

Paper & Paperboard Interlaboratory Testing Program

Summary Report #275S - March 2015

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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.

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

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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.

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.

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.

TAPPI-CTS Interlaboratory Testing Program
Analysis 305
Bursting Strength - Printing Papers

| WebCode | Data Flag | Sample SA17 | | | Sample SA18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3DY4HU | | 34.63 | 1.37 | 0.42 | 20.75 | -0.36 | -0.13 |
| 4JK9Y3 | | 32.70 | -0.55 | -0.17 | 18.45 | -2.66 | -0.98 |
| 74FUR4 | | 32.33 | -0.92 | -0.28 | 19.83 | -1.28 | -0.47 |
| 7N4DK2 | | 35.23 | 1.97 | 0.60 | 21.41 | 0.30 | 0.11 |
| 93FV62 | | 33.88 | 0.63 | 0.19 | 21.07 | -0.03 | -0.01 |
| 9LMAFZ | | 28.91 | -4.35 | -1.32 | 19.58 | -1.53 | -0.56 |
| A8ND4T | | 32.79 | -0.46 | -0.14 | 21.55 | 0.44 | 0.16 |
| B2CUCE | | 30.10 | -3.15 | -0.96 | 18.80 | -2.31 | -0.85 |
| B9D2YU | | 30.63 | -2.62 | -0.79 | 20.61 | -0.50 | -0.18 |
| DBD24J | | 31.39 | -1.87 | -0.57 | 20.03 | -1.08 | -0.40 |
| DHBJPM | | 35.60 | 2.35 | 0.71 | 24.10 | 2.99 | 1.10 |
| DZRW2Y | | 30.84 | -2.41 | -0.73 | 19.84 | -1.27 | -0.47 |
| EYYG4M | | 39.60 | 6.35 | 1.92 | 23.60 | 2.49 | 0.92 |
| HQUGGQ | | 30.52 | -2.73 | -0.83 | 20.88 | -0.23 | -0.08 |
| K3VZP9 | | 30.20 | -3.05 | -0.92 | 19.26 | -1.85 | -0.68 |
| K6KAWN | | 32.16 | -1.10 | -0.33 | 19.25 | -1.86 | -0.69 |
| KP74MA | | 38.80 | 5.55 | 1.68 | 24.10 | 2.99 | 1.10 |
| LB6RPP | | 33.89 | 0.64 | 0.19 | 22.71 | 1.61 | 0.59 |
| NBUUAB | | 36.01 | 2.76 | 0.83 | 21.57 | 0.46 | 0.17 |
| NUVKPE | | 32.17 | -1.08 | -0.33 | 21.07 | -0.04 | -0.01 |
| NYZFAE | | 27.17 | -6.08 | -1.84 | 15.60 | -5.51 | -2.03 |
| RNQCC7 | | 31.91 | -1.35 | -0.41 | 21.19 | 0.08 | 0.03 |
| RW7T6F | | 34.83 | 1.58 | 0.48 | 23.54 | 2.43 | 0.89 |
| TXUMJV | * | 40.56 | 7.31 | 2.21 | 28.91 | 7.80 | 2.87 |
| V2Q6FE | | 30.32 | -2.93 | -0.89 | 17.89 | -3.22 | -1.19 |
| XB6N7N | | 38.10 | 4.85 | 1.47 | 25.95 | 4.84 | 1.78 |
| Z8DMX7 | | 32.60 | -0.65 | -0.20 | 18.40 | -2.71 | -1.00 |

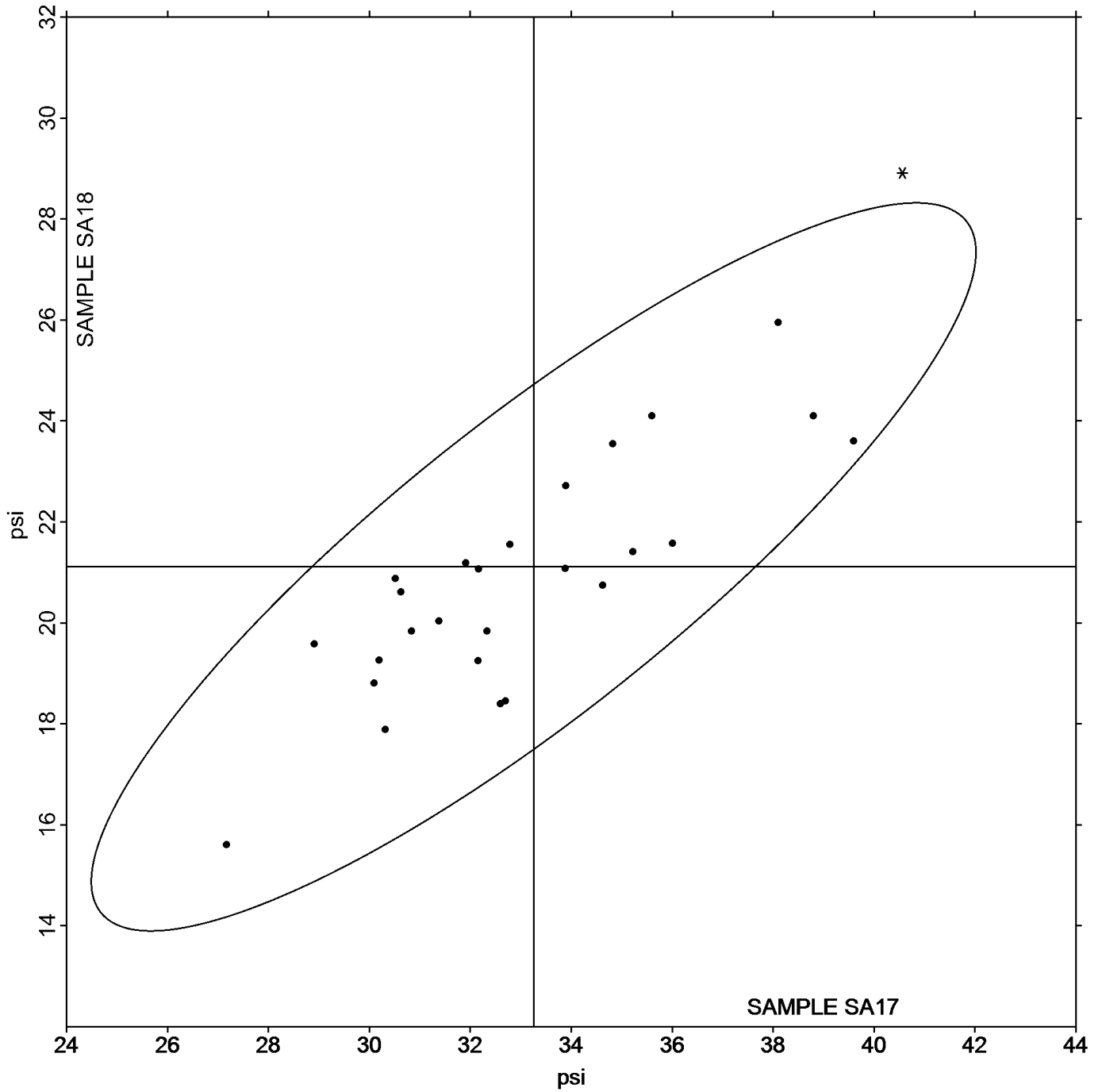
| | | Summary Statistics | |
|---|-------------|--------------------|-------------|
| | Sample SA17 | | Sample SA18 |
| Grand Means | 33.254 psi | | 21.109 psi |
| SD Btwn Labs | 3.302 psi | | 2.717 psi |
| Statistics based on 27 of 27 reporting participants | | | |

TAPPI-CTS Interlaboratory Testing Program
Analysis 305
Bursting Strength - Printing Papers

Grand Mean Sample SA17 = 33.254 psi

Grand Mean Sample SA18 = 21.109 psi

ANALYSIS 305



TAPPI-CTS Interlaboratory Testing Program
Analysis 310
Bursting Strength - Packaging Papers

| WebCode | Data Flag | Sample SB17 | | | Sample SB18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3DY4HU | | 86.36 | 1.65 | 0.33 | 48.09 | 1.05 | 0.23 |
| 3TP72J | | 80.80 | -3.91 | -0.78 | 43.40 | -3.64 | -0.78 |
| 93FV62 | | 78.25 | -6.46 | -1.29 | 43.54 | -3.50 | -0.75 |
| AAA68J | | 85.70 | 0.99 | 0.20 | 48.97 | 1.93 | 0.42 |
| ARB3CZ | | 81.16 | -3.55 | -0.71 | 44.21 | -2.83 | -0.61 |
| D3Z3GZ | | 87.94 | 3.22 | 0.64 | 53.51 | 6.47 | 1.40 |
| EJYJXH | | 81.24 | -3.48 | -0.69 | 45.08 | -1.96 | -0.42 |
| FLPZVW | | 94.62 | 9.90 | 1.98 | 55.32 | 8.28 | 1.79 |
| GLMT4P | | 78.30 | -6.41 | -1.28 | 43.39 | -3.65 | -0.79 |
| GPE27A | | 77.76 | -6.96 | -1.39 | 41.67 | -5.37 | -1.16 |
| GYP97J | X | 95.33 | 10.62 | 2.12 | 64.88 | 17.84 | 3.85 |
| HBFG4C | | 85.00 | 0.29 | 0.06 | 45.00 | -2.04 | -0.44 |
| J4CWEM | | 80.19 | -4.52 | -0.90 | 42.30 | -4.74 | -1.02 |
| JWD9Z4 | | 86.50 | 1.79 | 0.36 | 50.40 | 3.36 | 0.73 |
| LE7RPM | | 86.59 | 1.88 | 0.37 | 49.28 | 2.24 | 0.48 |
| LNBZ88 | | 95.55 | 10.84 | 2.16 | 56.70 | 9.66 | 2.08 |
| MQVBJH | | 83.56 | -1.16 | -0.23 | 41.81 | -5.22 | -1.13 |
| NAKM94 | | 80.29 | -4.42 | -0.88 | 43.57 | -3.47 | -0.75 |
| NEDPC3 | | 85.85 | 1.14 | 0.23 | 48.33 | 1.29 | 0.28 |
| NUVKPE | | 92.88 | 8.17 | 1.63 | 54.48 | 7.44 | 1.60 |
| Q876ZH | | 85.20 | 0.49 | 0.10 | 52.67 | 5.63 | 1.21 |
| V7232F | | 87.40 | 2.69 | 0.54 | 46.60 | -0.44 | -0.09 |
| WGCV72 | | 88.90 | 4.19 | 0.84 | 49.80 | 2.76 | 0.60 |
| XH7WU4 | | 82.76 | -1.95 | -0.39 | 42.77 | -4.27 | -0.92 |
| XT7LB6 | | 78.58 | -6.13 | -1.22 | 43.01 | -4.03 | -0.87 |
| ZBF826 | | 80.95 | -3.76 | -0.75 | 41.10 | -5.94 | -1.28 |
| ZX7UK6 | | 90.20 | 5.49 | 1.10 | 48.00 | 0.96 | 0.21 |

| Sample SB17 | | Summary Statistics | Sample SB18 | |
|---|------------|--------------------|-------------|------------|
| Grand Means | 84.712 psi | | | 47.038 psi |
| SD Btwn Labs | 5.011 psi | | | 4.637 psi |
| Statistics based on 26 of 27 reporting participants | | | | |

Comments on assigned Data Flags for Test #310

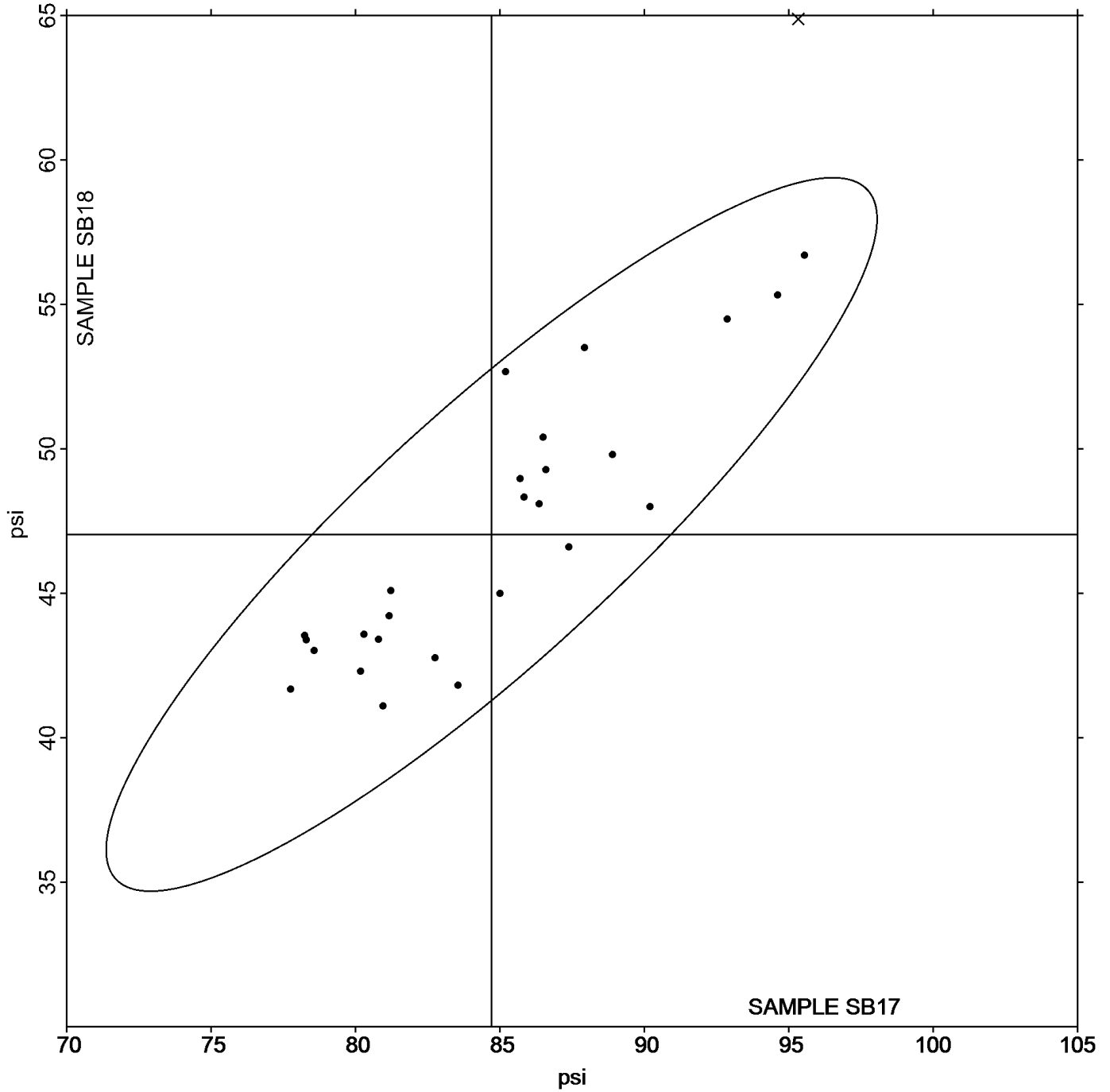
GYP97J (X) - Inconsistent in testing between samples, data for Sample SB18 are high.

TAPPI-CTS Interlaboratory Testing Program
Analysis 310
Bursting Strength - Packaging Papers

Grand Mean Sample **SB17** = 84.712 psi

Grand Mean Sample **SB18** = 47.038 psi

ANALYSIS 310



TAPPI-CTS Interlaboratory Testing Program
 Analysis 311
 Tearing Strength - Newsprint

| WebCode | Data Flag | Sample SK17 | | | Sample SK18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 34PRA4 | X | 36.65 | 10.30 | 12.58 | 37.18 | 11.05 | 13.90 |
| 3DY4HU | | 26.46 | 0.12 | 0.14 | 26.19 | 0.06 | 0.07 |
| A7QA4Q | | 25.89 | -0.45 | -0.55 | 25.23 | -0.90 | -1.13 |
| A8ND4T | | 24.80 | -1.54 | -1.89 | 25.10 | -1.03 | -1.30 |
| J98KGM | | 26.41 | 0.07 | 0.08 | 26.28 | 0.15 | 0.19 |
| PHCF3E | | 26.98 | 0.64 | 0.78 | 26.39 | 0.26 | 0.33 |
| RW7T6F | | 26.54 | 0.20 | 0.24 | 26.24 | 0.11 | 0.14 |
| XGV3YP | | 27.33 | 0.99 | 1.20 | 27.48 | 1.35 | 1.70 |

| Sample SK17 | | Summary Statistics | Sample SK18 | |
|---|--------------|--------------------|--------------|--|
| Grand Means | 26.345 Grams | | 26.130 Grams | |
| SD Btwn Labs | 0.819 Grams | | 0.795 Grams | |
| Statistics based on 7 of 8 reporting participants | | | | |

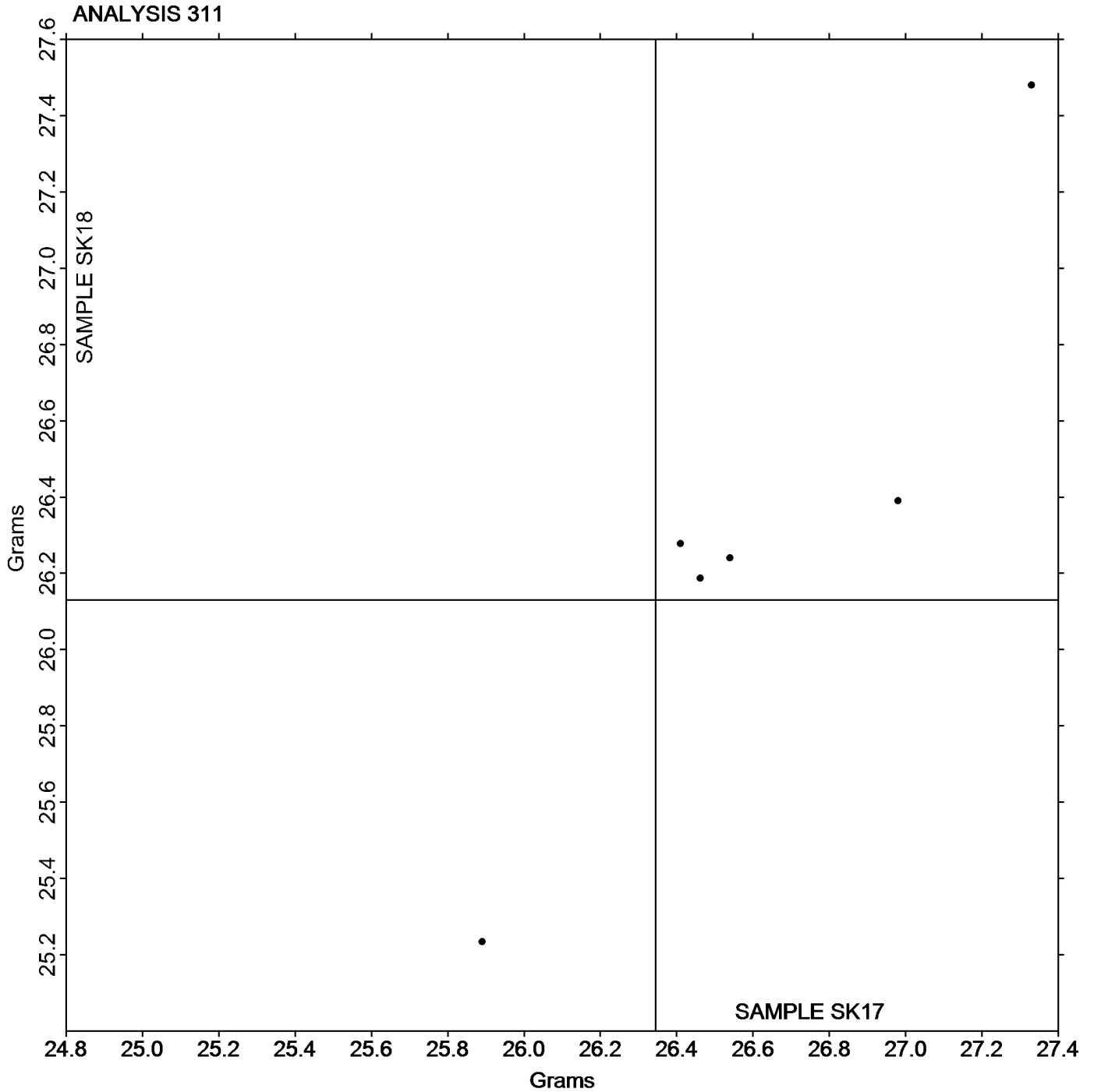
Comments on assigned Data Flags for Test #311

34PRA4 (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program
Analysis 311
Tearing Strength - Newsprint

Grand Mean Sample **SK17** = 26.345 Grams

Grand Mean Sample **SK18** = 26.130 Grams



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

TAPPI-CTS Interlaboratory Testing Program

Analysis 312

Tearing Strength - Printing Papers

| WebCode | Data Flag | Sample SC17 | | | Sample SC18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3DY4HU | | 47.82 | -1.53 | -0.37 | 65.79 | 0.18 | 0.04 |
| 3TP72J | | 44.64 | -4.71 | -1.13 | 59.51 | -6.11 | -1.35 |
| 6DAP8M | | 47.91 | -1.45 | -0.35 | 65.51 | -0.11 | -0.02 |
| 6WY3JQ | | 42.04 | -7.31 | -1.76 | 57.34 | -8.28 | -1.83 |
| 74FUR4 | | 48.99 | -0.36 | -0.09 | 67.77 | 2.15 | 0.48 |
| 7N4DK2 | | 51.81 | 2.46 | 0.59 | 69.32 | 3.70 | 0.82 |
| 7PVHYE | | 48.00 | -1.35 | -0.33 | 66.74 | 1.12 | 0.25 |
| 7TWFN2 | | 42.56 | -6.79 | -1.63 | 58.30 | -7.32 | -1.62 |
| 7WEM4N | | 49.91 | 0.56 | 0.13 | 67.35 | 1.73 | 0.38 |
| 93FV62 | | 49.41 | 0.05 | 0.01 | 63.98 | -1.64 | -0.36 |
| 9LMAFZ | | 43.29 | -6.06 | -1.46 | 59.32 | -6.30 | -1.39 |
| A87ALV | | 50.60 | 1.25 | 0.30 | 66.80 | 1.18 | 0.26 |
| ACYBPV | | 47.47 | -1.88 | -0.45 | 61.93 | -3.69 | -0.82 |
| ARB3CZ | | 48.45 | -0.91 | -0.22 | 62.62 | -2.99 | -0.66 |
| B9AQ3B | | 49.58 | 0.23 | 0.05 | 66.68 | 1.06 | 0.24 |
| B9D2YU | * | 57.76 | 8.41 | 2.02 | 70.17 | 4.55 | 1.01 |
| BRPZXW | | 51.55 | 2.20 | 0.53 | 70.91 | 5.29 | 1.17 |
| CXTY9L | | 43.94 | -5.41 | -1.30 | 58.96 | -6.66 | -1.47 |
| DBD24J | | 50.81 | 1.46 | 0.35 | 68.72 | 3.10 | 0.69 |
| DHBJPM | | 49.75 | 0.40 | 0.10 | 65.94 | 0.32 | 0.07 |
| DNGF9M | | 48.38 | -0.97 | -0.23 | 65.64 | 0.02 | 0.01 |
| DZRW2Y | | 49.84 | 0.49 | 0.12 | 65.28 | -0.34 | -0.07 |
| E6FYDN | | 51.23 | 1.88 | 0.45 | 68.30 | 2.68 | 0.59 |
| EJYJXH | | 47.72 | -1.63 | -0.39 | 63.68 | -1.94 | -0.43 |
| EYYG4M | | 49.39 | 0.04 | 0.01 | 66.98 | 1.36 | 0.30 |
| GPE27A | | 54.02 | 4.67 | 1.12 | 72.83 | 7.21 | 1.60 |
| HBFG4C | | 44.27 | -5.08 | -1.22 | 60.74 | -4.88 | -1.08 |
| HMUDEV | | 45.00 | -4.35 | -1.05 | 60.40 | -5.22 | -1.15 |
| HQUGGQ | | 52.32 | 2.97 | 0.71 | 69.44 | 3.82 | 0.85 |
| HTWETJ | | 39.64 | -9.71 | -2.34 | 58.00 | -7.62 | -1.69 |
| HVMKBU | | 50.22 | 0.87 | 0.21 | 65.50 | -0.12 | -0.03 |
| K3VZP9 | | 50.85 | 1.50 | 0.36 | 68.20 | 2.58 | 0.57 |
| K6KAWN | | 50.31 | 0.95 | 0.23 | 66.87 | 1.25 | 0.28 |
| KRVB7L | | 59.20 | 9.85 | 2.37 | 74.24 | 8.62 | 1.91 |
| LE7RPM | | 47.46 | -1.89 | -0.46 | 63.83 | -1.79 | -0.40 |
| MP44KF | | 55.02 | 5.67 | 1.36 | 74.78 | 9.16 | 2.03 |
| MQVBJH | | 49.85 | 0.50 | 0.12 | 64.42 | -1.20 | -0.27 |
| NAKM94 | | 50.41 | 1.06 | 0.26 | 69.28 | 3.66 | 0.81 |
| NBUUAB | | 49.20 | -0.15 | -0.04 | 67.00 | 1.38 | 0.31 |
| NUVKPE | | 52.70 | 3.35 | 0.80 | 70.20 | 4.58 | 1.01 |
| NYZFAE | | 55.00 | 5.65 | 1.36 | 66.60 | 0.98 | 0.22 |
| P3Z2KG | | 51.60 | 2.25 | 0.54 | 69.00 | 3.38 | 0.75 |
| RNQCC7 | | 51.46 | 2.10 | 0.51 | 69.07 | 3.45 | 0.76 |

TAPPI-CTS Interlaboratory Testing Program
Analysis 312
Tearing Strength - Printing Papers

| WebCode | Data Flag | Sample SC17 | | | Sample SC18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| U8XAT8 | | 46.00 | -3.35 | -0.81 | 62.20 | -3.42 | -0.76 |
| V2Q6FE | | 53.32 | 3.97 | 0.95 | 72.61 | 6.99 | 1.55 |
| VU9LCE | | 45.81 | -3.54 | -0.85 | 63.98 | -1.64 | -0.36 |
| W7W79V | * | 46.80 | -2.55 | -0.61 | 56.90 | -8.72 | -1.93 |
| WJNKF6 | X | 76.60 | 27.25 | 6.55 | 90.80 | 25.18 | 5.58 |
| WRYUX7 | X | 49.08 | -0.27 | -0.07 | 56.42 | -9.20 | -2.04 |
| XB6N7N | | 43.56 | -5.79 | -1.39 | 57.40 | -8.22 | -1.82 |
| XH7WU4 | | 51.50 | 2.14 | 0.52 | 68.88 | 3.27 | 0.72 |
| XNQZGD | * | 58.58 | 9.23 | 2.22 | 69.59 | 3.97 | 0.88 |
| XT7LB6 | | 46.00 | -3.35 | -0.81 | 59.84 | -5.78 | -1.28 |
| YD8YK4 | | 45.98 | -3.37 | -0.81 | 62.92 | -2.70 | -0.60 |
| ZX7UK6 | | 56.80 | 7.45 | 1.79 | 69.40 | 3.78 | 0.84 |

| Sample SC17 | | Summary Statistics | Sample SC18 | |
|---|--------------|--------------------|--------------|--|
| Grand Means | 49.353 Grams | | 65.616 Grams | |
| SD Btwn Labs | 4.159 Grams | | 4.517 Grams | |
| Statistics based on 53 of 55 reporting participants | | | | |

Comments on assigned Data Flags for Test #312

WJNKF6 (X) - Extreme data.

WRYUX7 (X) - Inconsistent in testing between samples.

TAPPI-CTS Interlaboratory Testing Program

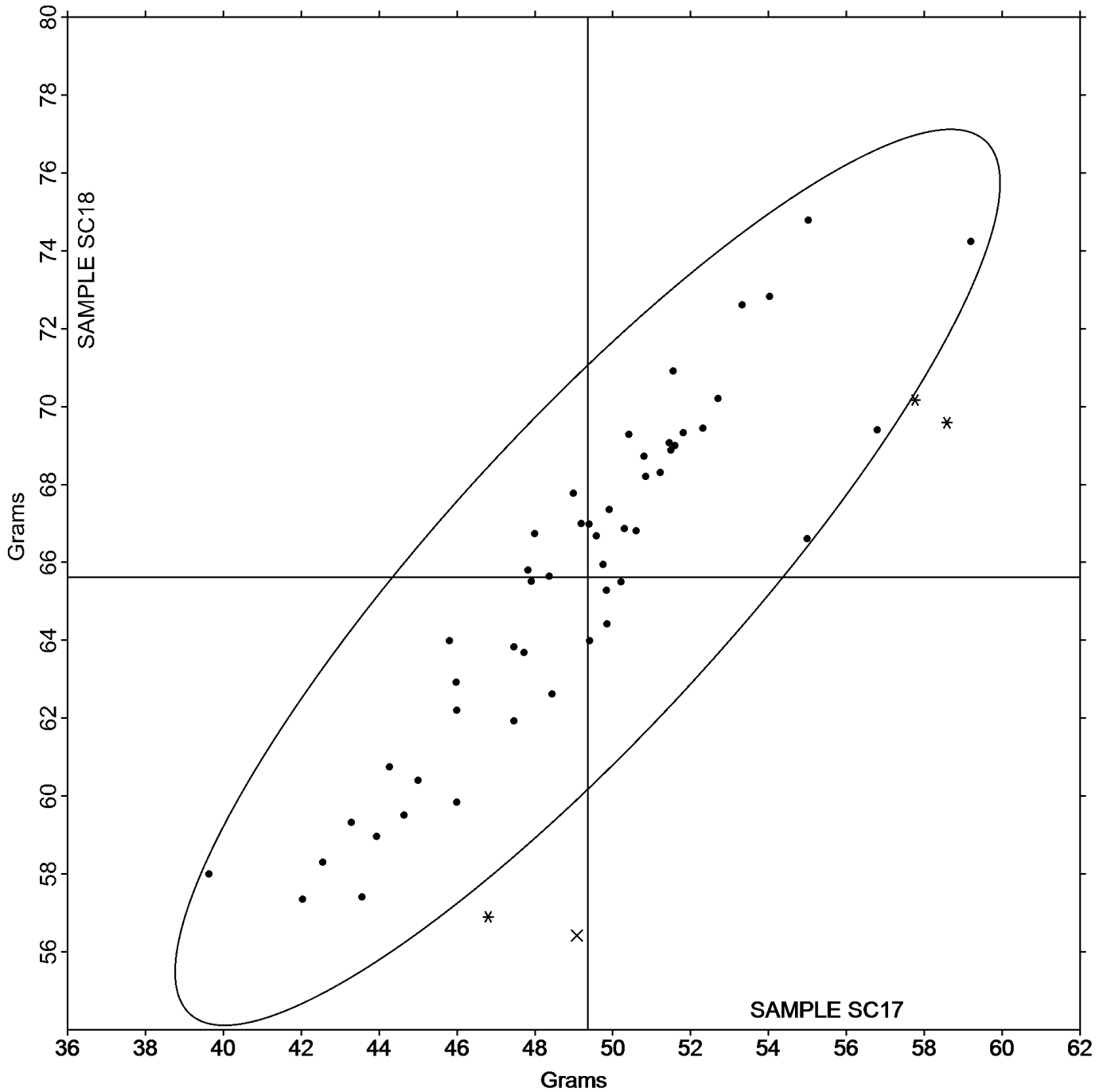
Analysis 312

Tearing Strength - Printing Papers

Grand Mean Sample **SC17** = 49.353 Grams

Grand Mean Sample **SC18** = 65.616 Grams

ANALYSIS 312



TAPPI-CTS Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

| WebCode | Data Flag | Sample SD17 | | | Sample SD18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 2BUDFL | | 131.4 | -13.0 | -1.34 | 143.3 | -16.8 | -1.34 |
| 3DY4HU | | 146.5 | 2.0 | 0.21 | 166.9 | 6.8 | 0.54 |
| 4JK9Y3 | | 134.4 | -10.1 | -1.04 | 146.4 | -13.7 | -1.09 |
| 4KVBLZ | | 146.4 | 1.9 | 0.20 | 155.5 | -4.6 | -0.37 |
| 4NQC GN | | 133.0 | -11.4 | -1.18 | 146.2 | -13.9 | -1.10 |
| 4TMVHL | | 129.0 | -15.4 | -1.59 | 139.2 | -20.9 | -1.66 |
| 6JX8LX | * | 146.1 | 1.6 | 0.17 | 147.1 | -13.0 | -1.04 |
| 6JXAB3 | X | 138.0 | -6.5 | -0.67 | 150.7 | -9.4 | -0.75 |
| A7QA4Q | | 140.4 | -4.0 | -0.42 | 158.1 | -2.0 | -0.16 |
| B2CUCE | | 134.8 | -9.7 | -1.00 | 148.4 | -11.7 | -0.93 |
| BHXK9T | | 134.6 | -9.9 | -1.02 | 146.7 | -13.4 | -1.07 |
| BPYP84 | | 156.8 | 12.3 | 1.27 | 176.8 | 16.7 | 1.33 |
| CLGUXJ | | 143.3 | -1.2 | -0.12 | 158.1 | -2.0 | -0.16 |
| D3Z3GZ | * | 142.4 | -2.1 | -0.22 | 171.8 | 11.7 | 0.93 |
| DQ7LRY | | 137.4 | -7.0 | -0.72 | 153.3 | -6.8 | -0.54 |
| EYYG4M | | 144.8 | 0.4 | 0.04 | 161.2 | 1.1 | 0.09 |
| FCZABQ | | 142.1 | -2.4 | -0.25 | 152.4 | -7.7 | -0.62 |
| G8JBAG | | 146.9 | 2.5 | 0.25 | 162.2 | 2.1 | 0.17 |
| GBJLBV | | 138.2 | -6.3 | -0.65 | 153.7 | -6.4 | -0.51 |
| GLMT4P | | 140.8 | -3.7 | -0.38 | 151.2 | -8.9 | -0.71 |
| GXTQ4H | | 148.6 | 4.1 | 0.42 | 167.0 | 6.9 | 0.55 |
| GYP97J | | 164.5 | 20.1 | 2.07 | 181.6 | 21.5 | 1.71 |
| HKNTQV | | 136.0 | -8.5 | -0.87 | 149.6 | -10.5 | -0.84 |
| J4CWEM | | 143.2 | -1.3 | -0.13 | 161.2 | 1.1 | 0.09 |
| JWD9Z4 | | 127.2 | -17.3 | -1.78 | 133.2 | -26.9 | -2.14 |
| KLM9KH | | 150.0 | 5.5 | 0.57 | 172.0 | 11.9 | 0.95 |
| L92W7M | | 148.8 | 4.3 | 0.44 | 166.5 | 6.4 | 0.51 |
| LNBZ88 | | 139.2 | -5.3 | -0.54 | 149.6 | -10.5 | -0.84 |
| N3626Q | | 147.9 | 3.4 | 0.35 | 171.7 | 11.6 | 0.92 |
| NEDPC3 | | 159.9 | 15.5 | 1.59 | 181.1 | 21.0 | 1.67 |
| NUDN7R | | 156.5 | 12.1 | 1.25 | 174.0 | 13.9 | 1.11 |
| P2QUHN | | 159.0 | 14.5 | 1.49 | 172.0 | 11.9 | 0.94 |
| PWTHDC | | 153.3 | 8.8 | 0.91 | 165.1 | 5.0 | 0.40 |
| Q876ZH | | 137.1 | -7.4 | -0.76 | 152.2 | -7.9 | -0.63 |
| RLPZYE | | 153.6 | 9.1 | 0.94 | 173.5 | 13.4 | 1.07 |
| TXUMJV | | 135.2 | -9.3 | -0.96 | 153.6 | -6.5 | -0.52 |
| V7232F | X | 138.0 | -6.5 | -0.67 | 158.7 | -1.4 | -0.11 |
| VNKVBD | | 148.9 | 4.5 | 0.46 | 162.8 | 2.7 | 0.22 |
| YQEWHC | X | 131.8 | -12.7 | -1.31 | 137.7 | -22.4 | -1.79 |
| YQVBNZ | | 168.3 | 23.8 | 2.46 | 186.0 | 25.9 | 2.07 |
| Z8DMX7 | | 137.6 | -6.9 | -0.71 | 161.1 | 1.0 | 0.08 |
| ZBF826 | | 150.2 | 5.7 | 0.59 | 171.8 | 11.7 | 0.93 |
| ZX7UK6 | X | 151.2 | 6.7 | 0.69 | 172.4 | 12.3 | 0.98 |

TAPPI-CTS Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

| | Sample SD17 | Summary Statistics | Sample SD18 |
|---|--------------|--------------------|--------------|
| Grand Means | 144.47 Grams | | 160.10 Grams |
| SD Btwn Labs | 9.70 Grams | | 12.54 Grams |
| Statistics based on 39 of 43 reporting participants | | | |

Comments on assigned Data Flags for Test #314

6JXAB3 (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).

V7232F (X) - Data appear to be off by a factor of 2; data converted by CTS (x0.5).

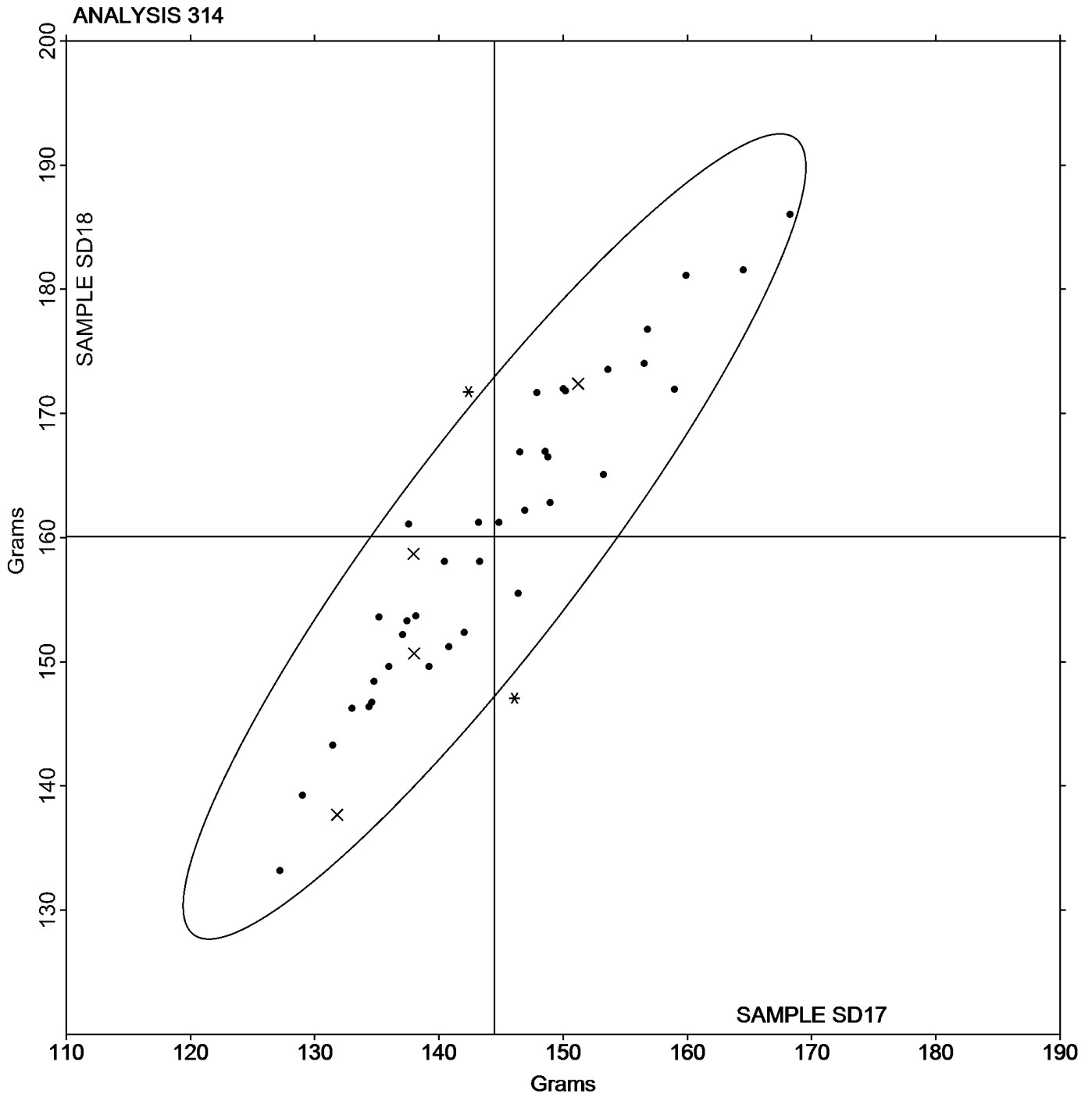
YQEWHC (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).

ZX7UK6 (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).

TAPPI-CTS Interlaboratory Testing Program
Analysis 314
Tearing Strength - Packaging Papers

Grand Mean Sample **SD17** = 144.47 Grams

Grand Mean Sample **SD18** = 160.10 Grams



TAPPI-CTS Interlaboratory Testing Program
Analysis 320
Tensile Breaking Strength - Newsprint

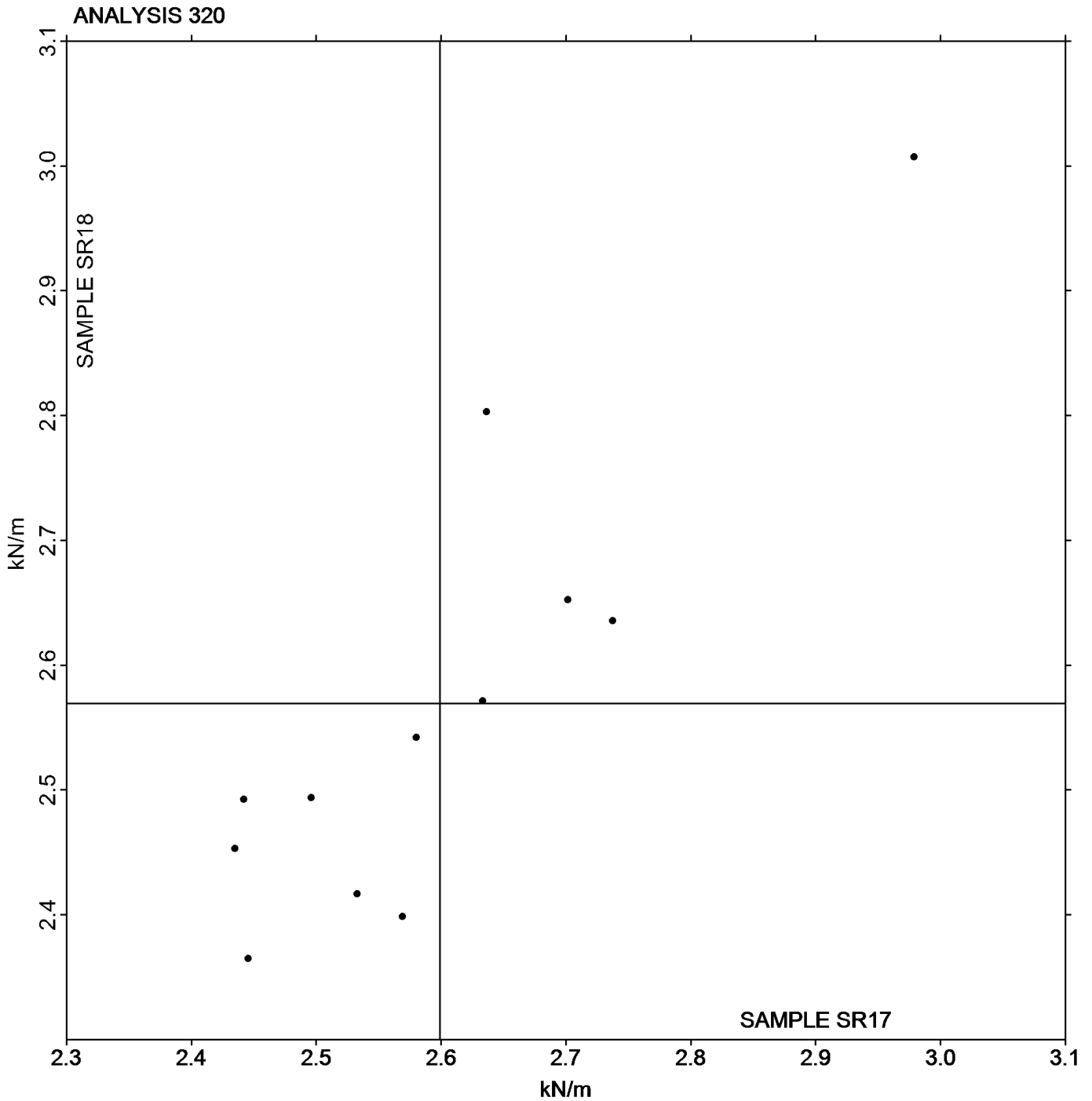
| WebCode | Data Flag | Sample SR17 | | | Sample SR18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 34PRA4 | | 2.633 | 0.034 | 0.22 | 2.571 | 0.002 | 0.01 |
| 93FV62 | | 2.435 | -0.164 | -1.05 | 2.453 | -0.116 | -0.63 |
| A7QA4Q | | 2.637 | 0.038 | 0.24 | 2.803 | 0.234 | 1.26 |
| A8ND4T | | 2.533 | -0.066 | -0.43 | 2.417 | -0.153 | -0.82 |
| J98KGM | | 2.442 | -0.157 | -1.01 | 2.493 | -0.077 | -0.41 |
| LB6RPP | | 2.496 | -0.103 | -0.66 | 2.494 | -0.076 | -0.41 |
| N96NQY | | 2.446 | -0.153 | -0.98 | 2.365 | -0.204 | -1.10 |
| NBUUAB | | 2.569 | -0.030 | -0.19 | 2.399 | -0.171 | -0.92 |
| PHCF3E | | 2.580 | -0.019 | -0.12 | 2.542 | -0.027 | -0.15 |
| QUKPY4 | | 2.979 | 0.380 | 2.43 | 3.007 | 0.438 | 2.36 |
| RW7T6F | | 2.701 | 0.102 | 0.66 | 2.652 | 0.083 | 0.45 |
| WGCV72 | | 2.737 | 0.138 | 0.89 | 2.636 | 0.066 | 0.36 |

| | | Summary Statistics | | | |
|---|--|--------------------|--|-------------|--|
| | | Sample SR17 | | Sample SR18 | |
| Grand Means | | 2.5990 kN/m | | 2.5693 kN/m | |
| SD Btwn Labs | | 0.1561 kN/m | | 0.1852 kN/m | |
| Statistics based on 12 of 12 reporting participants | | | | | |

TAPPI-CTS Interlaboratory Testing Program
Analysis 320
Tensile Breaking Strength - Newsprint

Grand Mean Sample **SR17** = 2.5990 kN/m

Grand Mean Sample **SR18** = 2.5693 kN/m



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 321
Tensile Energy Absorption - Newsprint

| WebCode | Data Flag | Sample SR17 | | | Sample SR18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 34PRA4 | | 19.00 | -1.01 | -0.40 | 14.99 | -1.64 | -0.66 |
| 93FV62 | | 17.49 | -2.53 | -1.00 | 14.85 | -1.77 | -0.71 |
| A7QA4Q | | 19.45 | -0.56 | -0.22 | 19.12 | 2.49 | 1.00 |
| A8ND4T | | 21.94 | 1.92 | 0.76 | 18.12 | 1.50 | 0.60 |
| J98KGM | | 17.76 | -2.26 | -0.89 | 14.48 | -2.14 | -0.86 |
| LB6RPP | | 18.77 | -1.24 | -0.49 | 15.46 | -1.17 | -0.47 |
| N96NQY | | 23.01 | 3.00 | 1.19 | 17.03 | 0.41 | 0.16 |
| NBUUAB | | 18.96 | -1.06 | -0.42 | 14.52 | -2.10 | -0.85 |
| PHCF3E | | 21.24 | 1.23 | 0.49 | 18.50 | 1.87 | 0.75 |
| QUKPY4 | | 24.27 | 4.25 | 1.68 | 21.06 | 4.43 | 1.78 |
| RW7T6F | | 22.37 | 2.36 | 0.93 | 18.72 | 2.09 | 0.84 |
| WGCV72 | | 15.91 | -4.10 | -1.62 | 12.66 | -3.96 | -1.59 |

| | | Summary Statistics | |
|---|--------------------|--------------------|--------------------|
| | Sample SR17 | | Sample SR18 |
| Grand Means | 20.014 Joules/sq m | | 16.626 Joules/sq m |
| SD Btwn Labs | 2.525 Joules/sq m | | 2.488 Joules/sq m |
| Statistics based on 12 of 12 reporting participants | | | |

TAPPI-CTS Interlaboratory Testing Program

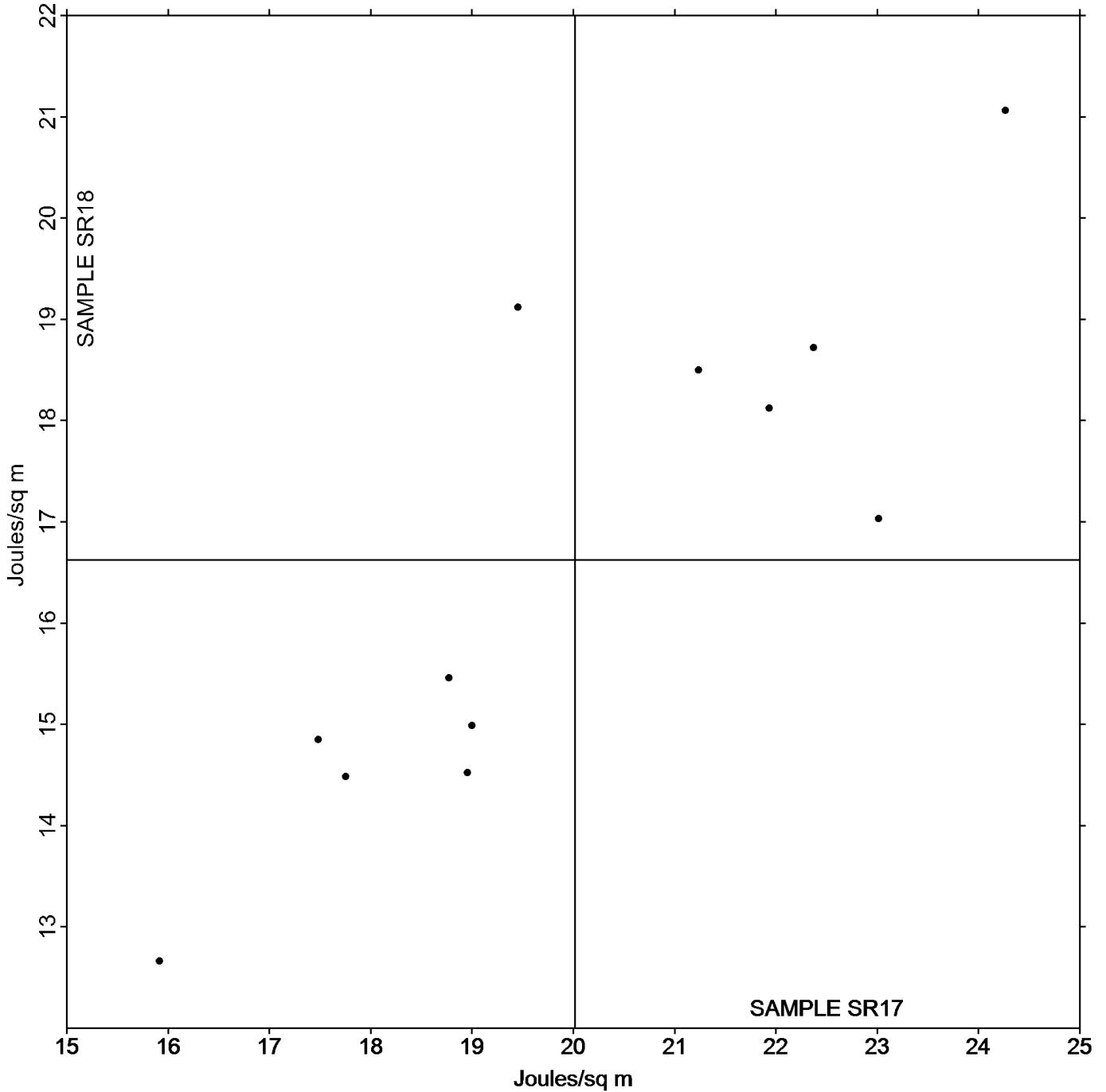
Analysis 321

Tensile Energy Absorption - Newsprint

Grand Mean Sample **SR17** = 20.014 Joules/sq m

Grand Mean Sample **SR18** = 16.626 Joules/sq m

ANALYSIS 321



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

TAPPI-CTS Interlaboratory Testing Program
 Analysis 322
 Elongation to Break - Newsprint

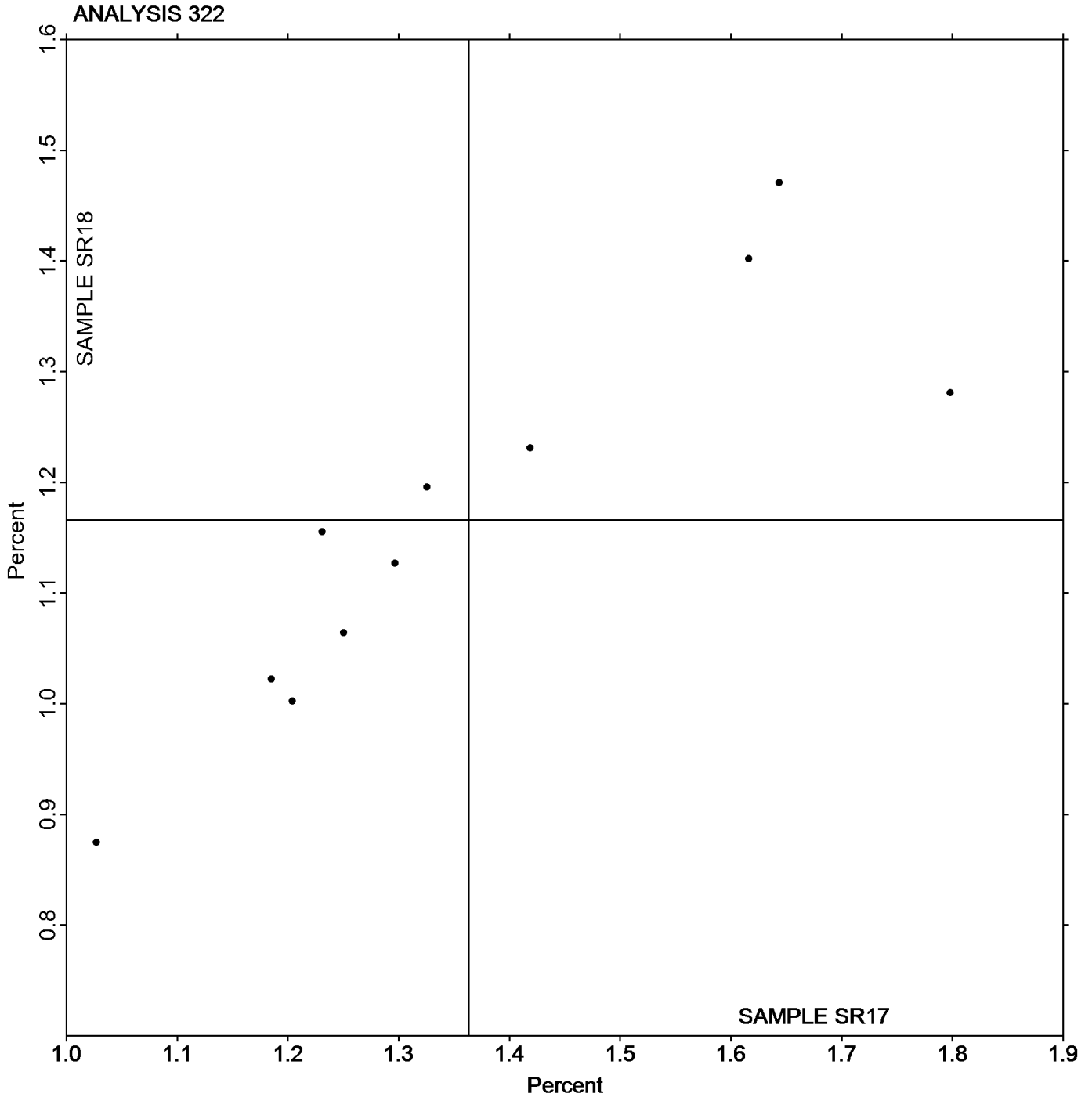
| WebCode | Data Flag | Sample SR17 | | | Sample SR18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 34PRA4 | | 1.204 | -0.159 | -0.69 | 1.002 | -0.164 | -0.93 |
| 93FV62 | | 1.185 | -0.178 | -0.77 | 1.022 | -0.144 | -0.82 |
| A7QA4Q | | 1.231 | -0.132 | -0.57 | 1.155 | -0.011 | -0.06 |
| A8ND4T | | 1.644 | 0.280 | 1.21 | 1.471 | 0.305 | 1.73 |
| LB6RPP | | 1.251 | -0.113 | -0.48 | 1.064 | -0.102 | -0.58 |
| N96NQY | | 1.798 | 0.435 | 1.87 | 1.281 | 0.115 | 0.65 |
| NBUUAB | | 1.419 | 0.056 | 0.24 | 1.231 | 0.065 | 0.37 |
| PHCF3E | | 1.326 | -0.038 | -0.16 | 1.196 | 0.030 | 0.17 |
| QUKPY4 | | 1.297 | -0.066 | -0.29 | 1.127 | -0.039 | -0.22 |
| RW7T6F | | 1.616 | 0.253 | 1.09 | 1.402 | 0.236 | 1.34 |
| WGCV72 | | 1.027 | -0.336 | -1.45 | 0.875 | -0.291 | -1.65 |

| | | Summary Statistics | |
|---|----------------|--------------------|----------------|
| | Sample SR17 | | Sample SR18 |
| Grand Means | 1.3634 Percent | | 1.1659 Percent |
| SD Btwn Labs | 0.2325 Percent | | 0.1765 Percent |
| Statistics based on 11 of 11 reporting participants | | | |

TAPPI-CTS Interlaboratory Testing Program
Analysis 322
Elongation to Break - Newsprint

Grand Mean Sample **SR17** = 1.3634 Percent

Grand Mean Sample **SR18** = 1.1659 Percent



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers

| WebCode | Data Flag | Sample SF17 | | | Sample SF18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 3DY4HU | | 4.857 | 0.039 | 0.12 | 4.086 | 0.019 | 0.07 | LH |
| 3YDTU4 | | 5.325 | 0.507 | 1.58 | 4.518 | 0.451 | 1.57 | TJ |
| 6GAXDH | | 4.714 | -0.104 | -0.33 | 4.079 | 0.011 | 0.04 | TP |
| 6WY3JQ | | 5.450 | 0.632 | 1.97 | 4.566 | 0.498 | 1.74 | LH |
| 74FUR4 | | 4.761 | -0.058 | -0.18 | 4.005 | -0.062 | -0.22 | IM |
| 7N4DK2 | | 4.848 | 0.030 | 0.09 | 4.059 | -0.009 | -0.03 | LH |
| 7PVHYE | | 4.851 | 0.032 | 0.10 | 4.128 | 0.060 | 0.21 | TI |
| 7TWFN2 | | 4.887 | 0.069 | 0.21 | 4.180 | 0.113 | 0.39 | LF |
| 7WEM4N | | 4.856 | 0.037 | 0.12 | 4.038 | -0.029 | -0.10 | LX |
| 93FV62 | | 4.546 | -0.273 | -0.85 | 3.811 | -0.256 | -0.89 | LH |
| 9LMAFZ | | 5.351 | 0.533 | 1.66 | 4.600 | 0.533 | 1.86 | LX |
| 9QZNME | | 5.505 | 0.687 | 2.15 | 4.656 | 0.589 | 2.05 | XX |
| ACYBPV | | 4.753 | -0.066 | -0.20 | 3.877 | -0.190 | -0.66 | XX |
| ARB3CZ | | 4.732 | -0.087 | -0.27 | 3.931 | -0.137 | -0.48 | XX |
| B9AQ3B | | 4.902 | 0.084 | 0.26 | 4.088 | 0.020 | 0.07 | MR |
| B9D2YU | | 4.550 | -0.269 | -0.84 | 3.925 | -0.142 | -0.50 | LA |
| BRPZXW | | 4.321 | -0.498 | -1.55 | 3.496 | -0.571 | -1.99 | IM |
| CXTY9L | | 5.512 | 0.694 | 2.17 | 4.655 | 0.588 | 2.05 | TB |
| DBD24J | | 4.609 | -0.210 | -0.65 | 3.947 | -0.120 | -0.42 | LI |
| DHBJPM | | 4.962 | 0.144 | 0.45 | 4.193 | 0.126 | 0.44 | LH |
| DNGF9M | | 4.747 | -0.072 | -0.22 | 4.124 | 0.057 | 0.20 | LE |
| DZRW2Y | | 4.515 | -0.304 | -0.95 | 3.829 | -0.238 | -0.83 | TB |
| E6FYDN | * | 4.029 | -0.789 | -2.47 | 3.330 | -0.737 | -2.57 | TP |
| GLMT4P | | 4.830 | 0.011 | 0.04 | 4.067 | 0.000 | 0.00 | IM |
| GPE27A | | 4.654 | -0.165 | -0.51 | 4.131 | 0.064 | 0.22 | LI |
| HBFG4C | | 4.992 | 0.174 | 0.54 | 4.189 | 0.122 | 0.43 | TP |
| HEC7M6 | | 4.851 | 0.032 | 0.10 | 4.005 | -0.062 | -0.22 | IN |
| HQUGGQ | X | 4.235 | -0.584 | -1.82 | 3.197 | -0.870 | -3.03 | ID |
| HTWETJ | X | 3.458 | -1.361 | -4.25 | 4.682 | 0.615 | 2.14 | TJ |
| J33QEE | | 4.696 | -0.123 | -0.38 | 3.919 | -0.148 | -0.52 | LH |
| K3VZP9 | | 4.487 | -0.332 | -1.04 | 3.723 | -0.344 | -1.20 | TO |
| K6KAWN | | 4.973 | 0.155 | 0.48 | 4.349 | 0.282 | 0.98 | LH |
| MP44KF | | 4.892 | 0.074 | 0.23 | 4.117 | 0.050 | 0.17 | LH |
| MQVBJH | | 4.879 | 0.061 | 0.19 | 4.076 | 0.009 | 0.03 | LH |
| NAKM94 | | 4.654 | -0.165 | -0.51 | 3.921 | -0.146 | -0.51 | LI |
| NUVKPE | | 4.577 | -0.242 | -0.75 | 4.007 | -0.060 | -0.21 | DL |
| P3Z2KG | | 4.812 | -0.007 | -0.02 | 3.877 | -0.190 | -0.66 | TC |
| QUKMAY | | 5.001 | 0.183 | 0.57 | 4.266 | 0.198 | 0.69 | LX |
| RNQCC7 | | 4.682 | -0.137 | -0.43 | 4.011 | -0.056 | -0.20 | LH |
| T4YH3V | X | 5.826 | 1.008 | 3.15 | 4.716 | 0.649 | 2.26 | LA |
| U8XAT8 | | 4.930 | 0.112 | 0.35 | 4.089 | 0.021 | 0.07 | TO |
| V2Q6FE | | 4.434 | -0.384 | -1.20 | 3.591 | -0.476 | -1.66 | LH |
| VBD496 | | 4.714 | -0.104 | -0.33 | 3.969 | -0.099 | -0.34 | TB |

TAPPI-CTS Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers

| WebCode | Data Flag | Sample SF17 | | | Sample SF18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| VU9LCE | | 4.854 | 0.035 | 0.11 | 4.062 | -0.005 | -0.02 | LI |
| W7W79V | | 4.655 | -0.164 | -0.51 | 4.008 | -0.060 | -0.21 | TB |
| WRYUX7 | | 4.478 | -0.340 | -1.06 | 3.975 | -0.092 | -0.32 | TF |
| XB6N7N | | 5.117 | 0.299 | 0.93 | 4.193 | 0.125 | 0.44 | TO |
| XNQZGD | | 4.214 | -0.604 | -1.89 | 3.564 | -0.504 | -1.76 | SP |
| XT7LB6 | | 5.035 | 0.217 | 0.68 | 4.310 | 0.242 | 0.85 | TA |
| YD8YK4 | | 5.474 | 0.656 | 2.05 | 4.623 | 0.556 | 1.94 | LA |

| Sample SF17 | | Summary Statistics | Sample SF18 | |
|---|-------------|--------------------|-------------|--|
| Grand Means | 4.8186 kN/m | | 4.0672 kN/m | |
| SD Btwn Labs | 0.3201 kN/m | | 0.2868 kN/m | |
| Statistics based on 47 of 50 reporting participants | | | | |

Comments on assigned Data Flags for Test #325

- HQUGGQ (X) - Inconsistent in testing between samples, data for Sample SF18 are low.
- HTWETJ (X) - Inconsistent in testing between samples, data for Sample SF17 are low.
- T4YH3V (X) - Inconsistent in testing between samples, data for Sample SF17 are high.

Instrument Code List

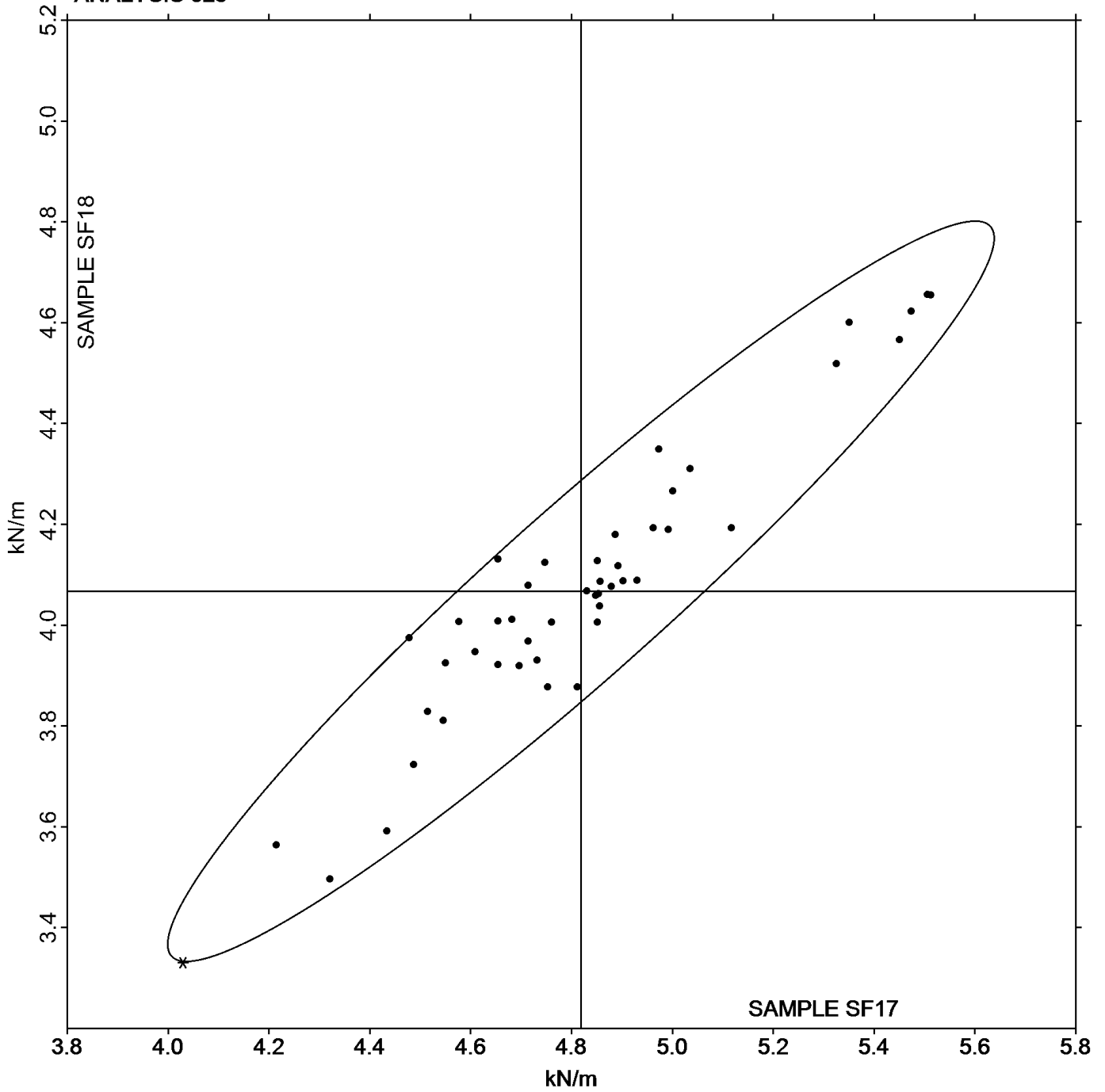
- | | |
|---|--|
| (DL) - EMIC DL500 Universal Testing Machines | (ID) - Instron 4201/4202 |
| (IM) - Instron 5500 Series | (IN) - Instron 3340 series |
| (LA) - L & W Tensile - Autoline 300 | (LE) - L & W Tensile Tester 066 |
| (LF) - L & W Tensile/Fracture Toughness Tester SE 064 | (LH) - L & W Alwetron TH1 (Horizontal) SE 060/065F |
| (LI) - L & W Tensile Tester SE 062 | (LX) - L & W (model not specified) |
| (MR) - MTS Alliance RT series | (SP) - Schopper Type Tensile Tester (TMI) |
| (TA) - Testometric AX | (TB) - Thwing-Albert EJA/1000 |
| (TC) - Thwing-Albert Electro-Hydraulic, Model 30LT | (TF) - Thwing-Albert EJA Vantage-1 |
| (TI) - Thwing-Albert QC II | (TJ) - Thwing-Albert QC II-XS |
| (TO) - Thwing-Albert QC-1000 | (TP) - TMI Monitor/Tensile 100 (84-21-01) |
| (XX) - Instrument make/model not specified by lab | |

TAPPI-CTS Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers

Grand Mean Sample **SF17** = 4.8186 kN/m

Grand Mean Sample **SF18** = 4.0672 kN/m

ANALYSIS 325



TAPPI-CTS Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers

| WebCode | Data Flag | Sample SF17 | | | Sample SF18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 3DY4HU | | 65.78 | -1.14 | -0.16 | 31.00 | -0.85 | -0.22 | LH |
| 3YDTU4 | | 80.50 | 13.57 | 1.90 | 37.10 | 5.24 | 1.37 | TJ |
| 6WY3JQ | | 70.68 | 3.75 | 0.52 | 31.50 | -0.36 | -0.09 | LH |
| 74FUR4 | | 78.33 | 11.41 | 1.59 | 36.94 | 5.08 | 1.33 | IM |
| 7N4DK2 | | 68.58 | 1.65 | 0.23 | 33.34 | 1.48 | 0.39 | LH |
| 7PVHYE | | 70.20 | 3.27 | 0.46 | 33.13 | 1.27 | 0.33 | TI |
| 7TWFN2 | | 55.09 | -11.84 | -1.65 | 26.63 | -5.22 | -1.37 | LW |
| 7WEM4N | | 62.55 | -4.38 | -0.61 | 28.40 | -3.46 | -0.91 | LX |
| 93FV62 | | 63.77 | -3.16 | -0.44 | 28.58 | -3.28 | -0.86 | LH |
| 9LMAFZ | | 65.22 | -1.71 | -0.24 | 28.72 | -3.14 | -0.82 | LX |
| ARB3CZ | | 69.32 | 2.39 | 0.33 | 32.30 | 0.44 | 0.12 | XX |
| B9AQ3B | | 65.34 | -1.59 | -0.22 | 30.43 | -1.43 | -0.38 | MR |
| B9D2YU | | 52.74 | -14.19 | -1.98 | 27.73 | -4.13 | -1.08 | LA |
| BRPZXW | | 61.43 | -5.50 | -0.77 | 28.21 | -3.65 | -0.96 | IM |
| CXTY9L | | 72.87 | 5.94 | 0.83 | 34.40 | 2.54 | 0.67 | TB |
| DBD24J | | 65.23 | -1.70 | -0.24 | 32.25 | 0.39 | 0.10 | LI |
| DHBJPM | | 65.70 | -1.23 | -0.17 | 30.71 | -1.15 | -0.30 | LH |
| DZRW2Y | | 68.63 | 1.70 | 0.24 | 32.96 | 1.10 | 0.29 | TB |
| E6FYDN | X | 33.86 | -33.07 | -4.62 | 20.66 | -11.19 | -2.94 | TP |
| GLMT4P | | 69.48 | 2.55 | 0.36 | 31.80 | -0.06 | -0.02 | IM |
| GPE27A | | 65.00 | -1.93 | -0.27 | 34.53 | 2.67 | 0.70 | LI |
| HBFG4C | * | 47.96 | -18.97 | -2.65 | 22.14 | -9.72 | -2.55 | TP |
| HQUGGQ | X | 62.26 | -4.67 | -0.65 | 21.14 | -10.72 | -2.81 | ID |
| J33QEE | | 67.67 | 0.74 | 0.10 | 32.54 | 0.69 | 0.18 | LH |
| K6KAWN | * | 68.92 | 1.99 | 0.28 | 37.38 | 5.52 | 1.45 | LH |
| MP44KF | | 59.19 | -7.74 | -1.08 | 28.30 | -3.56 | -0.93 | LH |
| MQVBJH | | 69.14 | 2.21 | 0.31 | 34.61 | 2.75 | 0.72 | LH |
| NAKM94 | | 64.22 | -2.70 | -0.38 | 29.89 | -1.96 | -0.52 | LI |
| NUVKPE | | 73.14 | 6.21 | 0.87 | 36.38 | 4.52 | 1.19 | DL |
| QUKMAY | | 73.44 | 6.51 | 0.91 | 37.59 | 5.73 | 1.50 | LX |
| RNQCC7 | | 59.69 | -7.23 | -1.01 | 28.88 | -2.98 | -0.78 | LH |
| U8XAT8 | | 60.51 | -6.42 | -0.90 | 27.91 | -3.95 | -1.04 | TO |
| V2Q6FE | | 68.40 | 1.47 | 0.21 | 30.80 | -1.05 | -0.28 | LH |
| VBD496 | | 67.52 | 0.59 | 0.08 | 30.39 | -1.47 | -0.39 | TB |
| VU9LCE | | 67.80 | 0.87 | 0.12 | 30.19 | -1.67 | -0.44 | LI |
| XB6N7N | | 82.16 | 15.23 | 2.13 | 39.26 | 7.40 | 1.94 | TO |
| YD8YK4 | | 76.31 | 9.38 | 1.31 | 38.14 | 6.28 | 1.65 | LA |

TAPPI-CTS Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers

| | Summary Statistics | |
|---|--------------------|--------------------|
| | Sample SF17 | Sample SF18 |
| Grand Means | 66.929 Joules/sq m | 31.858 Joules/sq m |
| SD Btwn Labs | 7.158 Joules/sq m | 3.812 Joules/sq m |
| Statistics based on 35 of 37 reporting participants | | |

Comments on assigned Data Flags for Test #327

E6FYDN (X) - Data for both samples are low.

HQUGGQ (X) - Data for Sample SF18 are low.

Analysis Notes:

3YDTU4 - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

VBD496 - Data appear to be reported as kg-m/sq m, not J/sq m as indicated on datasheet. Units corrected by CTS.

Instrument Code List

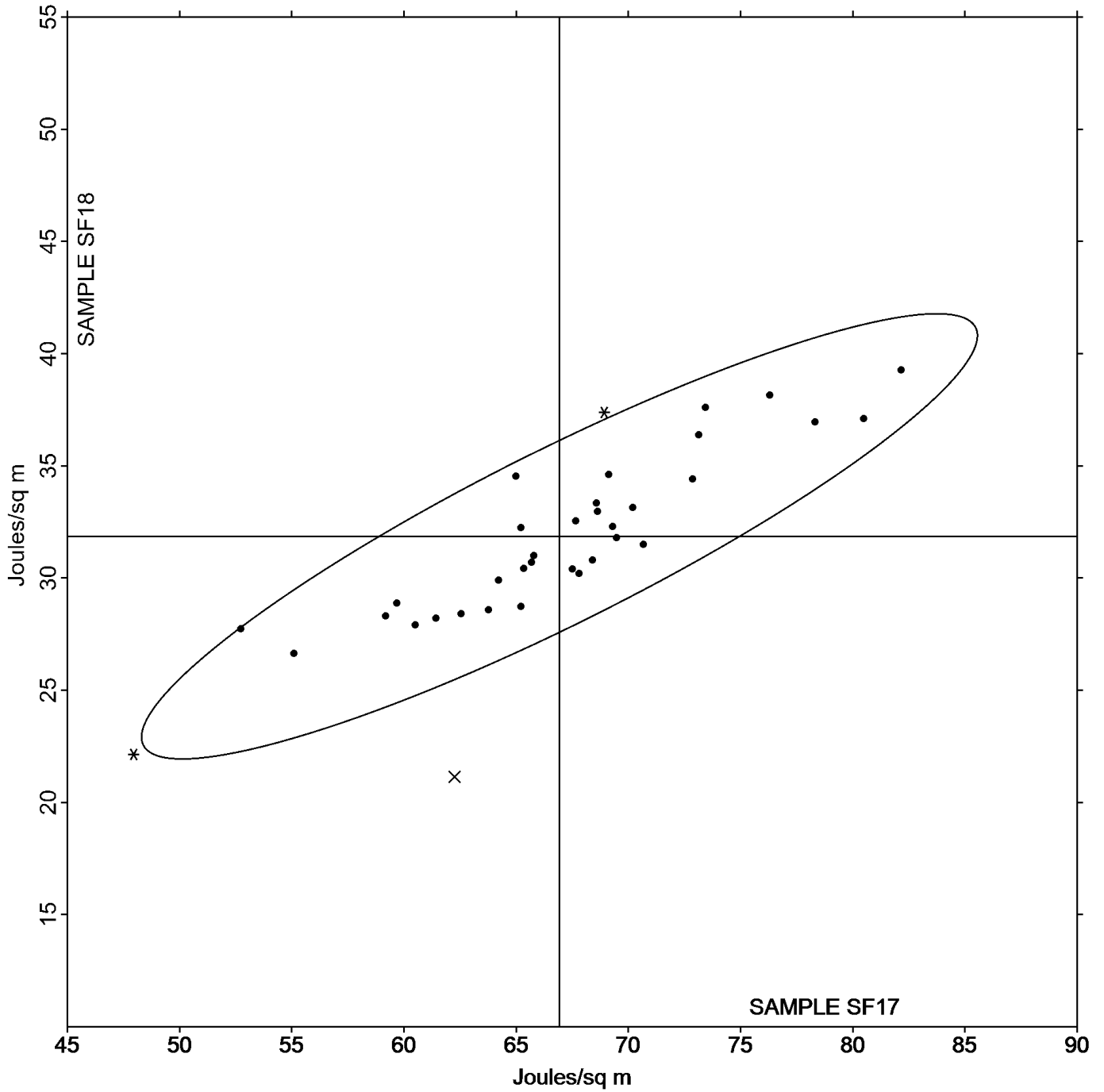
- | | |
|---|---|
| (DL) - EMIC DL500 Universal Testing Machines (IM) - Instron 5500 Series (LH) - L & W Alwetron TH1 (Horizontal) SE 060 (LW) - L & W Tensile Tester SE 064 (MR) - MTS Alliance RT series (TI) - Thwing-Albert QC II (TO) - Thwing-Albert QC-1000 (XX) - Instrument make/model not specified by lab | (ID) - Instron 4201 (LA) - L & W Tensile - Autoline 300 (LI) - L & W Tensile Tester SE 062 (LX) - L & W (model not specified) (TB) - Thwing-Albert EJA/1000 (TJ) - Thwing-Albert QC II-XS (TP) - TMI Monitor/Tensile 100 (84-21-01) |
|---|---|

TAPPI-CTS Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers

Grand Mean Sample **SF17** = 66.929 Joules/sq m

Grand Mean Sample **SF18** = 31.858 Joules/sq m

ANALYSIS 327



TAPPI-CTS Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

| WebCode | Data Flag | Sample SF17 | | | Sample SF18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 3DY4HU | | 2.017 | -0.069 | -0.33 | 1.201 | -0.059 | -0.42 | LH |
| 3YDTU4 | | 2.401 | 0.315 | 1.50 | 1.378 | 0.118 | 0.83 | TJ |
| 6WY3JQ | | 1.935 | -0.151 | -0.72 | 1.118 | -0.142 | -1.00 | LH |
| 74FUR4 | | 2.465 | 0.379 | 1.81 | 1.477 | 0.217 | 1.53 | IM |
| 7N4DK2 | | 2.087 | 0.001 | 0.00 | 1.281 | 0.021 | 0.15 | LH |
| 7PVHYE | | 2.210 | 0.124 | 0.59 | 1.336 | 0.076 | 0.54 | TI |
| 7TWFN2 | | 1.742 | -0.344 | -1.64 | 1.075 | -0.185 | -1.31 | LX |
| 7WEM4N | | 1.897 | -0.189 | -0.90 | 1.110 | -0.150 | -1.06 | LX |
| 93FV62 | | 2.068 | -0.018 | -0.09 | 1.169 | -0.091 | -0.64 | LH |
| 9LMAFZ | | 1.823 | -0.263 | -1.26 | 1.054 | -0.206 | -1.45 | LX |
| ARB3CZ | | 2.191 | 0.105 | 0.50 | 1.334 | 0.074 | 0.52 | XX |
| B9AQ3B | | 2.040 | -0.046 | -0.22 | 1.235 | -0.025 | -0.18 | MR |
| B9D2YU | | 2.049 | -0.037 | -0.18 | 1.308 | 0.048 | 0.34 | LA |
| BRPZXW | | 2.314 | 0.228 | 1.09 | 1.475 | 0.215 | 1.52 | XX |
| CXTY9L | | 1.974 | -0.112 | -0.54 | 1.189 | -0.071 | -0.50 | TB |
| DBD24J | | 2.104 | 0.018 | 0.08 | 1.277 | 0.017 | 0.12 | LI |
| DHBJPM | | 1.966 | -0.120 | -0.57 | 1.167 | -0.093 | -0.66 | LH |
| DZRW2Y | | 2.292 | 0.206 | 0.98 | 1.383 | 0.123 | 0.87 | TB |
| E6FYDN | X | 3.684 | 1.598 | 7.63 | 1.806 | 0.546 | 3.85 | TP |
| GLMT4P | | 2.136 | 0.050 | 0.24 | 1.246 | -0.014 | -0.10 | IM |
| GPE27A | | 2.072 | -0.014 | -0.07 | 1.296 | 0.036 | 0.25 | LI |
| HBFG4C | | 2.020 | -0.066 | -0.32 | 1.205 | -0.055 | -0.39 | TP |
| HEC7M6 | | 2.275 | 0.189 | 0.90 | 1.362 | 0.102 | 0.72 | IN |
| HQUGGQ | X | 2.182 | 0.096 | 0.46 | 1.082 | -0.178 | -1.26 | ID |
| HTWETJ | | 1.611 | -0.475 | -2.27 | 1.003 | -0.257 | -1.81 | LH |
| J33QEE | | 2.154 | 0.068 | 0.32 | 1.306 | 0.046 | 0.33 | LH |
| K3VZP9 | | 2.421 | 0.335 | 1.60 | 1.551 | 0.291 | 2.05 | TO |
| K6KAWN | | 2.034 | -0.052 | -0.25 | 1.322 | 0.062 | 0.44 | LH |
| MP44KF | | 1.738 | -0.348 | -1.66 | 1.044 | -0.216 | -1.52 | LH |
| MQVBJH | | 2.096 | 0.010 | 0.05 | 1.317 | 0.057 | 0.40 | LH |
| NAKM94 | | 2.042 | -0.044 | -0.21 | 1.202 | -0.058 | -0.41 | LI |
| NUVKPE | | 2.588 | 0.502 | 2.40 | 1.616 | 0.356 | 2.51 | DL |
| QUKMAY | | 2.070 | -0.016 | -0.08 | 1.256 | -0.004 | -0.03 | LX |
| RNQCC7 | | 1.801 | -0.285 | -1.36 | 1.051 | -0.209 | -1.47 | LH |
| U8XAT8 | | 1.823 | -0.263 | -1.26 | 1.068 | -0.192 | -1.35 | TG |
| V2Q6FE | | 2.274 | 0.188 | 0.90 | 1.313 | 0.053 | 0.37 | LH |
| VBD496 | | 2.179 | 0.093 | 0.44 | 1.249 | -0.011 | -0.08 | TB |
| VU9LCE | | 2.129 | 0.043 | 0.20 | 1.206 | -0.054 | -0.38 | LI |
| W7W79V | | 2.170 | 0.084 | 0.40 | 1.310 | 0.050 | 0.35 | TF |
| WRYUX7 | | 2.240 | 0.154 | 0.73 | 1.450 | 0.190 | 1.34 | TF |
| XB6N7N | X | 2.731 | 0.645 | 3.08 | 1.849 | 0.589 | 4.16 | TO |
| YD8YK4 | | 1.916 | -0.170 | -0.81 | 1.196 | -0.064 | -0.45 | LA |

TAPPI-CTS Interlaboratory Testing Program
Analysis 328
Elongation to Break - Printing Papers

| Sample SF17 | | Summary Statistics | Sample SF18 | |
|---|----------------|--------------------|----------------|--|
| Grand Means | 2.0863 Percent | | 1.2599 Percent | |
| SD Btwn Labs | 0.2093 Percent | | 0.1417 Percent | |
| Statistics based on 39 of 42 reporting participants | | | | |

Comments on assigned Data Flags for Test #328

E6FYDN (X) - Extreme data.

HQUGGQ (X) - Inconsistent in testing between samples.

XB6N7N (X) - Data for both samples are high.

Instrument Code List

(DL) - EMIC DL500 Universal Testing Machines

(IM) - Instron 5500

(LA) - L & W Tensile - Autoline 300

(LI) - L & W Tensile Tester SE 062

(MR) - MTS Alliance RT series

(TF) - Thwing-Albert EJA Vantage-1

(TI) - Thwing-Albert QC II

(TO) - Thwing-Albert QC-1000

(XX) - Instrument make/model not specified by lab

(ID) - Instron 4201

(IN) - Instron 3340 Series

(LH) - L & W Alwetron TH1 (Horizontal) SE 060

(LX) - L & W (model not specified)

(TB) - Thwing-Albert EJA/1000

(TG) - Thwing-Albert QC

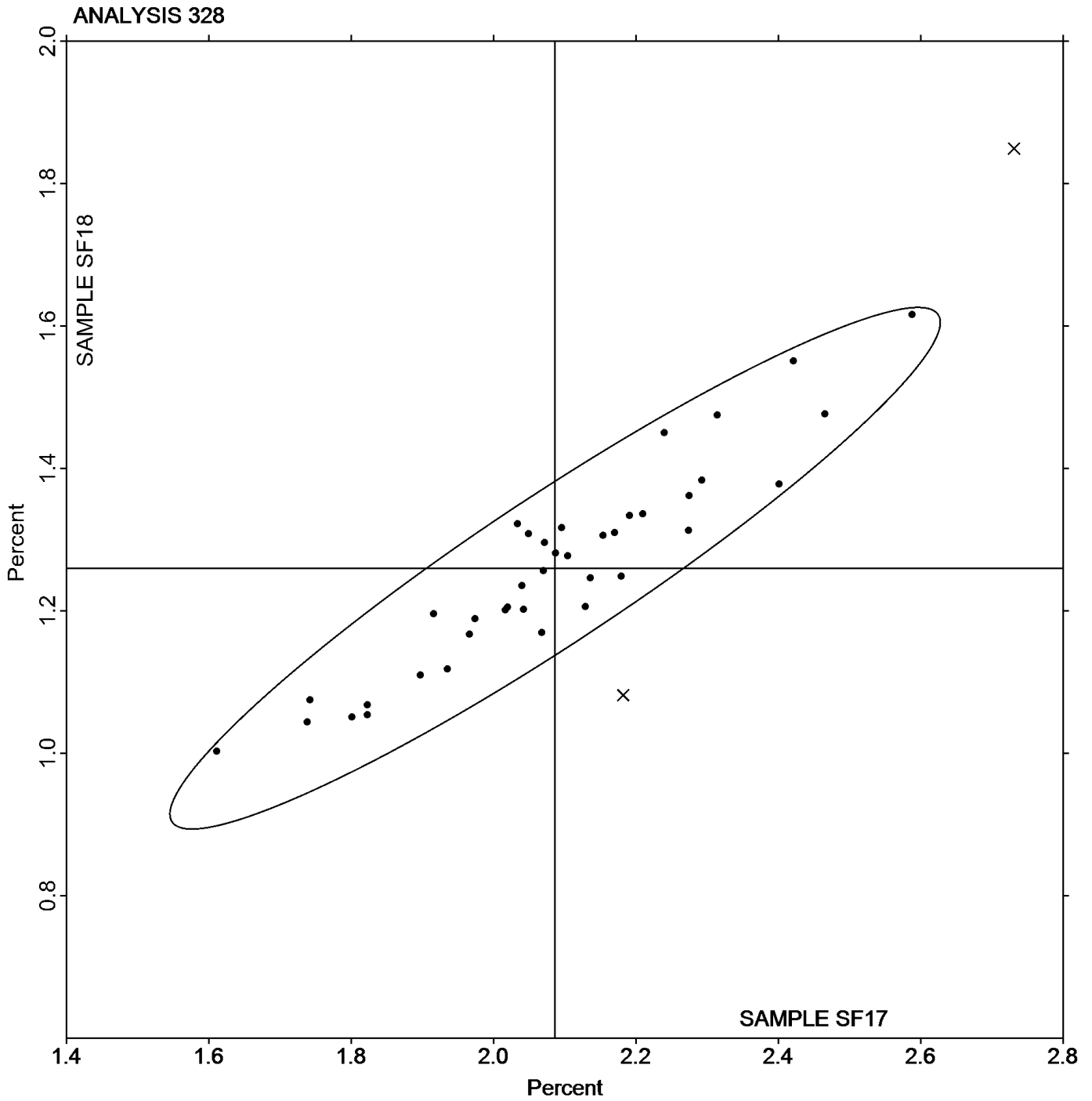
(TJ) - Thwing-Albert QC II-XS

(TP) - TMI Monitor/Tensile 100 (84-21-01)

TAPPI-CTS Interlaboratory Testing Program
Analysis 328
Elongation to Break - Printing Papers

Grand Mean Sample **SF17** = 2.0863 Percent

Grand Mean Sample **SF18** = 1.2599 Percent



TAPPI-CTS Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers

| WebCode | Data Flag | Sample SE17 | | | Sample SE18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2BUDFL | | 10.014 | 0.147 | 0.19 | 11.45 | -0.01 | -0.01 | IN |
| 3DY4HU | | 9.691 | -0.176 | -0.23 | 11.29 | -0.16 | -0.18 | LH |
| 4BKYKW | | 9.915 | 0.048 | 0.06 | 11.56 | 0.11 | 0.12 | TH |
| 4JK9Y3 | * | 10.035 | 0.168 | 0.22 | 12.47 | 1.02 | 1.12 | TK |
| 4KVBLZ | | 9.954 | 0.087 | 0.12 | 11.59 | 0.14 | 0.15 | LH |
| 4NQCGN | | 11.369 | 1.502 | 2.00 | 13.00 | 1.55 | 1.70 | LA |
| 7WZDW9 | | 11.650 | 1.783 | 2.37 | 13.33 | 1.88 | 2.07 | LA |
| AAA68J | | 9.434 | -0.433 | -0.58 | 11.08 | -0.37 | -0.41 | XX |
| AE8N9H | | 10.735 | 0.868 | 1.15 | 13.00 | 1.55 | 1.70 | TA |
| B2CUCE | | 10.720 | 0.853 | 1.13 | 12.40 | 0.95 | 1.04 | TH |
| BPYP84 | | 9.163 | -0.704 | -0.94 | 10.51 | -0.94 | -1.04 | XX |
| BW4BDL | | 10.967 | 1.100 | 1.46 | 12.65 | 1.20 | 1.32 | TX |
| CLGUXJ | | 10.366 | 0.499 | 0.66 | 11.98 | 0.52 | 0.58 | TO |
| D3Z3GZ | | 9.959 | 0.092 | 0.12 | 11.20 | -0.26 | -0.28 | LH |
| DGGZLZ | | 9.278 | -0.589 | -0.78 | 10.71 | -0.74 | -0.82 | IM |
| DQ7LRY | | 10.288 | 0.420 | 0.56 | 12.01 | 0.56 | 0.62 | TO |
| EYYG4M | | 9.486 | -0.381 | -0.51 | 10.75 | -0.70 | -0.77 | TB |
| F9Y7LN | | 8.860 | -1.008 | -1.34 | 10.39 | -1.07 | -1.17 | LA |
| FCZABQ | | 11.062 | 1.195 | 1.59 | 12.78 | 1.33 | 1.46 | TP |
| G8JBAG | | 9.359 | -0.508 | -0.68 | 10.38 | -1.07 | -1.18 | IF |
| GBJLBV | | 9.334 | -0.533 | -0.71 | 10.93 | -0.52 | -0.58 | SA |
| GXTQ4H | | 9.158 | -0.709 | -0.94 | 10.91 | -0.55 | -0.60 | ID |
| HBFG4C | | 10.268 | 0.400 | 0.53 | 11.63 | 0.18 | 0.20 | TO |
| HKNTQV | | 10.424 | 0.557 | 0.74 | 11.89 | 0.44 | 0.48 | LW |
| HVMKBU | | 9.509 | -0.358 | -0.48 | 11.06 | -0.40 | -0.43 | XX |
| JWD9Z4 | | 9.898 | 0.031 | 0.04 | 11.80 | 0.35 | 0.38 | IK |
| KLM9KH | | 8.440 | -1.427 | -1.90 | 10.04 | -1.42 | -1.56 | SP |
| LE7RPM | | 9.877 | 0.010 | 0.01 | 11.72 | 0.26 | 0.29 | IF |
| LNBZ88 | | 10.360 | 0.493 | 0.66 | 12.30 | 0.85 | 0.93 | TP |
| N3626Q | | 8.783 | -1.084 | -1.44 | 10.47 | -0.98 | -1.08 | TK |
| NEDPC3 | | 11.299 | 1.432 | 1.90 | 12.54 | 1.09 | 1.20 | LA |
| NUDN7R | | 8.674 | -1.193 | -1.59 | 9.91 | -1.54 | -1.70 | LW |
| NXB82X | | 9.539 | -0.328 | -0.44 | 11.43 | -0.02 | -0.03 | TB |
| P2QUHN | | 9.804 | -0.063 | -0.08 | 11.21 | -0.24 | -0.27 | IM |
| PWTHDC | | 10.898 | 1.031 | 1.37 | 12.69 | 1.24 | 1.36 | LA |
| Q876ZH | | 9.649 | -0.218 | -0.29 | 11.29 | -0.17 | -0.18 | IK |
| RB7KWC | | 9.321 | -0.547 | -0.73 | 10.59 | -0.86 | -0.95 | LW |
| RLPZYE | | 8.756 | -1.111 | -1.48 | 10.42 | -1.03 | -1.14 | TK |
| TXUMJV | * | 10.756 | 0.889 | 1.18 | 13.35 | 1.89 | 2.08 | TH |
| UWDREF | | 9.754 | -0.113 | -0.15 | 11.40 | -0.05 | -0.06 | LE |
| V294P6 | | 9.451 | -0.416 | -0.55 | 10.27 | -1.19 | -1.31 | XX |
| VNKVBD | | 9.619 | -0.248 | -0.33 | 11.16 | -0.29 | -0.32 | TB |
| XH7WU4 | | 9.108 | -0.759 | -1.01 | 10.67 | -0.78 | -0.86 | LE |

TAPPI-CTS Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers

| WebCode | Data Flag | Sample SE17 | | | Sample SE18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| YQVBNZ | | 9.446 | -0.421 | -0.56 | 10.98 | -0.48 | -0.52 | TP |
| Z8DMX7 | | 9.653 | -0.214 | -0.28 | 11.11 | -0.34 | -0.38 | TO |
| ZX7UK6 | | 9.805 | -0.062 | -0.08 | 10.56 | -0.90 | -0.99 | IF |

| Summary Statistics | | | |
|---|-------------|--|-------------|
| | Sample SE17 | | Sample SE18 |
| Grand Means | 9.8672 kN/m | | 11.453 kN/m |
| SD Btwn Labs | 0.7519 kN/m | | 0.910 kN/m |
| Statistics based on 46 of 46 reporting participants | | | |

Analysis Notes:

RLPZYE - Data appear to be reported as lb/inch, not lb/15mm as indicated on datasheet. Units corrected by CTS.

V294P6 - Data appear to be reported as lb/inch, not kN/m as indicated on datasheet. Units corrected by CTS.

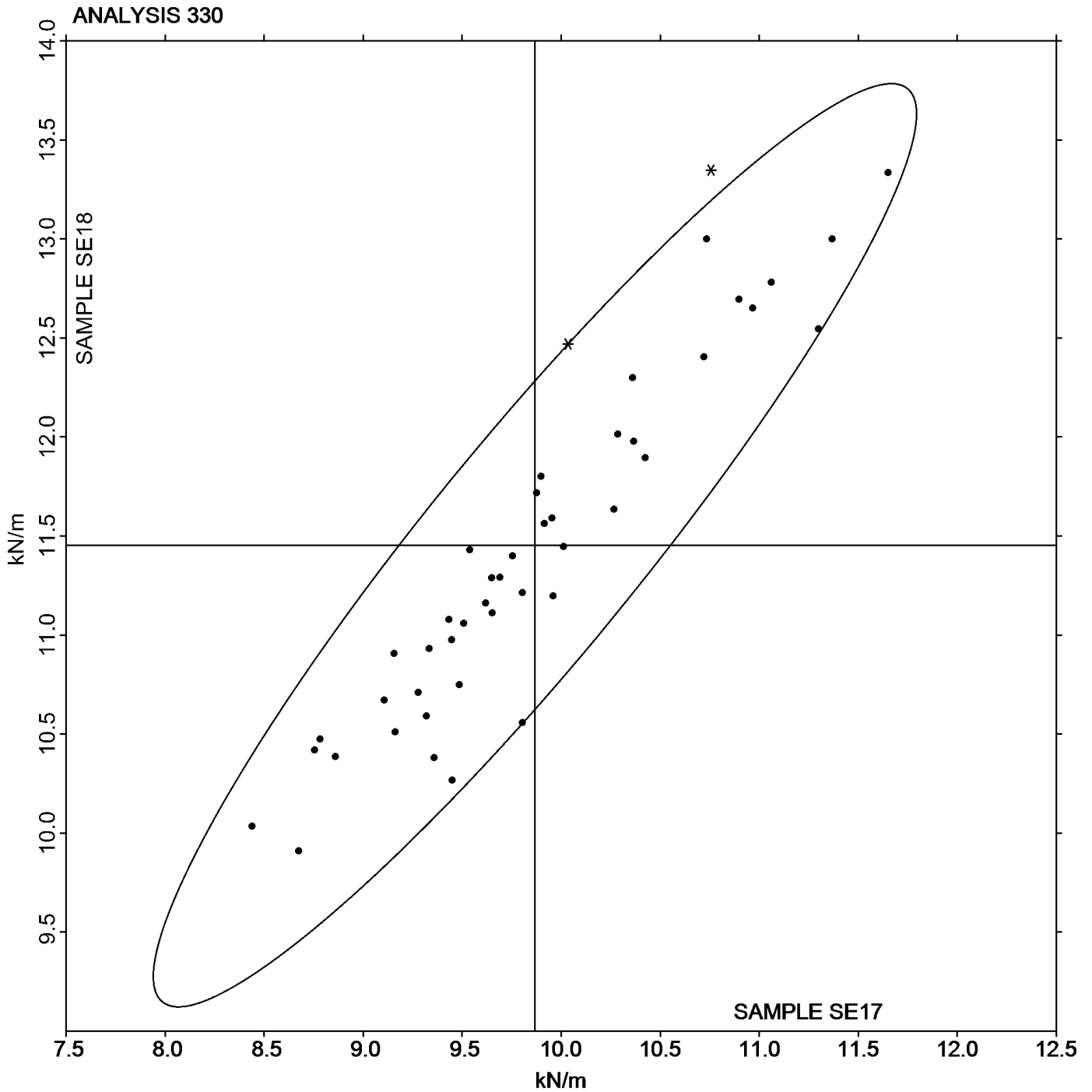
Instrument Code List

- | | |
|---|---|
| (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 | (SA) - Shimadzu Autograph AG 2000 A |
| (SP) - Schopper Type Tensile Tester (TMI) | (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) | (TX) - Thwing-Albert (model not specified) |
| (XX) - Instrument make/model not specified by lab | |

TAPPI-CTS Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers

Grand Mean Sample **SE17** = 9.8672 kN/m

Grand Mean Sample **SE18** = 11.453 kN/m



TAPPI-CTS Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers

| WebCode | Data Flag | Sample SE17 | | | Sample SE18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2BUDFL | | 129.9 | 15.1 | 1.14 | 221.4 | 7.8 | 0.30 | IN |
| 3DY4HU | | 107.5 | -7.4 | -0.56 | 200.6 | -12.9 | -0.50 | LH |
| 4BKYKW | | 113.1 | -1.8 | -0.14 | 213.7 | 0.2 | 0.01 | TH |
| 4KVBLZ | | 100.1 | -14.8 | -1.12 | 190.5 | -23.1 | -0.89 | LH |
| 4NQC GN | | 123.4 | 8.6 | 0.65 | 223.3 | 9.8 | 0.38 | LA |
| 7WZDW9 | | 111.1 | -3.7 | -0.28 | 203.2 | -10.3 | -0.40 | LA |
| AAA68J | | 121.7 | 6.8 | 0.52 | 238.8 | 25.3 | 0.97 | XX |
| B2CUCE | | 131.5 | 16.7 | 1.26 | 244.3 | 30.8 | 1.18 | TH |
| BPYP84 | | 105.3 | -9.5 | -0.72 | 192.9 | -20.6 | -0.79 | XX |
| BW4BDL | | 142.5 | 27.6 | 2.09 | 270.2 | 56.7 | 2.18 | XX |
| CLGUXJ | | 142.5 | 27.6 | 2.09 | 259.2 | 45.6 | 1.76 | TO |
| D3Z3GZ | | 104.5 | -10.4 | -0.79 | 174.0 | -39.5 | -1.52 | LH |
| DGGZLZ | | 109.3 | -5.6 | -0.42 | 196.8 | -16.7 | -0.64 | IM |
| DQ7LRY | | 122.1 | 7.2 | 0.55 | 235.8 | 22.2 | 0.86 | TO |
| F9Y7LN | | 113.0 | -1.9 | -0.14 | 215.4 | 1.8 | 0.07 | LA |
| FCZABQ | * | 71.9 | -42.9 | -3.26 | 132.8 | -80.7 | -3.11 | TP |
| GBJLBV | | 107.6 | -7.2 | -0.55 | 193.9 | -19.6 | -0.75 | SA |
| HBFG4C | | 120.7 | 5.8 | 0.44 | 225.3 | 11.8 | 0.46 | TO |
| HKNTQV | | 98.5 | -16.4 | -1.25 | 198.0 | -15.5 | -0.60 | LW |
| HVMKBU | | 113.6 | -1.3 | -0.10 | 206.6 | -6.9 | -0.27 | XX |
| JWD9Z4 | | 105.7 | -9.2 | -0.70 | 212.8 | -0.7 | -0.03 | XX |
| LE7RPM | | 121.5 | 6.6 | 0.50 | 227.4 | 13.9 | 0.54 | IF |
| LNBZ88 | | 120.5 | 5.6 | 0.43 | 218.9 | 5.4 | 0.21 | TP |
| N3626Q | | 107.2 | -7.7 | -0.59 | 205.9 | -7.7 | -0.29 | TK |
| NEDPC3 | | 118.5 | 3.6 | 0.27 | 225.9 | 12.4 | 0.48 | LA |
| NUDN7R | | 100.2 | -14.7 | -1.12 | 178.4 | -35.1 | -1.35 | LW |
| NXB82X | | 110.2 | -4.7 | -0.36 | 213.9 | 0.4 | 0.02 | TB |
| P2QUHN | | 116.4 | 1.5 | 0.12 | 211.1 | -2.4 | -0.09 | IM |
| PWTHDC | | 113.9 | -0.9 | -0.07 | 218.1 | 4.6 | 0.18 | LA |
| Q876ZH | | 128.8 | 14.0 | 1.06 | 223.9 | 10.4 | 0.40 | IK |
| TXUMJV | * | 125.7 | 10.8 | 0.82 | 265.1 | 51.6 | 1.99 | TH |
| UWDREF | | 114.6 | -0.3 | -0.02 | 215.9 | 2.4 | 0.09 | LE |
| VNKVBD | | 106.5 | -8.4 | -0.64 | 193.4 | -20.1 | -0.77 | TB |
| Z8DMX7 | | 126.2 | 11.4 | 0.86 | 220.5 | 7.0 | 0.27 | TO |
| ZX7UK6 | | 115.1 | 0.3 | 0.02 | 205.3 | -8.2 | -0.32 | IN |

Sample SE17**Summary Statistics****Sample SE18**

Grand Means 114.88 Joules/sq m
SD Btwn Labs 13.18 Joules/sq m

213.51 Joules/sq m
25.96 Joules/sq m

Statistics based on 35 of 35 reporting participants

TAPPI-CTS Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers

Instrument Code List

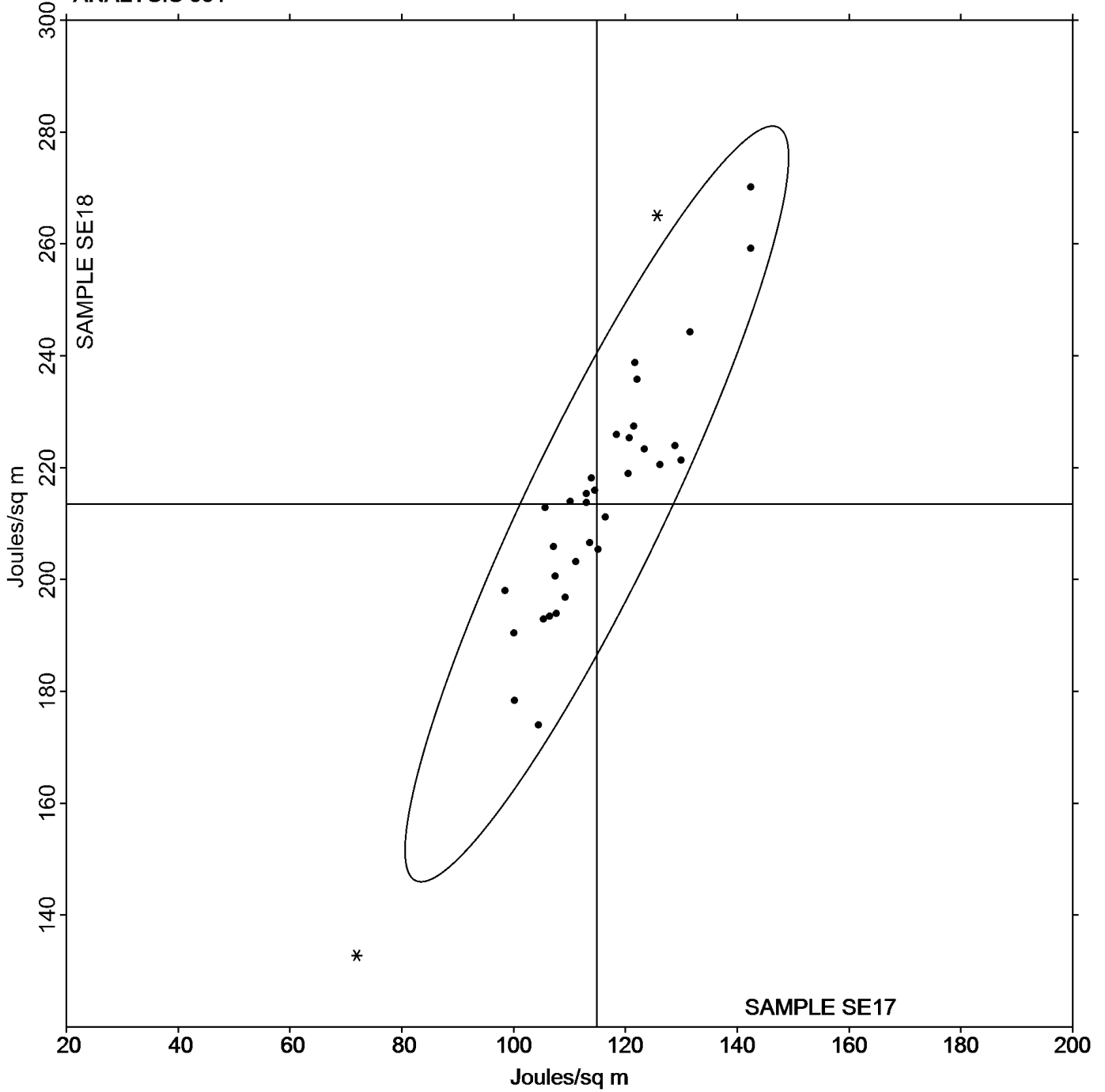
| | |
|---|---|
| (IF) - Instron 3340 Series | (IK) - Instron 4400 Series |
| (IM) - Instron 5500 Series | (IN) - Instron 3360 Series |
| (LA) - L & W Autoline | (LE) - L & W Tensile Tester 066 |
| (LH) - L & W Alwetron TH1 (Horizontal) SE 060 | (LW) - L & W Tensile Tester SE062 |
| (SA) - Shimadzu Autograph AG 2000 A | (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) |
| (XX) - Instrument make/model not specified by lab | |

TAPPI-CTS Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers

Grand Mean Sample **SE17** = 114.88 Joules/sq m

Grand Mean Sample **SE18** = 213.51 Joules/sq m

ANALYSIS 331



TAPPI-CTS Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers

| WebCode | Data Flag | Sample SE17 | | | Sample SE18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2BUDFL | X | 2.190 | 0.353 | 1.76 | 2.890 | 0.117 | 0.42 | IN |
| 3DY4HU | | 1.684 | -0.153 | -0.76 | 2.569 | -0.204 | -0.74 | LH |
| 4BKYKW | | 1.982 | 0.145 | 0.72 | 2.936 | 0.163 | 0.59 | TH |
| 4KVBLZ | | 1.540 | -0.297 | -1.48 | 2.430 | -0.343 | -1.24 | LH |
| 4NQC GN | | 1.621 | -0.216 | -1.07 | 2.457 | -0.316 | -1.14 | LA |
| 7WZDW9 | | 1.504 | -0.333 | -1.65 | 2.238 | -0.535 | -1.93 | XX |
| AAA68J | | 2.036 | 0.199 | 0.99 | 3.227 | 0.454 | 1.64 | XX |
| B2CUCE | | 2.044 | 0.207 | 1.03 | 2.992 | 0.219 | 0.79 | TH |
| BPYP84 | | 1.747 | -0.090 | -0.45 | 2.688 | -0.085 | -0.31 | XX |
| BW4BDL | | 2.111 | 0.274 | 1.37 | 3.245 | 0.472 | 1.70 | XX |
| CLGUXJ | | 2.192 | 0.355 | 1.77 | 3.277 | 0.504 | 1.82 | TO |
| D3Z3GZ | | 1.639 | -0.198 | -0.98 | 2.324 | -0.449 | -1.62 | LH |
| DGGZLZ | | 2.152 | 0.315 | 1.57 | 3.003 | 0.230 | 0.83 | IM |
| DQ7LRY | | 1.867 | 0.030 | 0.15 | 2.897 | 0.124 | 0.45 | TO |
| EYYG4M | | 1.790 | -0.047 | -0.23 | 2.595 | -0.178 | -0.64 | TB |
| F9Y7LN | | 1.631 | -0.206 | -1.02 | 2.561 | -0.212 | -0.77 | LA |
| FCZABQ | X | 0.151 | -1.686 | -8.39 | 0.285 | -2.489 | -8.98 | TP |
| GBJLBV | | 1.828 | -0.009 | -0.04 | 2.803 | 0.030 | 0.11 | SA |
| GXTQ4H | | 1.756 | -0.081 | -0.40 | 2.724 | -0.049 | -0.18 | ID |
| HBFG4C | | 1.846 | 0.009 | 0.05 | 2.872 | 0.099 | 0.36 | TO |
| HKNTQV | | 1.546 | -0.291 | -1.45 | 2.519 | -0.254 | -0.92 | LW |
| HVMKBU | | 1.941 | 0.104 | 0.52 | 2.844 | 0.071 | 0.25 | XX |
| JWD9Z4 | | 1.652 | -0.185 | -0.92 | 2.357 | -0.416 | -1.50 | XX |
| LE7RPM | | 2.026 | 0.189 | 0.94 | 2.991 | 0.218 | 0.79 | IF |
| LNBZ88 | | 2.220 | 0.383 | 1.91 | 3.200 | 0.427 | 1.54 | TP |
| N3626Q | | 1.872 | 0.036 | 0.18 | 2.890 | 0.117 | 0.42 | TK |
| NEDPC3 | | 1.678 | -0.159 | -0.79 | 2.526 | -0.247 | -0.89 | LA |
| NUDN7R | | 1.764 | -0.073 | -0.36 | 2.655 | -0.118 | -0.43 | LW |
| NXB82X | | 1.920 | 0.083 | 0.41 | 2.871 | 0.098 | 0.35 | TB |
| P2QUHN | | 1.831 | -0.006 | -0.03 | 2.795 | 0.022 | 0.08 | IM |
| PWTHDC | | 1.564 | -0.273 | -1.36 | 2.447 | -0.326 | -1.18 | LA |
| Q876ZH | | 2.164 | 0.328 | 1.63 | 3.038 | 0.265 | 0.95 | IK |
| RB7KWC | | 1.769 | -0.068 | -0.34 | 2.705 | -0.068 | -0.25 | LW |
| TXUMJV | | 2.027 | 0.190 | 0.95 | 3.165 | 0.392 | 1.41 | TH |
| UWDREF | | 1.783 | -0.054 | -0.27 | 2.752 | -0.021 | -0.08 | LE |
| VNKVBD | | 1.682 | -0.155 | -0.77 | 2.609 | -0.164 | -0.59 | TB |
| Z8DMX7 | X | 2.804 | 0.967 | 4.81 | 3.784 | 1.011 | 3.65 | TO |
| ZX7UK6 | | 1.872 | 0.035 | 0.17 | 2.866 | 0.093 | 0.33 | IN |

TAPPI-CTS Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers

| Sample SE17 | | Summary Statistics | Sample SE18 | |
|---|----------------|--------------------|----------------|--|
| Grand Means | 1.8366 Percent | | 2.7734 Percent | |
| SD Btwn Labs | 0.2010 Percent | | 0.2772 Percent | |
| Statistics based on 35 of 38 reporting participants | | | | |

Comments on assigned Data Flags for Test #332

2BUDFL (X) - Inconsistent in testing between samples and within the determinations for both samples.

FCZABQ (X) - Extreme data.

Z8DMX7 (X) - Data for both samples are high. Inconsistent within the determinations for Sample SE18.

Instrument Code List

(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

(SA) - Shimadzu Autograph AG 2000 A

(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)

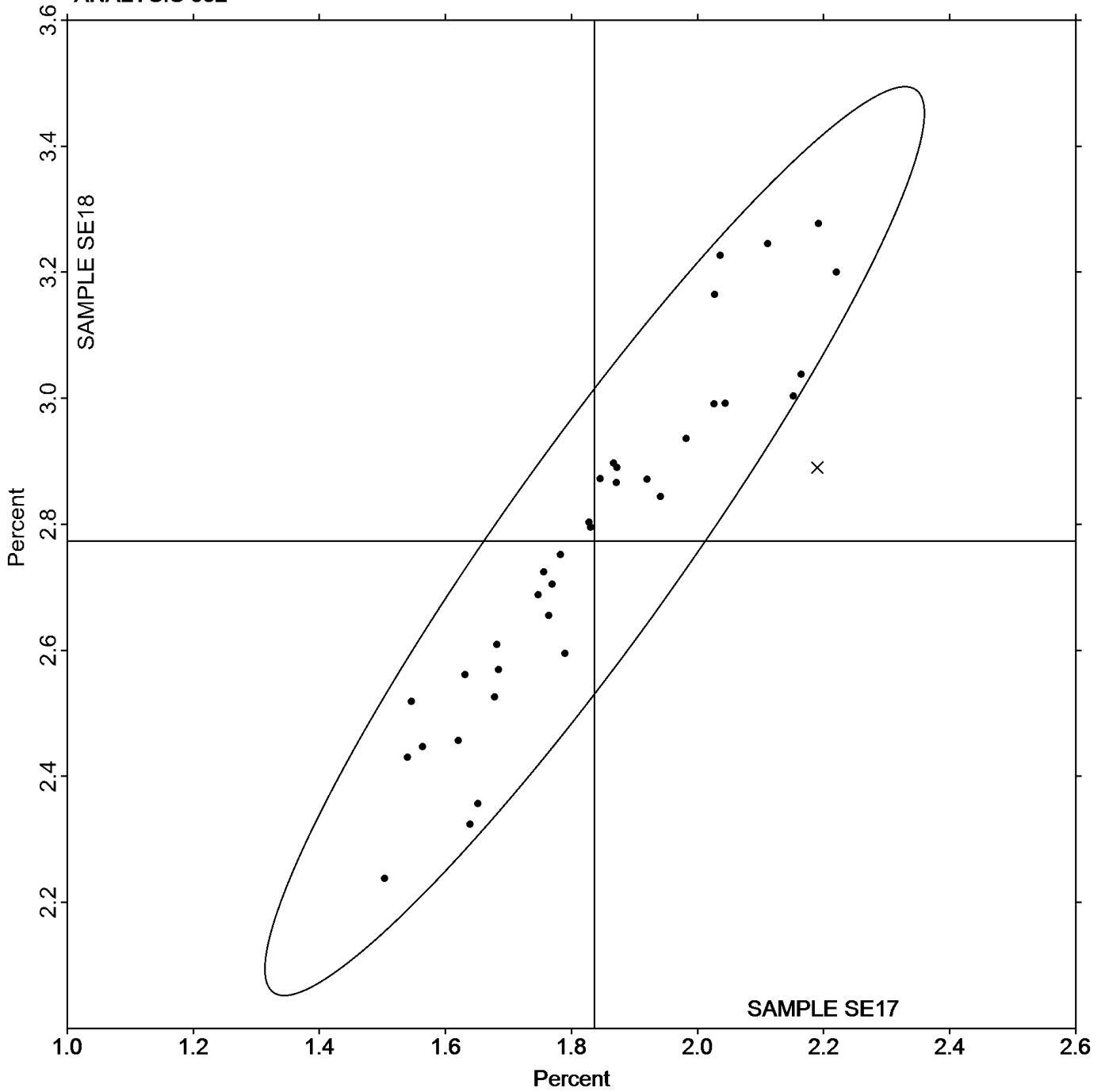
(XX) - Instrument make/model not specified by lab

TAPPI-CTS Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers

Grand Mean Sample **SE17** = 1.8366 Percent

Grand Mean Sample **SE18** = 2.7734 Percent

ANALYSIS 332



TAPPI-CTS Interlaboratory Testing Program
Analysis 334
Folding Endurance (MIT) - Double Folds

| WebCode | Data Flag | Sample SG17 | | | Sample SG18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 4JK9Y3 | | 133.90 | 38.39 | 1.61 | 45.70 | -10.79 | -0.88 | MT |
| 74FUR4 | | 109.80 | 14.29 | 0.60 | 63.50 | 7.01 | 0.57 | MT |
| 8C67XG | | 119.50 | 23.99 | 1.00 | 74.10 | 17.61 | 1.44 | MT |
| BRPZXW | | 111.30 | 15.79 | 0.66 | 61.80 | 5.31 | 0.44 | MT |
| DNGF9M | | 95.40 | -0.11 | 0.00 | 73.10 | 16.61 | 1.36 | MT |
| EYYG4M | | 60.80 | -34.71 | -1.45 | 45.90 | -10.59 | -0.87 | MT |
| HQUGGQ | | 103.30 | 7.79 | 0.33 | 56.60 | 0.11 | 0.01 | MT |
| HTWETJ | | 97.20 | 1.69 | 0.07 | 40.20 | -16.29 | -1.34 | MT |
| HVMKBU | | 86.40 | -9.11 | -0.38 | 60.70 | 4.21 | 0.35 | MT |
| KP74MA | | 118.40 | 22.89 | 0.96 | 61.60 | 5.11 | 0.42 | MT |
| PWTHDC | | 80.60 | -14.91 | -0.62 | 53.70 | -2.79 | -0.23 | XX |
| RB7KWC | | 64.20 | -31.31 | -1.31 | 49.60 | -6.89 | -0.56 | MT |
| VU9LCE | | 130.60 | 35.09 | 1.47 | 80.70 | 24.21 | 1.99 | MT |
| WRYUX7 | | 66.60 | -28.91 | -1.21 | 48.10 | -8.39 | -0.69 | MT |
| YQVBNZ | | 68.20 | -27.31 | -1.14 | 41.20 | -15.29 | -1.25 | MT |
| Z6QRDY | | 82.00 | -13.51 | -0.57 | 47.30 | -9.19 | -0.75 | XX |

| | | Summary Statistics | | | |
|---|--|--------------------|--------------|-------------|--------------|
| | | Sample SG17 | | Sample SG18 | |
| Grand Means | | 95.513 | Double Folds | 56.488 | Double Folds |
| SD Btwn Labs | | 23.911 | Double Folds | 12.196 | Double Folds |
| Statistics based on 16 of 16 reporting participants | | | | | |

Instrument Code List

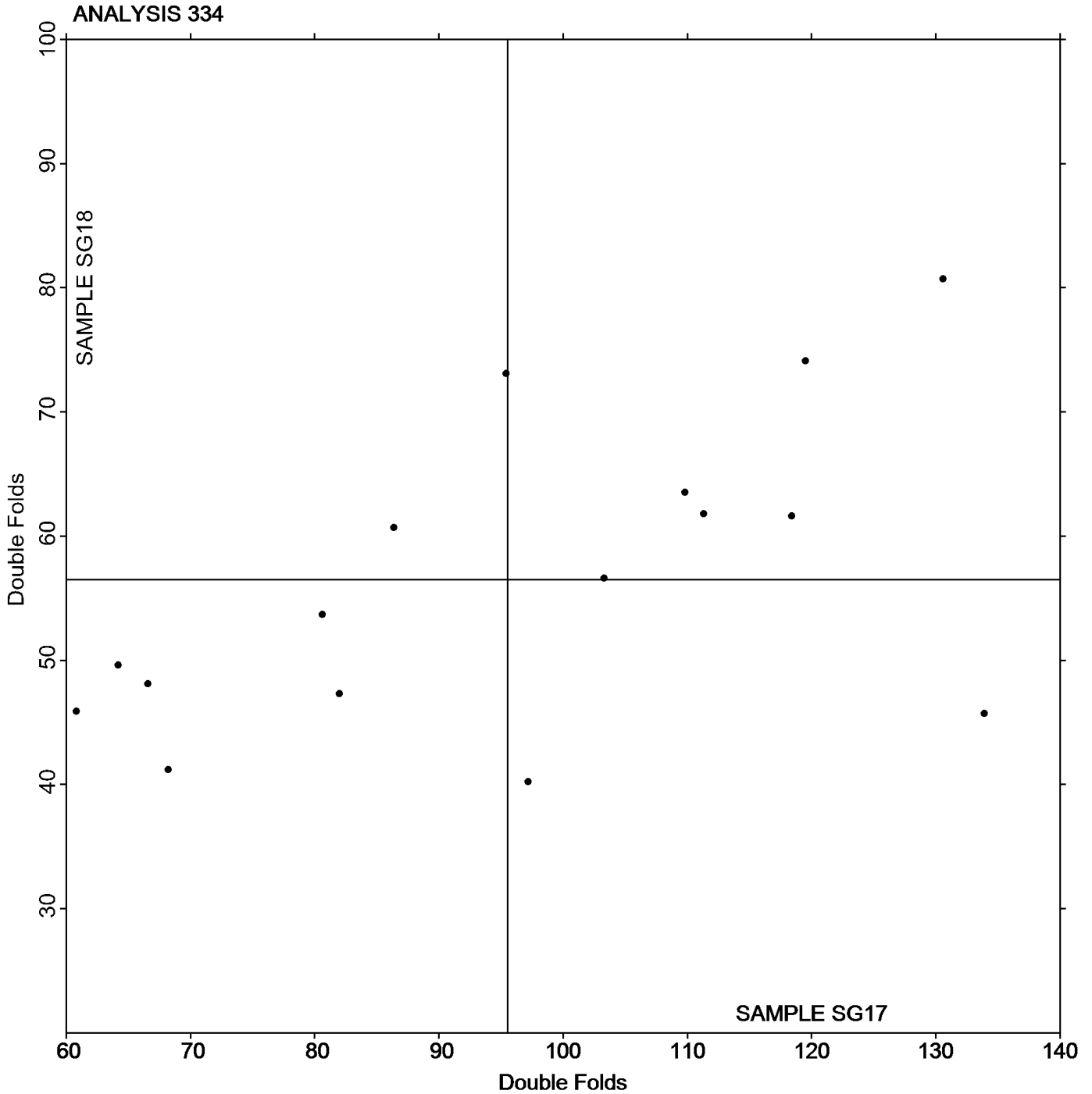
(MT) - MIT - Tinius Olsen

(XX) - Instrument make/model not specified by lab

TAPPI-CTS Interlaboratory Testing Program
Analysis 334
Folding Endurance (MIT) - Double Folds

Grand Mean Sample **SG17** = 95.513 Double Folds

Grand Mean Sample **SG18** = 56.488 Double Folds



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

TAPPI-CTS Interlaboratory Testing Program

Analysis 336

Bending Resistance, Gurley Type

| WebCode | Data Flag | Sample SH17 | | | Sample SH18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 6DAP8M | | 202.7 | 6.4 | 0.47 | 272.9 | 23.9 | 1.56 |
| 6WY3JQ | | 211.1 | 14.9 | 1.09 | 262.2 | 13.1 | 0.86 |
| 74FUR4 | | 187.8 | -8.4 | -0.62 | 253.1 | 4.0 | 0.26 |
| 7N4DK2 | | 203.4 | 7.1 | 0.52 | 274.4 | 25.4 | 1.66 |
| 7PVHYE | | 183.9 | -12.4 | -0.91 | 241.9 | -7.2 | -0.47 |
| B9AQ3B | | 178.0 | -18.2 | -1.34 | 233.8 | -15.3 | -1.00 |
| B9D2YU | | 198.7 | 2.4 | 0.18 | 248.5 | -0.6 | -0.04 |
| EYYG4M | | 214.7 | 18.4 | 1.36 | 263.2 | 14.2 | 0.93 |
| HMUDEV | | 186.0 | -10.3 | -0.76 | 238.5 | -10.5 | -0.69 |
| HTWETJ | | 192.0 | -4.2 | -0.31 | 248.5 | -0.5 | -0.04 |
| HVMKBU | | 196.7 | 0.4 | 0.03 | 249.7 | 0.7 | 0.05 |
| KRVB7L | X | 104.1 | -92.2 | -6.78 | 125.8 | -123.3 | -8.06 |
| LE7RPM | | 215.3 | 19.1 | 1.40 | 257.5 | 8.5 | 0.55 |
| P3Z2KG | | 182.8 | -13.5 | -0.99 | 239.4 | -9.6 | -0.63 |
| V2Q6FE | | 179.2 | -17.1 | -1.26 | 218.0 | -31.0 | -2.03 |
| VBD496 | | 188.5 | -7.8 | -0.57 | 229.5 | -19.5 | -1.27 |
| XB6N7N | | 176.3 | -20.0 | -1.47 | 229.1 | -19.9 | -1.30 |
| XGV3YP | | 207.1 | 10.9 | 0.80 | 252.5 | 3.4 | 0.22 |
| Z8DMX7 | | 207.4 | 11.2 | 0.82 | 253.3 | 4.3 | 0.28 |
| ZBF826 | | 217.3 | 21.1 | 1.55 | 265.7 | 16.7 | 1.09 |

| Sample SH17 | | Summary Statistics | Sample SH18 | |
|---|---------------------|--------------------|---------------------|--|
| Grand Means | 196.26 Gurley Units | | 249.04 Gurley Units | |
| SD Btwn Labs | 13.59 Gurley Units | | 15.30 Gurley Units | |
| Statistics based on 19 of 20 reporting participants | | | | |

Comments on assigned Data Flags for Test #336

KRVB7L (X) - Extreme data.

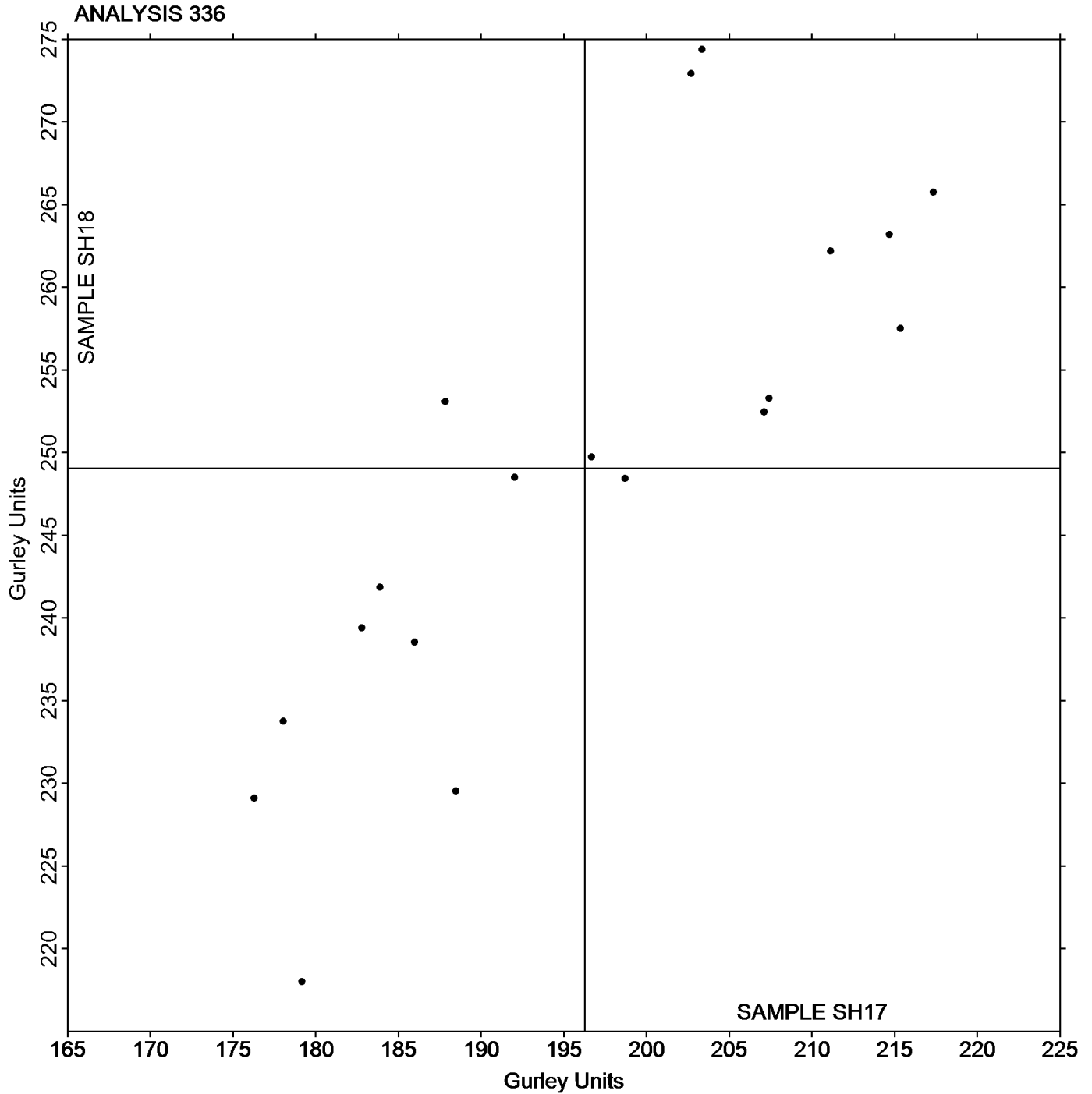
TAPPI-CTS Interlaboratory Testing Program

Analysis 336

Bending Resistance, Gurley Type

Grand Mean Sample **SH17** = 196.26 Gurley Units

Grand Mean Sample **SH18** = 249.04 Gurley Units



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 338
Bending Resistance, Taber Type - 0 to 10 Units

| WebCode | Data Flag | Sample SJ17 | | | Sample SJ18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 3YDTU4 | X | 3.650 | 1.809 | 8.60 | 2.590 | -0.018 | -0.07 |
| 6GAXDH | | 2.037 | 0.196 | 0.93 | 2.656 | 0.048 | 0.19 |
| 74FUR4 | | 1.666 | -0.175 | -0.83 | 2.560 | -0.048 | -0.19 |
| 7N4DK2 | | 2.239 | 0.398 | 1.89 | 3.033 | 0.425 | 1.66 |
| 8C67XG | | 1.870 | 0.030 | 0.14 | 2.636 | 0.028 | 0.11 |
| 9QZNME | | 1.908 | 0.067 | 0.32 | 2.862 | 0.254 | 0.99 |
| A87ALV | | 1.852 | 0.011 | 0.05 | 2.622 | 0.014 | 0.06 |
| B9AQ3B | | 1.339 | -0.502 | -2.39 | 1.932 | -0.676 | -2.64 |
| DZRW2Y | | 1.949 | 0.108 | 0.52 | 2.656 | 0.048 | 0.19 |
| HKNTQV | | 1.600 | -0.241 | -1.14 | 2.240 | -0.368 | -1.44 |
| HQUGGQ | | 1.943 | 0.102 | 0.49 | 2.845 | 0.237 | 0.93 |
| LE7RPM | | 1.748 | -0.093 | -0.44 | 2.615 | 0.007 | 0.03 |
| QUKMAY | | 1.953 | 0.112 | 0.53 | 2.702 | 0.094 | 0.37 |
| VBD496 | | 1.842 | 0.001 | 0.00 | 2.625 | 0.017 | 0.07 |
| YD8YK4 | | 1.704 | -0.137 | -0.65 | 2.605 | -0.003 | -0.01 |
| ZX7UK6 | | 1.960 | 0.119 | 0.57 | 2.530 | -0.078 | -0.30 |

| Summary Statistics | |
|---|--------------------|
| Sample SJ17 | Sample SJ18 |
| Grand Means | 1.8406 Taber Units |
| SD Btwn Labs | 0.2103 Taber Units |
| | 2.6079 Taber Units |
| | 0.2559 Taber Units |
| Statistics based on 15 of 16 reporting participants | |

Comments on assigned Data Flags for Test #338

3YDTU4 (X) - Extreme data.

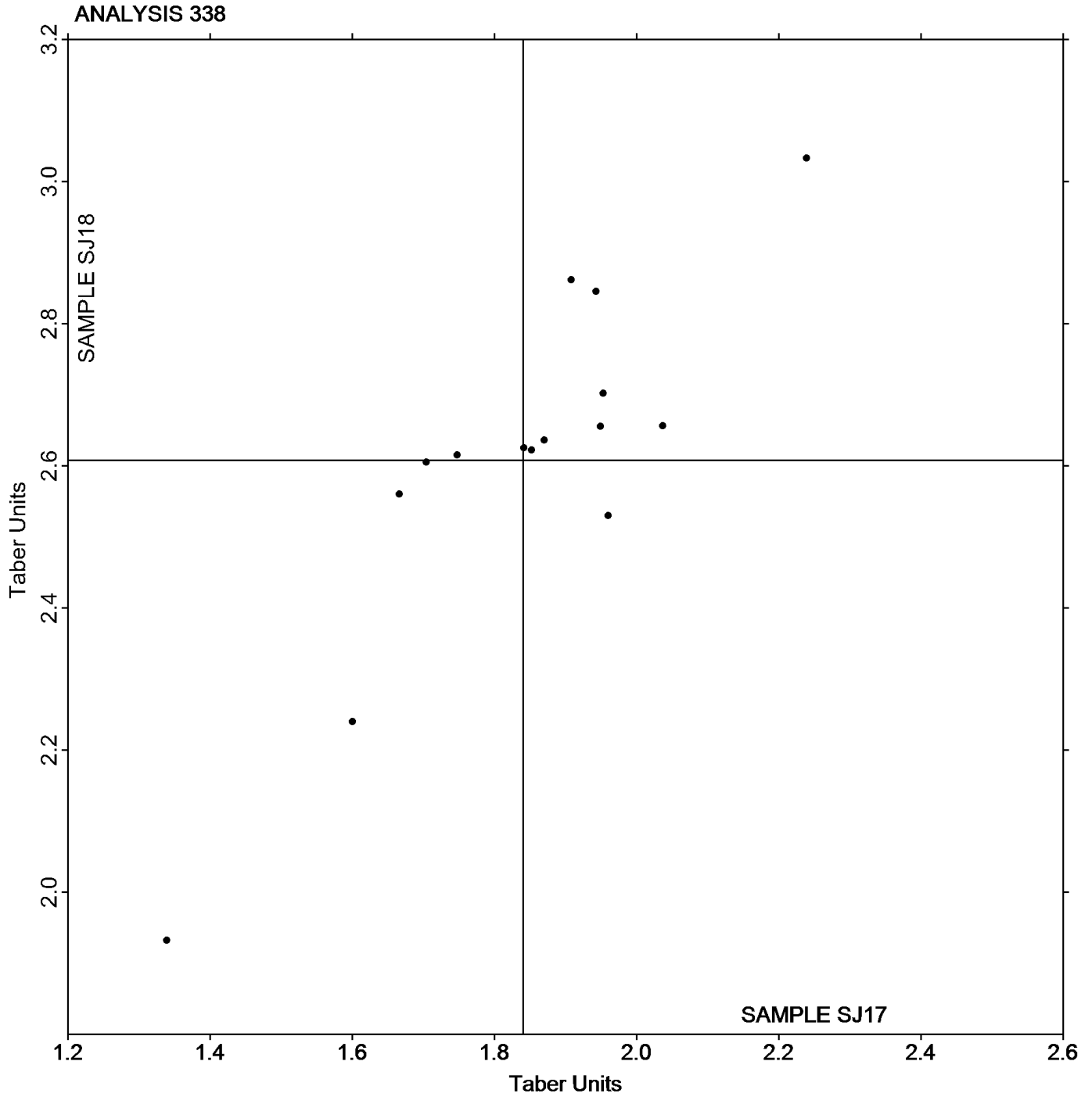
Analysis Notes:

QUKMAY - Data appear to be reported as mN-m, not g-cm as indicated on datasheet. Units corrected by CTS.

TAPPI-CTS Interlaboratory Testing Program
Analysis 338
Bending Resistance, Taber Type - 0 to 10 Units

Grand Mean Sample **SJ17** = 1.8406 Taber Units

Grand Mean Sample **SJ18** = 2.6079 Taber Units



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units

| WebCode | Data Flag | Sample SQ17 | | | Sample SQ18 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 74FUR4 | | 65.00 | 1.12 | 0.32 | 47.84 | 0.12 | 0.04 |
| A8ND4T | | 67.06 | 3.18 | 0.91 | 52.97 | 5.25 | 1.95 |
| F9Y7LN | | 60.12 | -3.76 | -1.08 | 45.64 | -2.08 | -0.77 |
| GLMT4P | | 69.60 | 5.72 | 1.64 | 51.20 | 3.48 | 1.29 |
| HKNTQV | | 58.35 | -5.53 | -1.59 | 44.95 | -2.77 | -1.03 |
| NUVKPE | | 59.70 | -4.18 | -1.20 | 43.10 | -4.62 | -1.72 |
| NXB82X | | 64.21 | 0.33 | 0.10 | 47.88 | 0.16 | 0.06 |
| PWTHDC | | 68.02 | 4.14 | 1.19 | 49.26 | 1.54 | 0.57 |
| RB7KWC | | 64.89 | 1.01 | 0.29 | 47.49 | -0.23 | -0.09 |
| U8XAT8 | | 62.70 | -1.18 | -0.34 | 47.55 | -0.17 | -0.06 |
| UWDREF | | 65.35 | 1.47 | 0.42 | 48.85 | 1.13 | 0.42 |
| ZBF826 | | 61.54 | -2.34 | -0.67 | 45.95 | -1.77 | -0.66 |

| | | Summary Statistics | |
|---|--------------------|--------------------|--------------------|
| | Sample SQ17 | | Sample SQ18 |
| Grand Means | 63.878 Taber Units | | 47.723 Taber Units |
| SD Btwn Labs | 3.485 Taber Units | | 2.695 Taber Units |
| Statistics based on 12 of 12 reporting participants | | | |

Analysis Notes:

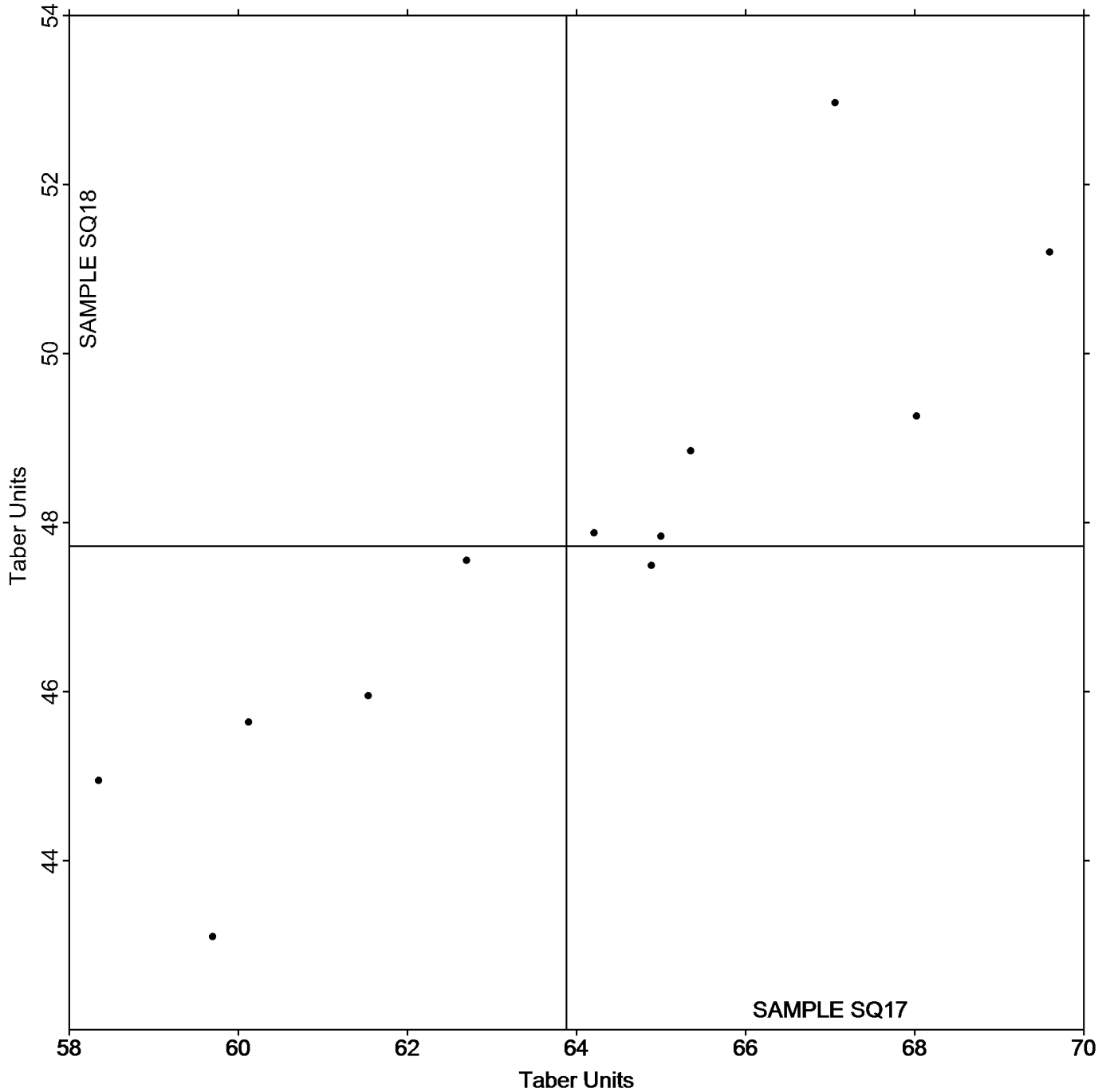
NXB82X - Data appear to be reported as g-cm, not mN-m as indicated on datasheet. Units corrected by CTS.

TAPPI-CTS Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units

Grand Mean Sample **SQ17** = 63.878 Taber Units

Grand Mean Sample **SQ18** = 47.723 Taber Units

ANALYSIS 339



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 340

Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard

| WebCode | Data Flag | Sample ST17 | | | Sample ST18 | | |
|---------|-----------|-------------|----------------------|--------|-------------|----------------------|--------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 4BKYKW | | 243.4 | -3.2 | -0.27 | 295.3 | 7.0 | 0.45 |
| 6JXAB3 | | 271.1 | 24.5 | 2.09 | 299.4 | 11.1 | 0.71 |
| A7QA4Q | | 246.2 | -0.4 | -0.03 | 289.4 | 1.1 | 0.07 |
| AE8N9H | | 243.4 | -3.2 | -0.27 | 248.0 | -40.3 | -2.57 |
| CEZEC2 | X | 114.5 | -132.1 | -11.28 | 121.8 | -166.6 | -10.63 |
| G8JBAG | | 253.0 | 6.4 | 0.55 | 305.6 | 17.3 | 1.10 |
| GBJLBV | | 235.6 | -11.0 | -0.94 | 279.7 | -8.6 | -0.55 |
| GXTQ4H | | 256.0 | 9.4 | 0.80 | 297.5 | 9.2 | 0.59 |
| HFB9CA | X | 328.4 | 81.8 | 6.99 | 286.6 | -1.7 | -0.11 |
| HKNTQV | | 232.8 | -13.8 | -1.18 | 277.8 | -10.6 | -0.67 |
| HVMKBU | | 238.9 | -7.7 | -0.65 | 278.7 | -9.7 | -0.62 |
| LNBZ88 | | 238.6 | -8.0 | -0.68 | 281.1 | -7.2 | -0.46 |
| NY2BU6 | | 260.9 | 14.3 | 1.22 | 300.6 | 12.3 | 0.78 |
| V7232F | | 232.2 | -14.4 | -1.23 | 290.0 | 1.7 | 0.11 |
| YQEWHC | | 253.5 | 6.9 | 0.59 | 305.2 | 16.8 | 1.07 |

| Summary Statistics | | |
|---|--------------------|--------------------|
| | Sample ST17 | Sample ST18 |
| Grand Means | 246.59 Taber Units | 288.32 Taber Units |
| SD Btwn Labs | 11.71 Taber Units | 15.67 Taber Units |
| Statistics based on 13 of 15 reporting participants | | |

Comments on assigned Data Flags for Test #340

CEZEC2 (X) - Extreme data.

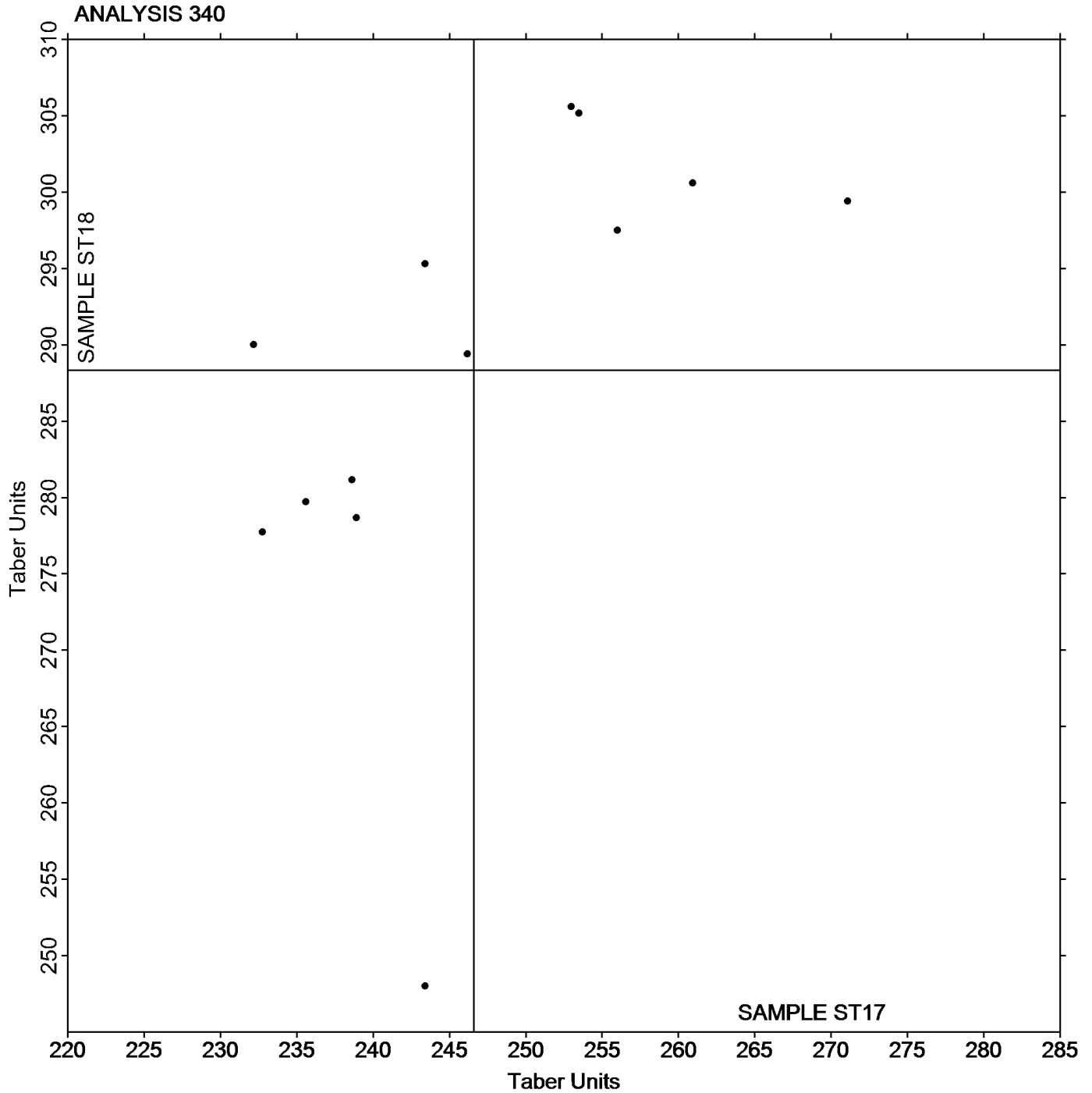
HFB9CA (X) - Extreme data for Sample ST17.

TAPPI-CTS Interlaboratory Testing Program Analysis 340

Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard

Grand Mean Sample **ST17** = 246.59 Taber Units

Grand Mean Sample **ST18** = 288.32 Taber Units



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 343
Z-Direction Tensile

| WebCode | Data Flag | Sample SM17 | | | Sample SM18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 4BKYKW | | 57.20 | -0.92 | -0.12 | 72.78 | -4.27 | -0.43 | LW |
| 74FUR4 | | 53.29 | -4.83 | -0.63 | 67.21 | -9.84 | -0.98 | TZ |
| 7K3JF6 | | 64.72 | 6.60 | 0.86 | 85.00 | 7.95 | 0.80 | DT |
| A8ND4T | | 51.47 | -6.65 | -0.86 | 68.55 | -8.50 | -0.85 | TZ |
| AAA68J | | 50.36 | -7.76 | -1.01 | 72.84 | -4.21 | -0.42 | DT |
| CEZEC2 | | 64.64 | 6.52 | 0.85 | 89.96 | 12.91 | 1.29 | CA |
| DBD24J | | 42.99 | -15.13 | -1.96 | 63.73 | -13.32 | -1.33 | LW |
| EDUMCW | | 65.20 | 7.08 | 0.92 | 78.20 | 1.15 | 0.12 | DT |
| HQUGGQ | | 43.02 | -15.10 | -1.96 | 65.48 | -11.57 | -1.16 | CD |
| L92W7M | | 63.88 | 5.76 | 0.75 | 84.04 | 6.99 | 0.70 | TA |
| LE7RPM | | 66.98 | 8.86 | 1.15 | 85.84 | 8.79 | 0.88 | TL |
| LNBZ88 | * | 55.75 | -2.37 | -0.31 | 57.49 | -19.56 | -1.96 | XX |
| NXB82X | | 66.60 | 8.48 | 1.10 | 91.41 | 14.36 | 1.44 | TA |
| PWTHDC | | 63.56 | 5.44 | 0.71 | 85.10 | 8.05 | 0.81 | LW |
| RB7KWC | | 58.80 | 0.68 | 0.09 | 83.84 | 6.79 | 0.68 | CD |
| UWDREF | | 60.92 | 2.80 | 0.36 | 82.02 | 4.97 | 0.50 | TA |
| WJNKF6 | | 58.72 | 0.60 | 0.08 | 76.34 | -0.71 | -0.07 | XX |

| Summary Statistics | | |
|---|-------------|-------------|
| | Sample SM17 | Sample SM18 |
| Grand Means | 58.124 psi | 77.049 psi |
| SD Btwn Labs | 7.702 psi | 9.995 psi |
| Statistics based on 17 of 17 reporting participants | | |

Instrument Code List

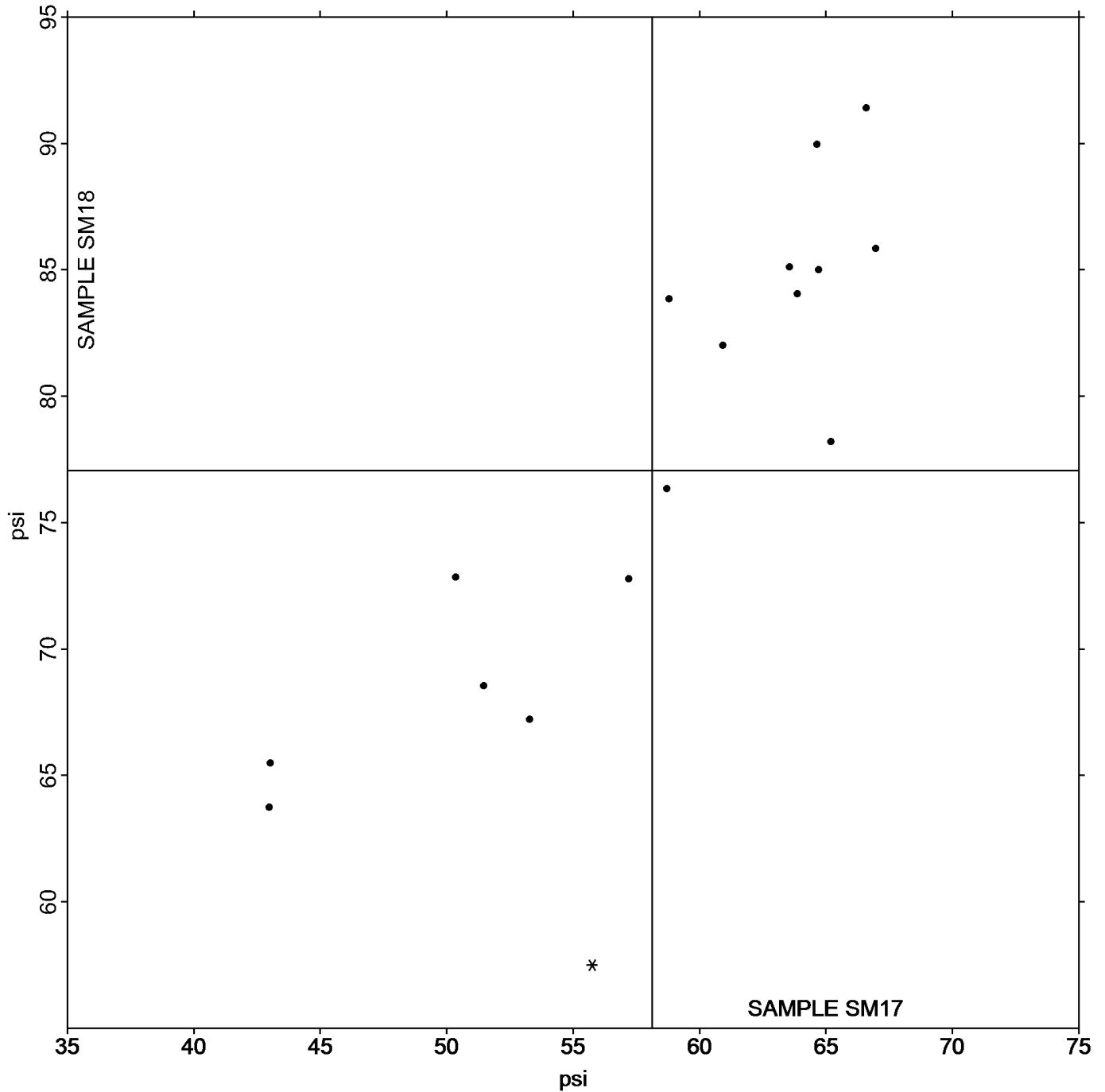
- | | |
|-------------------------------------|---|
| (CA) - CSI CS-163 | (CD) - CSI CS-163D |
| (DT) - Dek-Tron DCS-163A ZDT Tester | (LW) - L & W ZD Tensile Tester |
| (TA) - Thwing-Albert Tensile Tester | (TL) - TMI Lab Master |
| (TZ) - TMI Monitor/ZDT Tester | (XX) - Instrument make/model not specified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

TAPPI-CTS Interlaboratory Testing Program
Analysis 343
Z-Direction Tensile

Grand Mean Sample **SM17** = 58.124 psi

Grand Mean Sample **SM18** = 77.049 psi

ANALYSIS 343



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard

| WebCode | Data Flag | Sample SZ17 | | | Sample SZ18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 4NQC GN | | 39.52 | 0.26 | 0.10 | 37.00 | 1.49 | 0.53 | XX |
| 4TMVHL | | 37.42 | -1.85 | -0.71 | 34.94 | -0.57 | -0.20 | TL |
| 6JXAB3 | | 41.44 | 2.17 | 0.84 | 40.02 | 4.51 | 1.62 | TL |
| A7QA4Q | | 38.40 | -0.87 | -0.33 | 34.80 | -0.71 | -0.25 | CA |
| F6ZTXY | | 41.14 | 1.87 | 0.72 | 30.68 | -4.83 | -1.73 | LW |
| FLPZVW | | 40.86 | 1.59 | 0.62 | 35.32 | -0.19 | -0.07 | LW |
| HFB9CA | | 40.40 | 1.13 | 0.44 | 35.80 | 0.29 | 0.11 | TZ |
| HVMKBU | | 38.72 | -0.55 | -0.21 | 33.40 | -2.11 | -0.76 | CA |
| J3LPFJ | | 40.14 | 0.87 | 0.34 | 34.64 | -0.87 | -0.31 | XX |
| LB6RPP | | 38.98 | -0.29 | -0.11 | 31.72 | -3.79 | -1.36 | CA |
| NY2BU6 | | 33.38 | -5.89 | -2.27 | 34.10 | -1.41 | -0.51 | TL |
| Q876ZH | | 41.99 | 2.73 | 1.05 | 40.00 | 4.49 | 1.61 | PG |
| U767DE | | 42.92 | 3.65 | 1.41 | 39.78 | 4.27 | 1.53 | TL |
| V294P6 | | 34.22 | -5.05 | -1.95 | 33.06 | -2.45 | -0.88 | TL |
| V7232F | | 40.40 | 1.13 | 0.44 | 37.40 | 1.89 | 0.68 | CA |
| ZFCVPC | | 38.32 | -0.95 | -0.37 | 35.46 | -0.05 | -0.02 | LW |

| | | Summary Statistics | | | |
|---|--|--------------------|--|-------------|--|
| | | Sample SZ17 | | Sample SZ18 | |
| Grand Means | | 39.266 psi | | 35.507 psi | |
| SD Btwn Labs | | 2.589 psi | | 2.785 psi | |
| Statistics based on 16 of 16 reporting participants | | | | | |

Instrument Code List

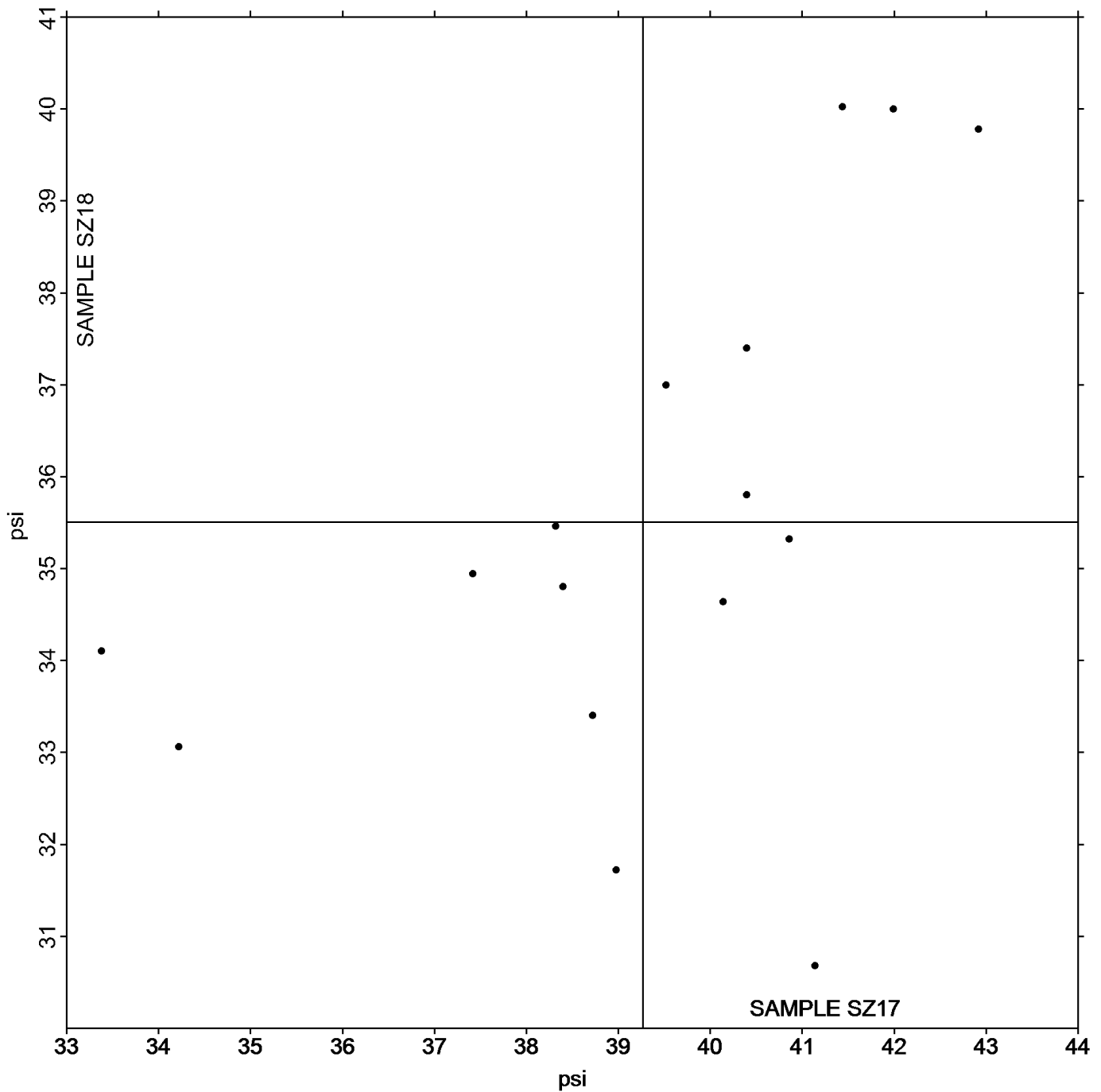
- | | |
|--------------------------------------|---|
| (CA) - CSI CS-163 | (LW) - L & W ZD Tensile Tester |
| (PG) - Perkins Model A Mullen Tester | (TL) - TMI Lab Master |
| (TZ) - TMI Monitor/ZDT Tester | (XX) - Instrument make/model not specified by lab |

TAPPI-CTS Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard

Grand Mean Sample **SZ17** = 39.266 psi

Grand Mean Sample **SZ18** = 35.507 psi

ANALYSIS 345



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics

| WebCode | Data Flag | Sample SN17 | | | Sample SN18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 4BKYKW | | 72.40 | -3.61 | -0.62 | 87.80 | -10.41 | -1.44 | HZ |
| 6WY3JQ | | 78.64 | 2.63 | 0.45 | 95.04 | -3.17 | -0.44 | HZ |
| 74FUR4 | | 81.60 | 5.59 | 0.97 | 101.80 | 3.59 | 0.50 | HY |
| 7N4DK2 | | 75.12 | -0.89 | -0.15 | 93.56 | -4.65 | -0.64 | KR |
| 7WEM4N | | 72.18 | -3.83 | -0.66 | 99.80 | 1.59 | 0.22 | HY |
| A8ND4T | | 67.00 | -9.01 | -1.56 | 89.60 | -8.61 | -1.19 | HY |
| CLGUXJ | | 76.80 | 0.79 | 0.14 | 93.40 | -4.81 | -0.66 | HZ |
| DQ7LRY | | 73.40 | -2.61 | -0.45 | 95.60 | -2.61 | -0.36 | HY |
| HQUGGQ | | 73.20 | -2.81 | -0.49 | 98.40 | 0.19 | 0.03 | HY |
| HTWETJ | | 68.40 | -7.61 | -1.32 | 97.00 | -1.21 | -0.17 | HY |
| HVMKBU | | 79.00 | 2.99 | 0.52 | 104.80 | 6.59 | 0.91 | HZ |
| K3VZP9 | | 71.40 | -4.61 | -0.80 | 94.20 | -4.01 | -0.55 | HY |
| L92W7M | | 83.20 | 7.19 | 1.24 | 112.80 | 14.59 | 2.02 | HY |
| NGZJVP | | 69.80 | -6.21 | -1.07 | 88.20 | -10.01 | -1.38 | XX |
| NXB82X | | 79.60 | 3.59 | 0.62 | 100.20 | 1.99 | 0.27 | HZ |
| PWTHDC | | 85.60 | 9.59 | 1.66 | 109.60 | 11.39 | 1.57 | XX |
| RB7KWC | | 71.60 | -4.41 | -0.76 | 94.80 | -3.41 | -0.47 | HY |
| UWDREF | | 88.60 | 12.59 | 2.18 | 112.80 | 14.59 | 2.02 | HY |
| VBD496 | | 74.08 | -1.93 | -0.33 | 96.24 | -1.97 | -0.27 | HY |
| XB6N7N | | 78.60 | 2.59 | 0.45 | 98.60 | 0.39 | 0.05 | HY |

| | | Summary Statistics | | | |
|---|--|--------------------|---------------|-------------|---------------|
| | | Sample SN17 | | Sample SN18 | |
| Grand Means | | 76.011 | 1000th ft-lbs | 98.212 | 1000th ft-lbs |
| SD Btw Labs | | 5.780 | 1000th ft-lbs | 7.240 | 1000th ft-lbs |
| Statistics based on 20 of 20 reporting participants | | | | | |

Instrument Code List

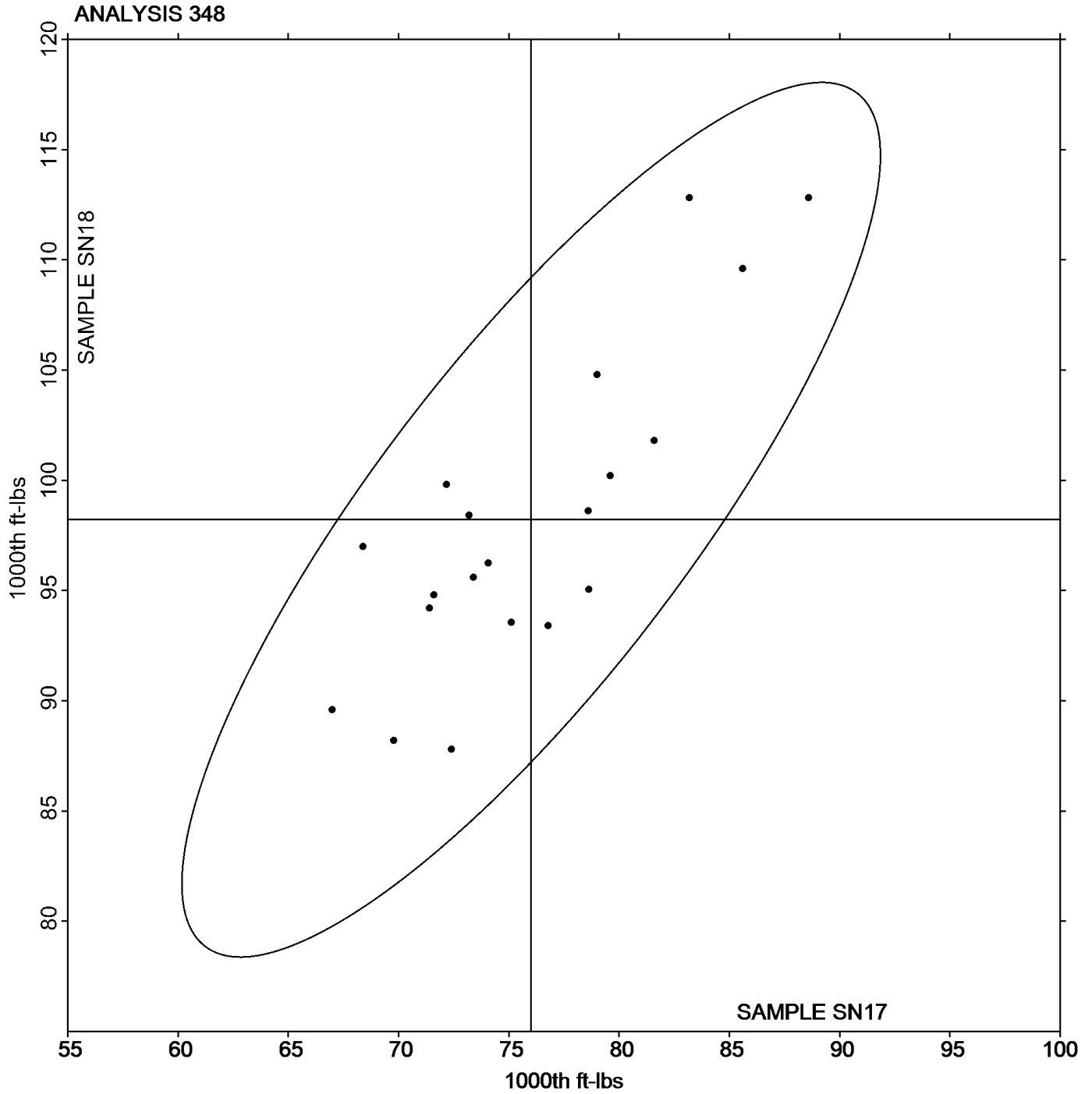
(HY) - Huygen Digitized Scott Internal Bond Tester
 (KR) - Kumagai Riki Kogyo Internal Bond Tester

(HZ) - Huygen Internal Bond Tester with AccuPress
 (XX) - Instrument make/model not specified by lab

TAPPI-CTS Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics

Grand Mean Sample **SN17** = 76.011 1000th ft-lbs

Grand Mean Sample **SN18** = 98.212 1000th ft-lbs



TAPPI-CTS Interlaboratory Testing Program
Analysis 349
Internal Bond Strength - Scott Bond Models

| WebCode | Data Flag | Sample SP17 | | | Sample SP18 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 3DY4HU | | 64.32 | 0.07 | 0.01 | 84.37 | -0.59 | -0.06 | TM |
| 93FV62 | | 64.43 | 0.19 | 0.03 | 85.18 | 0.22 | 0.02 | XX |
| FLPZVW | X | 101.60 | 37.36 | 6.39 | 82.00 | -2.95 | -0.29 | XX |
| G6U6PJ | | 73.20 | 8.96 | 1.53 | 91.20 | 6.25 | 0.60 | SC |
| HKNTQV | | 67.42 | 3.18 | 0.54 | 100.04 | 15.09 | 1.46 | SC |
| LNBZ88 | | 51.20 | -13.04 | -2.23 | 62.43 | -22.52 | -2.18 | TM |
| NUVKPE | | 61.40 | -2.84 | -0.49 | 78.99 | -5.96 | -0.58 | TM |
| PAJCP6 | | 64.80 | 0.56 | 0.10 | 85.59 | 0.63 | 0.06 | TM |
| Q876ZH | | 65.60 | 1.36 | 0.23 | 91.60 | 6.65 | 0.64 | TM |
| V294P6 | | 65.80 | 1.56 | 0.27 | 85.20 | 0.25 | 0.02 | XX |

| | | Summary Statistics | | | |
|--|--|--------------------|---------------|-------------|---------------|
| | | Sample SP17 | | Sample SP18 | |
| Grand Means | | 64.241 | 1000th ft-lbs | 84.955 | 1000th ft-lbs |
| SD Btwn Labs | | 5.843 | 1000th ft-lbs | 10.335 | 1000th ft-lbs |
| Statistics based on 9 of 10 reporting participants | | | | | |

Comments on assigned Data Flags for Test #349

FLPZVW (X) - Extreme data for Sample SP17.

Instrument Code List

(SC) - Scott Internal Bond Tester (Manual)

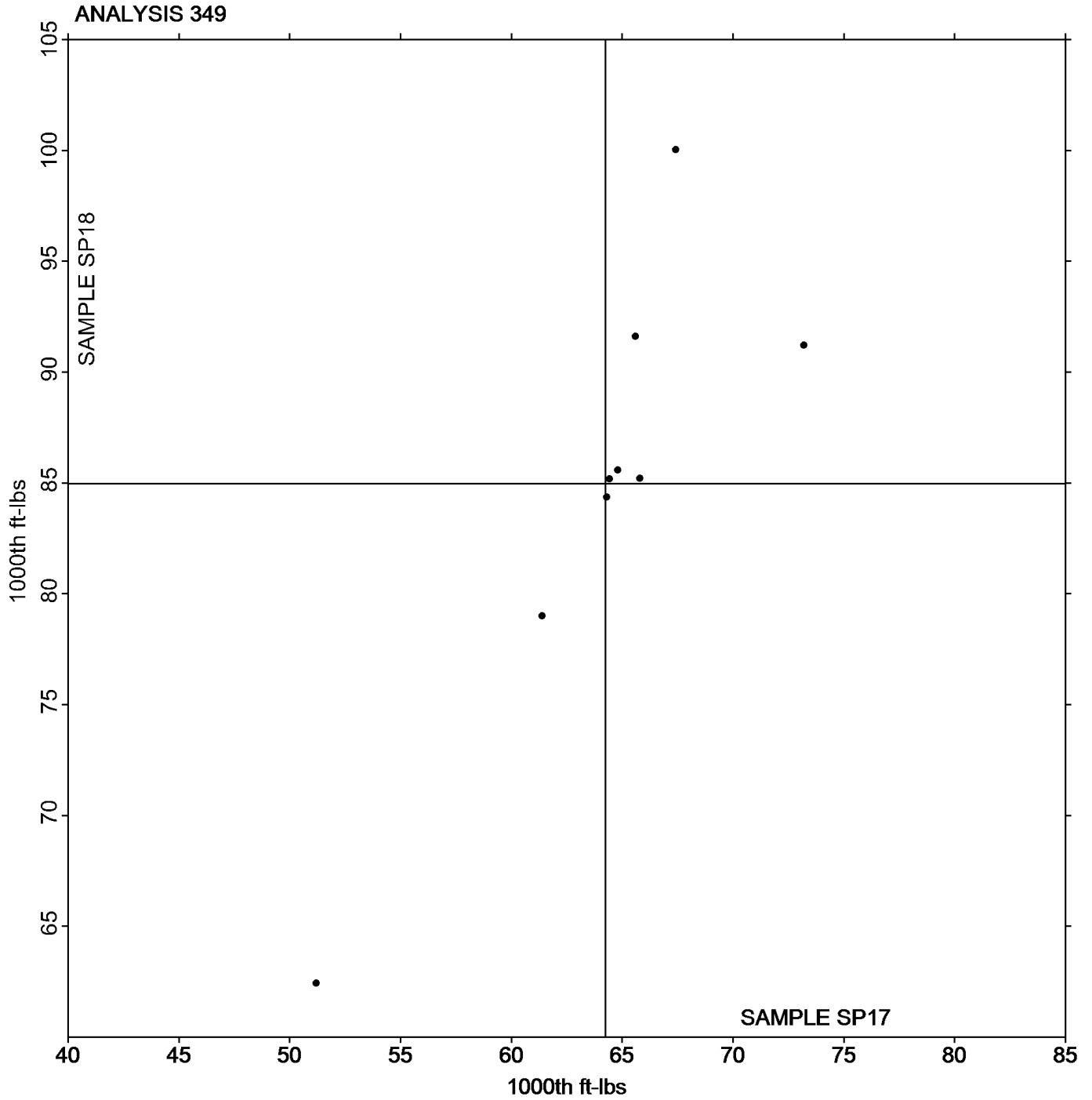
(TM) - TMI Monitor/Internal Bond Tester

(XX) - Instrument make/model not specified by lab

TAPPI-CTS Interlaboratory Testing Program
Analysis 349
Internal Bond Strength - Scott Bond Models

Grand Mean Sample **SP17** = 64.241 1000th ft-lbs

Grand Mean Sample **SP18** = 84.955 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.