tearing Strength - Newsprint
## TAPPI Official Test Method T414

| WebCode | Data Flag | Sample SK43 Lab Mean | Sample SK43 Diff from Grand Mean | Sample SK43 CPV | Sample SK44 Lab Mean | Sample SK44 Diff from Grand Mean | Sample SK44 CPV |
|---|---|---|---|---|---|---|---|
| 84TQFR | | 20.14 | -3.28 | -0.76 | 26.84 | -4.42 | -0.78 |
| GEJTU6 | | 20.38 | -3.04 | -0.70 | 27.27 | -3.99 | -0.70 |
| HMRGAP | | 24.52 | 1.11 | 0.26 | 33.55 | 2.29 | 0.40 |
| JD44PJ | | 20.27 | -3.15 | -0.73 | 26.46 | -4.80 | -0.84 |
| RRUZZE | | 23.92 | 0.51 | 0.12 | 32.36 | 1.09 | 0.19 |
| UCA4XN | X | 2.72 | -20.70 | -4.80 | 3.53 | -27.73 | -4.88 |
| ZZ2A7K | | 31.26 | 7.84 | 1.82 | 41.10 | 9.84 | 1.73 |

### Summary Statistics

| | Sample SK43 | Sample SK44 |
|---|---|---|
| Grand Means | 23.416 Grams | 31.262 Grams |
| SD Btwn Labs | 4.310 Grams | 5.688 Grams |

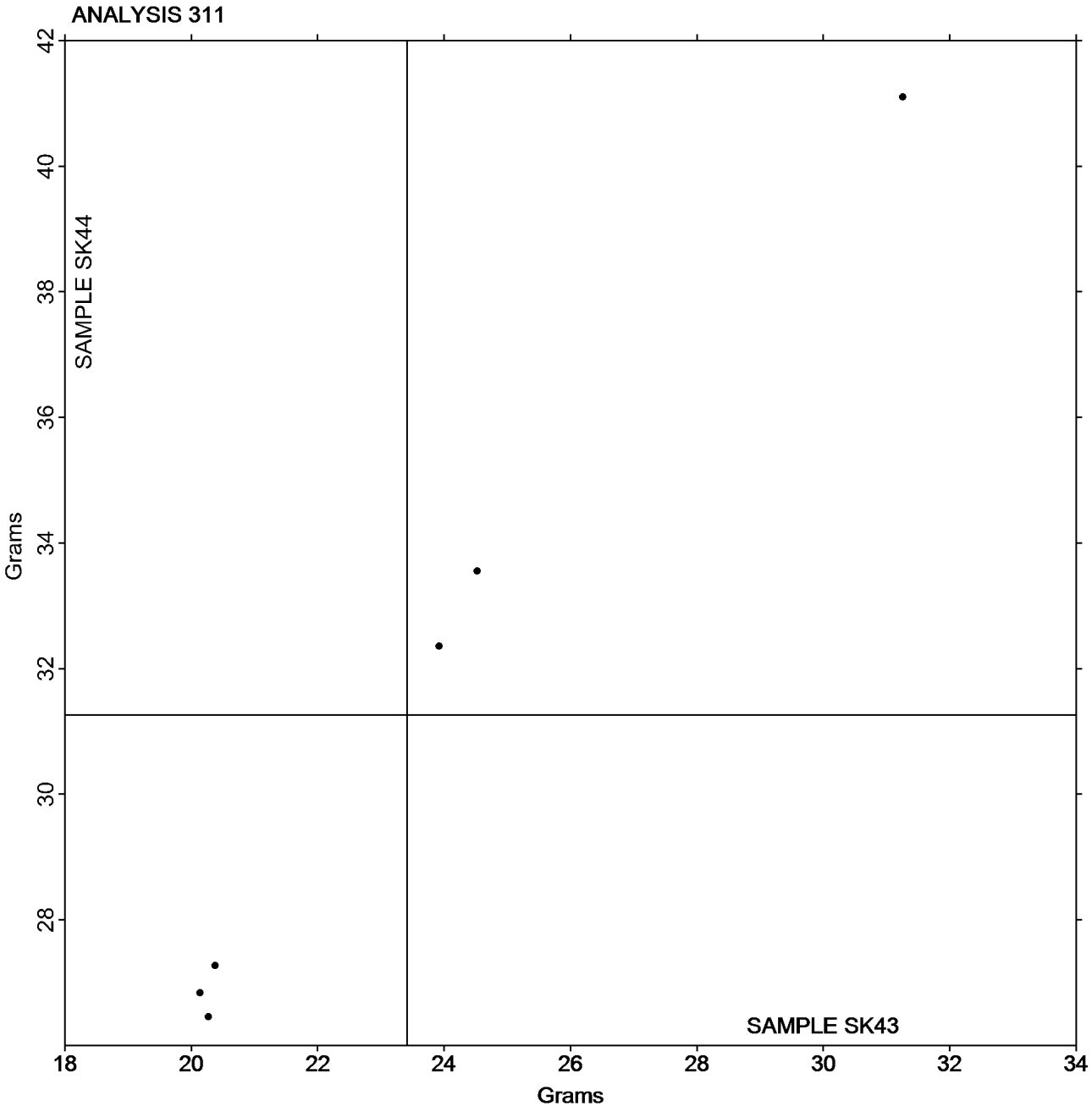
Statistics based on 6 of 7 reporting participants

**Comments on Assigned Data Flags for Test #311**

UCA4XN (X) - Data for both samples are low.

Grand Mean Sample **SK43** = 23.416 Grams

Grand Mean Sample **SK44** = 31.262 Grams




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 312

## Tearing Strength - Printing Papers

## TAPPI Official Test Method T414

| WebCode | Data Flag | Sample SC43 Lab Mean | Sample SC43 Diff from Grand Mean | Sample SC43 CPV | Sample SC44 Lab Mean | Sample SC44 Diff from Grand Mean | Sample SC44 CPV |
|---|---|---|---|---|---|---|---|
| 2C4BZ2 | | 62.90 | 0.29 | 0.07 | 64.02 | -0.04 | -0.01 |
| 2N3TVA | X | 4.88 | -57.73 | -14.61 | 8.52 | -55.54 | -14.72 |
| 36F4Q8 | | 58.16 | -4.45 | -1.13 | 59.06 | -5.00 | -1.33 |
| 3F3VLC | | 66.13 | 3.52 | 0.89 | 65.96 | 1.89 | 0.50 |
| 3TTM7F | | 65.64 | 3.03 | 0.77 | 66.48 | 2.42 | 0.64 |
| 484Q6F | | 57.90 | -4.71 | -1.19 | 59.20 | -4.86 | -1.29 |
| 4VCW2Y | | 62.46 | -0.15 | -0.04 | 63.70 | -0.36 | -0.10 |
| 6ARJHB | | 63.31 | 0.70 | 0.18 | 64.10 | 0.04 | 0.01 |
| 6RAKCD | | 65.22 | 2.61 | 0.66 | 67.38 | 3.32 | 0.88 |
| 6V7872 | | 67.78 | 5.17 | 1.31 | 67.61 | 3.55 | 0.94 |
| 7K4D4N | | 61.38 | -1.23 | -0.31 | 63.50 | -0.56 | -0.15 |
| 83DRYM | | 65.66 | 3.05 | 0.77 | 66.43 | 2.37 | 0.63 |
| 84TQFR | | 64.16 | 1.55 | 0.39 | 64.79 | 0.73 | 0.19 |
| 8TFKNX | | 61.31 | -1.31 | -0.33 | 62.34 | -1.73 | -0.46 |
| AM3NU8 | | 69.80 | 7.19 | 1.82 | 70.08 | 6.01 | 1.59 |
| AR7U4J | * | 55.52 | -7.09 | -1.80 | 61.74 | -2.32 | -0.62 |
| BCVA6R | | 58.04 | -4.57 | -1.16 | 59.54 | -4.52 | -1.20 |
| BPMUUV | | 61.76 | -0.85 | -0.22 | 64.26 | 0.20 | 0.05 |
| BRM88M | | 65.88 | 3.27 | 0.83 | 66.28 | 2.22 | 0.59 |
| CVK4B8 | | 62.78 | 0.17 | 0.04 | 61.62 | -2.44 | -0.65 |
| D4WGT3 | | 60.80 | -1.81 | -0.46 | 63.20 | -0.86 | -0.23 |
| D99A3G | | 63.92 | 1.31 | 0.33 | 65.68 | 1.62 | 0.43 |
| D9MR42 | X | 147.62 | 85.01 | 21.51 | 132.68 | 68.62 | 18.19 |
| DDGNTR | | 62.23 | -0.38 | -0.10 | 62.00 | -2.06 | -0.55 |
| DGEGFV | | 63.40 | 0.79 | 0.20 | 64.13 | 0.07 | 0.02 |
| DNKY4N | | 60.66 | -1.95 | -0.49 | 64.26 | 0.20 | 0.05 |
| EJJ6VK | X | 78.92 | 16.30 | 4.13 | 65.98 | 1.91 | 0.51 |
| EJZBZ3 | X | 58.93 | -3.68 | -0.93 | 53.16 | -10.90 | -2.89 |
| F88CNQ | | 58.37 | -4.24 | -1.07 | 59.69 | -4.37 | -1.16 |
| FXHL3Y | X | 78.69 | 16.08 | 4.07 | 67.87 | 3.81 | 1.01 |
| FZJRG4 | | 56.15 | -6.46 | -1.64 | 57.98 | -6.08 | -1.61 |
| H8FAPD | X | 80.53 | 17.92 | 4.53 | 79.60 | 15.54 | 4.12 |
| HFC46Y | | 61.54 | -1.07 | -0.27 | 61.88 | -2.18 | -0.58 |
| JJ3UPZ | | 58.71 | -3.91 | -0.99 | 58.79 | -5.28 | -1.40 |
| JKKJDM | | 57.18 | -5.43 | -1.38 | 58.88 | -5.18 | -1.37 |
| JVHQNC | | 58.93 | -3.68 | -0.93 | 58.15 | -5.91 | -1.57 |
| JVZFBD | | 58.10 | -4.51 | -1.14 | 58.93 | -5.13 | -1.36 |
| JX7YGL | | 65.04 | 2.43 | 0.61 | 67.76 | 3.70 | 0.98 |
| KC3URJ | X | 76.50 | 13.89 | 3.51 | 74.13 | 10.07 | 2.67 |
| KPAH33 | | 62.09 | -0.53 | -0.13 | 65.27 | 1.20 | 0.32 |

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 312

## Tearing Strength - Printing Papers

## TAPPI Official Test Method T414

| WebCode | Data Flag | Sample SC43 Lab Mean | Sample SC43 Diff from Grand Mean | Sample SC43 CPV | Sample SC44 Lab Mean | Sample SC44 Diff from Grand Mean | Sample SC44 CPV |
|---|---|---|---|---|---|---|---|
| LFXQ8C | X | 76.20 | 13.59 | 3.44 | 64.39 | 0.32 | 0.09 |
| P8DLUU | * | 52.65 | -9.96 | -2.52 | 56.08 | -7.98 | -2.12 |
| PBC8DK | | 63.00 | 0.39 | 0.10 | 64.70 | 0.64 | 0.17 |
| QXJZ4M | | 64.59 | 1.98 | 0.50 | 64.05 | -0.01 | 0.00 |
| RWM23T | | 68.35 | 5.74 | 1.45 | 66.34 | 2.28 | 0.60 |
| T3MNN2 | | 62.87 | 0.25 | 0.06 | 62.90 | -1.17 | -0.31 |
| UBJT6A | | 70.20 | 7.59 | 1.92 | 70.00 | 5.94 | 1.57 |
| UMWZ2A | | 64.70 | 2.09 | 0.53 | 69.49 | 5.43 | 1.44 |
| WULPBA | | 61.00 | -1.61 | -0.41 | 63.70 | -0.36 | -0.10 |
| X3QWNN | | 64.58 | 1.96 | 0.50 | 67.30 | 3.24 | 0.86 |
| X6DHC6 | | 64.70 | 2.09 | 0.53 | 66.10 | 2.04 | 0.54 |
| YDQU6W | | 62.31 | -0.30 | -0.08 | 65.25 | 1.18 | 0.31 |
| YKTY2M | | 60.19 | -2.42 | -0.61 | 64.16 | 0.10 | 0.03 |
| YMV4AZ | | 63.03 | 0.41 | 0.10 | 64.87 | 0.81 | 0.22 |
| Z4W2EH | * | 71.01 | 8.39 | 2.12 | 74.00 | 9.94 | 2.63 |
| ZD4XXE | | 69.40 | 6.79 | 1.72 | 71.40 | 7.34 | 1.94 |

### Summary Statistics

| | Sample SC43 | Sample SC44 |
|---|---|---|
| Grand Means | 62.614 Grams | 64.063 Grams |
| SD Btwn Labs | 3.952 Grams | 3.772 Grams |

Statistics based on 48 of 56 reporting participants

## Comments on Assigned Data Flags for Test #312

2N3TVA (X) - Extreme Data.

KC3URJ (X) - Data for sample SC43 are high.

FXHL3Y (X) - Data for sample SC43 are high.

D9MR42 (X) - Extreme Data.

EJZBZ3 (X) - Data for sample SC44 are low.

LFXQ8C (X) - Data for sample SC43 are high.

EJJ6VK (X) - Data for sample SC43 are high.

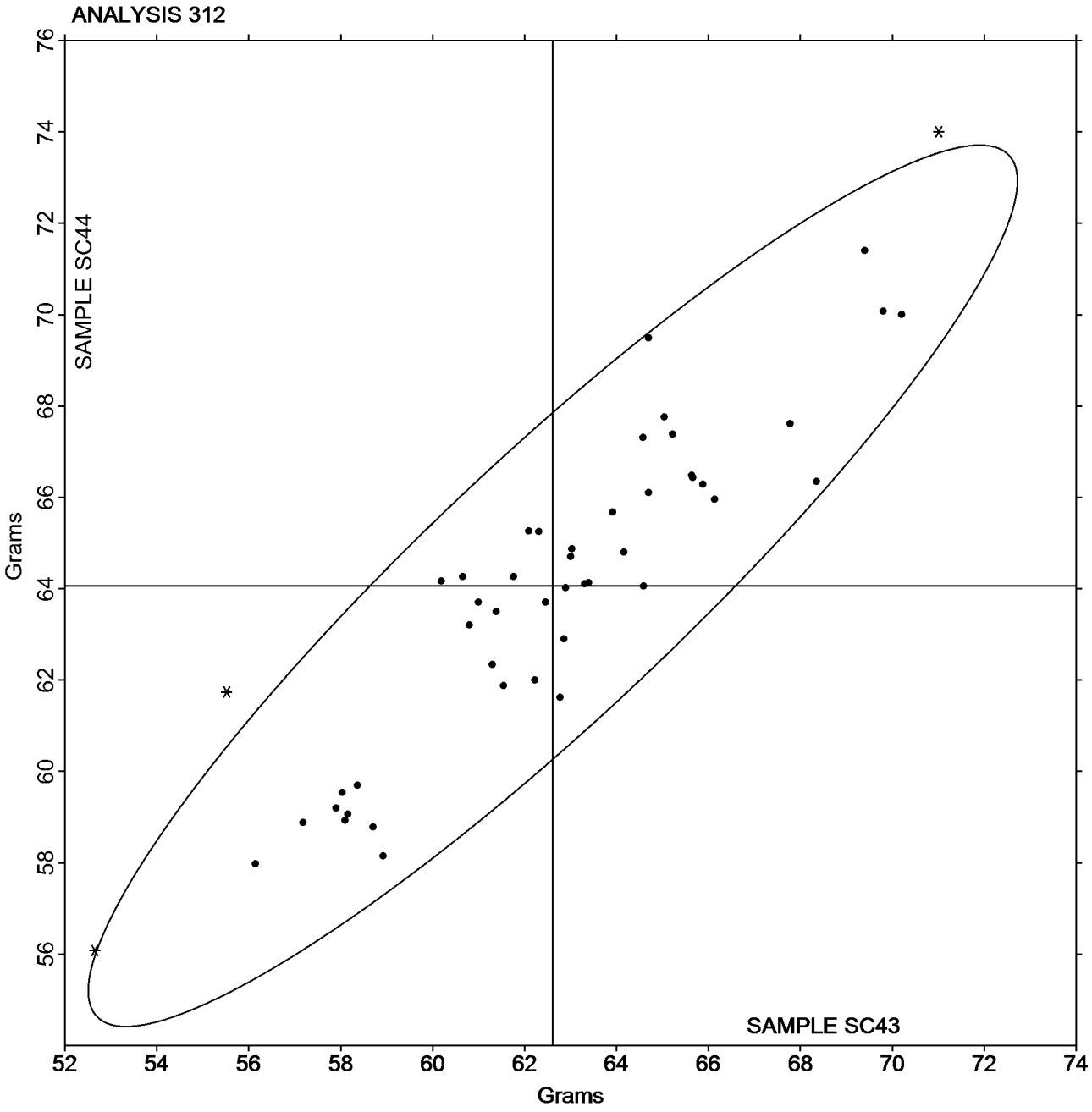
H8FAPD (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample SC43.

## Analysis Notes:

JJ3UPZ - Data appear to be off by a factor of 2; data converted by CTS (x.5).

Grand Mean Sample **SC43** = 62.614 Grams

Grand Mean Sample **SC44** = 64.063 Grams



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 314

## Tearing Strength - Packaging Papers

## TAPPI Official Test Method T414

| WebCode | Data Flag | Sample SD43 Lab Mean | Sample SD43 Diff from Grand Mean | Sample SD43 CPV | Sample SD44 Lab Mean | Sample SD44 Diff from Grand Mean | Sample SD44 CPV |
|---|---|---|---|---|---|---|---|
| 2ZUNMA | | 176.8 | -23.0 | -1.54 | 187.2 | -16.4 | -1.05 |
| 42EBGA | | 203.3 | 3.5 | 0.24 | 195.6 | -8.0 | -0.51 |
| 73KCFD | | 196.8 | -3.0 | -0.20 | 208.8 | 5.2 | 0.33 |
| 78CN73 | | 175.6 | -24.2 | -1.62 | 174.4 | -29.2 | -1.87 |
| 824KVU | | 173.9 | -25.9 | -1.73 | 189.3 | -14.3 | -0.92 |
| 84TQFR | | 213.8 | 14.1 | 0.94 | 216.4 | 12.8 | 0.82 |
| 8KXEP6 | | 220.4 | 20.6 | 1.38 | 219.4 | 15.8 | 1.02 |
| 8PPPGV | * | 205.6 | 5.8 | 0.39 | 234.6 | 31.0 | 1.99 |
| 993MH7 | | 208.5 | 8.7 | 0.58 | 218.1 | 14.5 | 0.93 |
| ACGGX4 | | 186.9 | -12.9 | -0.86 | 194.0 | -9.6 | -0.62 |
| AM3NU8 | | 204.6 | 4.8 | 0.32 | 210.7 | 7.1 | 0.46 |
| AP89KT | | 206.8 | 7.0 | 0.47 | 208.0 | 4.4 | 0.28 |
| C4ZK73 | | 212.4 | 12.6 | 0.84 | 211.5 | 7.9 | 0.51 |
| CU9BEJ | | 183.2 | -16.6 | -1.11 | 199.2 | -4.4 | -0.28 |
| CVK4B8 | | 194.3 | -5.5 | -0.37 | 197.0 | -6.6 | -0.42 |
| EYEGC2 | X | 271.2 | 71.4 | 4.78 | 246.8 | 43.2 | 2.77 |
| HC9CRR | | 207.7 | 7.9 | 0.53 | 214.1 | 10.5 | 0.67 |
| HTZXMJ | | 194.9 | -4.9 | -0.33 | 192.7 | -10.9 | -0.70 |
| LFJG3H | | 205.3 | 5.5 | 0.37 | 207.0 | 3.4 | 0.22 |
| M38FXC | | 211.4 | 11.6 | 0.78 | 205.0 | 1.4 | 0.09 |
| NAMAWE | X | 140.0 | -59.8 | -4.00 | 164.4 | -39.2 | -2.51 |
| NTFDDF | * | 168.3 | -31.5 | -2.11 | 201.1 | -2.5 | -0.16 |
| NTVLFP | | 231.7 | 31.9 | 2.13 | 225.5 | 21.9 | 1.40 |
| PYHTDN | | 180.0 | -19.8 | -1.32 | 180.4 | -23.2 | -1.49 |
| QKEY7C | | 191.7 | -8.1 | -0.54 | 186.6 | -17.0 | -1.09 |
| QMHKAB | | 209.8 | 10.0 | 0.67 | 210.7 | 7.1 | 0.45 |
| QQHTF8 | | 207.0 | 7.2 | 0.48 | 195.6 | -8.0 | -0.51 |
| T4ZKT7 | * | 184.0 | -15.8 | -1.06 | 166.6 | -37.0 | -2.37 |
| TR62KT | | 207.2 | 7.4 | 0.50 | 213.2 | 9.6 | 0.62 |
| U33HR9 | | 202.9 | 3.1 | 0.21 | 200.2 | -3.4 | -0.22 |
| U4DBGG | | 216.1 | 16.3 | 1.09 | 221.3 | 17.7 | 1.14 |
| VZCH8H | | 194.0 | -5.8 | -0.39 | 198.0 | -5.6 | -0.36 |
| X2F22W | | 175.3 | -24.5 | -1.64 | 182.7 | -20.9 | -1.34 |
| XD8TKE | X | 275.3 | 75.5 | 5.05 | 210.5 | 6.9 | 0.44 |
| XLN6Z2 | | 201.7 | 1.9 | 0.13 | 207.1 | 3.5 | 0.23 |
| YRRJ63 | | 214.5 | 14.8 | 0.99 | 223.8 | 20.2 | 1.30 |
| YXTXNJ | | 200.0 | 0.2 | 0.01 | 201.8 | -1.8 | -0.11 |
| YYPDZF | | 221.5 | 21.8 | 1.46 | 223.1 | 19.5 | 1.25 |
| ZD4XXE | | 205.2 | 5.4 | 0.36 | 224.8 | 21.2 | 1.36 |
| ZR9YXB | | 198.8 | -0.9 | -0.06 | 187.3 | -16.3 | -1.05 |

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 314

## Tearing Strength - Packaging Papers

## TAPPI Official Test Method T414

| WebCode | Data Flag | Sample SD43 Lab Mean | Sample SD43 Diff from Grand Mean | Sample SD43 CPV | Sample SD44 Lab Mean | Sample SD44 Diff from Grand Mean | Sample SD44 CPV |
|---|---|---|---|---|---|---|---|

### Summary Statistics

| | Sample SD43 | Sample SD44 |
|---|---|---|
| Grand Means | 199.77 Grams | 203.59 Grams |
| SD Btwn Labs | 14.95 Grams | 15.58 Grams |

Statistics based on 37 of 40 reporting participants

### Comments on Assigned Data Flags for Test #314

NAMAWE (X) - Data for sample SD43 are low.

EYEGC2 (X) - Data for both samples are high. Possible Systematic Error.

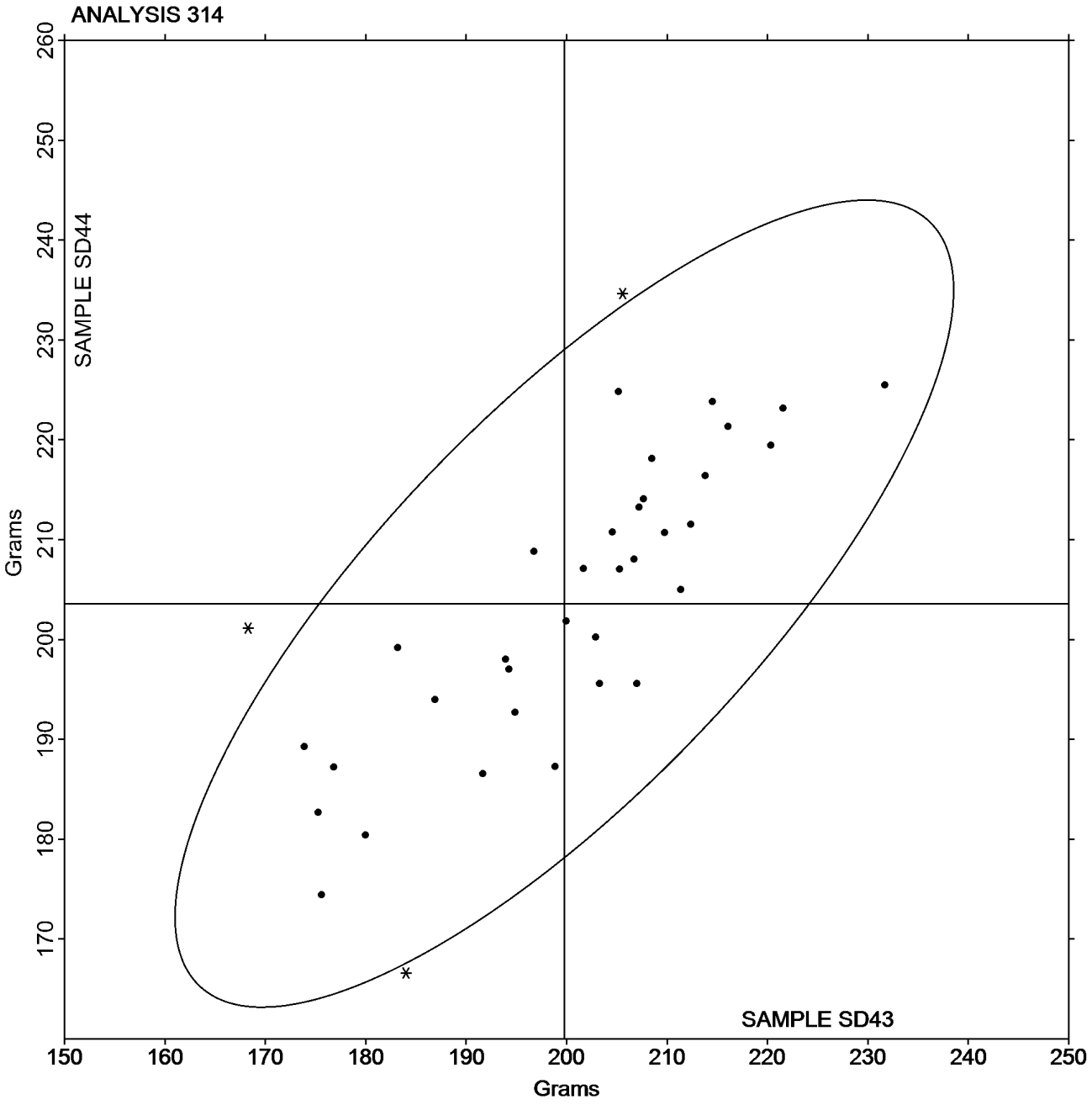
XD8TKE (X) - Data for sample SD43 are high. Inconsistent within the determinations of sample SD43.

### Analysis Notes:

8KXEP6 - Data appear to be off by a factor of .25; data converted by CTS (x4).

Grand Mean Sample **SD43** = 199.77 Grams

Grand Mean Sample **SD44** = 203.59 Grams



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 320

## Tensile Breaking Strength - Newsprint

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SR43 Lab Mean | Sample SR43 Diff from Grand Mean | Sample SR43 CPV | Sample SR44 Lab Mean | Sample SR44 Diff from Grand Mean | Sample SR44 CPV |
|---|---|---|---|---|---|---|---|
| 48Z8Y6 | | 1.994 | -0.141 | -1.18 | 2.778 | -0.199 | -0.95 |
| 67L43R | | 2.448 | 0.313 | 2.62 | 3.551 | 0.573 | 2.73 |
| 8TFKNX | | 2.139 | 0.004 | 0.04 | 2.949 | -0.029 | -0.14 |
| AM3NU8 | | 2.158 | 0.024 | 0.20 | 2.956 | -0.021 | -0.10 |
| DX6DZY | | 2.079 | -0.056 | -0.47 | 2.810 | -0.167 | -0.80 |
| GEJTU6 | | 2.101 | -0.034 | -0.28 | 2.833 | -0.145 | -0.69 |
| HMRGAP | | 2.169 | 0.035 | 0.29 | 3.118 | 0.141 | 0.67 |
| JD44PJ | | 2.078 | -0.057 | -0.47 | 2.804 | -0.174 | -0.83 |
| RNR9N8 | | 2.018 | -0.117 | -0.98 | 2.783 | -0.194 | -0.93 |
| RRUZZE | | 2.164 | 0.030 | 0.25 | 3.098 | 0.120 | 0.57 |
| UCA4XN | | 1.996 | -0.139 | -1.16 | 2.956 | -0.021 | -0.10 |
| X6DHC6 | | 2.227 | 0.093 | 0.78 | 3.046 | 0.069 | 0.33 |
| ZZ2A7K | | 2.178 | 0.043 | 0.36 | 3.025 | 0.047 | 0.23 |

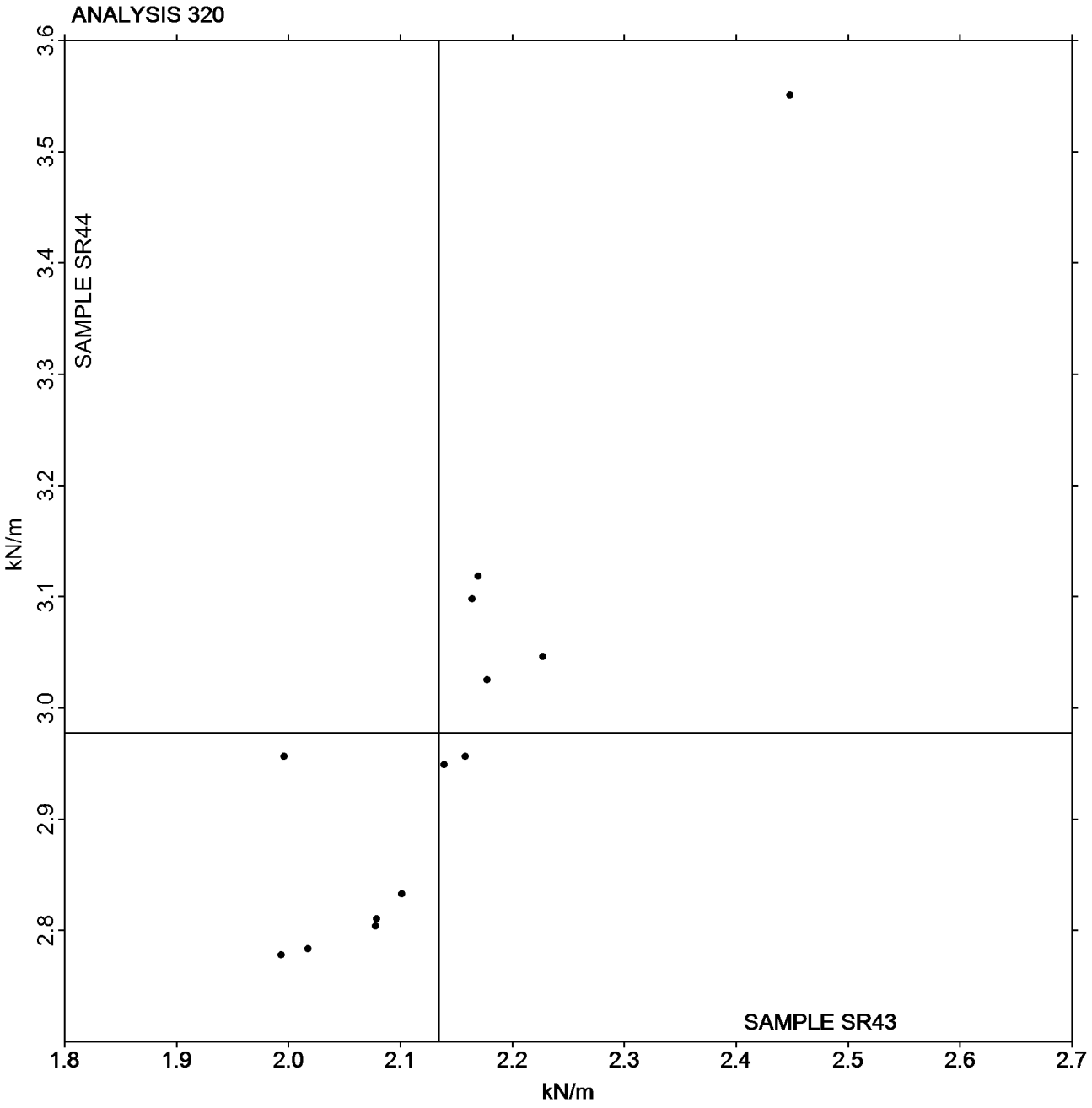
### Summary Statistics

| | Sample SR43 | Sample SR44 |
|---|---|---|
| Grand Means | 2.1345 kN/m | 2.9776 kN/m |
| SD Btwn Labs | 0.1196 kN/m | 0.2098 kN/m |

Statistics based on 13 of 13 reporting participants

Grand Mean Sample **SR43** = 2.1345 kN/m

Grand Mean Sample **SR44** = 2.9776 kN/m




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 321

## Tensile Energy Absorption - Newsprint

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SR43 Lab Mean | Sample SR43 Diff from Grand Mean | Sample SR43 CPV | Sample SR44 Lab Mean | Sample SR44 Diff from Grand Mean | Sample SR44 CPV |
|---|---|---|---|---|---|---|---|
| 48Z8Y6 | | 15.99 | 1.49 | 1.12 | 28.43 | 3.58 | 1.36 |
| 67L43R | | 16.46 | 1.96 | 1.47 | 28.57 | 3.72 | 1.41 |
| 8TFKNX | | 13.07 | -1.43 | -1.08 | 21.82 | -3.03 | -1.15 |
| AM3NU8 | | 16.04 | 1.54 | 1.16 | 27.62 | 2.77 | 1.05 |
| DX6DZY | | 13.25 | -1.25 | -0.94 | 21.83 | -3.02 | -1.15 |
| GEJTU6 | | 15.53 | 1.02 | 0.77 | 23.70 | -1.16 | -0.44 |
| HMRGAP | | 12.98 | -1.52 | -1.14 | 22.51 | -2.34 | -0.89 |
| RNR9N8 | | 13.83 | -0.67 | -0.51 | 23.45 | -1.40 | -0.53 |
| RRUZZE | | 13.19 | -1.31 | -0.98 | 23.17 | -1.68 | -0.64 |
| UCA4XN | | 13.96 | -0.54 | -0.41 | 27.57 | 2.71 | 1.03 |
| X6DHC6 | | 15.67 | 1.17 | 0.88 | 26.36 | 1.51 | 0.57 |
| ZZ2A7K | | 14.05 | -0.46 | -0.34 | 23.20 | -1.65 | -0.63 |

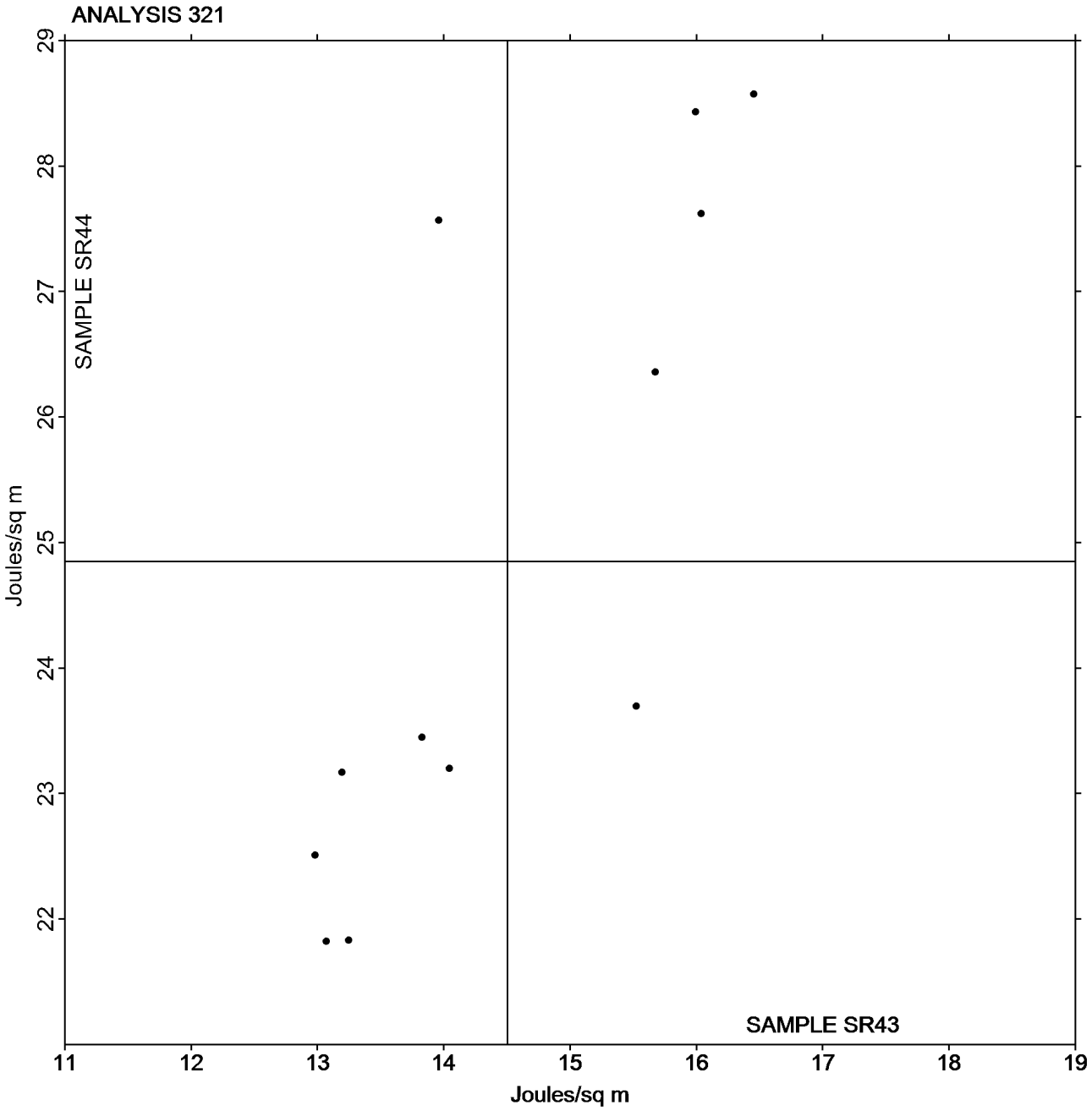
### Summary Statistics

| | Sample SR43 | Sample SR44 |
|---|---|---|
| Grand Means | 14.502 Joules/sq m | 24.851 Joules/sq m |
| SD Btwn Labs | 1.329 Joules/sq m | 2.639 Joules/sq m |

Statistics based on 12 of 12 reporting participants

Grand Mean Sample **SR43** = 14.502 Joules/sq m

Grand Mean Sample **SR44** = 24.851 Joules/sq m




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 322
## Elongation to Break - Newsprint
## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SR43 Lab Mean | Sample SR43 Diff from Grand Mean | Sample SR43 CPV | Sample SR44 Lab Mean | Sample SR44 Diff from Grand Mean | Sample SR44 CPV |
|---|---|---|---|---|---|---|---|
| 48Z8Y6 | | 1.463 | 0.292 | 2.04 | 1.969 | 0.560 | 2.60 |
| 67L43R | | 1.076 | -0.095 | -0.66 | 1.269 | -0.140 | -0.65 |
| 8TFKNX | | 1.033 | -0.138 | -0.96 | 1.218 | -0.191 | -0.88 |
| AM3NU8 | | 1.066 | -0.105 | -0.73 | 1.280 | -0.129 | -0.60 |
| DX6DZY | | 1.092 | -0.079 | -0.55 | 1.297 | -0.111 | -0.52 |
| GEJTU6 | | 1.209 | 0.038 | 0.27 | 1.362 | -0.047 | -0.22 |
| HMRGAP | | 1.035 | -0.136 | -0.95 | 1.221 | -0.188 | -0.87 |
| RNR9N8 | | 1.128 | -0.042 | -0.29 | 1.371 | -0.037 | -0.17 |
| UCA4XN | | 1.120 | -0.051 | -0.35 | 1.505 | 0.096 | 0.45 |
| X6DHC6 | | 1.297 | 0.126 | 0.88 | 1.530 | 0.121 | 0.56 |
| ZZ2A7K | | 1.358 | 0.187 | 1.31 | 1.473 | 0.064 | 0.30 |

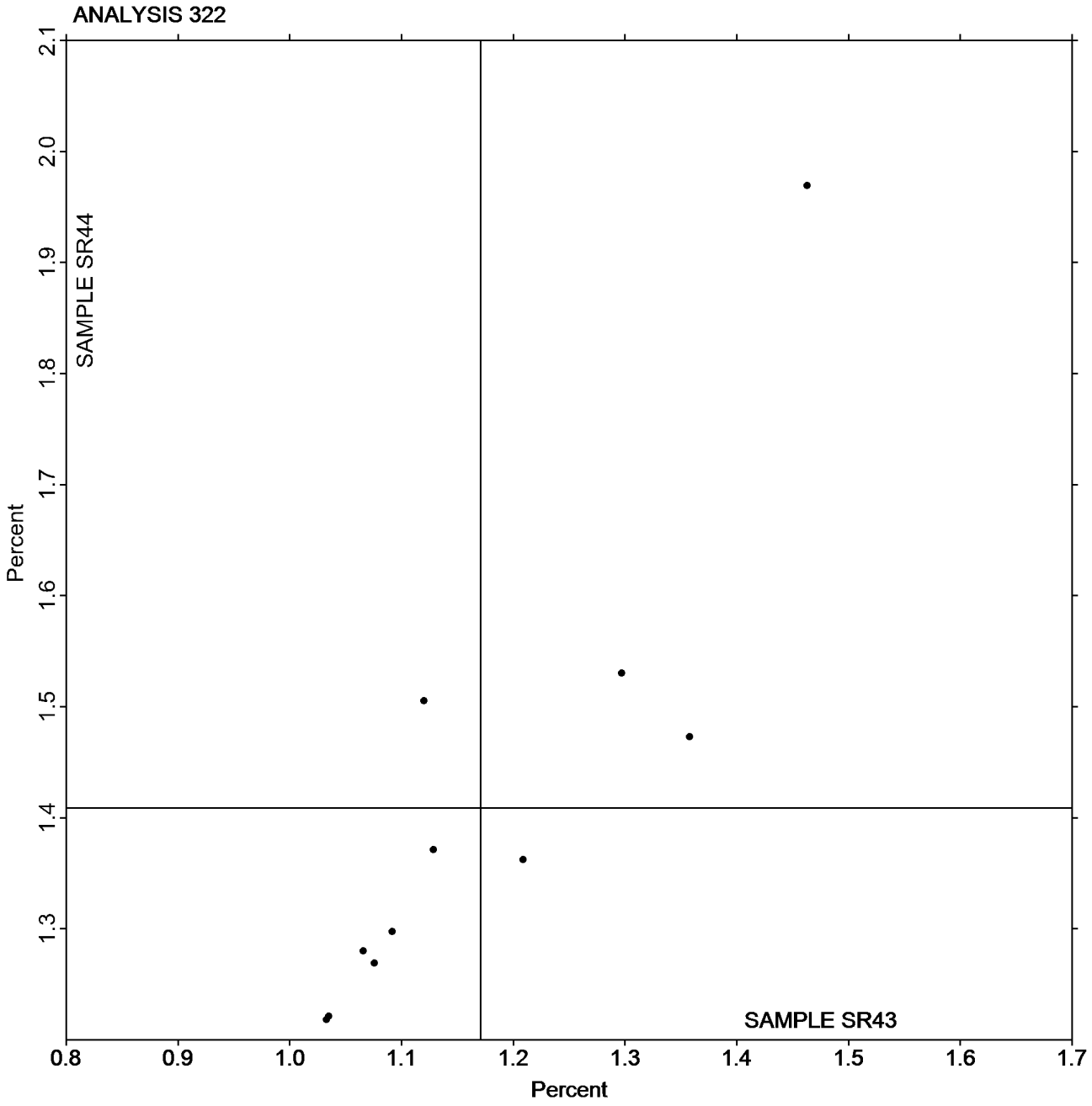
### Summary Statistics

| | Sample SR43 | Sample SR44 |
|---|---|---|
| Grand Means | 1.1707 Percent | 1.4087 Percent |
| SD Btwn Labs | 0.1435 Percent | 0.2158 Percent |

Statistics based on 11 of 11 reporting participants

Grand Mean Sample **SR43** = 1.1707 Percent

Grand Mean Sample **SR44** = 1.4087 Percent




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 325

## Tensile Breaking Strength - Printing Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SF43 Lab Mean | Sample SF43 Diff from Grand Mean | Sample SF43 CPV | Sample SF44 Lab Mean | Sample SF44 Diff from Grand Mean | Sample SF44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2C4BZ2 | | 6.772 | 0.031 | 0.07 | 4.458 | 0.167 | 0.51 | MR |
| 2NXLK2 | | 6.189 | -0.551 | -1.24 | 3.936 | -0.355 | -1.09 | RE |
| 36F4Q8 | | 6.777 | 0.037 | 0.08 | 4.182 | -0.109 | -0.33 | TO |
| 3F3VLC | | 6.851 | 0.110 | 0.25 | 4.329 | 0.038 | 0.12 | LH |
| 3TTM7F | | 6.533 | -0.207 | -0.46 | 4.178 | -0.113 | -0.35 | LH |
| 484Q6F | | 7.057 | 0.316 | 0.71 | 4.559 | 0.268 | 0.82 | TO |
| 4VCW2Y | | 6.625 | -0.115 | -0.26 | 4.156 | -0.135 | -0.42 | TO |
| 6ARJHB | | 6.886 | 0.145 | 0.33 | 4.285 | -0.006 | -0.02 | LH |
| 6V7872 | | 6.818 | 0.078 | 0.18 | 4.562 | 0.271 | 0.83 | LH |
| 73KCFD | | 6.683 | -0.057 | -0.13 | 4.268 | -0.023 | -0.07 | TB |
| 83DRYM | | 6.273 | -0.467 | -1.05 | 4.027 | -0.264 | -0.81 | LI |
| 84TQFR | | 6.615 | -0.126 | -0.28 | 4.320 | 0.029 | 0.09 | LH |
| 8TFKNX | | 6.851 | 0.111 | 0.25 | 4.121 | -0.170 | -0.52 | LH |
| AR7U4J | | 6.649 | -0.091 | -0.21 | 4.073 | -0.218 | -0.67 | TB |
| BCVA6R | | 7.275 | 0.534 | 1.20 | 4.706 | 0.415 | 1.27 | TB |
| BPMUUV | | 6.469 | -0.271 | -0.61 | 3.996 | -0.295 | -0.91 | LE |
| BRM88M | | 6.552 | -0.188 | -0.42 | 4.162 | -0.129 | -0.40 | LX |
| D99A3G | | 6.003 | -0.737 | -1.66 | 4.050 | -0.241 | -0.74 | TF |
| D9MR42 | | 7.111 | 0.371 | 0.83 | 4.465 | 0.174 | 0.53 | LX |
| DDGNTR | | 6.606 | -0.134 | -0.30 | 4.295 | 0.004 | 0.01 | IM |
| DGEGFV | * | 7.618 | 0.878 | 1.97 | 5.168 | 0.877 | 2.69 | PP |
| DNKY4N | | 6.801 | 0.060 | 0.14 | 4.226 | -0.065 | -0.20 | TB |
| EJJ6VK | | 7.106 | 0.366 | 0.82 | 4.766 | 0.475 | 1.46 | LI |
| EJZBZ3 | | 6.565 | -0.175 | -0.39 | 4.203 | -0.088 | -0.27 | TP |
| F88CNQ | | 6.827 | 0.087 | 0.19 | 4.372 | 0.081 | 0.25 | LF |
| FXHL3Y | | 5.890 | -0.850 | -1.91 | 3.565 | -0.726 | -2.23 | CB |
| FZJRG4 | | 7.284 | 0.544 | 1.22 | 4.331 | 0.040 | 0.12 | XX |
| HFC46Y | | 6.459 | -0.281 | -0.63 | 4.158 | -0.133 | -0.41 | TF |
| JJ3UPZ | | 7.585 | 0.845 | 1.90 | 5.081 | 0.790 | 2.43 | TJ |
| JKKJDM | | 7.523 | 0.783 | 1.76 | 4.518 | 0.227 | 0.70 | TJ |
| JVHQNC | | 6.600 | -0.140 | -0.31 | 4.545 | 0.254 | 0.78 | TF |
| JX7YGL | | 6.054 | -0.686 | -1.54 | 3.623 | -0.668 | -2.05 | ID |
| KC3URJ | X | 10.304 | 3.564 | 8.01 | 6.468 | 2.177 | 6.69 | LH |
| KPAH33 | | 5.951 | -0.789 | -1.77 | 3.833 | -0.458 | -1.41 | IM |
| LFXQ8C | | 7.187 | 0.447 | 1.00 | 4.580 | 0.289 | 0.89 | LI |
| NAMAWE | | 6.560 | -0.180 | -0.41 | 4.251 | -0.040 | -0.12 | IM |
| P8DLUU | * | 7.114 | 0.373 | 0.84 | 4.117 | -0.174 | -0.53 | VM |
| PBC8DK | | 6.798 | 0.057 | 0.13 | 4.440 | 0.149 | 0.46 | LH |
| QXJZ4M | | 6.861 | 0.121 | 0.27 | 4.242 | -0.049 | -0.15 | LI |
| RCENNK | | 7.180 | 0.440 | 0.99 | 4.643 | 0.352 | 1.08 | TN |

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 325

## Tensile Breaking Strength - Printing Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SF43 Lab Mean | Sample SF43 Diff from Grand Mean | Sample SF43 CPV | Sample SF44 Lab Mean | Sample SF44 Diff from Grand Mean | Sample SF44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| RWM23T | | 6.068 | -0.672 | -1.51 | 3.887 | -0.404 | -1.24 | XX |
| T3MNN2 | | 6.901 | 0.161 | 0.36 | 4.418 | 0.127 | 0.39 | LI |
| WULPBA | | 6.832 | 0.092 | 0.21 | 4.328 | 0.037 | 0.11 | TC |
| X3QWNN | | 6.077 | -0.663 | -1.49 | 3.934 | -0.357 | -1.10 | LA |
| X83PW2 | | 7.565 | 0.825 | 1.85 | 4.737 | 0.446 | 1.37 | LI |
| Z4W2EH | | 6.312 | -0.428 | -0.96 | 4.003 | -0.288 | -0.88 | DL |

### Summary Statistics

| | Sample SF43 | Sample SF44 |
|---|---|---|
| Grand Means | 6.7403 kN/m | 4.2910 kN/m |
| SD Btwn Labs | 0.4449 kN/m | 0.3256 kN/m |

Statistics based on 45 of 46 reporting participants

### Comments on Assigned Data Flags for Test #325

KC3URJ (X) - Extreme Data.

### Analysis Notes:

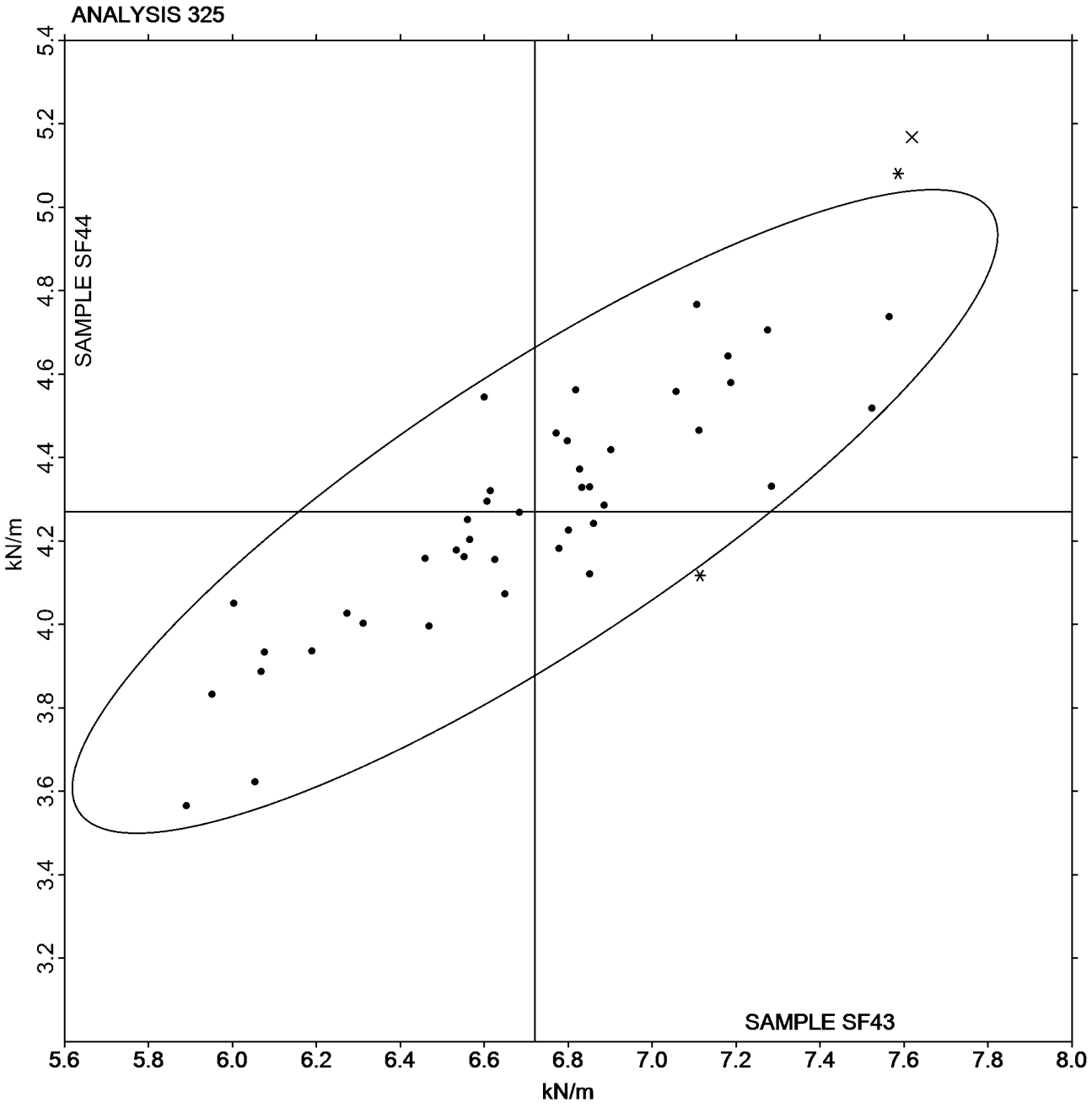
P8DLUU - Data appear to be reported as lb/inch, not kN/m as indicated on datasheet. Units corrected by CTS.

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| CB | Chatillon DFIS 50 (Digital Gauge)/TCD 200 | DL | EMIC DL500 Universal Testing Machines |
| ID | Instron 4201/4202 | IM | Instron 5500 Series |
| LA | L & W Tensile - Autoline 300 | LE | L & W Tensile Tester 066 |
| LF | L & W Tensile/Fracture Toughness Tester SE 064 | LH | L & W Alwetron TH1 (Horizontal) SE 060/065F |
| LI | L & W Tensile Tester SE 062 | LX | L & W (model not specified) |
| MR | MTS Alliance RT series | PP | Technidyne Profile/Plus |
| RE | Regmed | TB | Thwing-Albert EJA/1000 |
| TC | Thwing-Albert Electro-Hydraulic, Model 30LT | TF | Thwing-Albert EJA Vantage-1 |
| TJ | Thwing-Albert QC II-XS | TN | Testometric M100-1CT |
| TO | Thwing-Albert QC-1000 | TP | TMI Monitor/Tensile 100 (84-21-01) |
| VM | Valmet PaperLab (was Kajaani/Robotest) | XX | Instrument make/model not specified by lab |

Grand Mean Sample **SF43** = 6.7403 kN/m

Grand Mean Sample **SF44** = 4.2910 kN/m



| WebCode | Data Flag | Sample SF43 Lab Mean | Sample SF43 Diff from Grand Mean | Sample SF43 CPV | Sample SF44 Lab Mean | Sample SF44 Diff from Grand Mean | Sample SF44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2C4BZ2 | | 88.79 | -7.22 | -0.77 | 40.96 | -1.27 | -0.28 | MR |
| 2NXLK2 | | 93.79 | -2.22 | -0.24 | 38.64 | -3.59 | -0.79 | RE |
| 36F4Q8 | | 114.85 | 18.84 | 2.00 | 49.77 | 7.54 | 1.67 | TO |
| 3F3VLC | | 98.51 | 2.49 | 0.26 | 44.47 | 2.24 | 0.50 | LH |
| 3TTM7F | X | 31.00 | -65.02 | -6.90 | 21.16 | -21.07 | -4.66 | LH |
| 484Q6F | | 92.21 | -3.81 | -0.40 | 40.36 | -1.86 | -0.41 | TO |
| 4VCW2Y | | 96.61 | 0.60 | 0.06 | 40.72 | -1.51 | -0.33 | TO |
| 6ARJHB | | 98.62 | 2.61 | 0.28 | 42.56 | 0.33 | 0.07 | LH |
| 6V7872 | | 95.12 | -0.90 | -0.10 | 45.22 | 2.99 | 0.66 | LH |
| 73KCFD | | 95.94 | -0.07 | -0.01 | 39.56 | -2.67 | -0.59 | TB |
| 83DRYM | | 84.84 | -11.17 | -1.19 | 35.82 | -6.41 | -1.42 | LI |
| 84TQFR | | 92.75 | -3.26 | -0.35 | 45.03 | 2.81 | 0.62 | LH |
| 8TFKNX | | 95.49 | -0.52 | -0.06 | 38.05 | -4.18 | -0.92 | LH |
| BCVA6R | | 102.56 | 6.55 | 0.69 | 43.40 | 1.17 | 0.26 | TB |
| BRM88M | | 92.48 | -3.53 | -0.37 | 39.73 | -2.50 | -0.55 | LX |
| D99A3G | | 85.04 | -10.97 | -1.16 | 42.91 | 0.68 | 0.15 | TF |
| D9MR42 | | 96.74 | 0.72 | 0.08 | 42.76 | 0.54 | 0.12 | LX |
| DDGNTR | | 98.98 | 2.97 | 0.31 | 42.96 | 0.73 | 0.16 | IM |
| DGEGFV | | 92.95 | -3.07 | -0.33 | 40.48 | -1.74 | -0.39 | PP |
| DNKY4N | | 105.93 | 9.92 | 1.05 | 42.57 | 0.35 | 0.08 | TB |
| EJJ6VK | | 91.58 | -4.44 | -0.47 | 45.08 | 2.85 | 0.63 | LI |
| F88CNQ | | 76.06 | -19.95 | -2.12 | 35.57 | -6.66 | -1.47 | LW |
| FZJRG4 | | 112.28 | 16.26 | 1.73 | 50.89 | 8.66 | 1.91 | XX |
| JJ3UPZ | | 115.69 | 19.67 | 2.09 | 53.63 | 11.40 | 2.52 | TJ |
| JVHQNC | | 92.57 | -3.45 | -0.37 | 48.10 | 5.87 | 1.30 | TF |
| JX7YGL | | 101.98 | 5.96 | 0.63 | 38.20 | -4.03 | -0.89 | ID |
| KC3URJ | X | 161.61 | 65.59 | 6.96 | 75.74 | 33.51 | 7.41 | LH |
| KPAH33 | | 82.66 | -13.36 | -1.42 | 34.78 | -7.45 | -1.65 | IM |
| LFXQ8C | | 101.22 | 5.20 | 0.55 | 45.91 | 3.68 | 0.81 | LI |
| NAMAWE | X | 1,948.27 | 1,852.26 | 196.51 | 884.99 | 842.76 | 186.39 | IM |
| QXJZ4M | | 93.31 | -2.71 | -0.29 | 40.61 | -1.62 | -0.36 | LI |
| RCENNK | | 95.28 | -0.73 | -0.08 | 43.27 | 1.04 | 0.23 | LX |
| RWM23T | | 77.96 | -18.05 | -1.92 | 33.58 | -8.65 | -1.91 | XX |
| T3MNN2 | | 92.64 | -3.37 | -0.36 | 41.80 | -0.43 | -0.10 | LI |
| X3QWNN | X | 30.02 | -66.00 | -7.00 | 20.23 | -22.00 | -4.87 | LA |
| X83PW2 | | 113.06 | 17.04 | 1.81 | 46.25 | 4.02 | 0.89 | LI |
| Z4W2EH | | 100.00 | 3.99 | 0.42 | 39.91 | -2.32 | -0.51 | DL |

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 327

## Tensile Energy Absorption - Printing Papers

## TAPPI Official Test Method T494

**Summary Statistics**

| | Sample SF43 | Sample SF44 |
|---|---|---|
| Grand Means | 96.016 Joules/sq m | 42.228 Joules/sq m |
| SD Btwn Labs | 9.426 Joules/sq m | 4.522 Joules/sq m |

Statistics based on 33 of 37 reporting participants

### Comments on Assigned Data Flags for Test #327

NAMAWE (X) - Extreme Data.

KC3URJ (X) - Extreme Data.

3TTM7F (X) - Extreme Data.

X3QWNN (X) - Extreme Data.

### Analysis Notes:

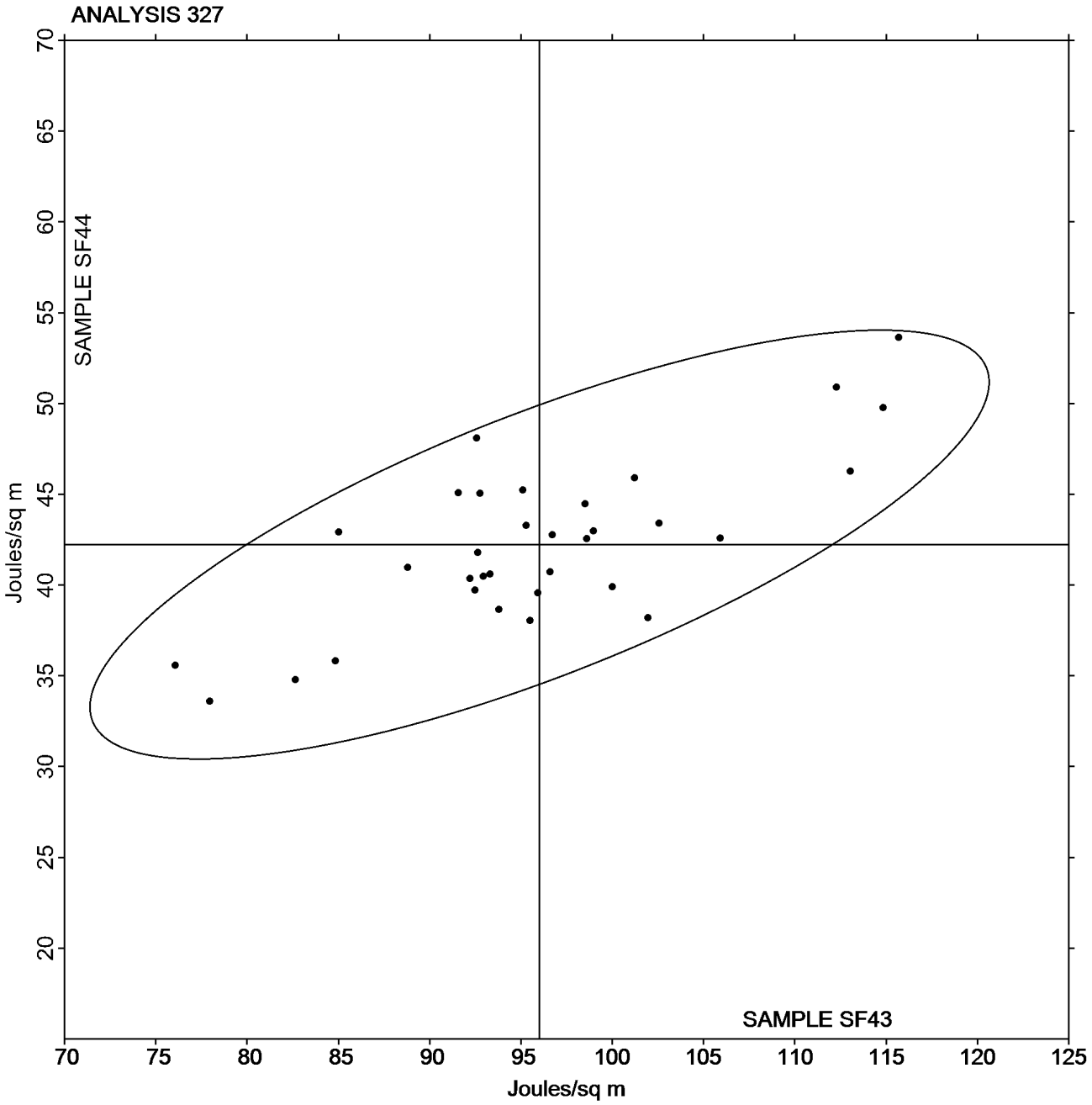
73KCFD - Data appear to be reported as kg-m/sq m, not J/sq m as indicated on datasheet. Units corrected by CTS.

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| DL | EMIC DL500 Universal Testing Machines | ID | Instron 4201 |
| IM | Instron 5500 Series | LA | L & W Tensile - Autoline 300 |
| LH | L & W Alwetron TH1 (Horizontal) SE 060 | LI | L & W Tensile Tester SE 062 |
| LW | L & W Tensile Tester SE 064 | LX | L & W (model not specified) |
| MR | MTS Alliance RT series | PP | Technidyne Profile/Plus |
| RE | Regmed | TB | Thwing-Albert EJA/1000 |
| TF | Thwing-Albert EJA Vantage-1 | TJ | Thwing-Albert QC II-XS |
| TO | Thwing-Albert QC-1000 | XX | Instrument make/model not specified by lab |

Grand Mean Sample **SF43** = 96.016 Joules/sq m

Grand Mean Sample **SF44** = 42.228 Joules/sq m



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 328

## Elongation to Break - Printing Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SF43 Lab Mean | Sample SF43 Diff from Grand Mean | Sample SF43 CPV | Sample SF44 Lab Mean | Sample SF44 Diff from Grand Mean | Sample SF44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2C4BZ2 | | 2.034 | -0.183 | -0.85 | 1.461 | -0.070 | -0.45 | MR |
| 2NXLK2 | | 2.389 | 0.172 | 0.80 | 1.611 | 0.079 | 0.51 | RE |
| 36F4Q8 | X | 2.990 | 0.773 | 3.58 | 2.141 | 0.609 | 3.93 | TO |
| 3F3VLC | | 2.216 | -0.001 | 0.00 | 1.570 | 0.038 | 0.25 | LH |
| 3TTM7F | X | 6.259 | 4.042 | 18.73 | 2.695 | 1.163 | 7.50 | LH |
| 484Q6F | | 1.987 | -0.230 | -1.07 | 1.355 | -0.177 | -1.14 | TG |
| 4VCW2Y | | 2.224 | 0.007 | 0.03 | 1.513 | -0.019 | -0.12 | TO |
| 6ARJHB | | 2.182 | -0.035 | -0.16 | 1.519 | -0.013 | -0.08 | LH |
| 6V7872 | | 2.118 | -0.099 | -0.46 | 1.526 | -0.006 | -0.04 | LH |
| 73KCFD | | 2.213 | -0.004 | -0.02 | 1.458 | -0.074 | -0.48 | TB |
| 83DRYM | | 2.051 | -0.166 | -0.77 | 1.366 | -0.166 | -1.07 | LI |
| 84TQFR | | 2.102 | -0.115 | -0.53 | 1.576 | 0.044 | 0.29 | LH |
| 8TFKNX | | 2.119 | -0.098 | -0.45 | 1.418 | -0.114 | -0.73 | LH |
| AR7U4J | | 2.340 | 0.123 | 0.57 | 1.420 | -0.112 | -0.72 | TF |
| BCVA6R | | 2.168 | -0.049 | -0.23 | 1.453 | -0.079 | -0.51 | TB |
| BRM88M | | 2.142 | -0.075 | -0.35 | 1.450 | -0.082 | -0.53 | LX |
| D99A3G | | 2.201 | -0.016 | -0.08 | 1.636 | 0.104 | 0.67 | TF |
| D9MR42 | | 2.086 | -0.131 | -0.61 | 1.484 | -0.048 | -0.31 | LX |
| DDGNTR | | 2.304 | 0.086 | 0.40 | 1.568 | 0.037 | 0.24 | IM |
| DGEGFV | * | 1.702 | -0.515 | -2.39 | 1.071 | -0.461 | -2.97 | PP |
| DNKY4N | | 2.455 | 0.238 | 1.10 | 1.604 | 0.072 | 0.46 | TB |
| EJJ6VK | | 1.812 | -0.405 | -1.88 | 1.382 | -0.150 | -0.97 | LI |
| F88CNQ | | 1.754 | -0.463 | -2.15 | 1.314 | -0.218 | -1.40 | LX |
| FZJRG4 | | 2.350 | 0.133 | 0.62 | 1.733 | 0.201 | 1.30 | XX |
| HFC46Y | | 2.420 | 0.203 | 0.94 | 1.640 | 0.108 | 0.70 | TF |
| JJ3UPZ | | 2.454 | 0.237 | 1.10 | 1.714 | 0.182 | 1.17 | TJ |
| JVHQNC | | 2.343 | 0.126 | 0.58 | 1.799 | 0.267 | 1.72 | TF |
| JX7YGL | | 2.552 | 0.335 | 1.55 | 1.624 | 0.092 | 0.59 | ID |
| KC3URJ | * | 2.638 | 0.421 | 1.95 | 1.980 | 0.448 | 2.89 | LH |
| KPAH33 | | 2.350 | 0.133 | 0.62 | 1.575 | 0.043 | 0.28 | XX |
| LFXQ8C | | 2.149 | -0.068 | -0.32 | 1.543 | 0.011 | 0.07 | LI |
| NAMAWE | | 2.247 | 0.030 | 0.14 | 1.582 | 0.050 | 0.32 | IM |
| P8DLUU | | 2.000 | -0.217 | -1.01 | 1.540 | 0.008 | 0.05 | VM |
| QXJZ4M | | 2.138 | -0.079 | -0.37 | 1.509 | -0.023 | -0.15 | LI |
| RCENNK | * | 2.392 | 0.175 | 0.81 | 1.349 | -0.183 | -1.18 | LX |
| RWM23T | | 2.476 | 0.259 | 1.20 | 1.700 | 0.168 | 1.08 | XX |
| T3MNN2 | | 2.060 | -0.157 | -0.73 | 1.468 | -0.064 | -0.41 | LI |
| X3QWNN | X | 4.753 | 2.536 | 11.75 | 1.953 | 0.421 | 2.72 | LA |
| X83PW2 | | 2.290 | 0.073 | 0.34 | 1.534 | 0.002 | 0.01 | LI |
| Z4W2EH | | 2.573 | 0.356 | 1.65 | 1.630 | 0.098 | 0.63 | DL |

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 328

## Elongation to Break - Printing Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SF43 Lab Mean | Sample SF43 Diff from Grand Mean | Sample SF43 CPV | Sample SF44 Lab Mean | Sample SF44 Diff from Grand Mean | Sample SF44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|

### Summary Statistics

| | Sample SF43 | Sample SF44 |
|---|---|---|
| Grand Means | 2.2170 Percent | 1.5318 Percent |
| SD Btwn Labs | 0.2159 Percent | 0.1551 Percent |

Statistics based on 37 of 40 reporting participants

### Comments on Assigned Data Flags for Test #328

3TTM7F (X) - Extreme Data.

X3QWNN (X) - Extreme Data.

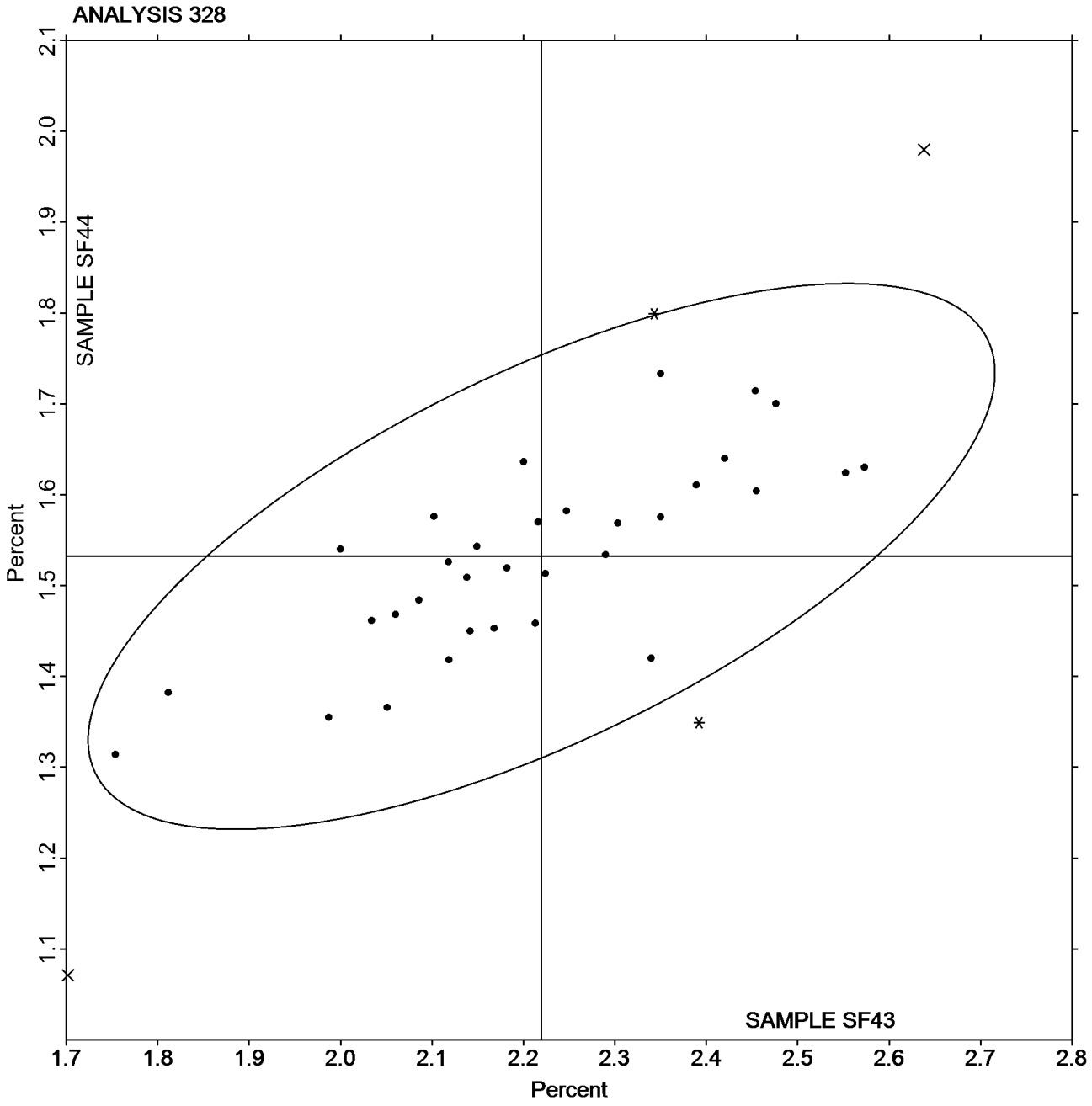
36F4Q8 (X) - Data for both samples are high.

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| DL | EMIC DL500 Universal Testing Machines | ID | Instron 4201 |
| IM | Instron 5500 | LA | L & W Tensile - Autoline 300 |
| LH | L & W Alwetron TH1 (Horizontal) SE 060 | LI | L & W Tensile Tester SE 062 |
| LX | L & W (model not specified) | MR | MTS Alliance RT series |
| PP | Technidyne Profile/Plus | RE | Regmed |
| TB | Thwing-Albert EJA/1000 | TF | Thwing-Albert EJA Vantage-1 |
| TG | Thwing-Albert QC | TJ | Thwing-Albert QC II-XS |
| TO | Thwing-Albert QC-1000 | VM | Valmet PaperLab (was Kajaani/Robotest) |
| XX | Instrument make/model not specified by lab | | |

Grand Mean Sample **SF43** = 2.2170 Percent

Grand Mean Sample **SF44** = 1.5318 Percent



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 330

## Tensile Breaking Strength - Packaging Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SE43 Lab Mean | Sample SE43 Diff from Grand Mean | Sample SE43 CPV | Sample SE44 Lab Mean | Sample SE44 Diff from Grand Mean | Sample SE44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2ZUNMA | | 9.087 | -0.038 | -0.06 | 12.39 | -0.36 | -0.42 | XX |
| 3U4RHJ | | 8.165 | -0.961 | -1.50 | 11.74 | -1.01 | -1.18 | LA |
| 69BAMN | | 9.397 | 0.272 | 0.43 | 13.53 | 0.77 | 0.90 | TH |
| 6RAKCD | | 8.575 | -0.550 | -0.86 | 12.10 | -0.65 | -0.76 | LE |
| 6XVDQX | | 10.338 | 1.213 | 1.90 | 14.66 | 1.91 | 2.23 | LA |
| 73KCFD | | 8.927 | -0.198 | -0.31 | 12.58 | -0.17 | -0.19 | TB |
| 78CN73 | | 10.045 | 0.920 | 1.44 | 13.97 | 1.22 | 1.42 | TH |
| 824KVU | | 8.522 | -0.604 | -0.94 | 11.76 | -0.99 | -1.16 | IF |
| 84TQFR | | 8.785 | -0.340 | -0.53 | 12.51 | -0.24 | -0.28 | LH |
| 8PPPGV | | 8.878 | -0.247 | -0.39 | 12.41 | -0.34 | -0.39 | ID |
| 9BP97M | | 9.580 | 0.454 | 0.71 | 12.55 | -0.20 | -0.23 | TB |
| ACGGX4 | | 8.899 | -0.226 | -0.35 | 12.47 | -0.28 | -0.32 | IK |
| AP89KT | | 8.601 | -0.524 | -0.82 | 12.89 | 0.14 | 0.16 | XX |
| AZKH3R | | 9.440 | 0.314 | 0.49 | 13.46 | 0.71 | 0.82 | LI |
| B8DAMQ | X | 16.698 | 7.572 | 11.85 | 21.74 | 8.99 | 10.49 | LA |
| CU9BEJ | * | 10.794 | 1.668 | 2.61 | 13.97 | 1.22 | 1.42 | IK |
| CVK4B8 | | 8.994 | -0.131 | -0.21 | 11.58 | -1.17 | -1.37 | TB |
| D66UDP | | 8.625 | -0.500 | -0.78 | 12.38 | -0.37 | -0.43 | IM |
| HC9CRR | | 8.515 | -0.611 | -0.96 | 11.82 | -0.93 | -1.09 | IN |
| HTZXMJ | | 9.053 | -0.072 | -0.11 | 12.36 | -0.39 | -0.46 | TR |
| JNZDUK | | 8.900 | -0.225 | -0.35 | 13.02 | 0.27 | 0.31 | IM |
| JVHQNC | | 9.198 | 0.072 | 0.11 | 12.64 | -0.12 | -0.13 | TO |
| LFJG3H | | 9.400 | 0.275 | 0.43 | 13.29 | 0.54 | 0.63 | LH |
| LQJW4G | | 9.335 | 0.210 | 0.33 | 12.71 | -0.04 | -0.05 | TH |
| MQBA4E | | 9.404 | 0.279 | 0.44 | 13.26 | 0.51 | 0.59 | TO |
| NTFDDF | | 9.891 | 0.765 | 1.20 | 13.47 | 0.72 | 0.84 | TK |
| NTVLFP | | 9.459 | 0.334 | 0.52 | 13.29 | 0.54 | 0.63 | TA |
| P8T84W | | 8.088 | -1.038 | -1.62 | 11.49 | -1.26 | -1.47 | LW |
| QQHTF8 | X | 5.773 | -3.353 | -5.24 | 8.40 | -4.35 | -5.07 | TP |
| T4ZKT7 | | 8.844 | -0.282 | -0.44 | 12.28 | -0.47 | -0.54 | ID |
| U33HR9 | | 8.899 | -0.226 | -0.35 | 12.48 | -0.27 | -0.32 | LW |
| UMWZ2A | | 7.933 | -1.192 | -1.86 | 11.86 | -0.89 | -1.04 | XX |
| V8UXT2 | | 9.703 | 0.578 | 0.90 | 13.53 | 0.78 | 0.91 | TX |
| VZCH8H | | 9.118 | -0.007 | -0.01 | 12.67 | -0.08 | -0.09 | LE |
| X8J7RV | | 8.943 | -0.182 | -0.28 | 12.22 | -0.53 | -0.62 | XX |
| XD8TKE | * | 10.695 | 1.570 | 2.46 | 15.28 | 2.53 | 2.95 | LA |
| XLN6Z2 | | 9.303 | 0.177 | 0.28 | 12.01 | -0.74 | -0.86 | TO |
| YDQU6W | | 9.800 | 0.674 | 1.06 | 14.11 | 1.36 | 1.59 | TR |
| YKTY2M | | 9.072 | -0.054 | -0.08 | 13.06 | 0.31 | 0.37 | IF |
| YRRJ63 | | 8.291 | -0.835 | -1.31 | 11.83 | -0.92 | -1.07 | LE |

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 330

## Tensile Breaking Strength - Packaging Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SE43 Lab Mean | Sample SE43 Diff from Grand Mean | Sample SE43 CPV | Sample SE44 Lab Mean | Sample SE44 Diff from Grand Mean | Sample SE44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| YXTXNJ | | 8.857 | -0.269 | -0.42 | 12.24 | -0.51 | -0.60 | LH |
| ZAMFWW | | 8.499 | -0.626 | -0.98 | 11.71 | -1.04 | -1.21 | TT |
| ZD4XXE | X | 9.118 | -0.008 | -0.01 | 11.07 | -1.68 | -1.96 | IF |
| ZR9YXB | | 9.289 | 0.164 | 0.26 | 13.19 | 0.44 | 0.51 | TO |

### Summary Statistics

| | Sample SE43 | Sample SE44 |
|---|---|---|
| Grand Means | 9.1254 kN/m | 12.750 kN/m |
| SD Btwn Labs | 0.6393 kN/m | 0.858 kN/m |

Statistics based on 41 of 44 reporting participants

### Comments on Assigned Data Flags for Test #330

ZD4XXE (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SE43.

B8DAMQ (X) - Extreme Data.

QQHTF8 (X) - Data for both samples are low.

### Analysis Notes:

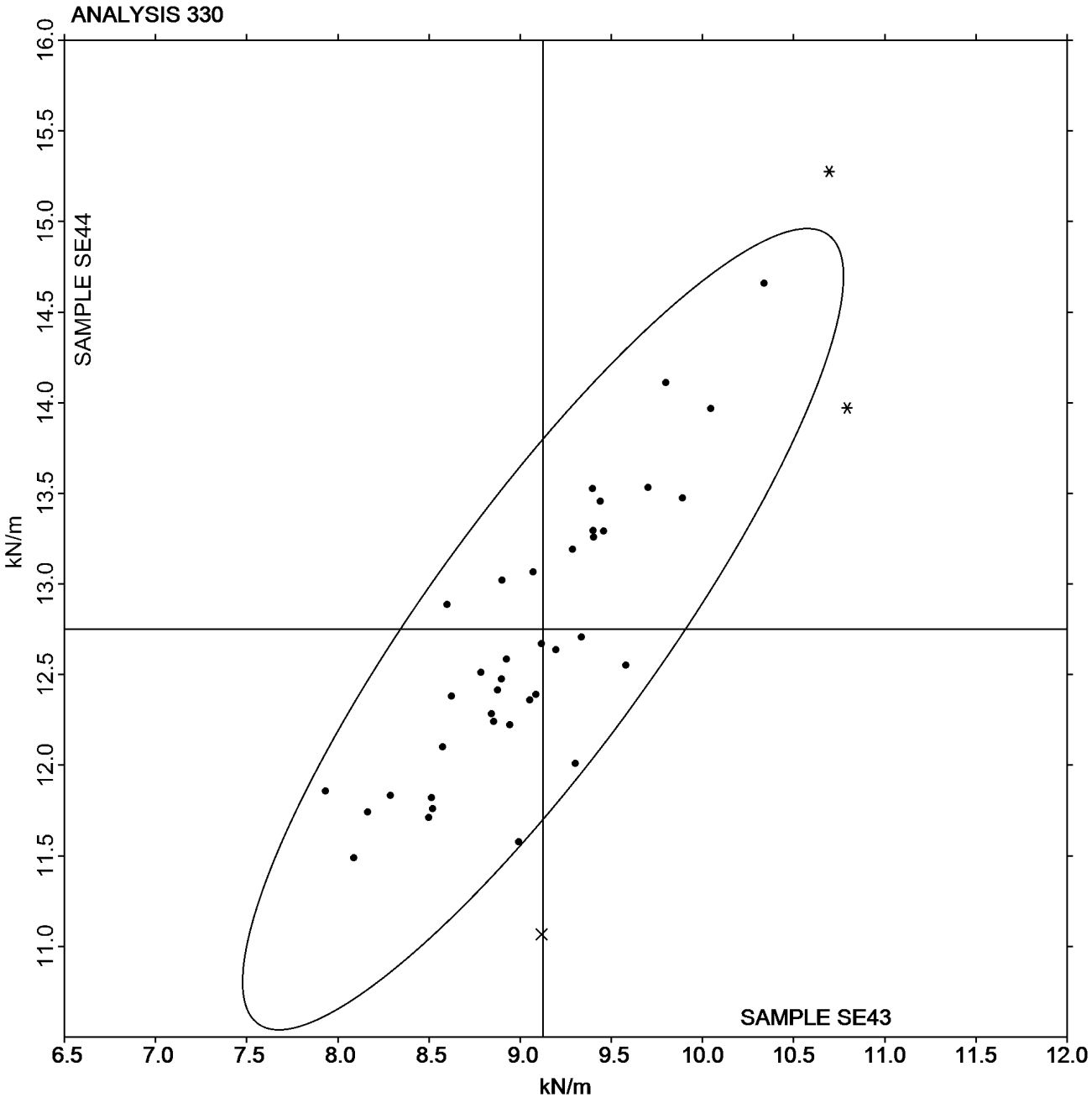
CVK4B8 - Data appear to be reported as kN/m, not kg/15mm as indicated on datasheet. Units corrected by CTS.

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| ID | Instron 4201 | IF | Instron 3340 Series |
| IK | Instron 4400 Series | IM | Instron 5500 Series |
| IN | Instron 3360 Series | LA | L & W Autoline |
| LE | L & W Tensile Tester 066 | LH | L & W Alwetron TH1 (Horizontal) SE 060 |
| LI | LLoyds Instruments | LW | L & W Tensile Tester SE062 |
| TA | Thwing-Albert Tensile Tester | TB | Thwing-Albert EJA/1000 |
| TH | Thwing-Albert QC-3A | TK | Thwing-Albert Model 37-4 |
| TO | Thwing-Albert QC-1000 | TP | TMI Monitor/Tensile 100 (84-21-01) |
| TR | TMI Horizontal Tensile Tester | TT | Tinius Olsen Model MHT |
| TX | Thwing-Albert (model not specified) | XX | Instrument make/model not specified by lab |

Grand Mean Sample **SE43** = 9.1254 kN/m

Grand Mean Sample **SE44** = 12.750 kN/m



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 331

## Tensile Energy Absorption - Packaging Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SE43 Lab Mean | Sample SE43 Diff from Grand Mean | Sample SE43 CPV | Sample SE44 Lab Mean | Sample SE44 Diff from Grand Mean | Sample SE44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2ZUNMA | | 106.7 | 2.8 | 0.27 | 160.5 | -1.9 | -0.11 | XX |
| 3U4RHJ | | 107.4 | 3.5 | 0.34 | 164.0 | 1.6 | 0.09 | LA |
| 6RAKCD | | 91.5 | -12.4 | -1.20 | 135.9 | -26.6 | -1.54 | LE |
| 6XVDQX | | 93.4 | -10.5 | -1.01 | 155.5 | -7.0 | -0.41 | LA |
| 73KCFD | | 96.6 | -7.3 | -0.70 | 150.8 | -11.7 | -0.68 | XX |
| 78CN73 | | 111.8 | 7.9 | 0.76 | 179.5 | 17.0 | 0.99 | TH |
| 84TQFR | | 93.4 | -10.5 | -1.01 | 153.2 | -9.3 | -0.54 | LH |
| 9BP97M | | 110.1 | 6.3 | 0.60 | 164.8 | 2.4 | 0.14 | TB |
| ACGGX4 | | 124.7 | 20.8 | 2.00 | 203.4 | 41.0 | 2.38 | IK |
| AP89KT | | 93.5 | -10.4 | -1.00 | 153.6 | -8.9 | -0.51 | XX |
| B8DAMQ | | 105.2 | 1.3 | 0.13 | 170.1 | 7.6 | 0.44 | LA |
| CU9BEJ | | 111.2 | 7.3 | 0.71 | 178.2 | 15.7 | 0.91 | XX |
| D66UDP | | 99.5 | -4.4 | -0.42 | 155.6 | -6.9 | -0.40 | IM |
| HC9CRR | | 101.4 | -2.5 | -0.24 | 149.0 | -13.4 | -0.78 | IN |
| HTZXMJ | | 93.0 | -10.9 | -1.05 | 140.4 | -22.1 | -1.28 | TR |
| JNZDUK | | 95.6 | -8.2 | -0.79 | 162.0 | -0.4 | -0.02 | IM |
| JVHQNC | | 107.7 | 3.8 | 0.37 | 161.8 | -0.6 | -0.04 | TO |
| LFJG3H | | 101.5 | -2.4 | -0.23 | 157.4 | -5.1 | -0.29 | LH |
| LQJW4G | | 112.9 | 9.0 | 0.87 | 168.9 | 6.4 | 0.37 | TH |
| MQBA4E | | 111.8 | 7.9 | 0.76 | 181.1 | 18.6 | 1.08 | TO |
| NTFDDF | | 115.4 | 11.5 | 1.11 | 177.0 | 14.6 | 0.85 | TK |
| NTVLFP | | 102.1 | -1.8 | -0.17 | 164.9 | 2.5 | 0.14 | TA |
| P8T84W | | 86.8 | -17.1 | -1.64 | 135.0 | -27.4 | -1.59 | LW |
| QQHTF8 | * | 106.7 | 2.8 | 0.27 | 201.3 | 38.8 | 2.26 | TP |
| T4ZKT7 | * | 132.8 | 28.9 | 2.79 | 185.3 | 22.9 | 1.33 | ID |
| U33HR9 | | 92.0 | -11.9 | -1.15 | 141.5 | -21.0 | -1.22 | LW |
| UMWZ2A | | 91.5 | -12.4 | -1.19 | 165.1 | 2.7 | 0.15 | XX |
| V8UXT2 | | 115.8 | 12.0 | 1.15 | 188.3 | 25.8 | 1.50 | XX |
| VZCH8H | | 103.5 | -0.4 | -0.04 | 152.9 | -9.6 | -0.56 | LE |
| X8J7RV | | 92.5 | -11.4 | -1.10 | 150.9 | -11.5 | -0.67 | XX |
| XD8TKE | | 107.1 | 3.2 | 0.31 | 178.2 | 15.7 | 0.91 | LA |
| XLN6Z2 | * | 113.8 | 10.0 | 0.96 | 147.4 | -15.1 | -0.88 | TO |
| YDQU6W | | 116.8 | 12.9 | 1.24 | 174.7 | 12.2 | 0.71 | TR |
| YKTY2M | | 108.4 | 4.5 | 0.43 | 173.9 | 11.5 | 0.67 | IF |
| YRRJ63 | | 89.5 | -14.4 | -1.38 | 138.0 | -24.5 | -1.42 | LE |
| YXTXNJ | | 94.1 | -9.8 | -0.94 | 137.1 | -25.4 | -1.47 | LH |
| ZAMFWW | | 108.3 | 4.4 | 0.43 | 150.6 | -11.9 | -0.69 | TT |
| ZD4XXE | X | 74.8 | -29.1 | -2.81 | 82.7 | -79.8 | -4.63 | IN |
| ZR9YXB | | 101.6 | -2.3 | -0.22 | 165.7 | 3.2 | 0.19 | TO |

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 331

## Tensile Energy Absorption - Packaging Papers

## TAPPI Official Test Method T494

**Summary Statistics**

| | Sample SE43 | Sample SE44 |
|---|---|---|
| Grand Means | 103.87 Joules/sq m | 162.46 Joules/sq m |
| SD Btwn Labs | 10.37 Joules/sq m | 17.21 Joules/sq m |

Statistics based on 38 of 39 reporting participants

### Comments on Assigned Data Flags for Test #331

ZD4XXE (X) - Data for both samples are low.

### Analysis Notes:

2ZUNMA - Data appear to be reported as ft-lb/sq ft, not J/sq as indicated on datasheet. Units corrected by CTS.

73KCFD - Data appear to be reported as kg-m/sq m, not J/sq m as indicated on datasheet. Units corrected by CTS.

QQHTF8 - Data appear to be reported as J/sq m, not ft-lb/sq ft inch as indicated on datasheet. Units corrected by CTS.

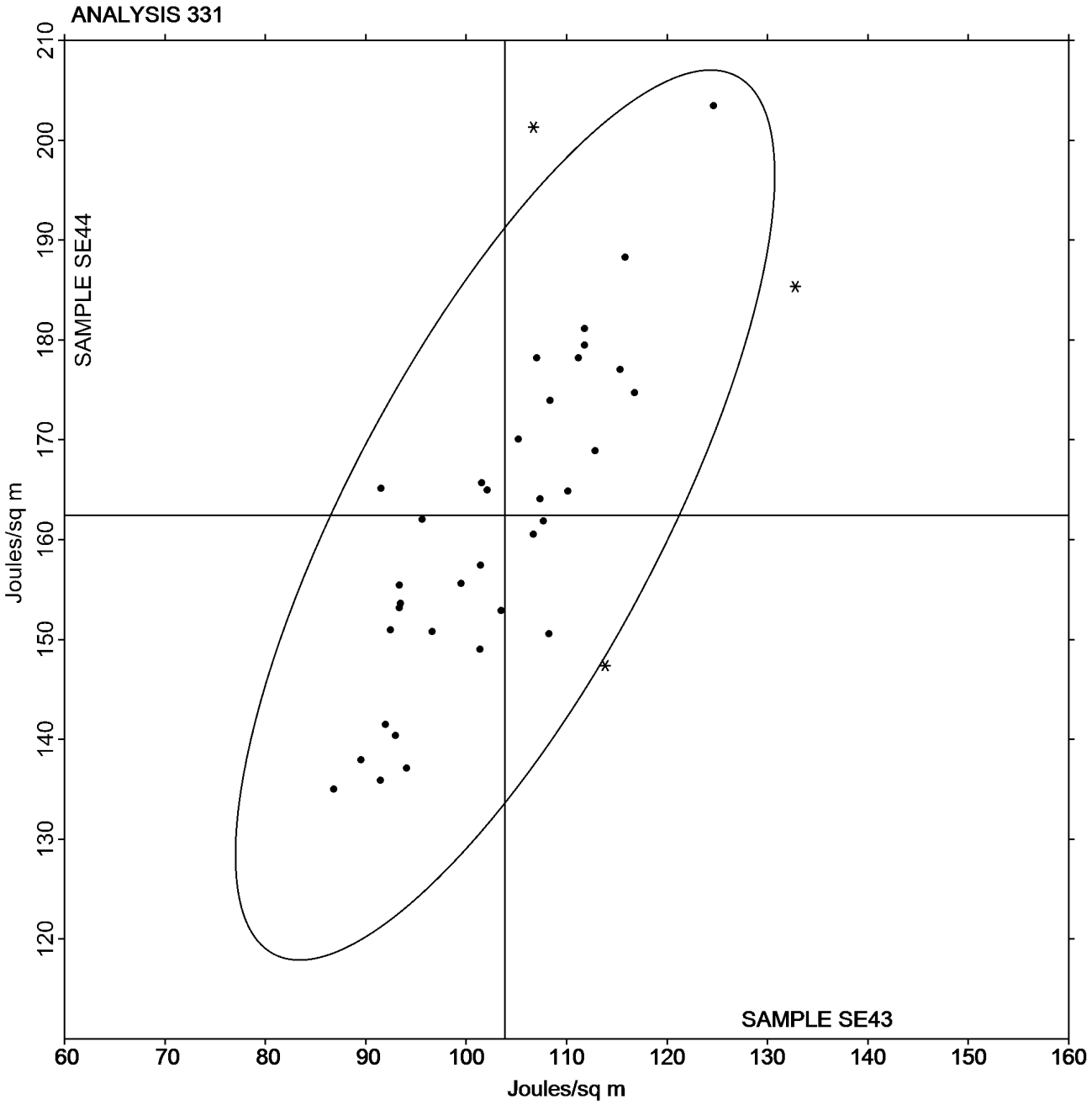
X8J7RV - Data appear to be reported as J/sq m, not ft-lb/sq ft inch as indicated on datasheet. Units corrected by CTS.

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| ID | Instron 4201 | IF | Instron 3340 Series |
| IK | Instron 4400 Series | IM | Instron 5500 Series |
| IN | Instron 3360 Series | LA | L & W Autoline |
| LE | L & W Tensile Tester 066 | LH | L & W Alwetron TH1 (Horizontal) SE 060 |
| LW | L & W Tensile Tester SE062 | TA | Thwing-Albert Tensile Tester |
| TB | Thwing-Albert EJA/1000 | TH | Thwing-Albert QC-3A |
| TK | Thwing-Albert Model 37-4 | TO | Thwing-Albert QC-1000 |
| TP | TMI Monitor/Tensile 100 (84-21-01) | TR | TMI Horizontal Tensile Tester |
| TT | Tinius Olsen Model MHT | XX | Instrument make/model not specified by lab |

Grand Mean Sample **SE43** = 103.87 Joules/sq m

Grand Mean Sample **SE44** = 162.46 Joules/sq m



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 332

## Elongation to Break - Packaging Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SE43 Lab Mean | Sample SE43 Diff from Grand Mean | Sample SE43 CPV | Sample SE44 Lab Mean | Sample SE44 Diff from Grand Mean | Sample SE44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2ZUNMA | | 1.890 | 0.136 | 0.64 | 2.133 | 0.150 | 0.55 | XX |
| 3U4RHJ | | 1.658 | -0.096 | -0.45 | 1.826 | -0.157 | -0.58 | LA |
| 6RAKCD | | 1.605 | -0.149 | -0.70 | 1.745 | -0.238 | -0.87 | LE |
| 6XVDQX | | 1.600 | -0.154 | -0.72 | 1.905 | -0.078 | -0.29 | XX |
| 73KCFD | | 1.663 | -0.091 | -0.43 | 1.887 | -0.096 | -0.35 | TB |
| 78CN73 | | 1.917 | 0.163 | 0.76 | 2.109 | 0.126 | 0.46 | TH |
| 84TQFR | | 1.675 | -0.079 | -0.37 | 1.863 | -0.120 | -0.44 | LH |
| 8PPPGV | | 1.709 | -0.045 | -0.21 | 1.968 | -0.015 | -0.06 | ID |
| 9BP97M | | 1.784 | 0.030 | 0.14 | 2.085 | 0.102 | 0.37 | TB |
| ACGGX4 | | 2.245 | 0.491 | 2.30 | 2.656 | 0.672 | 2.47 | IK |
| AP89KT | | 1.650 | -0.104 | -0.49 | 1.870 | -0.113 | -0.42 | XX |
| B8DAMQ | | 1.223 | -0.531 | -2.48 | 1.344 | -0.639 | -2.34 | XX |
| CU9BEJ | | 1.439 | -0.315 | -1.47 | 1.630 | -0.353 | -1.30 | XX |
| CVK4B8 | | 1.746 | -0.008 | -0.04 | 2.012 | 0.029 | 0.11 | TA |
| D66UDP | | 2.010 | 0.256 | 1.20 | 2.251 | 0.268 | 0.98 | IM |
| HC9CRR | | 1.970 | 0.216 | 1.01 | 2.110 | 0.127 | 0.47 | IN |
| HTZXMJ | | 1.626 | -0.128 | -0.60 | 1.842 | -0.141 | -0.52 | TR |
| JNZDUK | | 1.659 | -0.095 | -0.44 | 1.956 | -0.027 | -0.10 | IM |
| JVHQNC | | 1.877 | 0.123 | 0.57 | 2.106 | 0.123 | 0.45 | TO |
| LFJG3H | | 1.655 | -0.099 | -0.46 | 1.857 | -0.126 | -0.46 | LH |
| LQJW4G | | 2.111 | 0.357 | 1.67 | 2.346 | 0.363 | 1.33 | TH |
| MQBA4E | | 1.960 | 0.206 | 0.96 | 2.320 | 0.337 | 1.24 | TO |
| NTFDDF | | 1.844 | 0.090 | 0.42 | 2.123 | 0.140 | 0.51 | TK |
| NTVLFP | | 1.697 | -0.057 | -0.27 | 1.896 | -0.087 | -0.32 | TA |
| P8T84W | | 1.610 | -0.144 | -0.67 | 1.817 | -0.166 | -0.61 | LW |
| QQHTF8 | X | 2.199 | 0.445 | 2.08 | 2.793 | 0.810 | 2.97 | TP |
| T4ZKT7 | X | 2.965 | 1.211 | 5.66 | 3.000 | 1.017 | 3.73 | ID |
| U33HR9 | | 1.601 | -0.153 | -0.72 | 1.789 | -0.194 | -0.71 | LW |
| UMWZ2A | | 1.837 | 0.083 | 0.39 | 2.258 | 0.275 | 1.01 | XX |
| V8UXT2 | | 1.966 | 0.212 | 0.99 | 2.322 | 0.339 | 1.24 | XX |
| VZCH8H | | 1.735 | -0.019 | -0.09 | 1.912 | -0.071 | -0.26 | LE |
| X8J7RV | | 1.991 | 0.237 | 1.11 | 2.416 | 0.433 | 1.59 | XX |
| XD8TKE | | 1.540 | -0.214 | -1.00 | 1.768 | -0.215 | -0.79 | LA |
| XLN6Z2 | * | 1.918 | 0.164 | 0.77 | 1.985 | 0.002 | 0.01 | TO |
| YDQU6W | | 1.857 | 0.103 | 0.48 | 2.034 | 0.050 | 0.18 | TR |
| YKTY2M | | 2.110 | 0.356 | 1.66 | 2.330 | 0.347 | 1.27 | IF |
| YRRJ63 | | 1.631 | -0.123 | -0.58 | 1.824 | -0.159 | -0.58 | LE |
| YXTXNJ | | 1.638 | -0.116 | -0.54 | 1.765 | -0.218 | -0.80 | LH |
| ZAMFWW | X | 2.301 | 0.547 | 2.56 | 2.412 | 0.429 | 1.57 | TT |
| ZD4XXE | * | 1.302 | -0.452 | -2.11 | 1.285 | -0.698 | -2.56 | IN |

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 332

## Elongation to Break - Packaging Papers

## TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SE43 Lab Mean | Sample SE43 Diff from Grand Mean | Sample SE43 CPV | Sample SE44 Lab Mean | Sample SE44 Diff from Grand Mean | Sample SE44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| ZR9YXB | | 1.707 | -0.047 | -0.22 | 2.018 | 0.035 | 0.13 | TO |

### Summary Statistics

| | Sample SE43 | Sample SE44 |
|---|---|---|
| Grand Means | 1.7541 Percent | 1.9832 Percent |
| SD Btwn Labs | 0.2139 Percent | 0.2726 Percent |

Statistics based on 38 of 41 reporting participants

### Comments on Assigned Data Flags for Test #332

T4ZKT7 (X) - Data for both samples are high. Inconsistent within the determinations of sample SE43.

ZAMFWW (X) - Inconsistent in testing between samples.

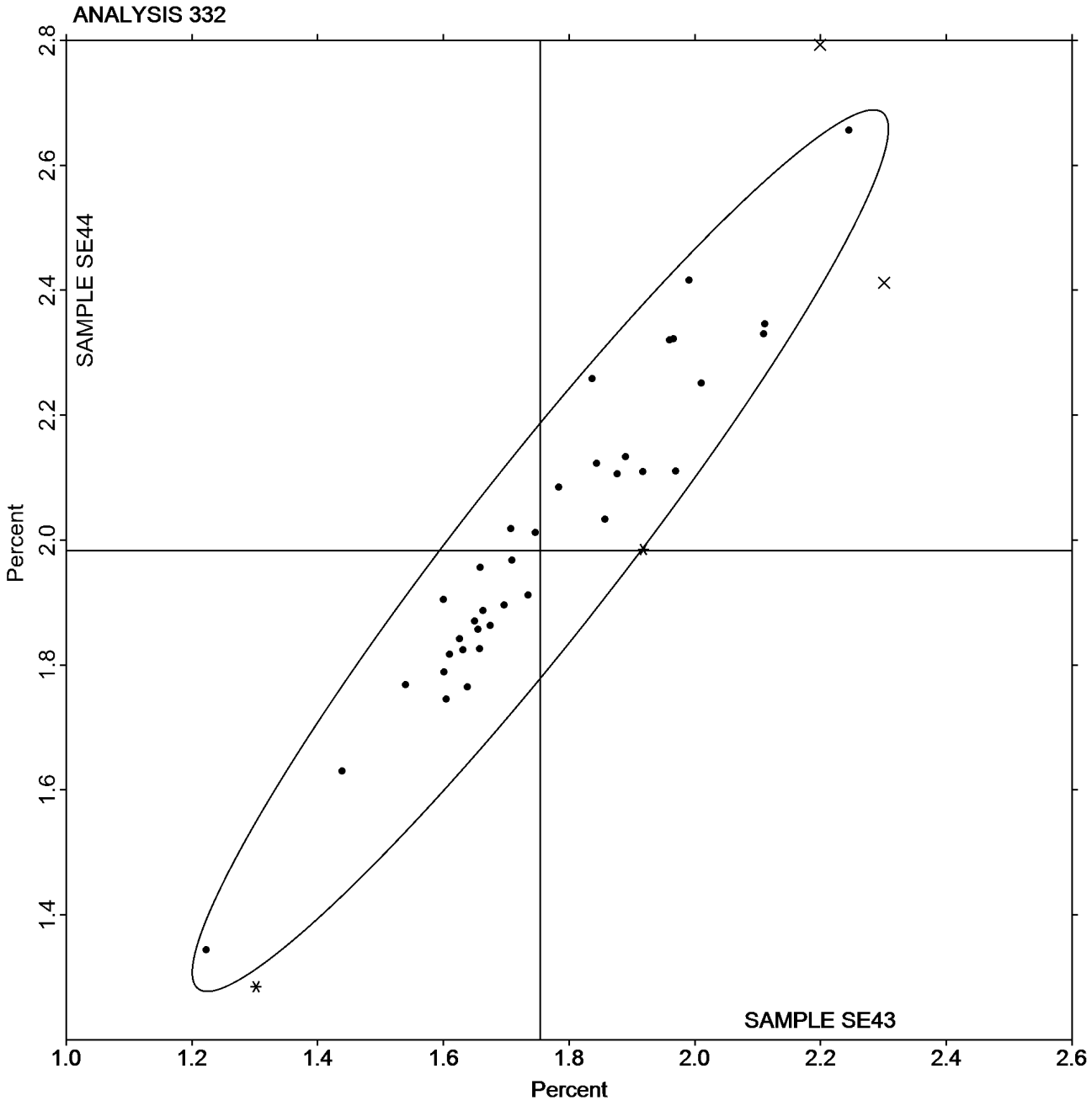
QQHTF8 (X) - Data for sample SE44 are high.

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| ID | Instron 4201 | IF | Instron 3340 Series |
| IK | Instron 4400 Series | IM | Instron 5500 Series |
| IN | Instron 3360 Series | LA | L & W Autoline 300 |
| LE | L & W Tensile Tester 066 | LH | L & W Alwetron TH1 (Horizontal) SE 060 |
| LW | L & W Tensile Tester SE062 | TA | Thwing-Albert Tensile Tester |
| TB | Thwing-Albert EJA/1000 | TH | Thwing-Albert QC-3A |
| TK | Thwing-Albert Model 37-4 | TO | Thwing-Albert QC-1000 |
| TP | TMI Monitor/Tensile 100 (84-21-01) | TR | TMI Horizontal Tensile Tester |
| TT | Tinius Olsen Model MHT | XX | Instrument make/model not specified by lab |

Grand Mean Sample **SE43** = 1.7541 Percent

Grand Mean Sample **SE44** = 1.9832 Percent



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 334

## Folding Endurance (MIT) - Double Folds

## TAPPI Official Test Method T511

| WebCode | Data Flag | Sample SG43 Lab Mean | Sample SG43 Diff from Grand Mean | Sample SG43 CPV | Sample SG44 Lab Mean | Sample SG44 Diff from Grand Mean | Sample SG44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| BPMUUV | | 310.6 | 105.0 | 1.65 | 333.7 | 72.2 | 0.77 | MT |
| CVK4B8 | | 173.3 | -32.3 | -0.51 | 179.5 | -82.0 | -0.87 | MT |
| DDGNTR | | 235.6 | 30.0 | 0.47 | 337.0 | 75.5 | 0.80 | MT |
| G4J6VG | | 152.3 | -53.3 | -0.84 | 249.3 | -12.2 | -0.13 | MT |
| HFC46Y | | 171.5 | -34.1 | -0.54 | 231.2 | -30.3 | -0.32 | MT |
| JD44PJ | | 170.6 | -35.0 | -0.55 | 232.7 | -28.8 | -0.31 | XX |
| JKKJDM | | 161.4 | -44.2 | -0.70 | 173.1 | -88.4 | -0.94 | MT |
| JX7YGL | | 244.9 | 39.3 | 0.62 | 335.9 | 74.4 | 0.79 | MT |
| K2H9YH | | 196.5 | -9.1 | -0.14 | 318.8 | 57.3 | 0.61 | MT |
| LQJW4G | | 135.5 | -70.1 | -1.10 | 84.2 | -177.3 | -1.89 | MT |
| P8DLUU | | 187.9 | -17.7 | -0.28 | 270.6 | 9.1 | 0.10 | MT |
| P8T84W | | 278.1 | 72.5 | 1.14 | 355.6 | 94.1 | 1.00 | MT |
| QXJZ4M | | 327.3 | 121.7 | 1.92 | 417.0 | 155.5 | 1.65 | MT |
| UMWZ2A | | 132.4 | -73.2 | -1.15 | 142.3 | -119.2 | -1.27 | MT |

### Summary Statistics

| | Sample SG43 | Sample SG44 |
|---|---|---|
| Grand Means | 205.56 Double Folds | 261.49 Double Folds |
| SD Btwn Labs | 63.51 Double Folds | 94.02 Double Folds |

Statistics based on 14 of 14 reporting participants

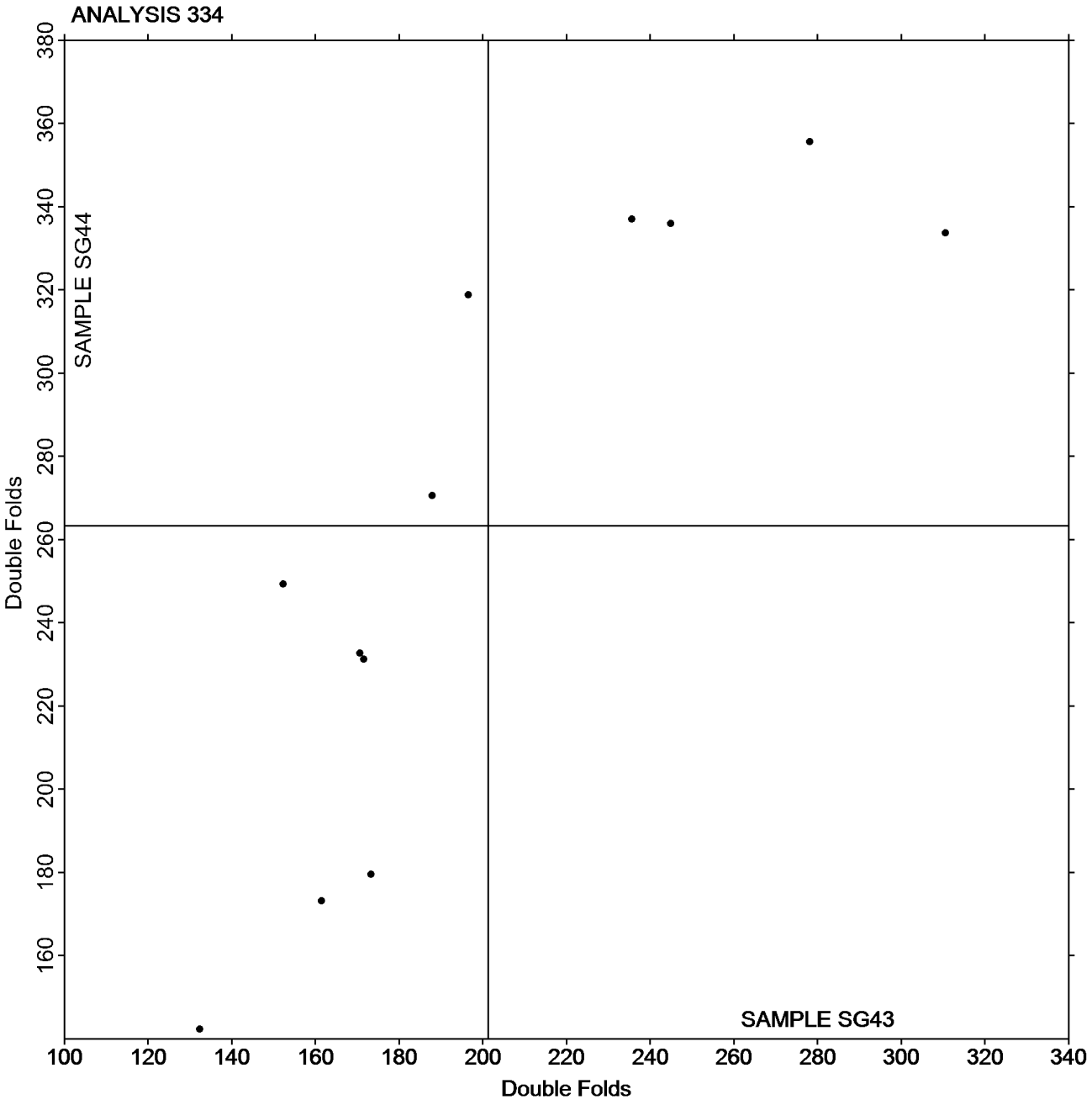
### Key to Instrument Codes Reported by Participants

MT MIT - Tinius Olsen

XX Instrument make/model not specified by lab

Grand Mean Sample **SG43** = 205.56 Double Folds

Grand Mean Sample **SG44** = 261.49 Double Folds




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 336
## Bending Resistance, Gurley Type
## TAPPI Official Test Method T543

| WebCode | Data Flag | Sample SH43 Lab Mean | Sample SH43 Diff from Grand Mean | Sample SH43 CPV | Sample SH44 Lab Mean | Sample SH44 Diff from Grand Mean | Sample SH44 CPV |
|---|---|---|---|---|---|---|---|
| 2C4BZ2 | | 261.4 | -35.7 | -1.16 | 220.0 | -23.4 | -1.10 |
| 36F4Q8 | | 262.7 | -34.3 | -1.12 | 210.7 | -32.7 | -1.55 |
| 4VCW2Y | | 275.5 | -21.5 | -0.70 | 230.2 | -13.2 | -0.62 |
| 6V7872 | | 332.5 | 35.4 | 1.15 | 264.9 | 21.5 | 1.02 |
| 73KCFD | | 257.7 | -39.3 | -1.28 | 206.0 | -37.4 | -1.77 |
| BRM88M | * | 260.4 | -36.7 | -1.19 | 251.9 | 8.5 | 0.40 |
| CVK4B8 | | 268.9 | -28.1 | -0.91 | 229.8 | -13.6 | -0.64 |
| D99A3G | | 288.5 | -8.6 | -0.28 | 229.1 | -14.3 | -0.67 |
| DDGNTR | | 292.0 | -5.0 | -0.16 | 246.3 | 2.8 | 0.13 |
| DNKY4N | | 293.8 | -3.2 | -0.11 | 228.1 | -15.4 | -0.73 |
| DX6DZY | | 291.6 | -5.5 | -0.18 | 246.0 | 2.6 | 0.12 |
| JD44PJ | | 302.7 | 5.7 | 0.18 | 249.4 | 6.0 | 0.28 |
| M38FXC | | 320.0 | 23.0 | 0.75 | 253.4 | 10.0 | 0.47 |
| P8DLUU | * | 386.3 | 89.3 | 2.90 | 285.4 | 42.0 | 1.98 |
| PBC8DK | | 327.4 | 30.4 | 0.99 | 286.6 | 43.2 | 2.04 |
| QKEY7C | | 295.0 | -2.0 | -0.07 | 226.8 | -16.7 | -0.79 |
| UBJT6A | | 284.6 | -12.4 | -0.40 | 236.4 | -7.0 | -0.33 |
| UMWZ2A | | 322.3 | 25.2 | 0.82 | 263.1 | 19.7 | 0.93 |
| WULPBA | | 296.9 | -0.1 | 0.00 | 245.7 | 2.3 | 0.11 |
| X3QWNN | | 322.4 | 25.4 | 0.83 | 250.9 | 7.5 | 0.36 |
| YKTY2M | | 295.3 | -1.8 | -0.06 | 250.9 | 7.5 | 0.35 |

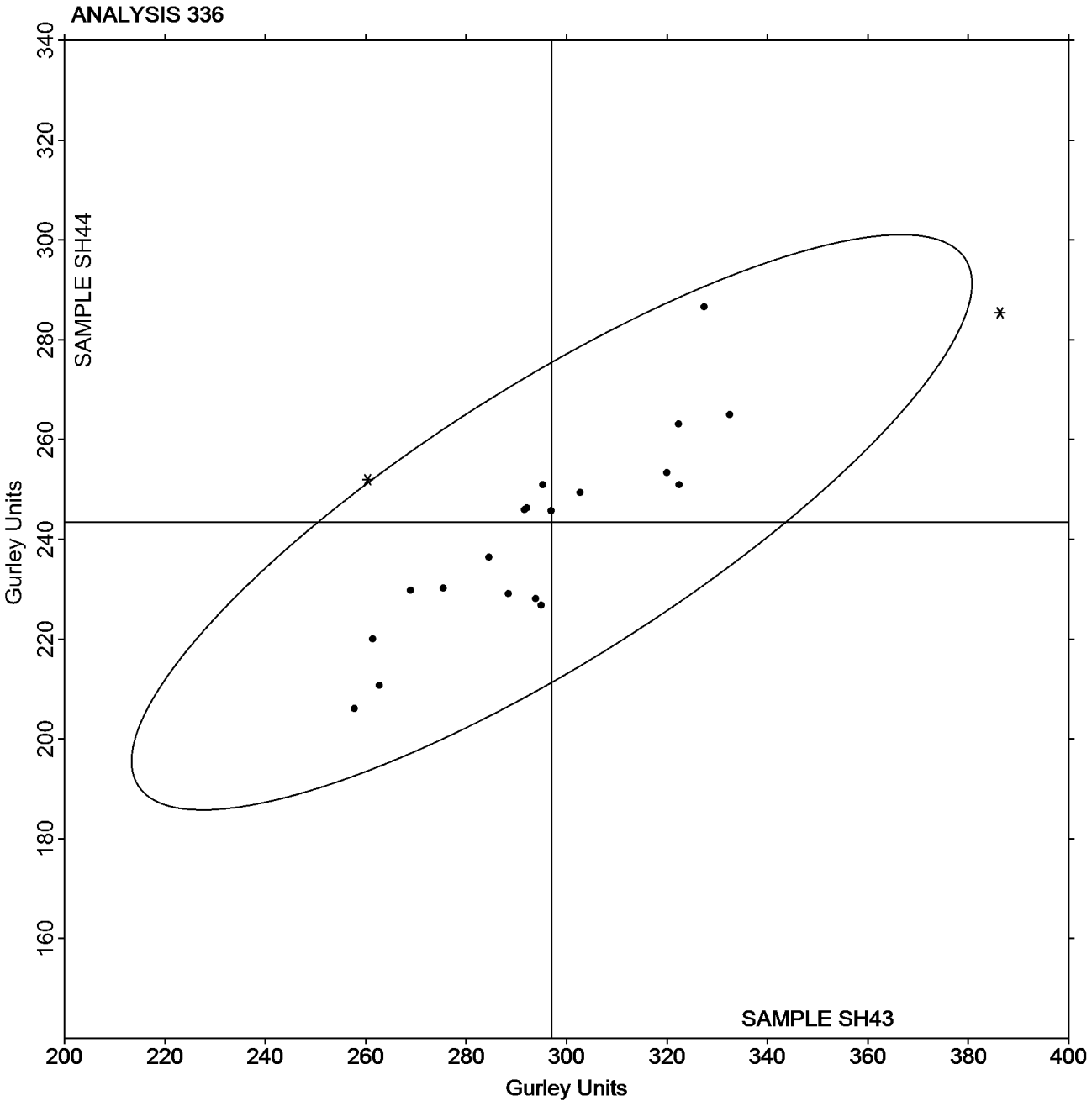
### Summary Statistics

| | Sample SH43 | Sample SH44 |
|---|---|---|
| Grand Means | 297.04 Gurley Units | 243.40 Gurley Units |
| SD Btwn Labs | 30.73 Gurley Units | 21.16 Gurley Units |

Statistics based on 21 of 21 reporting participants

Grand Mean Sample **SH43** = 297.04 Gurley Units

Grand Mean Sample **SH44** = 243.40 Gurley Units



# Paper & Paperboard Interlaboratory Testing Program

## Analysis 338

## Bending Resistance, Taber Type - 0 to 10 Units

## TAPPI Official Test Method T566

| WebCode | Data Flag | Sample SJ43 Lab Mean | Sample SJ43 Diff from Grand Mean | Sample SJ43 CPV | Sample SJ44 Lab Mean | Sample SJ44 Diff from Grand Mean | Sample SJ44 CPV |
|---|---|---|---|---|---|---|---|
| 6V7872 | | 4.258 | 0.092 | 0.17 | 3.487 | -0.135 | -0.19 |
| DDGNTR | | 3.993 | -0.173 | -0.33 | 3.373 | -0.249 | -0.34 |
| DNKY4N | | 3.977 | -0.190 | -0.36 | 3.338 | -0.284 | -0.39 |
| JD44PJ | | 4.955 | 0.789 | 1.49 | 4.005 | 0.383 | 0.53 |
| JJ3UPZ | X | 42.357 | 38.191 | 72.07 | 35.875 | 32.253 | 44.51 |
| JKKJDM | | 4.634 | 0.468 | 0.88 | 3.504 | -0.118 | -0.16 |
| JX7YGL | | 3.918 | -0.248 | -0.47 | 3.242 | -0.380 | -0.52 |
| RCENNK | | 4.470 | 0.304 | 0.57 | 3.785 | 0.163 | 0.22 |
| U33HR9 | | 3.650 | -0.516 | -0.97 | 5.160 | 1.538 | 2.12 |
| X8J7RV | | 3.233 | -0.933 | -1.76 | 2.328 | -1.294 | -1.79 |
| YKTY2M | | 3.863 | -0.303 | -0.57 | 3.243 | -0.379 | -0.52 |
| ZD4XXE | | 4.880 | 0.714 | 1.35 | 4.380 | 0.758 | 1.05 |

### Summary Statistics

| | Sample SJ43 | Sample SJ44 |
|---|---|---|
| Grand Means | 4.1664 Taber Units | 3.6223 Taber Units |
| SD Btwn Labs | 0.5299 Taber Units | 0.7246 Taber Units |

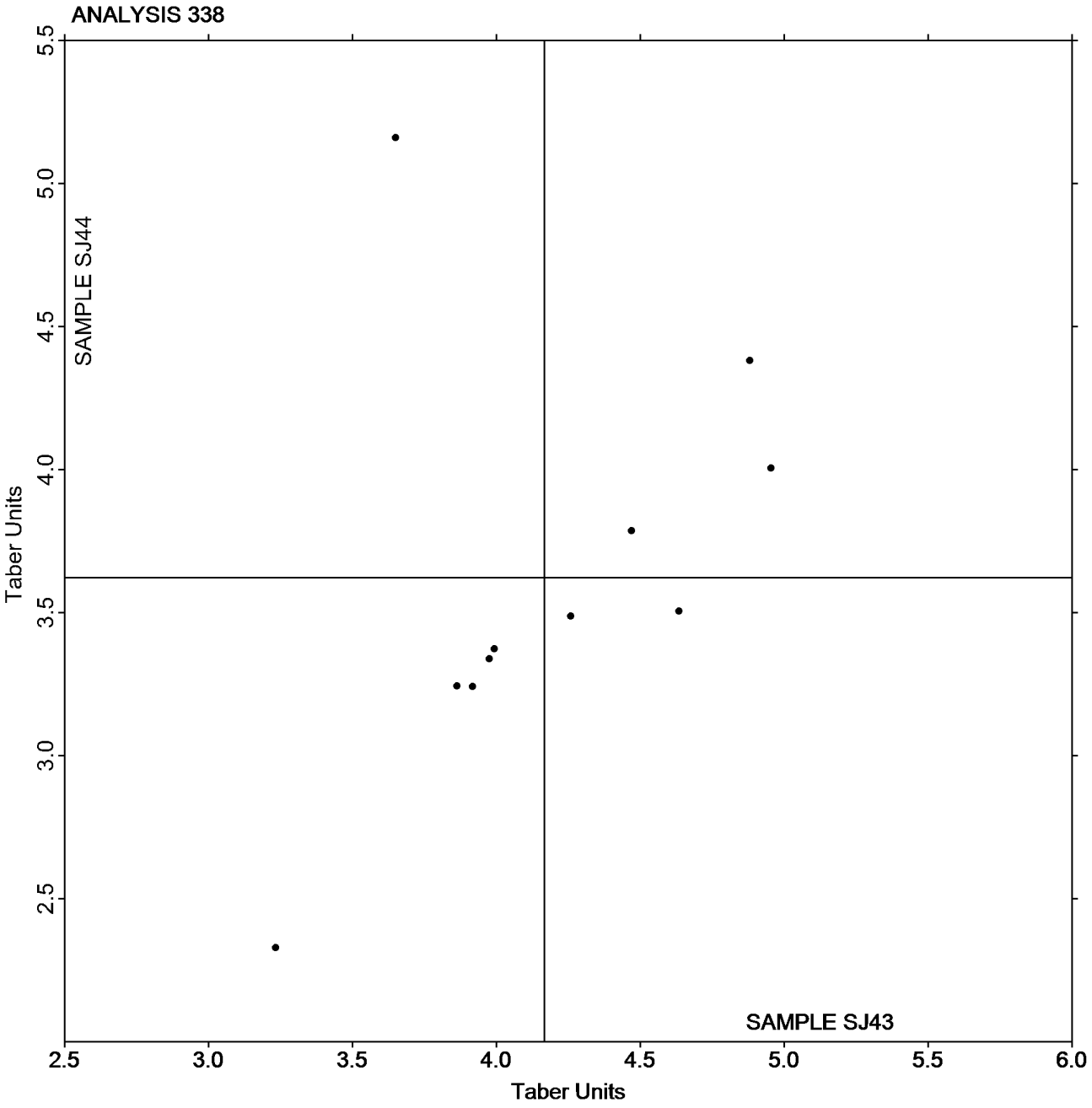
Statistics based on 11 of 12 reporting participants

**Comments on Assigned Data Flags for Test #338**

JJ3UPZ (X) - Extreme Data.

Grand Mean Sample **SJ43** = 4.1664 Taber Units

Grand Mean Sample **SJ44** = 3.6223 Taber Units




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 339

## Bending Resistance, Taber Type - 10 to 100 Taber Units

## TAPPI Official Test Method T489

| WebCode | Data Flag | Sample SQ43 Lab Mean | Sample SQ43 Diff from Grand Mean | Sample SQ43 CPV | Sample SQ44 Lab Mean | Sample SQ44 Diff from Grand Mean | Sample SQ44 CPV |
|---|---|---|---|---|---|---|---|
| 3U4RHJ | | 24.56 | 2.64 | 1.53 | 38.12 | 1.36 | 0.67 |
| 484Q6F | | 22.75 | 0.83 | 0.48 | 36.75 | -0.01 | 0.00 |
| 73KCFD | | 20.98 | -0.94 | -0.55 | 35.75 | -1.01 | -0.50 |
| 9BP97M | X | 28.76 | 6.84 | 3.96 | 45.05 | 8.29 | 4.11 |
| DDGNTR | | 24.20 | 2.28 | 1.32 | 38.07 | 1.31 | 0.65 |
| DX6DZY | | 22.37 | 0.45 | 0.26 | 38.83 | 2.07 | 1.02 |
| EJZBZ3 | | 19.60 | -2.32 | -1.34 | 32.26 | -4.50 | -2.23 |
| FZJRG4 | | 21.26 | -0.66 | -0.38 | 35.27 | -1.49 | -0.74 |
| M38FXC | | 19.90 | -2.02 | -1.17 | 34.87 | -1.89 | -0.94 |
| NAMAWE | X | 49.20 | 27.28 | 15.77 | 51.35 | 14.59 | 7.23 |
| P8T84W | | 22.45 | 0.53 | 0.31 | 38.12 | 1.36 | 0.67 |
| U33HR9 | | 23.10 | 1.18 | 0.68 | 38.00 | 1.24 | 0.61 |
| UCA4XN | | 22.57 | 0.65 | 0.38 | 39.17 | 2.41 | 1.19 |
| VZCH8H | X | 260.00 | 238.08 | 137.64 | 482.00 | 445.24 | 220.60 |
| Z4W2EH | | 19.28 | -2.64 | -1.53 | 35.91 | -0.85 | -0.42 |

### Summary Statistics

| | Sample SQ43 | Sample SQ44 |
|---|---|---|
| Grand Means | 21.918 Taber Units | 36.760 Taber Units |
| SD Btwn Labs | 1.730 Taber Units | 2.018 Taber Units |

Statistics based on 12 of 15 reporting participants

### Comments on Assigned Data Flags for Test #339

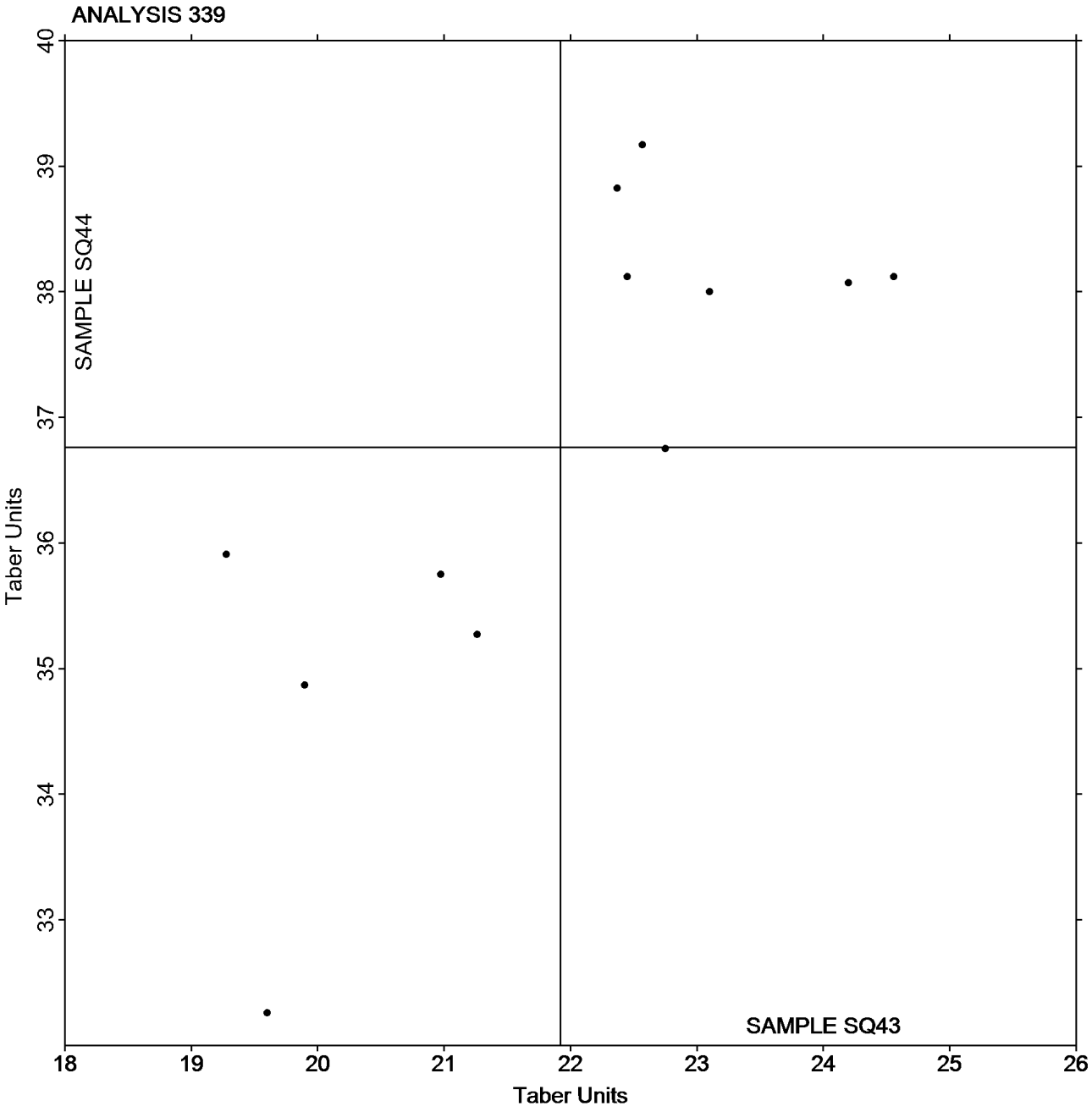
NAMAWE (X) - Extreme Data.

VZCH8H (X) - Extreme Data.

9BP97M (X) - Data for both samples are high.

Grand Mean Sample **SQ43** = 21.918 Taber Units

Grand Mean Sample **SQ44** = 36.760 Taber Units




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 340

## nding Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboc

## TAPPI Official Test Method T489

| WebCode | Data Flag | Sample ST43 Lab Mean | Sample ST43 Diff from Grand Mean | Sample ST43 CPV | Sample ST44 Lab Mean | Sample ST44 Diff from Grand Mean | Sample ST44 CPV |
|---|---|---|---|---|---|---|---|
| 2N3TVA | | 267.2 | -19.4 | -1.84 | 263.2 | -15.3 | -1.32 |
| 42EBGA | | 271.6 | -15.0 | -1.42 | 276.9 | -1.6 | -0.14 |
| 69BAMN | X | 327.0 | 40.4 | 3.83 | 339.0 | 60.5 | 5.24 |
| 6CVE4Y | | 291.1 | 4.5 | 0.43 | 294.0 | 15.5 | 1.34 |
| 824KVU | | 300.0 | 13.4 | 1.27 | 287.8 | 9.3 | 0.81 |
| 8KXEP6 | | 297.5 | 10.9 | 1.03 | 295.1 | 16.6 | 1.44 |
| DX6DZY | | 288.8 | 2.2 | 0.21 | 279.1 | 0.6 | 0.05 |
| EYEGC2 | | 283.9 | -2.7 | -0.25 | 272.0 | -6.5 | -0.56 |
| HTZXMJ | | 276.2 | -10.4 | -0.99 | 274.6 | -3.9 | -0.34 |
| LQJW4G | | 302.8 | 16.2 | 1.54 | 296.5 | 18.0 | 1.56 |
| P8T84W | | 294.5 | 7.9 | 0.75 | 284.6 | 6.1 | 0.53 |
| QQHTF8 | | 290.7 | 4.1 | 0.39 | 269.6 | -8.9 | -0.77 |
| TR62KT | | 289.8 | 3.2 | 0.31 | 268.9 | -9.6 | -0.83 |
| U33HR9 | | 272.5 | -14.1 | -1.33 | 256.3 | -22.2 | -1.92 |
| UMWZ2A | | 279.2 | -7.4 | -0.70 | 272.8 | -5.7 | -0.49 |
| X2F22W | | 291.2 | 4.6 | 0.44 | 279.0 | 0.5 | 0.05 |
| XW4ATH | | 288.1 | 1.5 | 0.15 | 285.2 | 6.7 | 0.58 |

### Summary Statistics

| | Sample ST43 | Sample ST44 |
|---|---|---|
| Grand Means | 286.56 Taber Units | 278.47 Taber Units |
| SD Btwn Labs | 10.55 Taber Units | 11.55 Taber Units |

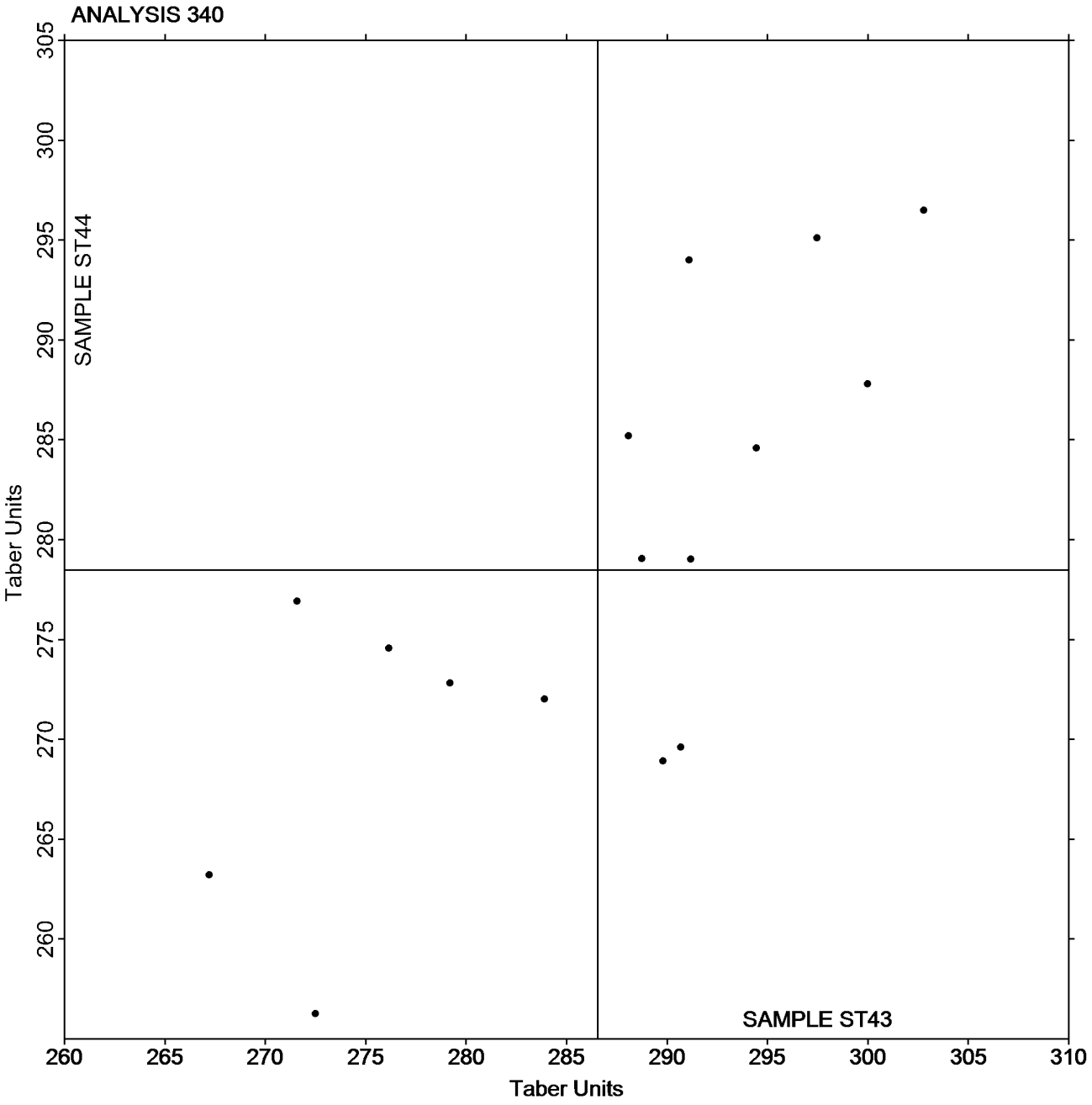
Statistics based on 16 of 17 reporting participants

**Comments on Assigned Data Flags for Test #340**

69BAMN (X) - Data for both samples are high. Possible Systematic Error.

Grand Mean Sample **ST43** = 286.56 Taber Units

Grand Mean Sample **ST44** = 278.47 Taber Units




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 343
## Z-Direction Tensile
## TAPPI Official Test Method T541

| WebCode | Data Flag | Sample SM43 Lab Mean | Sample SM43 Diff from Grand Mean | Sample SM43 CPV | Sample SM44 Lab Mean | Sample SM44 Diff from Grand Mean | Sample SM44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 6CVE4Y | | 106.40 | 13.76 | 0.83 | 73.60 | 4.14 | 0.49 | CA |
| 9BP97M | | 111.70 | 19.05 | 1.15 | 85.74 | 16.28 | 1.94 | TA |
| AM3NU8 | | 100.40 | 7.76 | 0.47 | 69.64 | 0.18 | 0.02 | XX |
| C4ZK73 | | 115.66 | 23.02 | 1.39 | 79.48 | 10.02 | 1.19 | TA |
| DDGNTR | | 79.70 | -12.94 | -0.78 | 61.34 | -8.12 | -0.97 | TZ |
| ELPHKY | | 81.62 | -11.02 | -0.67 | 60.90 | -8.56 | -1.02 | XX |
| FZJRG4 | | 114.73 | 22.09 | 1.34 | 74.03 | 4.57 | 0.54 | LW |
| G9W3AV | | 91.64 | -1.00 | -0.06 | 71.28 | 1.82 | 0.22 | XX |
| JX7YGL | | 56.06 | -36.58 | -2.21 | 58.56 | -10.90 | -1.30 | CD |
| LFXQ8C | | 85.09 | -7.55 | -0.46 | 57.13 | -12.33 | -1.47 | LW |
| LQJW4G | | 90.44 | -2.20 | -0.13 | 66.40 | -3.06 | -0.36 | LW |
| MQBA4E | | 88.60 | -4.04 | -0.24 | 65.40 | -4.06 | -0.48 | TA |
| P8T84W | | 98.86 | 6.22 | 0.38 | 74.46 | 5.00 | 0.59 | LW |
| QQHTF8 | | 68.52 | -24.13 | -1.46 | 68.63 | -0.83 | -0.10 | LX |
| UCA4XN | | 79.53 | -13.12 | -0.79 | 56.76 | -12.70 | -1.51 | TZ |
| VZCH8H | | 92.78 | 0.14 | 0.01 | 69.60 | 0.14 | 0.02 | TA |
| X8J7RV | | 115.24 | 22.60 | 1.37 | 78.52 | 9.06 | 1.08 | DT |
| YKTY2M | | 90.63 | -2.02 | -0.12 | 78.84 | 9.38 | 1.12 | TL |

### Summary Statistics

| | Sample SM43 | Sample SM44 |
|---|---|---|
| Grand Means | 92.644 psi | 69.462 psi |
| SD Btwn Labs | 16.529 psi | 8.402 psi |

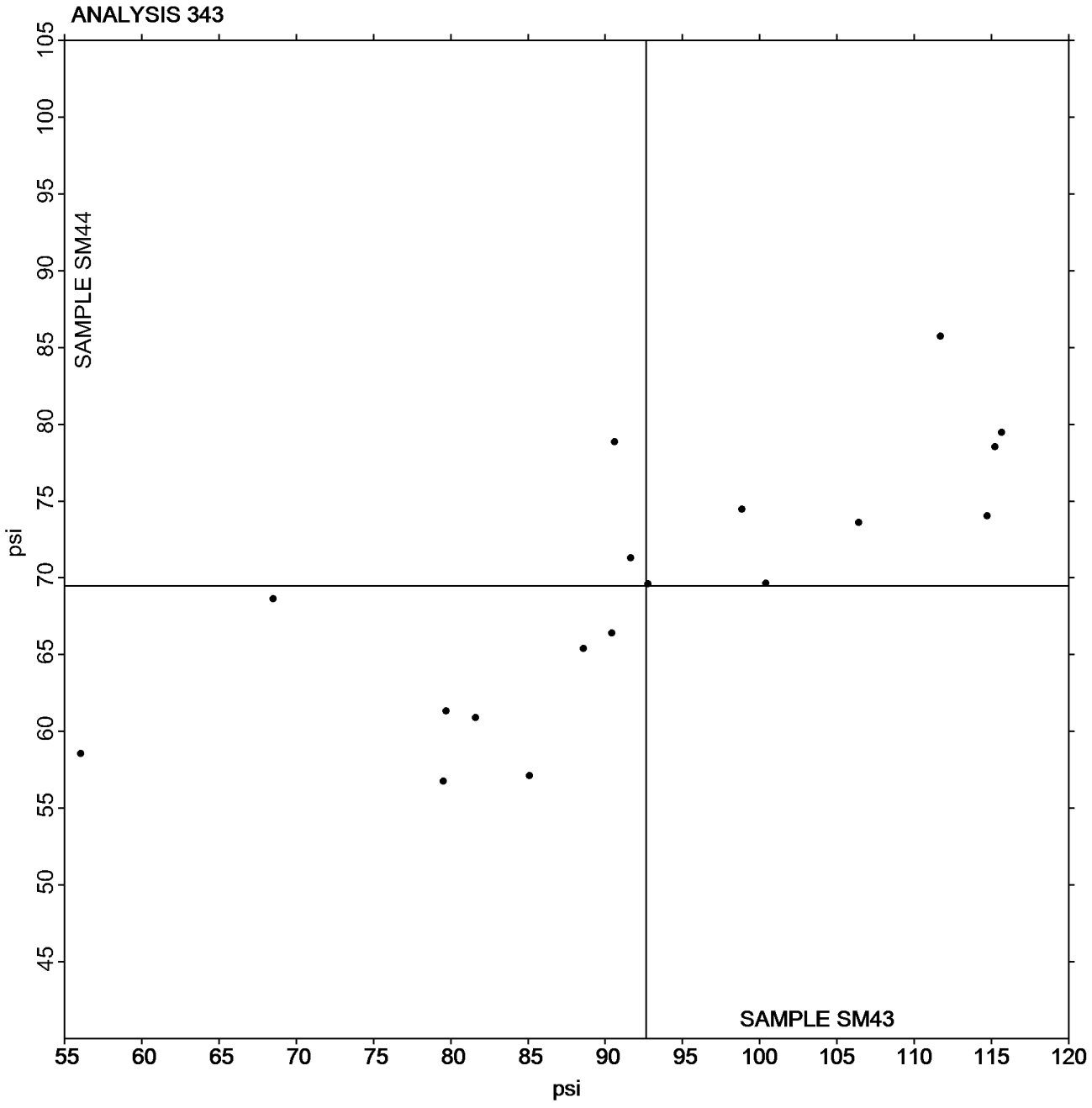
Statistics based on 18 of 18 reporting participants

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| CA | CSI CS-163 | CD | CSI CS-163D |
| DT | Dek-Tron DCS-163A ZDT Tester | LW | L & W ZD Tensile Tester |
| LX | L & W (model not specified) | TA | Thwing-Albert Tensile Tester |
| TL | TMI Lab Master | TZ | TMI Monitor/ZDT Tester |
| XX | Instrument make/model not specified by lab | | |

Grand Mean Sample **SM43** = 92.644 psi

Grand Mean Sample **SM44** = 69.462 psi




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

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 345
## Z-Direction Tensile, Recycled Paperboard
## TAPPI Official Test Method T541

| WebCode | Data Flag | Sample SZ43 Lab Mean | Sample SZ43 Diff from Grand Mean | Sample SZ43 CPV | Sample SZ44 Lab Mean | Sample SZ44 Diff from Grand Mean | Sample SZ44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2N3TVA | | 35.80 | 0.12 | 0.05 | 36.00 | 0.52 | 0.24 | CA |
| 42EBGA | | 35.40 | -0.28 | -0.12 | 35.80 | 0.32 | 0.15 | CA |
| 4TJFBX | | 38.00 | 2.32 | 1.00 | 38.60 | 3.12 | 1.47 | CA |
| 4W8KCH | | 37.48 | 1.80 | 0.78 | 35.96 | 0.48 | 0.23 | CD |
| ACGGX4 | | 39.78 | 4.10 | 1.77 | 38.75 | 3.26 | 1.54 | PG |
| ACJ732 | | 32.54 | -3.14 | -1.35 | 33.00 | -2.48 | -1.17 | LW |
| AZKH3R | | 38.64 | 2.96 | 1.28 | 38.88 | 3.40 | 1.61 | CH |
| DX6DZY | | 33.58 | -2.10 | -0.90 | 33.44 | -2.04 | -0.96 | CA |
| EYEGC2 | | 35.60 | -0.08 | -0.03 | 35.26 | -0.22 | -0.11 | TL |
| KKWVBH | | 34.78 | -0.90 | -0.39 | 33.76 | -1.72 | -0.81 | LW |
| TR62KT | | 36.56 | 0.88 | 0.38 | 36.32 | 0.84 | 0.39 | CD |
| UMWZ2A | | 34.20 | -1.48 | -0.64 | 33.90 | -1.58 | -0.75 | CA |
| W3WP77 | | 31.36 | -4.32 | -1.86 | 32.02 | -3.46 | -1.63 | LW |
| X2F22W | | 34.24 | -1.44 | -0.62 | 34.36 | -1.12 | -0.53 | TA |
| XW4ATH | | 37.20 | 1.52 | 0.66 | 36.20 | 0.72 | 0.34 | CA |

### Summary Statistics

| | Sample SZ43 | Sample SZ44 |
|---|---|---|
| Grand Means | 35.677 psi | 35.483 psi |
| SD Btwn Labs | 2.320 psi | 2.119 psi |

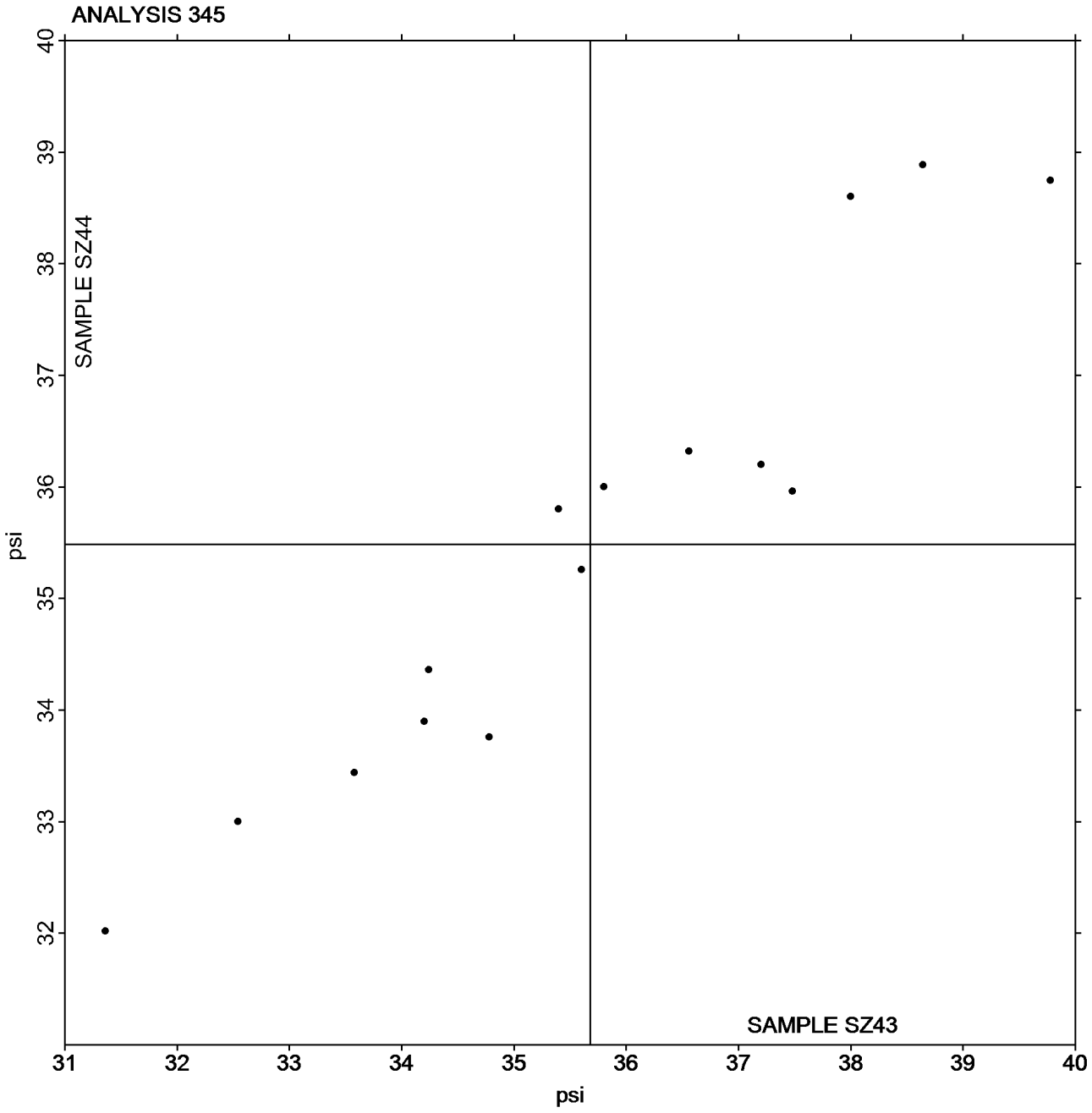
Statistics based on 15 of 15 reporting participants

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| CA | CSI CS-163 | CD | CSI CS-163D |
| CH | Chatillon Ametek | LW | L & W ZD Tensile Tester |
| PG | Perkins Model A Mullen Tester | TA | Thwing-Albert Tensile Tester |
| TL | TMI Lab Master | | |

Grand Mean Sample **SZ43** = 35.677 psi

Grand Mean Sample **SZ44** = 35.483 psi




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

# Paper & Paperboard Interlaboratory Testing Program

**Report #288S**
**May 2017**

**Analysis 348**
**Internal Bond Strength - Modified Scott Mechanics**
**TAPPI Provisional Test Method T569**

| WebCode | Data Flag | Sample SN43 Lab Mean | Sample SN43 Diff from Grand Mean | Sample SN43 CPV | Sample SN44 Lab Mean | Sample SN44 Diff from Grand Mean | Sample SN44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2NXLK2 | | 149.5 | -1.2 | -0.14 | 86.13 | 3.43 | 0.65 | HY |
| 36F4Q8 | | 156.0 | 5.3 | 0.62 | 83.20 | 0.50 | 0.09 | HY |
| 6V7872 | | 135.5 | -15.2 | -1.77 | 79.36 | -3.34 | -0.63 | KR |
| 73KCFD | | 147.8 | -2.8 | -0.33 | 79.36 | -3.34 | -0.63 | HY |
| 9BP97M | | 154.2 | 3.5 | 0.41 | 82.40 | -0.30 | -0.06 | HZ |
| BRM88M | | 158.2 | 7.5 | 0.87 | 84.20 | 1.50 | 0.28 | HY |
| C4ZK73 | | 160.8 | 10.1 | 1.18 | 90.60 | 7.90 | 1.49 | HY |
| D99A3G | | 158.4 | 7.7 | 0.90 | 83.80 | 1.10 | 0.21 | HY |
| DDGNTR | | 155.8 | 5.1 | 0.59 | 88.00 | 5.30 | 1.00 | HY |
| JX7YGL | | 157.6 | 6.9 | 0.80 | 83.40 | 0.70 | 0.13 | HY |
| LQJW4G | | 144.4 | -6.3 | -0.73 | 76.80 | -5.90 | -1.11 | HZ |
| P8DLUU | * | 142.0 | -8.7 | -1.01 | 69.20 | -13.50 | -2.54 | HY |
| P8T84W | | 154.6 | 3.9 | 0.46 | 87.20 | 4.50 | 0.85 | HY |
| UCA4XN | | 139.9 | -10.8 | -1.26 | 81.60 | -1.10 | -0.21 | HY |
| UMWZ2A | | 140.6 | -10.1 | -1.17 | 80.60 | -2.10 | -0.39 | HZ |
| VZCH8H | | 162.0 | 11.3 | 1.32 | 87.00 | 4.30 | 0.81 | HY |
| X2F22W | | 160.2 | 9.5 | 1.11 | 91.60 | 8.90 | 1.68 | HZ |
| XLN6Z2 | | 137.2 | -13.5 | -1.57 | 77.60 | -5.10 | -0.96 | HZ |
| ZR9YXB | | 148.4 | -2.3 | -0.27 | 79.20 | -3.50 | -0.66 | HY |

## Summary Statistics

| | Sample SN43 | Sample SN44 |
|---|---|---|
| Grand Means | 150.69 1000th ft-lbs | 82.697 1000th ft-lbs |
| SD Btwn Labs | 8.59 1000th ft-lbs | 5.311 1000th ft-lbs |

Statistics based on 19 of 19 reporting participants

**Analysis Notes:**

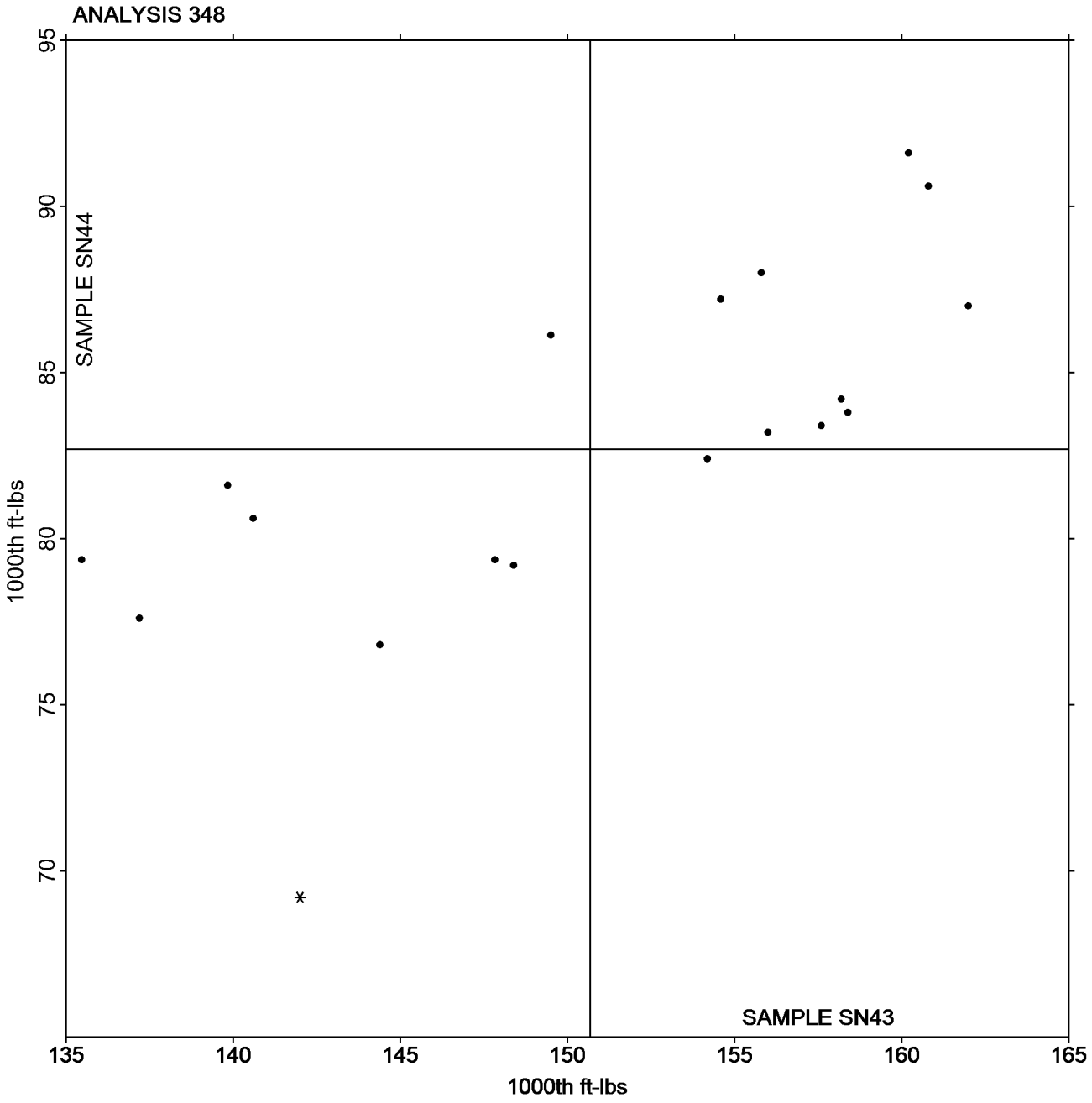
UCA4XN - One determination removed from the Lab Mean of Sample SN43 per Grubb's Test at 1% risk (TAPPI 1205).

## Key to Instrument Codes Reported by Participants

HY Huygen Digitized Scott Internal Bond Tester
HZ Huygen Internal Bond Tester with AccuPress
KR Kumagai Riki Kogyo Internal Bond Tester

Grand Mean Sample **SN43** = 150.69 1000th ft-lbs

Grand Mean Sample **SN44** = 82.697 1000th ft-lbs

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# Paper & Paperboard Interlaboratory Testing Program

## Analysis 349

## Internal Bond Strength - Scott Bond Models

## TAPPI Provisional Test Method T569

| WebCode | Data Flag | Sample SP43 Lab Mean | Sample SP43 Diff from Grand Mean | Sample SP43 CPV | Sample SP44 Lab Mean | Sample SP44 Diff from Grand Mean | Sample SP44 CPV | Instr Code |
|---|---|---|---|---|---|---|---|---|
| 2ZUNMA | X | 200.0 | 61.7 | 2.01 | 196.00 | 103.62 | 7.98 | XX |
| 7K4D4N | | 176.0 | 37.7 | 1.23 | 104.60 | 12.22 | 0.94 | SC |
| 84TQFR | | 141.8 | 3.5 | 0.11 | 94.98 | 2.60 | 0.20 | TM |
| 8TFKNX | | 131.9 | -6.4 | -0.21 | 84.32 | -8.06 | -0.62 | XX |
| ACGGX4 | | 147.8 | 9.5 | 0.31 | 90.20 | -2.18 | -0.17 | TM |
| ACJ732 | | 118.2 | -20.1 | -0.66 | 93.20 | 0.82 | 0.06 | XX |
| AZKH3R | | 123.6 | -14.7 | -0.48 | 86.80 | -5.58 | -0.43 | TM |
| QQHTF8 | | 76.5 | -61.8 | -2.01 | 65.48 | -26.90 | -2.07 | TM |
| U33HR9 | | 155.7 | 17.4 | 0.57 | 104.84 | 12.46 | 0.96 | XX |
| U4DBGG | | 173.4 | 35.1 | 1.14 | 107.00 | 14.62 | 1.13 | XX |

### Summary Statistics

| | Sample SP43 | Sample SP44 |
|---|---|---|
| Grand Means | 138.32 1000th ft-lbs | 92.380 1000th ft-lbs |
| SD Btwn Labs | 30.69 1000th ft-lbs | 12.992 1000th ft-lbs |

Statistics based on 9 of 10 reporting participants

**Comments on Assigned Data Flags for Test #349**

2ZUNMA (X) - Extreme Data for Sample SP44.

**Key to Instrument Codes Reported by Participants**

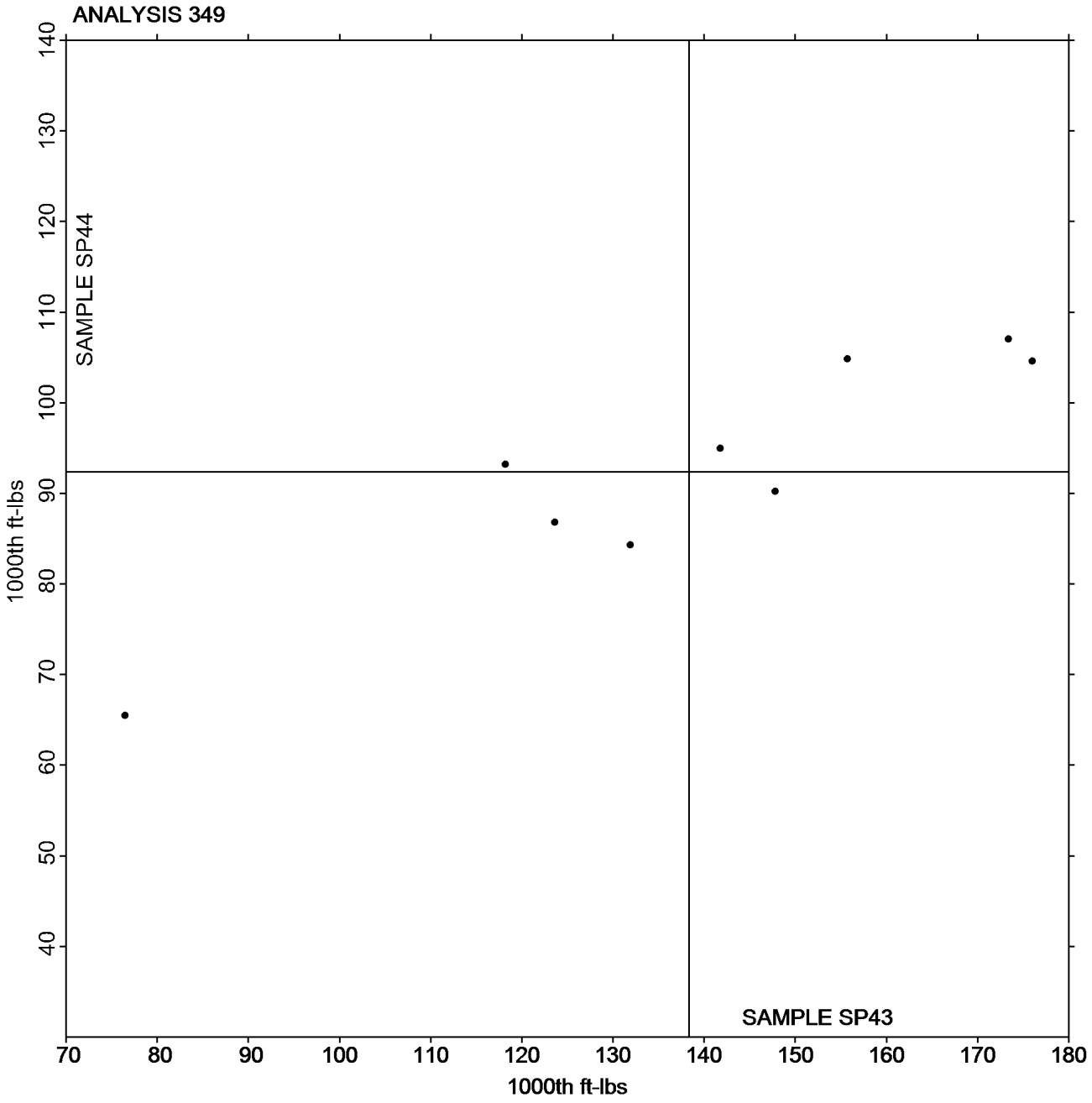
SC Scott Internal Bond Tester (Manual)

TM TMI Monitor/Internal Bond Tester

XX Instrument make/model not specified by lab

Grand Mean Sample **SP43** = 138.32 1000th ft-lbs

Grand Mean Sample **SP44** = 92.380 1000th ft-lbs




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