

Paper & Paperboard Interlaboratory Testing Program

Summary Report #284S - September 2016

[Introduction to the Paper & Paperboard Interlaboratory Program](#)

[Explanation of Tables and Definitions of Terms](#)

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| 311 | Tearing Strength - Newsprint |
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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.



Paper & Paperboard Interlaboratory Testing Program
Analysis 305
Bursting Strength - Printing Papers
TAPPI Official Test Method T403

Report #2845
 September 2016

| WebCode | Data Flag | Sample SA35 | | | Sample SA36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 2VPEDA | | 25.76 | -0.43 | -0.20 | 41.96 | -1.40 | -0.48 |
| 373N8Z | | 24.68 | -1.51 | -0.69 | 40.39 | -2.97 | -1.02 |
| 3AP4ZG | | 26.06 | -0.13 | -0.06 | 43.56 | 0.20 | 0.07 |
| 63YREB | | 30.15 | 3.96 | 1.80 | 48.30 | 4.94 | 1.69 |
| 7GTJXQ | | 28.37 | 2.18 | 0.99 | 43.66 | 0.30 | 0.10 |
| 7TPZUZ | | 22.73 | -3.46 | -1.58 | 40.54 | -2.82 | -0.96 |
| AX6YDV | | 27.21 | 1.02 | 0.46 | 43.71 | 0.36 | 0.12 |
| CAQHXY | | 29.54 | 3.35 | 1.52 | 46.61 | 3.25 | 1.11 |
| CNBZQ3 | | 26.76 | 0.57 | 0.26 | 40.83 | -2.53 | -0.86 |
| GYWT7E | | 24.56 | -1.64 | -0.75 | 40.55 | -2.81 | -0.96 |
| HAP7QN | | 26.73 | 0.54 | 0.24 | 45.03 | 1.67 | 0.57 |
| HVADDY | | 25.95 | -0.25 | -0.11 | 40.39 | -2.97 | -1.01 |
| HYDAYM | | 29.12 | 2.93 | 1.33 | 45.18 | 1.82 | 0.62 |
| KJBG7G | | 24.80 | -1.39 | -0.63 | 46.90 | 3.54 | 1.21 |
| MZR8HL | | 27.50 | 1.31 | 0.59 | 49.00 | 5.64 | 1.93 |
| PHLEBG | | 24.10 | -2.09 | -0.95 | 39.68 | -3.68 | -1.26 |
| PUVJDQ | | 27.58 | 1.39 | 0.63 | 44.55 | 1.19 | 0.41 |
| Q6AYVJ | | 24.09 | -2.10 | -0.96 | 40.14 | -3.22 | -1.10 |
| QCUU2T | | 24.20 | -1.99 | -0.91 | 38.40 | -4.96 | -1.69 |
| QUA7PD | | 30.00 | 3.81 | 1.73 | 46.90 | 3.54 | 1.21 |
| R7MPLE | | 24.46 | -1.74 | -0.79 | 41.22 | -2.14 | -0.73 |
| RLDT3H | | 27.00 | 0.81 | 0.37 | 43.90 | 0.54 | 0.18 |
| UDU796 | | 26.34 | 0.14 | 0.06 | 41.69 | -1.67 | -0.57 |
| UQKXT9 | | 28.17 | 1.97 | 0.90 | 46.14 | 2.78 | 0.95 |
| WJD97L | | 22.60 | -3.59 | -1.63 | 40.50 | -2.86 | -0.98 |
| XBQAX6 | * | 22.55 | -3.64 | -1.66 | 45.50 | 2.14 | 0.73 |
| ZACXLZ | | 26.24 | 0.04 | 0.02 | 45.48 | 2.12 | 0.73 |

| | Sample SA35 | Summary Statistics | Sample SA36 |
|-----------------------------------------------------|-------------|--------------------|-------------|
| Grand Means | 26.194 psi | | 43.359 psi |
| SD Btwn Labs | 2.199 psi | | 2.926 psi |
| Statistics based on 27 of 27 reporting participants | | | |



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 305

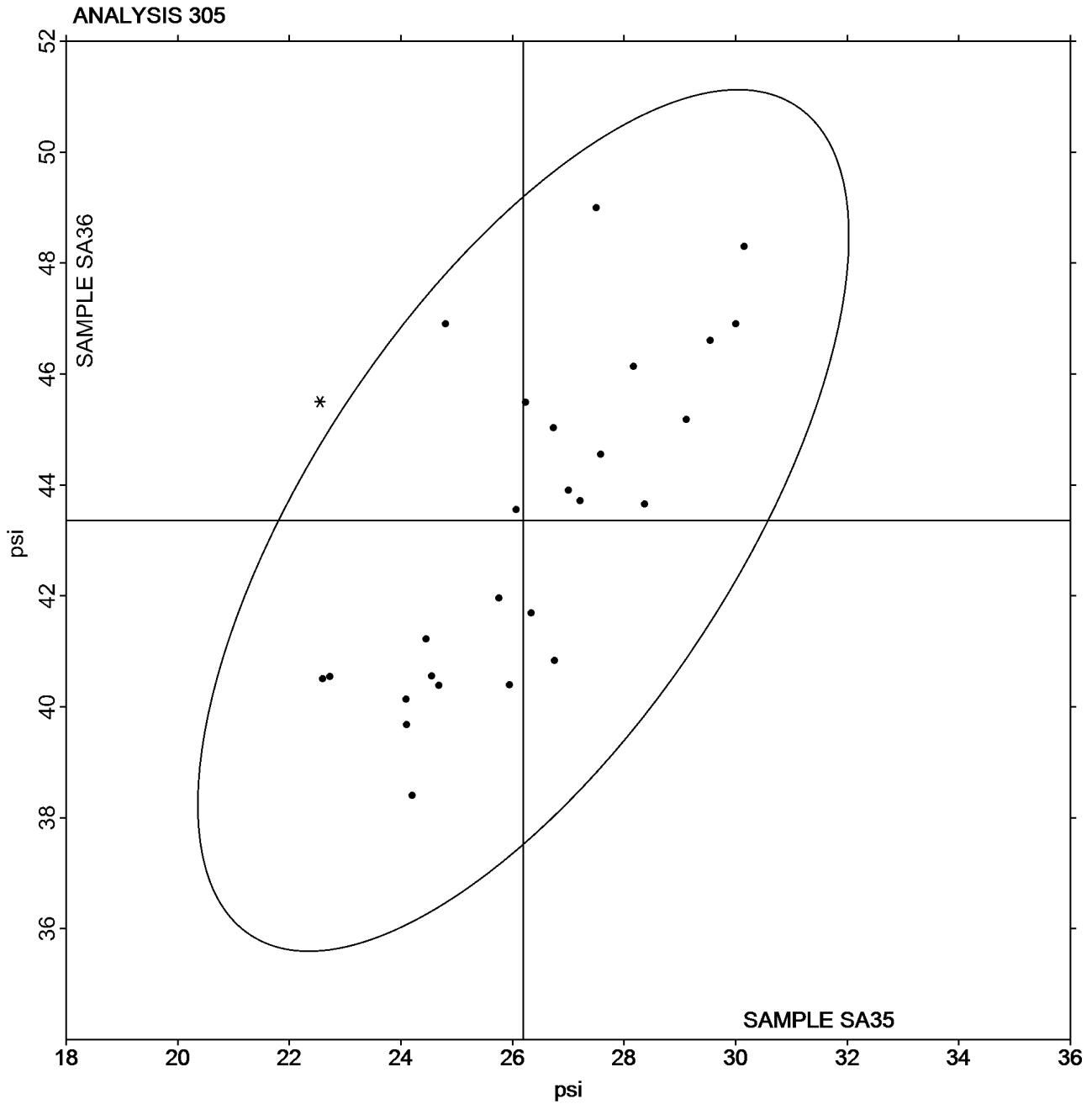
September 2016

Bursting Strength - Printing Papers

TAPPI Official Test Method T403

Grand Mean Sample SA35 = 26.194 psi

Grand Mean Sample SA36 = 43.359 psi





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 310

September 2016

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

| WebCode | Data Flag | Sample SB35 | | | Sample SB36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 2TM9PB | | 91.00 | 0.16 | 0.03 | 92.58 | -3.42 | -0.58 |
| 3MTTD9 | | 96.87 | 6.03 | 1.03 | 107.33 | 11.33 | 1.94 |
| 3T3PK4 | | 78.43 | -12.41 | -2.13 | 86.40 | -9.60 | -1.64 |
| 43KNQY | | 88.45 | -2.39 | -0.41 | 93.02 | -2.98 | -0.51 |
| 47H8RX | | 92.50 | 1.66 | 0.29 | 102.40 | 6.40 | 1.09 |
| 7TN3J6 | | 101.18 | 10.34 | 1.77 | 103.45 | 7.45 | 1.27 |
| 8P38A4 | | 99.01 | 8.18 | 1.40 | 98.92 | 2.93 | 0.50 |
| 9ZZTN2 | | 88.52 | -2.32 | -0.40 | 87.79 | -8.20 | -1.40 |
| AX6YDV | | 86.41 | -4.42 | -0.76 | 98.23 | 2.24 | 0.38 |
| BC6X2T | | 82.03 | -8.81 | -1.51 | 94.69 | -1.31 | -0.22 |
| BZNBRR | | 98.90 | 8.06 | 1.38 | 99.30 | 3.30 | 0.56 |
| CAQHXY | | 88.76 | -2.08 | -0.36 | 90.69 | -5.31 | -0.91 |
| CB9AA4 | | 86.40 | -4.44 | -0.76 | 94.70 | -1.30 | -0.22 |
| DUHQVT | | 95.00 | 4.16 | 0.71 | 101.38 | 5.39 | 0.92 |
| EA6QYX | | 89.95 | -0.89 | -0.15 | 95.50 | -0.50 | -0.08 |
| FNJBYH | | 99.06 | 8.22 | 1.41 | 100.94 | 4.94 | 0.84 |
| FU66C3 | | 90.35 | -0.49 | -0.08 | 92.90 | -3.10 | -0.53 |
| HHL CXR | | 85.04 | -5.80 | -1.00 | 95.52 | -0.47 | -0.08 |
| J6WULY | | 91.70 | 0.86 | 0.15 | 93.60 | -2.40 | -0.41 |
| KQVHNE | | 98.06 | 7.22 | 1.24 | 103.88 | 7.88 | 1.35 |
| LU8G6J | | 90.97 | 0.13 | 0.02 | 97.00 | 1.01 | 0.17 |
| N3UKED | | 95.22 | 4.38 | 0.75 | 101.94 | 5.94 | 1.01 |
| NFYN3T | | 92.98 | 2.15 | 0.37 | 96.96 | 0.96 | 0.16 |
| PRPW38 | | 96.00 | 5.16 | 0.89 | 99.60 | 3.60 | 0.62 |
| PUVJDQ | | 90.93 | 0.09 | 0.02 | 97.38 | 1.38 | 0.24 |
| QCUU2T | | 93.36 | 2.52 | 0.43 | 101.58 | 5.58 | 0.95 |
| RETZZC | | 95.65 | 4.81 | 0.83 | 97.35 | 1.35 | 0.23 |
| TKFYLP | | 88.35 | -2.49 | -0.43 | 96.53 | 0.53 | 0.09 |
| TYV34E | | 83.17 | -7.67 | -1.32 | 91.01 | -4.98 | -0.85 |
| VQWWNH | | 87.89 | -2.95 | -0.51 | 92.91 | -3.08 | -0.53 |
| YFMLNH | | 85.40 | -5.44 | -0.93 | 86.60 | -9.40 | -1.60 |
| ZKX2RE | * | 79.30 | -11.54 | -1.98 | 79.80 | -16.20 | -2.77 |

| Sample SB35 | | Summary Statistics | Sample SB36 | |
|-----------------------------------------------------|------------|--------------------|-------------|--|
| Grand Means | 90.838 psi | | 95.996 psi | |
| SD Btwn Labs | 5.828 psi | | 5.855 psi | |
| Statistics based on 32 of 32 reporting participants | | | | |



Paper & Paperboard Interlaboratory Testing Program

Analysis 310

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

Report #284S

September 2016

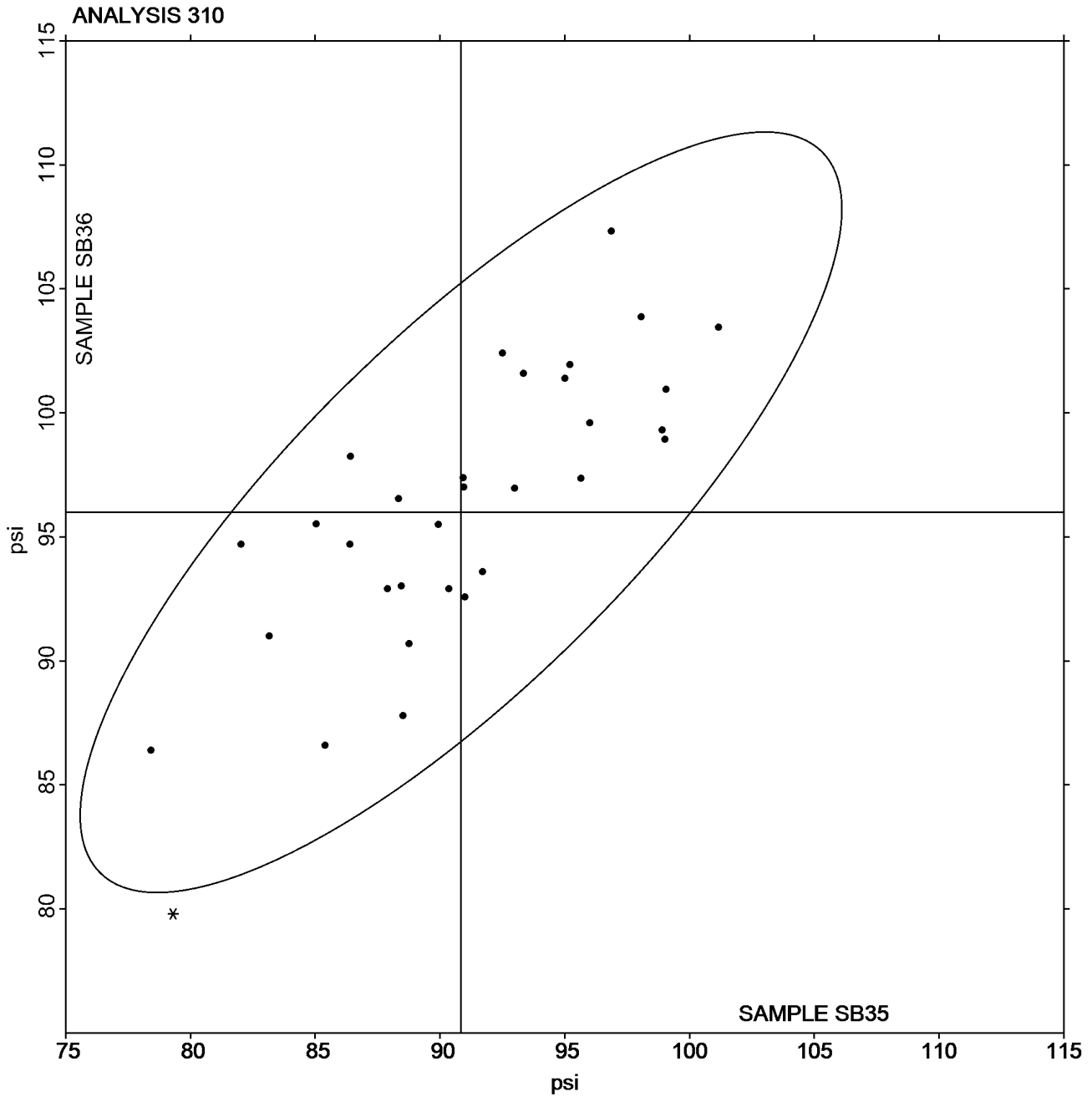


Paper & Paperboard Interlaboratory Testing Program
Analysis 310
Bursting Strength - Packaging Papers
TAPPI Official Test Method T403

Report #2845
September 2016

Grand Mean Sample **SB35** = 90.838 psi

Grand Mean Sample **SB36** = 95.996 psi





Paper & Paperboard Interlaboratory Testing Program
Analysis 311
Tearing Strength - Newsprint
TAPPI Official Test Method T414

Report #2845
September 2016

| WebCode | Data Flag | Sample SK35 | | | Sample SK36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 6FMAD2 | X | 35.34 | 9.15 | 10.24 | 34.88 | 7.79 | 22.02 |
| BC239T | | 25.79 | -0.40 | -0.45 | 27.35 | 0.26 | 0.73 |
| HYDAYM | | 25.64 | -0.55 | -0.62 | 26.81 | -0.28 | -0.79 |
| MVW8QN | | 25.29 | -0.90 | -1.01 | 26.83 | -0.26 | -0.74 |
| PUVJDQ | | 26.81 | 0.62 | 0.69 | 27.58 | 0.49 | 1.39 |
| VXEU3A | | 27.43 | 1.24 | 1.39 | 26.88 | -0.21 | -0.60 |

| Sample SK35 | | Summary Statistics | Sample SK36 | |
|---------------------------------------------------|--------------|--------------------|--------------|--|
| Grand Means | 26.192 Grams | | 27.091 Grams | |
| SD Btwn Labs | 0.894 Grams | | 0.354 Grams | |
| Statistics based on 5 of 6 reporting participants | | | | |

Comments on Assigned Data Flags for Test #311

6FMAD2 (X) - Extreme Data.



Paper & Paperboard Interlaboratory Testing Program

Report #2845

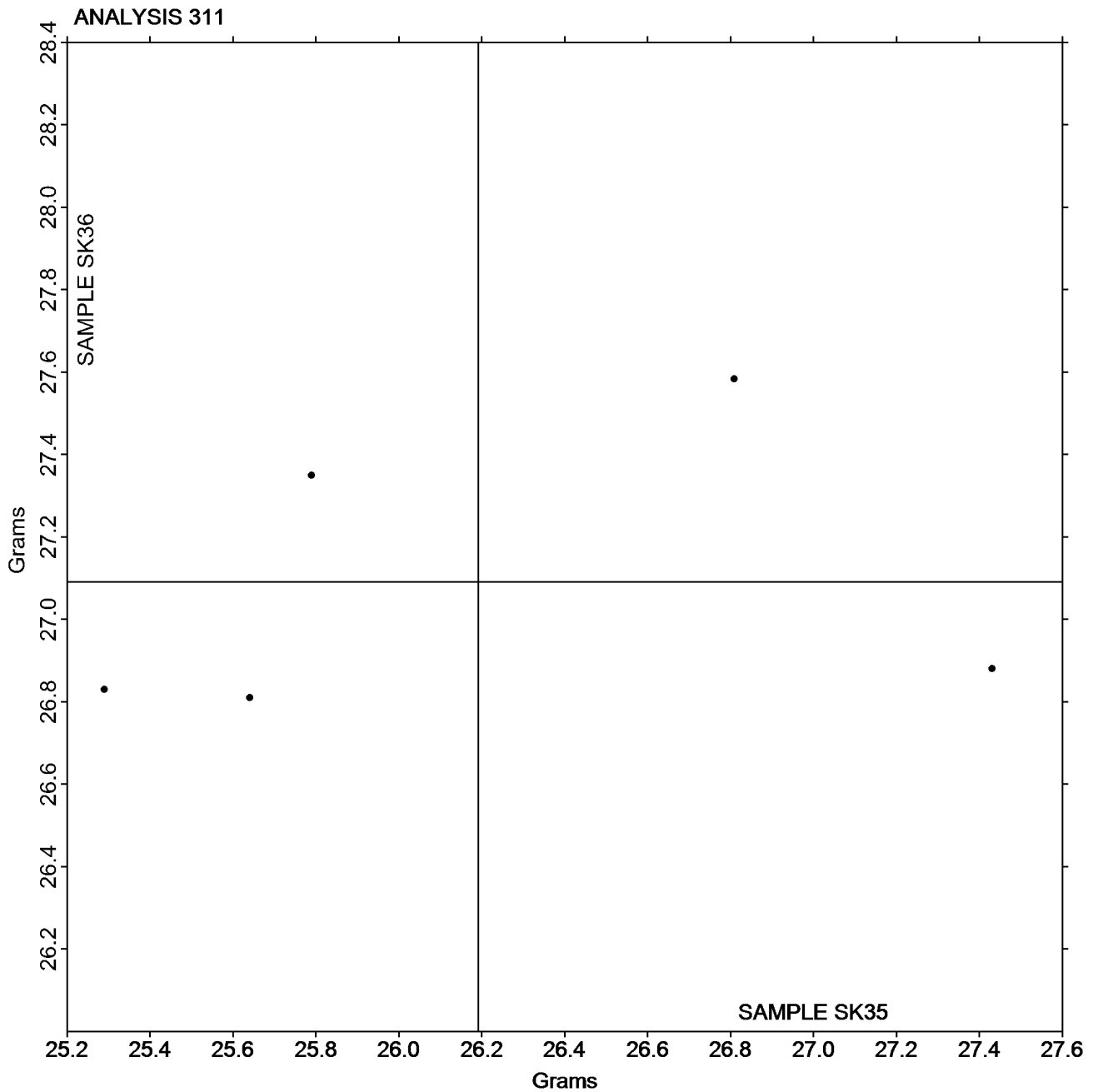
Analysis 311

September 2016

Tearing Strength - Newsprint TAPPI Official Test Method T414

Grand Mean Sample **SK35** = 26.192 Grams

Grand Mean Sample **SK36** = 27.091 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

Report #2845

Analysis 312

September 2016

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

| WebCode | Data Flag | Sample SC35 | | | Sample SC36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 2TM9PB | | 48.66 | -0.55 | -0.17 | 63.64 | -0.12 | -0.03 |
| 2VPEDA | | 49.70 | 0.48 | 0.15 | 61.90 | -1.86 | -0.55 |
| 373N8Z | | 47.55 | -1.67 | -0.51 | 61.24 | -2.52 | -0.74 |
| 3HELY3 | | 50.40 | 1.18 | 0.37 | 63.73 | -0.03 | -0.01 |
| 3PG3MA | | 54.80 | 5.58 | 1.72 | 70.00 | 6.24 | 1.84 |
| 3T3PK4 | | 42.68 | -6.54 | -2.02 | 57.04 | -6.72 | -1.98 |
| 43KNQY | | 50.34 | 1.13 | 0.35 | 65.99 | 2.23 | 0.66 |
| 4V4MFA | | 53.40 | 4.18 | 1.29 | 69.20 | 5.44 | 1.60 |
| 4WEMC4 | | 43.43 | -5.79 | -1.79 | 60.01 | -3.75 | -1.10 |
| 4WEP28 | | 47.02 | -2.20 | -0.68 | 60.48 | -3.28 | -0.97 |
| 63YREB | | 45.44 | -3.78 | -1.17 | 60.68 | -3.08 | -0.91 |
| 7GTJXQ | X | 46.74 | -2.48 | -0.76 | 60.84 | -2.92 | -0.86 |
| 7TPZUZ | | 52.44 | 3.22 | 1.00 | 66.34 | 2.59 | 0.76 |
| 9EEQX9 | | 51.40 | 2.18 | 0.67 | 67.10 | 3.34 | 0.98 |
| 9ZZTN2 | | 52.23 | 3.01 | 0.93 | 65.79 | 2.03 | 0.60 |
| ATCYYZ | | 50.46 | 1.24 | 0.38 | 64.22 | 0.46 | 0.14 |
| AX6YDV | | 47.96 | -1.26 | -0.39 | 61.66 | -2.09 | -0.62 |
| CAQHXY | | 49.94 | 0.73 | 0.22 | 64.23 | 0.47 | 0.14 |
| CRP6BV | | 51.34 | 2.12 | 0.66 | 61.98 | -1.78 | -0.52 |
| DB64AL | | 50.08 | 0.86 | 0.27 | 60.32 | -3.44 | -1.01 |
| DYQAUL | | 55.20 | 5.98 | 1.85 | 71.58 | 7.83 | 2.31 |
| EW3ZHZ | | 45.87 | -3.35 | -1.03 | 59.31 | -4.45 | -1.31 |
| FNJBYH | | 45.10 | -4.12 | -1.27 | 58.72 | -5.04 | -1.48 |
| FU66C3 | | 47.75 | -1.47 | -0.45 | 64.40 | 0.64 | 0.19 |
| GYWT7E | | 49.00 | -0.22 | -0.07 | 66.90 | 3.14 | 0.93 |
| HAP7QN | | 50.05 | 0.83 | 0.26 | 64.57 | 0.81 | 0.24 |
| HVADDY | | 47.96 | -1.26 | -0.39 | 63.31 | -0.44 | -0.13 |
| J6WULY | | 48.37 | -0.85 | -0.26 | 63.84 | 0.08 | 0.02 |
| K4VGCC | | 47.48 | -1.74 | -0.54 | 65.33 | 1.57 | 0.46 |
| KJBG7G | | 46.66 | -2.56 | -0.79 | 61.60 | -2.16 | -0.64 |
| KQVHNE | | 52.46 | 3.24 | 1.00 | 69.61 | 5.86 | 1.73 |
| L98LMC | X | 47.14 | -2.08 | -0.64 | 65.51 | 1.75 | 0.51 |
| LU8G6J | | 47.94 | -1.28 | -0.39 | 61.17 | -2.58 | -0.76 |
| LXBHJH | | 48.74 | -0.48 | -0.15 | 62.52 | -1.24 | -0.36 |
| M89ZBW | | 48.17 | -1.05 | -0.32 | 58.71 | -5.05 | -1.49 |
| MZR8HL | X | 56.00 | 6.78 | 2.09 | 62.50 | -1.26 | -0.37 |
| NFYN3T | | 47.54 | -1.68 | -0.52 | 63.48 | -0.28 | -0.08 |
| NNULRG | * | 57.46 | 8.24 | 2.54 | 69.04 | 5.28 | 1.56 |
| NP7HWL | | 48.30 | -0.92 | -0.28 | 60.34 | -3.42 | -1.01 |
| P839RE | | 47.12 | -2.10 | -0.65 | 65.18 | 1.42 | 0.42 |



Paper & Paperboard Interlaboratory Testing Program
Analysis 312
Tearing Strength - Printing Papers
TAPPI Official Test Method T414

Report #2845
 September 2016

| WebCode | Data Flag | Sample SC35 | | | Sample SC36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| P9XN6C | | 47.17 | -2.05 | -0.63 | 63.59 | -0.17 | -0.05 |
| PUVJDQ | | 49.18 | -0.03 | -0.01 | 66.86 | 3.11 | 0.91 |
| PYNLGP | | 51.84 | 2.62 | 0.81 | 65.78 | 2.02 | 0.60 |
| Q6AYVJ | | 51.06 | 1.84 | 0.57 | 63.46 | -0.30 | -0.09 |
| QBZ96G | X | 56.28 | 7.06 | 2.18 | 76.84 | 13.08 | 3.85 |
| QCADKQ | | 44.00 | -5.22 | -1.61 | 58.56 | -5.20 | -1.53 |
| QUA7PD | | 50.77 | 1.55 | 0.48 | 65.62 | 1.86 | 0.55 |
| R7MPLE | | 54.57 | 5.35 | 1.65 | 66.56 | 2.80 | 0.83 |
| T66YB9 | | 44.70 | -4.52 | -1.39 | 60.90 | -2.86 | -0.84 |
| TYV34E | | 51.05 | 1.83 | 0.57 | 64.30 | 0.55 | 0.16 |
| UDU796 | | 50.60 | 1.38 | 0.43 | 63.80 | 0.04 | 0.01 |
| UQKXT9 | | 43.76 | -5.46 | -1.68 | 60.76 | -3.00 | -0.88 |
| UZ9Q67 | | 42.99 | -6.23 | -1.92 | 59.10 | -4.66 | -1.37 |
| VW3MTA | | 51.72 | 2.50 | 0.77 | 65.50 | 1.74 | 0.51 |
| WJD97L | | 51.64 | 2.42 | 0.75 | 65.76 | 2.00 | 0.59 |
| YYYDPY | | 49.85 | 0.63 | 0.20 | 61.99 | -1.77 | -0.52 |
| ZKX2RE | X | 58.60 | 9.38 | 2.90 | 71.00 | 7.24 | 2.13 |
| ZMH8Q2 | | 53.11 | 3.89 | 1.20 | 71.43 | 7.67 | 2.26 |

| Sample SC35 | | Summary Statistics | Sample SC36 | |
|-----------------------------------------------------|--------------|--------------------|--------------|--|
| Grand Means | 49.216 Grams | | 63.757 Grams | |
| SD Btwn Labs | 3.240 Grams | | 3.395 Grams | |
| Statistics based on 53 of 58 reporting participants | | | | |

Comments on Assigned Data Flags for Test #312

- L98LMC (X) - Data appear to be off by a factor of 2. Corrected by CTS (x.5).
- 7GTJXQ (X) - Data appear to be off by a factor of .5; data converted by CTS (x2).
- ZKX2RE (X) - Data appear to be off by a factor of .5; data converted by CTS (x2).
- MZR8HL (X) - Inconsistent in testing between samples.
- QBZ96G (X) - Data for sample SC36 are high.

Analysis Notes:

- 7GTJXQ - Data appear to be reported as gf, not mN as indicated on datasheet. Units corrected by CTS.



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 312

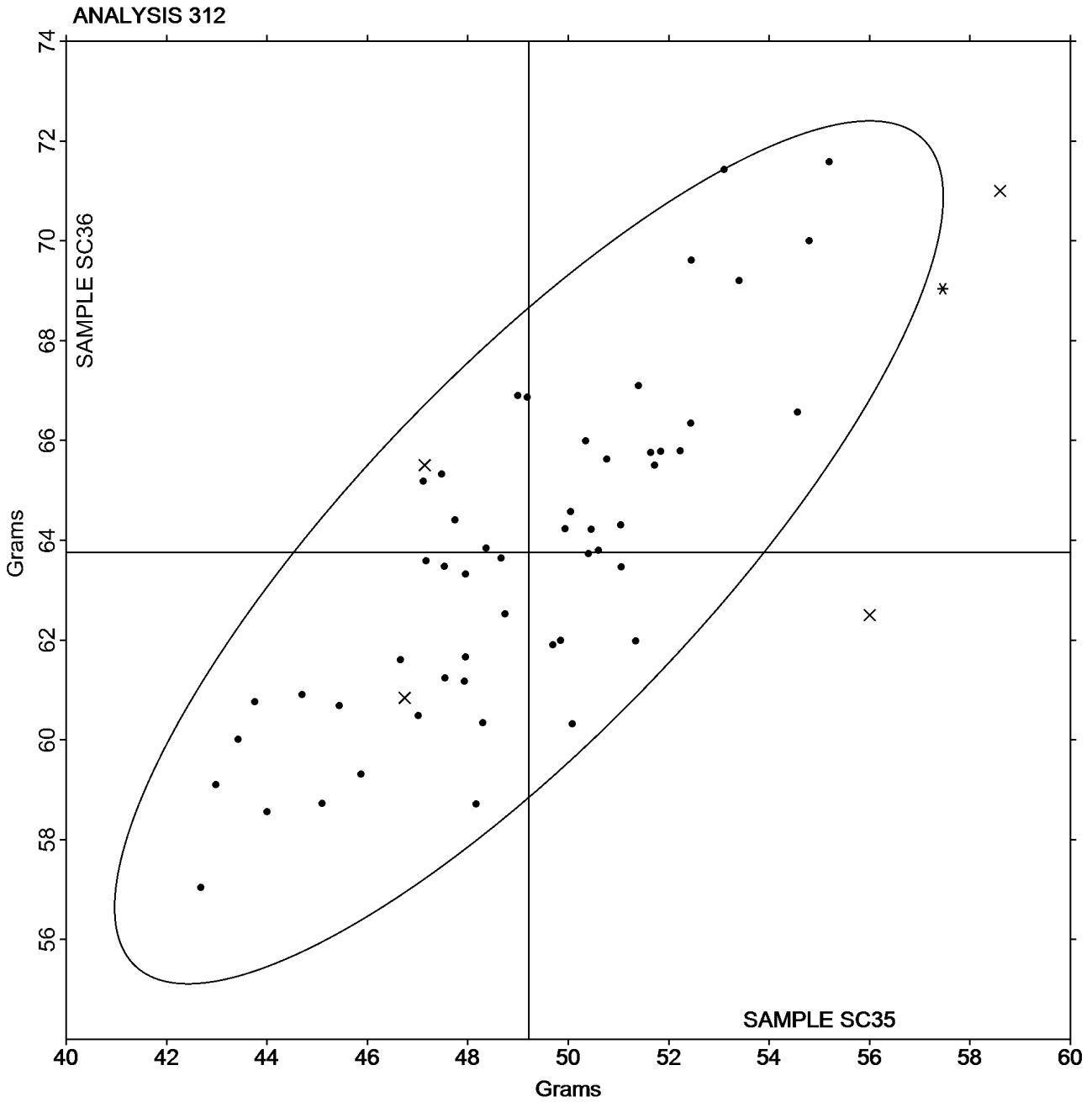
September 2016

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

Grand Mean Sample **SC35** = 49.216 Grams

Grand Mean Sample **SC36** = 63.757 Grams





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 314

September 2016

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

| WebCode | Data Flag | Sample SD35 | | | Sample SD36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 2E2UNW | | 171.2 | -12.0 | -1.00 | 207.3 | 1.1 | 0.09 |
| 3V6NVW | | 190.2 | 7.0 | 0.58 | 209.2 | 3.0 | 0.24 |
| 47H8RX | | 181.5 | -1.8 | -0.15 | 208.4 | 2.2 | 0.18 |
| 6GDZB9 | X | 165.3 | -18.0 | -1.50 | 189.9 | -16.3 | -1.30 |
| 7VTTNY | | 183.7 | 0.5 | 0.04 | 198.8 | -7.4 | -0.60 |
| 86ZP8V | | 187.4 | 4.1 | 0.35 | 228.0 | 21.8 | 1.75 |
| 8P38A4 | | 174.8 | -8.5 | -0.71 | 202.4 | -3.8 | -0.30 |
| 98HWZB | | 179.2 | -4.1 | -0.34 | 200.0 | -6.2 | -0.50 |
| B23AZ3 | | 166.0 | -17.3 | -1.45 | 200.0 | -6.2 | -0.50 |
| BC6X2T | | 167.0 | -16.3 | -1.36 | 191.2 | -15.0 | -1.20 |
| BYVPC3 | | 162.3 | -20.9 | -1.75 | 183.4 | -22.8 | -1.83 |
| BZNBRR | | 201.7 | 18.4 | 1.54 | 227.4 | 21.2 | 1.70 |
| DUHQVT | | 177.8 | -5.4 | -0.45 | 207.6 | 1.4 | 0.11 |
| DWMEBJ | | 202.4 | 19.1 | 1.60 | 225.9 | 19.7 | 1.58 |
| DYQAUL | | 188.6 | 5.4 | 0.45 | 207.9 | 1.7 | 0.13 |
| EA6QYX | | 174.4 | -8.9 | -0.74 | 207.2 | 1.0 | 0.08 |
| HHLCCR | X | 221.7 | 38.4 | 3.21 | 268.3 | 62.1 | 4.98 |
| JGTAFM | | 189.1 | 5.9 | 0.49 | 217.5 | 11.3 | 0.91 |
| JXVHLV | | 201.4 | 18.1 | 1.51 | 207.9 | 1.7 | 0.14 |
| KGJKGM | | 169.3 | -14.0 | -1.17 | 195.6 | -10.6 | -0.85 |
| KJBG7G | | 173.1 | -10.2 | -0.85 | 198.3 | -7.9 | -0.63 |
| L8RW9J | | 177.1 | -6.1 | -0.51 | 194.3 | -11.9 | -0.95 |
| N3D9YT | | 171.4 | -11.9 | -0.99 | 194.1 | -12.1 | -0.97 |
| NE6PCD | | 192.8 | 9.5 | 0.80 | 213.8 | 7.6 | 0.61 |
| PHLEBG | | 179.6 | -3.7 | -0.31 | 220.0 | 13.8 | 1.11 |
| PRPW38 | | 182.0 | -1.3 | -0.11 | 196.5 | -9.7 | -0.78 |
| PUVJDQ | | 192.4 | 9.2 | 0.77 | 211.3 | 5.1 | 0.41 |
| QCUU2T | | 185.6 | 2.3 | 0.20 | 201.6 | -4.6 | -0.37 |
| RETZZC | | 175.8 | -7.5 | -0.62 | 195.7 | -10.5 | -0.84 |
| T3FP28 | X | 196.6 | 13.3 | 1.11 | 220.1 | 13.9 | 1.12 |
| TERR7J | | 160.8 | -22.5 | -1.88 | 180.0 | -26.2 | -2.10 |
| TKFYLP | * | 200.5 | 17.3 | 1.44 | 239.2 | 33.0 | 2.64 |
| UHJF3G | | 181.1 | -2.1 | -0.18 | 199.8 | -6.4 | -0.52 |
| UP4EVA | | 198.4 | 15.1 | 1.26 | 224.1 | 17.9 | 1.44 |
| UUGJKC | | 210.4 | 27.2 | 2.27 | 218.9 | 12.7 | 1.01 |
| VKCUKL | | 182.9 | -0.4 | -0.03 | 200.3 | -5.9 | -0.47 |
| VQWWNH | X | 171.6 | -11.7 | -0.97 | 190.6 | -15.6 | -1.25 |
| WEZ3DD | | 178.7 | -4.5 | -0.38 | 196.5 | -9.7 | -0.78 |
| WVPDGN | | 182.8 | -0.4 | -0.03 | 203.0 | -3.2 | -0.26 |
| XBQAX6 | | 181.0 | -2.3 | -0.19 | 206.1 | -0.1 | -0.01 |



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Report #2845
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| WebCode | Data Flag | Sample SD35 | | | Sample SD36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| YFMLNH | | 193.6 | 10.3 | 0.87 | 208.0 | 1.8 | 0.14 |
| YQHYK9 | | 195.6 | 12.3 | 1.03 | 208.5 | 2.3 | 0.18 |
| ZKX2RE | X | 172.8 | -10.5 | -0.87 | 183.6 | -22.6 | -1.81 |

| Sample SD35 | | Summary Statistics | Sample SD36 | |
|-----------------------------------------------------|--------------|--------------------|--------------|--|
| Grand Means | 183.25 Grams | | 206.19 Grams | |
| SD Btwn Labs | 11.96 Grams | | 12.48 Grams | |
| Statistics based on 38 of 43 reporting participants | | | | |

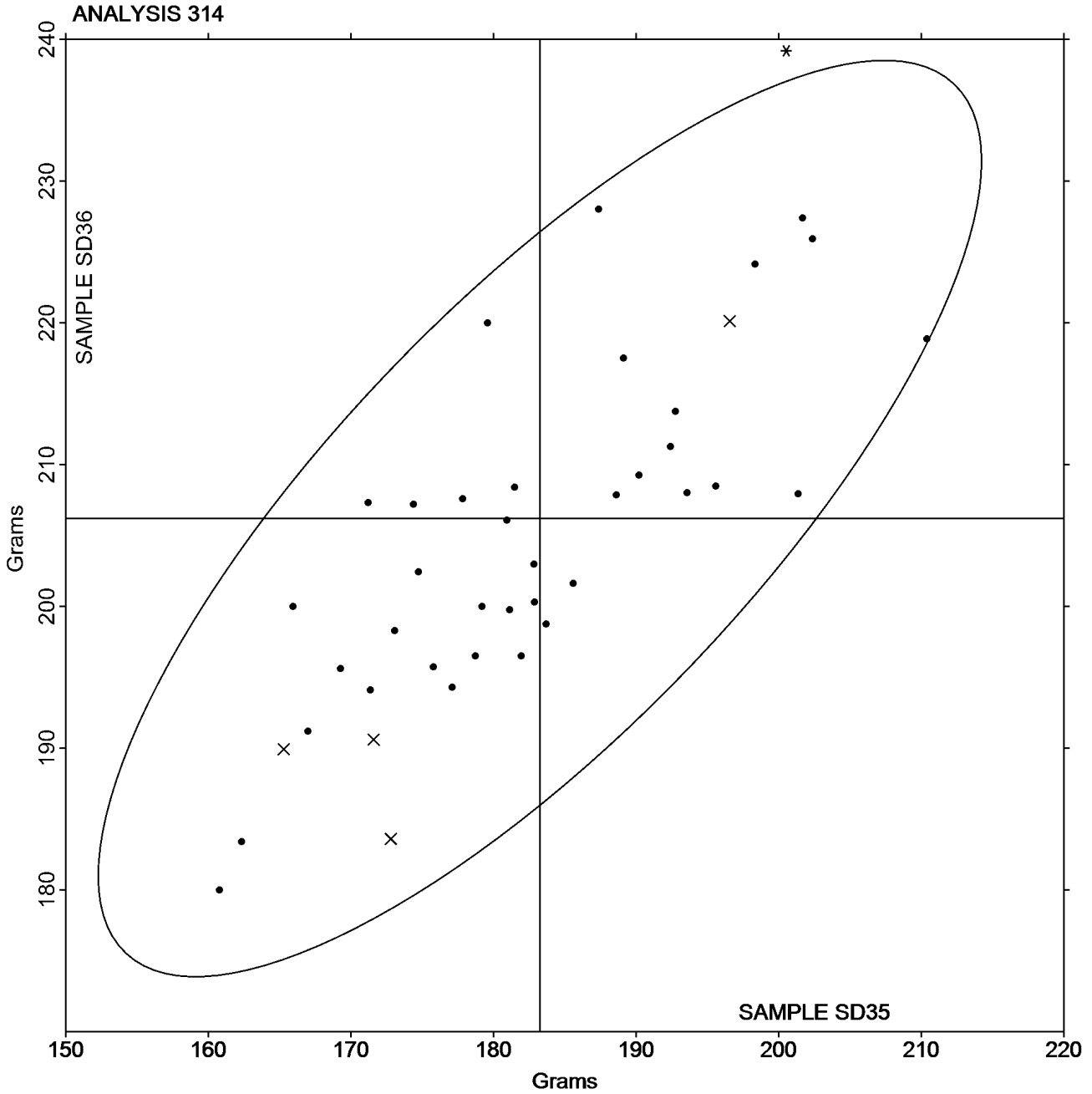
Comments on Assigned Data Flags for Test #314

- T3FP28 (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).
- ZKX2RE (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).
- 6GDZB9 (X) - Data appear to be off by a factor of 4; data converted by CTS (x.25).
- VQWWNH (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).
-
- HHLCXR (X) - Data for both samples are high. Possible Systematic Error.



Grand Mean Sample SD35 = 183.25 Grams

Grand Mean Sample SD36 = 206.19 Grams





Paper & Paperboard Interlaboratory Testing Program
Analysis 320
Tensile Breaking Strength - Newsprint
TAPPI Official Test Method T494

Report #2845
 September 2016

| WebCode | Data Flag | Sample SR35 | | | Sample SR36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 6FMAD2 | | 2.831 | 0.104 | 0.81 | 3.088 | 0.155 | 1.27 |
| 7ERF74 | X | 3.260 | 0.532 | 4.17 | 3.409 | 0.477 | 3.89 |
| AX6YDV | | 2.533 | -0.195 | -1.53 | 2.810 | -0.122 | -1.00 |
| BC239T | | 2.726 | -0.002 | -0.01 | 2.937 | 0.005 | 0.04 |
| CB9AA4 | | 2.673 | -0.055 | -0.43 | 2.883 | -0.049 | -0.40 |
| DYQAUL | | 2.736 | 0.008 | 0.06 | 2.766 | -0.166 | -1.36 |
| HYDAYM | | 2.929 | 0.201 | 1.58 | 3.107 | 0.175 | 1.43 |
| MVW8QN | | 2.615 | -0.113 | -0.88 | 2.846 | -0.086 | -0.70 |
| MZR8HL | | 2.931 | 0.204 | 1.60 | 3.121 | 0.189 | 1.54 |
| PYR4JV | | 2.724 | -0.003 | -0.02 | 2.867 | -0.065 | -0.53 |
| VXEU3A | | 2.702 | -0.026 | -0.20 | 2.949 | 0.017 | 0.14 |
| ZACXLZ | | 2.603 | -0.125 | -0.98 | 2.879 | -0.053 | -0.43 |

| Sample SR35 | | Summary Statistics | Sample SR36 | |
|-----------------------------------------------------|-------------|--------------------|-------------|--|
| Grand Means | 2.7275 kN/m | | 2.9322 kN/m | |
| SD Btwn Labs | 0.1275 kN/m | | 0.1226 kN/m | |
| Statistics based on 11 of 12 reporting participants | | | | |

Comments on Assigned Data Flags for Test #320

7ERF74 (X) - Data for both samples are high. Possible Systematic Error.

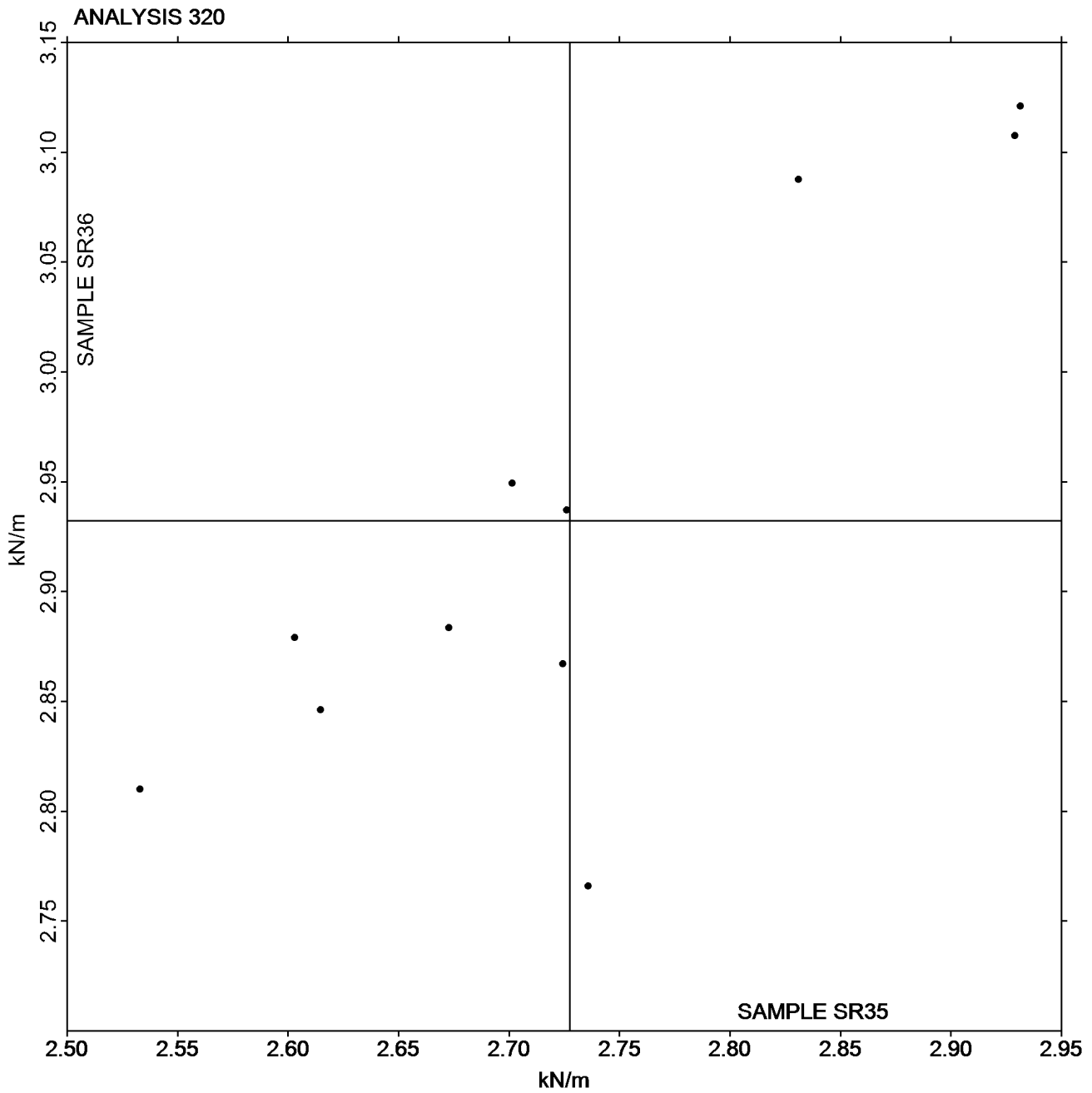


Paper & Paperboard Interlaboratory Testing Program
Analysis 320
Tensile Breaking Strength - Newsprint
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Grand Mean Sample **SR35** = 2.7275 kN/m

Grand Mean Sample **SR36** = 2.9322 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
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| WebCode | Data Flag | Sample SR35 | | | Sample SR36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 6FMAD2 | | 18.64 | -1.29 | -0.49 | 22.98 | -1.45 | -0.63 |
| 7ERF74 | | 21.72 | 1.78 | 0.67 | 24.81 | 0.37 | 0.16 |
| AX6YDV | | 15.25 | -4.68 | -1.77 | 20.64 | -3.80 | -1.63 |
| BC239T | | 20.36 | 0.42 | 0.16 | 24.77 | 0.33 | 0.14 |
| CB9AA4 | | 17.78 | -2.16 | -0.82 | 24.20 | -0.24 | -0.10 |
| DYQAUL | | 21.88 | 1.94 | 0.74 | 24.02 | -0.42 | -0.18 |
| HYDAYM | | 20.90 | 0.96 | 0.37 | 25.06 | 0.62 | 0.27 |
| MZR8HL | | 22.46 | 2.52 | 0.96 | 26.14 | 1.70 | 0.73 |
| PYR4JV | | 24.14 | 4.20 | 1.59 | 29.58 | 5.14 | 2.21 |
| VXEU3A | | 16.97 | -2.97 | -1.12 | 21.76 | -2.68 | -1.15 |
| ZACXLZ | | 19.20 | -0.74 | -0.28 | 24.86 | 0.43 | 0.18 |

| | | Summary Statistics | |
|-----------------------------------------------------|--------------------|--------------------|--------------------|
| | Sample SR35 | | Sample SR36 |
| Grand Means | 19.935 Joules/sq m | | 24.439 Joules/sq m |
| SD Btwn Labs | 2.640 Joules/sq m | | 2.325 Joules/sq m |
| Statistics based on 11 of 11 reporting participants | | | |



Paper & Paperboard Interlaboratory Testing Program

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Analysis 321

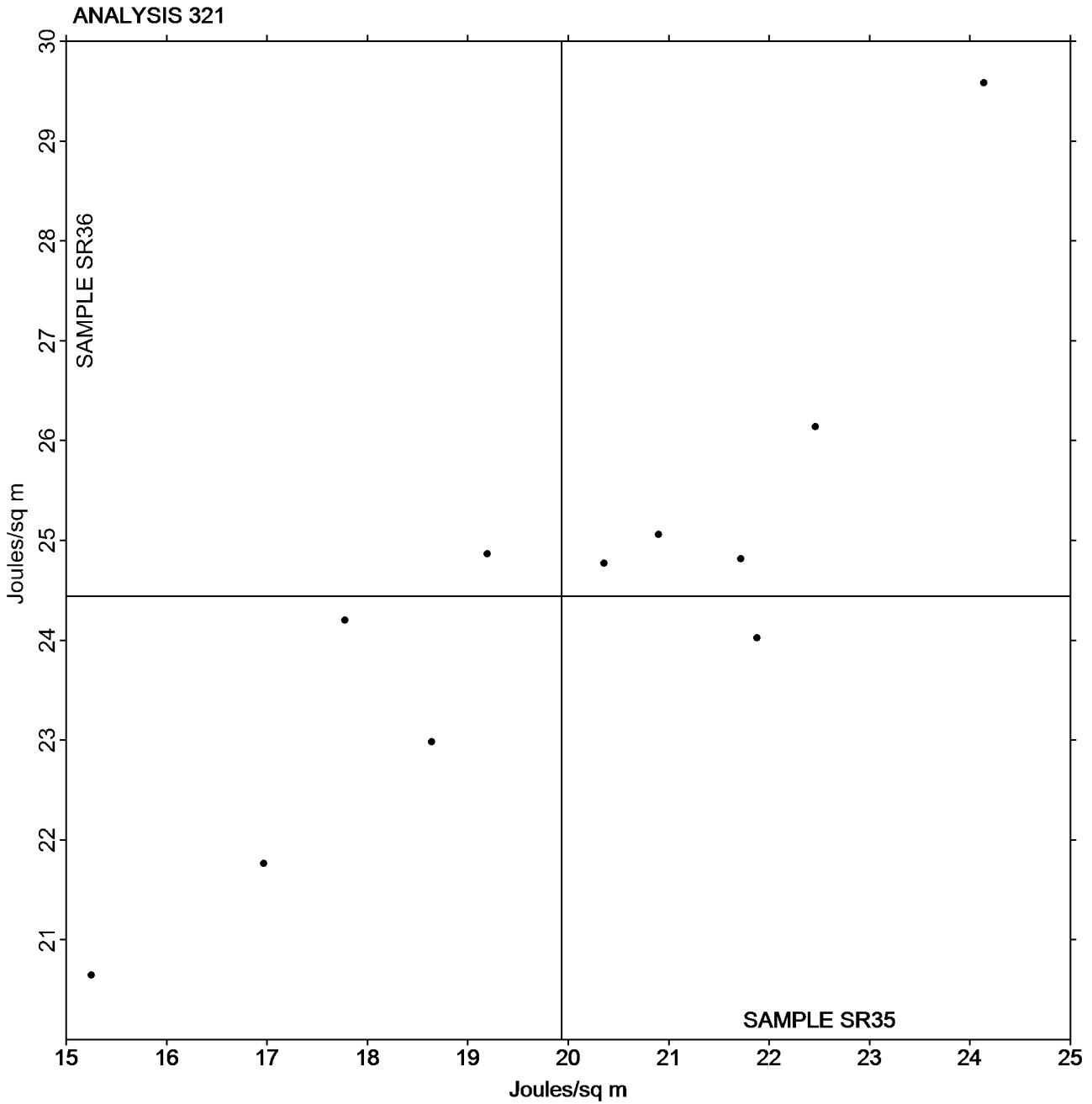
September 2016

Tensile Energy Absorption - Newsprint

TAPPI Official Test Method T494

Grand Mean Sample **SR35** = 19.935 Joules/sq m

Grand Mean Sample **SR36** = 24.439 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

Report #2845
September 2016

| WebCode | Data Flag | Sample SR35 | | | Sample SR36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 6FMAD2 | | 1.110 | -0.125 | -0.66 | 1.246 | -0.140 | -0.69 |
| 7ERF74 | | 1.078 | -0.157 | -0.82 | 1.141 | -0.245 | -1.20 |
| AX6YDV | | 1.017 | -0.218 | -1.14 | 1.207 | -0.179 | -0.88 |
| BC239T | | 1.228 | -0.007 | -0.04 | 1.367 | -0.019 | -0.09 |
| CB9AA4 | | 1.116 | -0.119 | -0.62 | 1.359 | -0.027 | -0.13 |
| DYQAUL | | 1.133 | -0.102 | -0.54 | 1.219 | -0.167 | -0.82 |
| HYDAYM | | 1.411 | 0.176 | 0.92 | 1.561 | 0.175 | 0.86 |
| MZR8HL | | 1.442 | 0.207 | 1.08 | 1.535 | 0.149 | 0.73 |
| PYR4JV | | 1.610 | 0.375 | 1.96 | 1.809 | 0.423 | 2.08 |
| ZACXLZ | | 1.208 | -0.027 | -0.14 | 1.419 | 0.032 | 0.16 |

| | | Summary Statistics | | | |
|-----------------------------------------------------|--|--------------------|---------|-------------|---------|
| | | Sample SR35 | | Sample SR36 | |
| Grand Means | | 1.2353 | Percent | 1.3863 | Percent |
| SD Btwn Labs | | 0.1908 | Percent | 0.2037 | Percent |
| Statistics based on 10 of 10 reporting participants | | | | | |

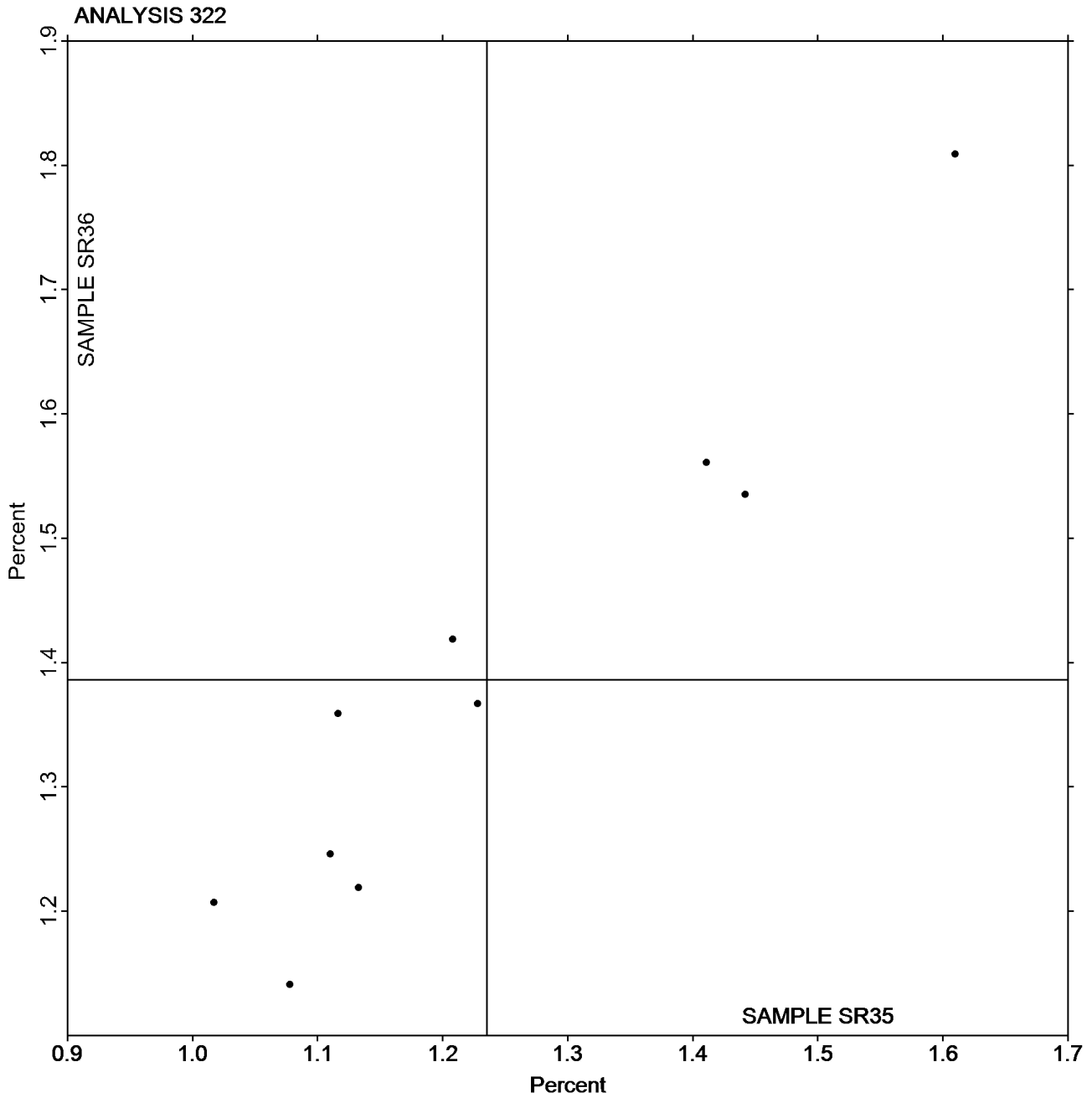


Paper & Paperboard Interlaboratory Testing Program
Analysis 322
Elongation to Break - Newsprint
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Grand Mean Sample **SR35** = 1.2353 Percent

Grand Mean Sample **SR36** = 1.3863 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

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Analysis 325

September 2016

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SF35 | | | Sample SF36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2BG4ZD | | 4.950 | 0.145 | 0.51 | 6.780 | 0.121 | 0.29 | LH |
| 2TM9PB | | 4.859 | 0.054 | 0.19 | 6.773 | 0.114 | 0.27 | LH |
| 2VPEDA | | 4.330 | -0.475 | -1.66 | 6.249 | -0.410 | -0.97 | TB |
| 373N8Z | | 4.807 | 0.002 | 0.01 | 6.756 | 0.097 | 0.23 | IM |
| 3AP4ZG | | 4.660 | -0.145 | -0.50 | 6.415 | -0.244 | -0.58 | XX |
| 3HELY3 | | 4.753 | -0.052 | -0.18 | 6.263 | -0.396 | -0.94 | TC |
| 3PG3MA | | 4.932 | 0.127 | 0.44 | 7.180 | 0.521 | 1.24 | XX |
| 3T3PK4 | | 4.735 | -0.070 | -0.24 | 6.673 | 0.014 | 0.03 | TA |
| 4DLCJG | | 5.066 | 0.262 | 0.91 | 6.535 | -0.124 | -0.29 | XX |
| 4WEMC4 | | 4.910 | 0.105 | 0.37 | 7.029 | 0.370 | 0.88 | LF |
| 4WEP28 | | 5.003 | 0.198 | 0.69 | 7.000 | 0.341 | 0.81 | TO |
| 63YREB | | 4.595 | -0.210 | -0.73 | 6.487 | -0.172 | -0.41 | TO |
| 7GTJXQ | | 5.020 | 0.215 | 0.75 | 6.869 | 0.210 | 0.50 | LX |
| 7TPZUZ | | 4.203 | -0.602 | -2.10 | 5.927 | -0.732 | -1.73 | ID |
| 9EEQX9 | | 4.551 | -0.254 | -0.88 | 6.529 | -0.130 | -0.31 | LH |
| 9ZZTN2 | | 4.494 | -0.311 | -1.08 | 6.335 | -0.324 | -0.77 | LI |
| AX6YDV | | 4.352 | -0.453 | -1.58 | 6.460 | -0.199 | -0.47 | LH |
| BC6X2T | | 4.834 | 0.029 | 0.10 | 6.611 | -0.048 | -0.11 | IM |
| CNBZQ3 | | 5.272 | 0.467 | 1.63 | 7.317 | 0.658 | 1.56 | LH |
| CRP6BV | | 5.052 | 0.247 | 0.86 | 6.903 | 0.244 | 0.58 | MR |
| DB64AL | | 4.629 | -0.176 | -0.61 | 6.296 | -0.363 | -0.86 | TF |
| EW3ZHZ | | 5.139 | 0.334 | 1.16 | 6.740 | 0.081 | 0.19 | XX |
| FU66C3 | | 4.844 | 0.039 | 0.13 | 6.661 | 0.002 | 0.00 | TX |
| GYWT7E | | 4.901 | 0.096 | 0.33 | 6.910 | 0.251 | 0.59 | LH |
| HAP7QN | | 4.897 | 0.092 | 0.32 | 7.002 | 0.343 | 0.81 | LH |
| HVADDY | | 5.245 | 0.440 | 1.53 | 7.229 | 0.570 | 1.35 | LI |
| K4VGCC | | 4.970 | 0.165 | 0.58 | 6.969 | 0.310 | 0.74 | CB |
| KQVHNE | | 4.834 | 0.029 | 0.10 | 6.388 | -0.271 | -0.64 | DL |
| L98LMC | * | 5.485 | 0.680 | 2.37 | 7.274 | 0.614 | 1.46 | TJ |
| LU8G6J | | 4.596 | -0.209 | -0.73 | 6.458 | -0.201 | -0.48 | XX |
| LXBHJH | | 4.819 | 0.014 | 0.05 | 6.562 | -0.097 | -0.23 | LE |
| M89ZBW | | 4.760 | -0.045 | -0.16 | 6.459 | -0.200 | -0.48 | LA |
| N3UKED | | 4.969 | 0.164 | 0.57 | 6.795 | 0.136 | 0.32 | TB |
| NNULRG | | 4.166 | -0.639 | -2.22 | 5.645 | -1.014 | -2.40 | XX |
| NP7HWL | | 4.603 | -0.202 | -0.70 | 6.335 | -0.324 | -0.77 | TB |
| P839RE | | 5.004 | 0.199 | 0.69 | 7.108 | 0.449 | 1.06 | TJ |
| P9XN6C | | 4.774 | -0.031 | -0.11 | 6.934 | 0.275 | 0.65 | LI |
| PUVJDQ | | 4.745 | -0.060 | -0.21 | 6.666 | 0.007 | 0.02 | LH |
| PYNLGP | | 5.205 | 0.400 | 1.39 | 7.393 | 0.734 | 1.74 | TB |
| Q6AYVJ | | 4.395 | -0.410 | -1.43 | 5.902 | -0.757 | -1.79 | TF |



Paper & Paperboard Interlaboratory Testing Program
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Tensile Breaking Strength - Printing Papers
TAPPI Official Test Method T494

Report #2845
 September 2016

| WebCode | Data Flag | Sample SF35 | | | Sample SF36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| QCADKQ | | 5.179 | 0.374 | 1.30 | 7.160 | 0.501 | 1.19 | LH |
| QUA7PD | | 4.664 | -0.141 | -0.49 | 6.454 | -0.205 | -0.49 | LH |
| R7MPLE | | 4.477 | -0.328 | -1.14 | 6.060 | -0.599 | -1.42 | LA |
| RGJTRU | | 4.700 | -0.104 | -0.36 | 6.061 | -0.598 | -1.42 | TP |
| T66YB9 | | 4.972 | 0.167 | 0.58 | 6.888 | 0.228 | 0.54 | TO |
| TYV34E | | 4.838 | 0.033 | 0.12 | 6.666 | 0.007 | 0.02 | LI |
| U9HFKP | | 5.224 | 0.419 | 1.46 | 7.051 | 0.392 | 0.93 | XX |
| UQKXT9 | X | 4.186 | -0.619 | -2.16 | 6.720 | 0.061 | 0.14 | TJ |
| UZ9Q67 | * | 4.824 | 0.019 | 0.07 | 7.289 | 0.630 | 1.49 | TP |
| VJT8NP | | 4.760 | -0.045 | -0.16 | 6.396 | -0.263 | -0.62 | LA |
| VW3MTA | | 4.330 | -0.475 | -1.65 | 5.879 | -0.780 | -1.85 | IM |
| WJD97L | | 4.691 | -0.113 | -0.40 | 6.555 | -0.104 | -0.25 | LX |
| YYYDPY | X | 4.606 | -0.199 | -0.69 | 5.494 | -1.165 | -2.76 | XX |
| ZMH8Q2 | | 5.215 | 0.410 | 1.43 | 7.480 | 0.821 | 1.95 | LA |
| ZVU6V9 | | 4.428 | -0.377 | -1.31 | 6.177 | -0.482 | -1.14 | RE |

| Sample SF35 | | Summary Statistics | Sample SF36 | |
|-----------------------------------------------------|-------------|--------------------|-------------|--|
| Grand Means | 4.8049 kN/m | | 6.6591 kN/m | |
| SD Btwn Labs | 0.2871 kN/m | | 0.4219 kN/m | |
| Statistics based on 53 of 55 reporting participants | | | | |

Comments on Assigned Data Flags for Test #325

UQKXT9 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SF35.
 YYYDPY (X) - Data for sample SF36 are low.

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 | RE Regmed |
| TA Testometric AX | TB Thwing-Albert EJA/1000 |
| TC Thwing-Albert Electro-Hydraulic, Model 30LT | TF Thwing-Albert EJA Vantage-1 |
| TJ Thwing-Albert QC II-XS | 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 | |

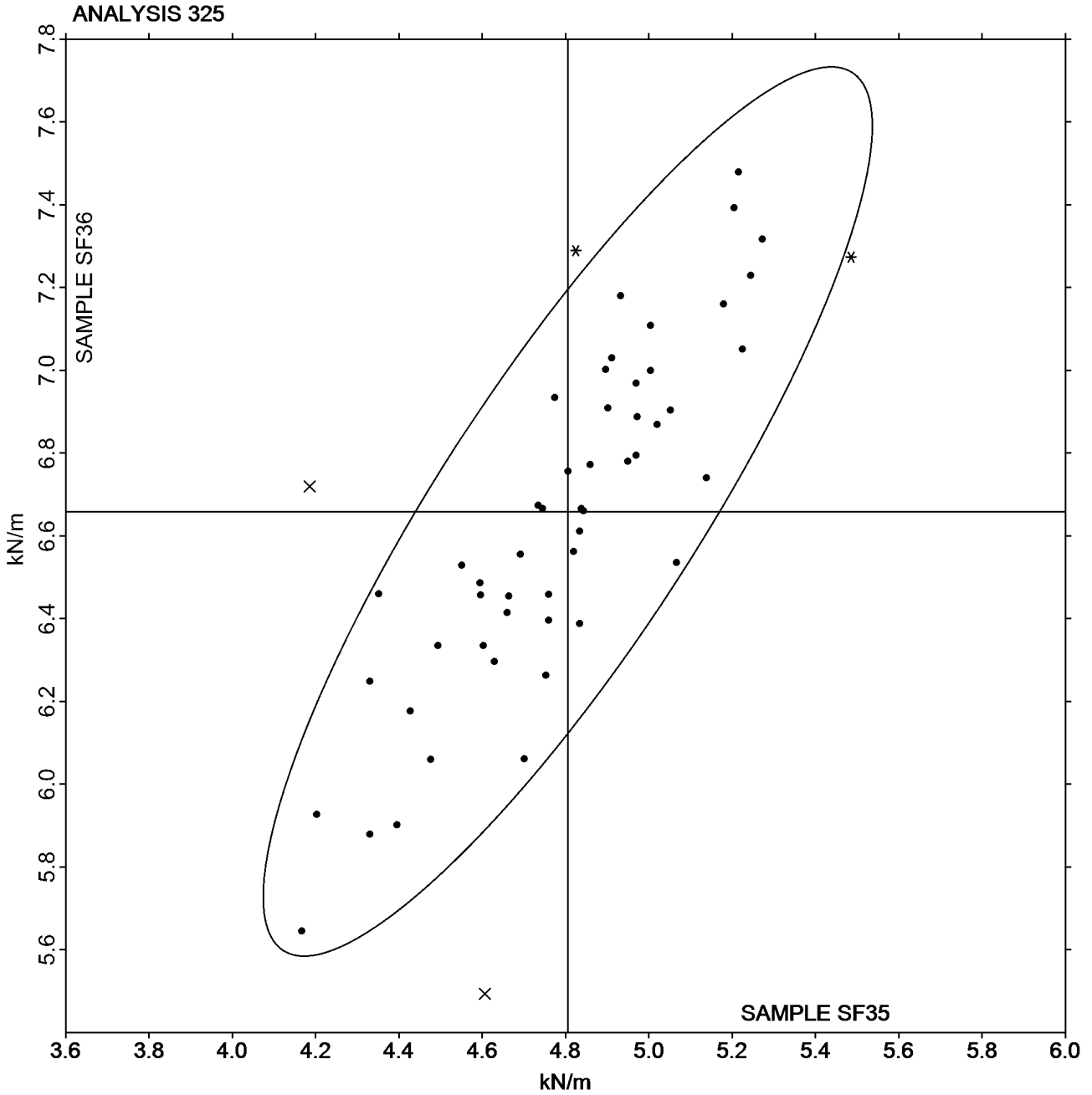


Paper & Paperboard Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers
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Grand Mean Sample **SF35** = 4.8049 kN/m

Grand Mean Sample **SF36** = 6.6591 kN/m





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 327

September 2016

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SF35 | | | Sample SF36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2BG4ZD | | 74.61 | 7.92 | 1.15 | 101.36 | 8.68 | 1.05 | LH |
| 2TM9PB | | 67.59 | 0.90 | 0.13 | 96.39 | 3.71 | 0.45 | LH |
| 2VPEDA | | 53.99 | -12.69 | -1.84 | 83.97 | -8.71 | -1.05 | TB |
| 373N8Z | | 71.81 | 5.12 | 0.74 | 100.92 | 8.24 | 1.00 | IM |
| 3AP4ZG | | 64.10 | -2.58 | -0.38 | 85.16 | -7.52 | -0.91 | XX |
| 4WEMC4 | | 57.91 | -8.78 | -1.27 | 82.34 | -10.34 | -1.25 | LW |
| 4WEP28 | | 69.90 | 3.22 | 0.47 | 98.36 | 5.68 | 0.69 | TO |
| 63YREB | | 75.45 | 8.77 | 1.27 | 105.37 | 12.69 | 1.53 | TO |
| 7GTJXQ | | 64.92 | -1.76 | -0.26 | 89.27 | -3.41 | -0.41 | LX |
| 7TPZUZ | | 64.53 | -2.15 | -0.31 | 91.80 | -0.88 | -0.11 | ID |
| 9ZZTN2 | | 60.92 | -5.76 | -0.84 | 85.95 | -6.73 | -0.81 | LI |
| AX6YDV | * | 54.85 | -11.83 | -1.72 | 88.13 | -4.55 | -0.55 | LH |
| BC6X2T | | 69.53 | 2.84 | 0.41 | 96.32 | 3.64 | 0.44 | IM |
| CNBZQ3 | | 72.54 | 5.85 | 0.85 | 102.43 | 9.75 | 1.18 | LH |
| CRP6BV | | 67.31 | 0.62 | 0.09 | 90.11 | -2.57 | -0.31 | MR |
| FU66C3 | | 72.20 | 5.51 | 0.80 | 95.82 | 3.14 | 0.38 | TA |
| GYWT7E | | 71.96 | 5.28 | 0.77 | 98.33 | 5.65 | 0.68 | LH |
| HAP7QN | | 69.29 | 2.60 | 0.38 | 100.51 | 7.83 | 0.95 | LH |
| HVADDY | | 76.36 | 9.68 | 1.40 | 106.27 | 13.59 | 1.64 | LI |
| KQVHNE | | 77.03 | 10.34 | 1.50 | 96.05 | 3.37 | 0.41 | DL |
| L98LMC | X | 85.51 | 18.82 | 2.73 | 125.32 | 32.64 | 3.94 | TJ |
| LU8G6J | | 66.69 | 0.00 | 0.00 | 92.72 | 0.04 | 0.01 | XX |
| M89ZBW | | 68.83 | 2.15 | 0.31 | 94.80 | 2.12 | 0.26 | LA |
| NNULRG | | 49.79 | -16.89 | -2.45 | 74.24 | -18.44 | -2.23 | XX |
| P9XN6C | | 62.32 | -4.36 | -0.63 | 91.10 | -1.58 | -0.19 | LI |
| PUVJDQ | | 70.29 | 3.61 | 0.52 | 91.31 | -1.37 | -0.17 | LH |
| PYNLGP | | 70.98 | 4.30 | 0.62 | 106.57 | 13.89 | 1.68 | TB |
| Q6AYVJ | | 64.04 | -2.64 | -0.38 | 81.75 | -10.93 | -1.32 | TF |
| QCADKQ | | 69.56 | 2.87 | 0.42 | 95.22 | 2.54 | 0.31 | LH |
| QUA7PD | | 62.58 | -4.11 | -0.60 | 82.48 | -10.19 | -1.23 | LH |
| R7MPLE | | 53.43 | -13.26 | -1.92 | 73.54 | -19.14 | -2.31 | LA |
| T66YB9 | | 65.89 | -0.79 | -0.12 | 93.19 | 0.51 | 0.06 | TO |
| TYV34E | | 73.08 | 6.40 | 0.93 | 95.23 | 2.55 | 0.31 | LI |
| U9HFKP | | 69.45 | 2.76 | 0.40 | 97.41 | 4.73 | 0.57 | LX |
| UZ9Q67 | | 57.57 | -9.11 | -1.32 | 88.31 | -4.37 | -0.53 | TP |
| VW3MTA | | 58.77 | -7.91 | -1.15 | 81.57 | -11.11 | -1.34 | IM |
| WJD97L | | 69.28 | 2.59 | 0.38 | 96.09 | 3.41 | 0.41 | LX |
| YYYPY | | 70.45 | 3.76 | 0.55 | 92.76 | 0.08 | 0.01 | XX |
| ZMH8Q2 | | 77.53 | 10.85 | 1.57 | 105.18 | 12.50 | 1.51 | LA |
| ZVU6V9 | | 63.38 | -3.30 | -0.48 | 86.15 | -6.53 | -0.79 | RE |



Paper & Paperboard Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers
TAPPI Official Test Method T494

Report #2845
September 2016

| WebCode | Data Flag | Sample SF35 | | | Sample SF36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-----|-------------|----------------------|-----|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |

| Sample SF35 | | Summary Statistics | Sample SF36 | |
|-----------------------------------------------------|--------------------|--------------------|--------------------|--|
| Grand Means | 66.685 Joules/sq m | | 92.679 Joules/sq m | |
| SD Btwn Labs | 6.889 Joules/sq m | | 8.276 Joules/sq m | |
| Statistics based on 39 of 40 reporting participants | | | | |

Comments on Assigned Data Flags for Test #327

L98LMC (X) - Data for both samples are high. Inconsistent within the determinations of sample SF36.

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 | RE | Regmed |
| TA | Thwing-Albert | TB | Thwing-Albert EJA/1000 |
| TF | Thwing-Albert EJA Vantage-1 | 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 | | |

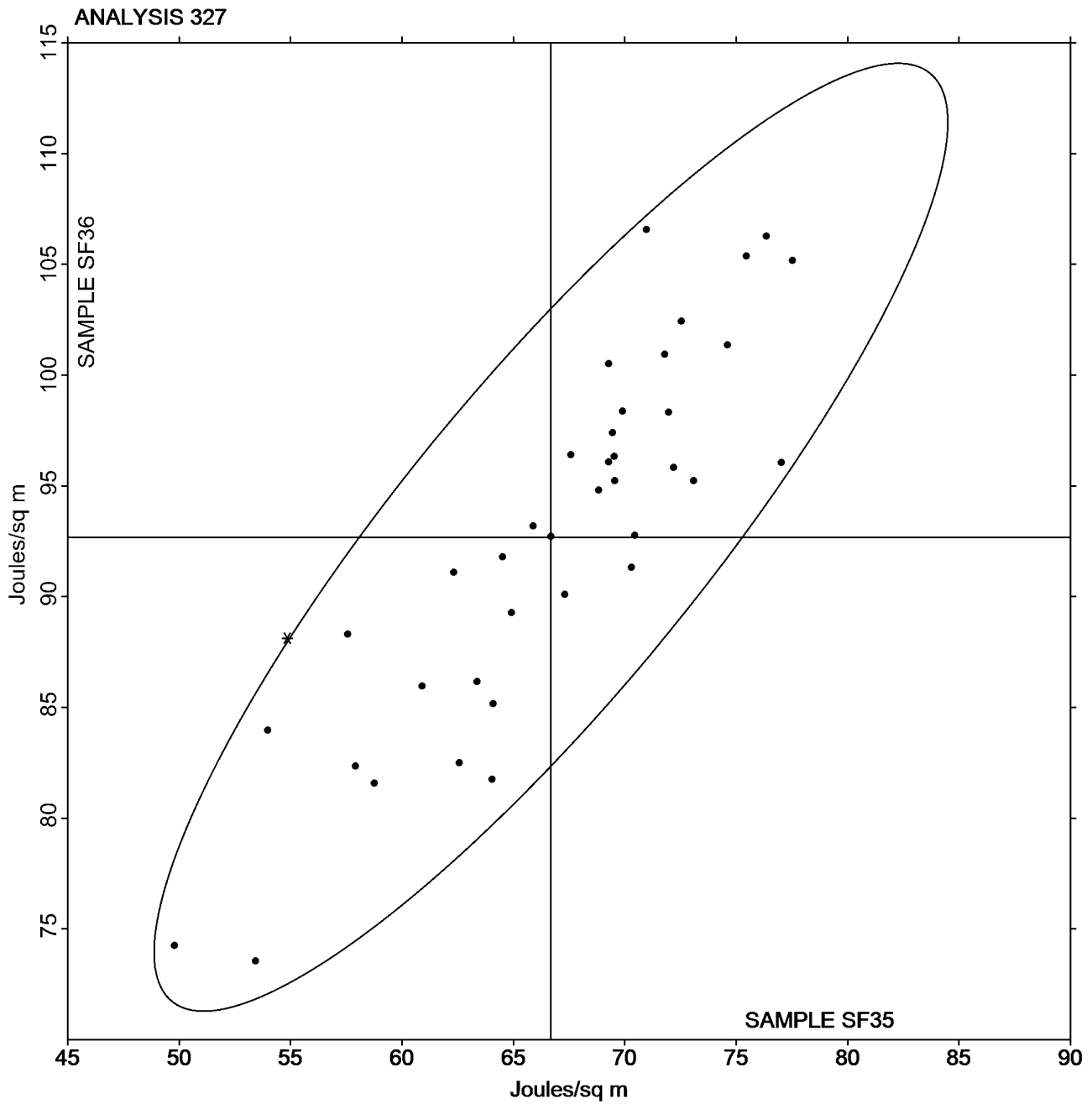


Paper & Paperboard Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SF35** = 66.685 Joules/sq m

Grand Mean Sample **SF36** = 92.679 Joules/sq m





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 328

September 2016

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SF35 | | | Sample SF36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2BG4ZD | | 2.192 | 0.056 | 0.31 | 2.198 | -0.010 | -0.05 | LH |
| 2TM9PB | | 2.053 | -0.083 | -0.45 | 2.165 | -0.043 | -0.21 | LH |
| 2VPEDA | | 1.959 | -0.177 | -0.96 | 2.159 | -0.049 | -0.24 | TB |
| 373N8Z | | 2.250 | 0.114 | 0.62 | 2.314 | 0.106 | 0.53 | IM |
| 3AP4ZG | | 2.041 | -0.095 | -0.52 | 2.036 | -0.172 | -0.85 | XX |
| 4WEMC4 | | 1.777 | -0.359 | -1.95 | 1.840 | -0.368 | -1.82 | LX |
| 4WEP28 | | 2.092 | -0.044 | -0.24 | 2.181 | -0.027 | -0.13 | TO |
| 63YREB | * | 2.709 | 0.573 | 3.12 | 2.786 | 0.578 | 2.86 | TO |
| 7GTJXQ | | 1.945 | -0.191 | -1.04 | 2.006 | -0.202 | -1.00 | LX |
| 7TPZUZ | | 2.258 | 0.123 | 0.67 | 2.343 | 0.135 | 0.67 | ID |
| 9ZZTN2 | | 2.000 | -0.136 | -0.74 | 2.051 | -0.157 | -0.78 | LI |
| AX6YDV | | 1.862 | -0.274 | -1.49 | 2.070 | -0.138 | -0.68 | LH |
| BC6X2T | | 2.159 | 0.023 | 0.13 | 2.263 | 0.055 | 0.27 | IM |
| CNBZQ3 | | 1.927 | -0.209 | -1.14 | 1.974 | -0.234 | -1.16 | LH |
| CRP6BV | | 2.003 | -0.133 | -0.72 | 2.020 | -0.189 | -0.93 | MR |
| DB64AL | | 2.330 | 0.194 | 1.06 | 2.420 | 0.212 | 1.05 | TF |
| FU66C3 | | 2.316 | 0.180 | 0.98 | 2.319 | 0.111 | 0.55 | TX |
| GYWT7E | | 2.141 | 0.005 | 0.03 | 2.154 | -0.054 | -0.27 | LH |
| HAP7QN | | 2.088 | -0.048 | -0.26 | 2.180 | -0.028 | -0.14 | LH |
| HVADDY | | 2.165 | 0.029 | 0.16 | 2.250 | 0.042 | 0.21 | LI |
| KQVHNE | | 2.521 | 0.385 | 2.10 | 2.487 | 0.279 | 1.38 | DL |
| L98LMC | * | 2.463 | 0.327 | 1.78 | 2.754 | 0.546 | 2.70 | TJ |
| LU8G6J | | 2.144 | 0.008 | 0.05 | 2.214 | 0.006 | 0.03 | XX |
| M89ZBW | X | 11.120 | 8.984 | 48.89 | 11.280 | 9.072 | 44.85 | XX |
| N3UKED | | 2.115 | -0.021 | -0.11 | 2.149 | -0.059 | -0.29 | TB |
| NNULRG | | 2.338 | 0.202 | 1.10 | 2.509 | 0.301 | 1.49 | XX |
| NP7HWL | | 2.260 | 0.124 | 0.68 | 2.330 | 0.122 | 0.60 | TF |
| P839RE | X | 2.320 | 0.184 | 1.00 | 2.050 | -0.158 | -0.78 | LH |
| P9XN6C | | 1.964 | -0.172 | -0.93 | 2.036 | -0.172 | -0.85 | LI |
| PUVJDQ | | 2.166 | 0.030 | 0.17 | 2.157 | -0.051 | -0.25 | LH |
| PYNLGP | | 2.037 | -0.099 | -0.54 | 2.213 | 0.005 | 0.03 | TB |
| Q6AYVJ | | 1.989 | -0.147 | -0.80 | 2.137 | -0.071 | -0.35 | TF |
| QCADKQ | | 1.982 | -0.154 | -0.84 | 2.024 | -0.184 | -0.91 | LH |
| QUA7PD | | 1.999 | -0.137 | -0.74 | 1.960 | -0.248 | -1.23 | LH |
| R7MPLE | | 2.140 | 0.004 | 0.02 | 2.168 | -0.040 | -0.20 | LA |
| T66YB9 | | 1.933 | -0.203 | -1.10 | 2.044 | -0.164 | -0.81 | TG |
| TYV34E | | 2.245 | 0.109 | 0.59 | 2.184 | -0.024 | -0.12 | LI |
| U9HFKP | X | 1.877 | -0.259 | -1.41 | 2.431 | 0.223 | 1.10 | LX |
| VW3MTA | | 2.139 | 0.003 | 0.02 | 2.237 | 0.029 | 0.14 | XX |
| WJD97L | | 2.175 | 0.039 | 0.21 | 2.228 | 0.020 | 0.10 | LX |



Paper & Paperboard Interlaboratory Testing Program
Analysis 328
Elongation to Break - Printing Papers
TAPPI Official Test Method T494

Report #2845
 September 2016

| WebCode | Data Flag | Sample SF35 | | | Sample SF36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| YYYPY | | 2.282 | 0.146 | 0.80 | 2.521 | 0.313 | 1.55 | XX |
| ZMH8Q2 | | 2.029 | -0.107 | -0.58 | 1.947 | -0.261 | -1.29 | LA |
| ZVU6V9 | | 2.239 | 0.104 | 0.56 | 2.294 | 0.086 | 0.43 | RE |

| Sample SF35 | | Summary Statistics | Sample SF36 | |
|-----------------------------------------------------|--------|--------------------|-------------|---------|
| Grand Means | 2.1357 | Percent | 2.2081 | Percent |
| SD Btwn Labs | 0.1838 | Percent | 0.2023 | Percent |
| Statistics based on 40 of 43 reporting participants | | | | |

Comments on Assigned Data Flags for Test #328

- P839RE (X) - Inconsistent in testing between samples.
- U9HFKP (X) - Inconsistent in testing between samples.
- M89ZBW (X) - Extreme Data.

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 |
| 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 |
| TX Thwing-Albert (model not specified) | XX Instrument make/model not specified by lab |



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 328

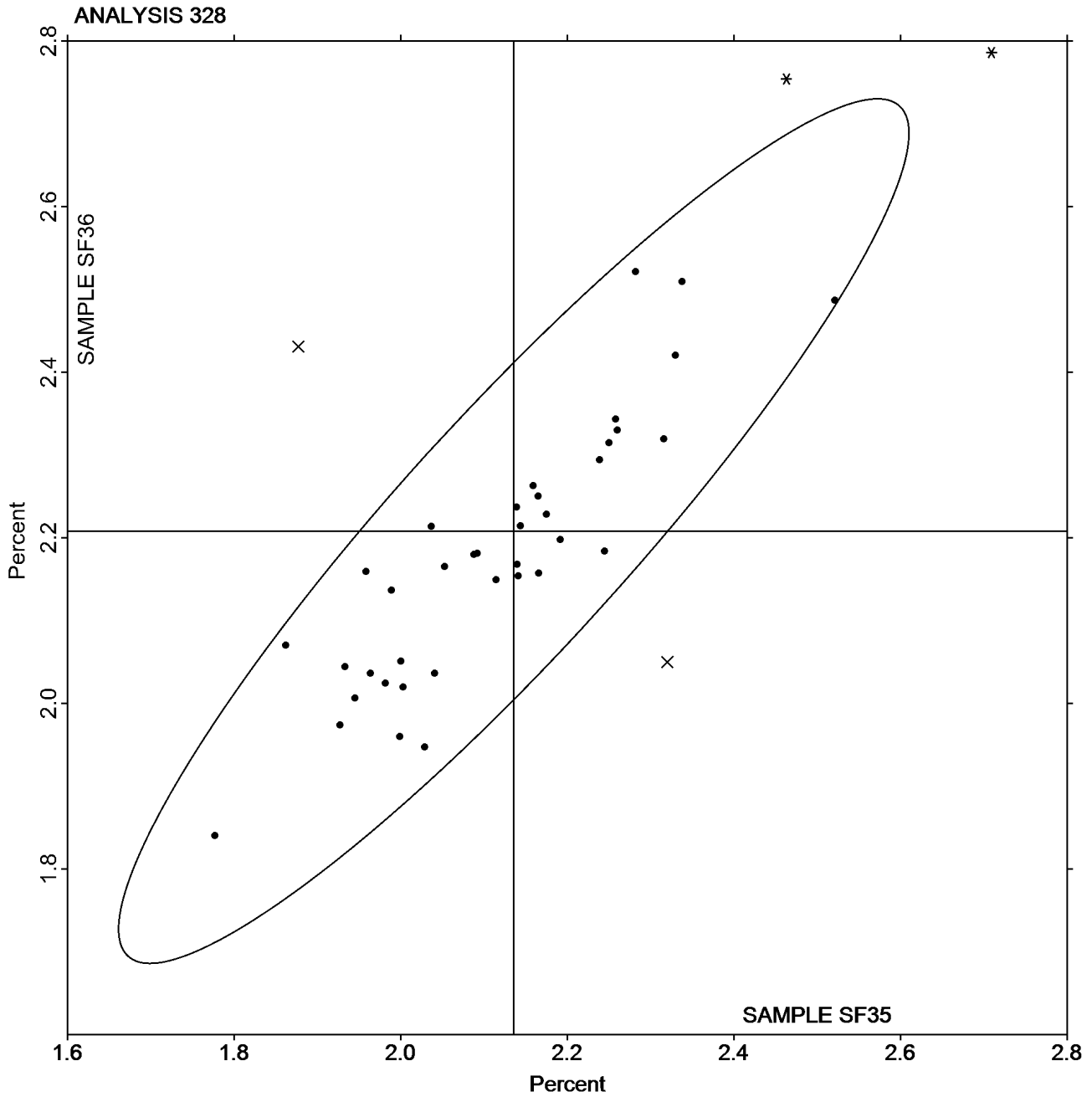
September 2016

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

Grand Mean Sample **SF35** = 2.1357 Percent

Grand Mean Sample **SF36** = 2.2081 Percent





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 330

September 2016

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SE35 | | | Sample SE36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 3MTTD9 | | 9.362 | 0.447 | 0.72 | 14.36 | 0.61 | 0.63 | XX |
| 3V6NVW | | 9.066 | 0.150 | 0.24 | 13.85 | 0.10 | 0.10 | LE |
| 43KNQY | | 8.472 | -0.444 | -0.71 | 13.13 | -0.62 | -0.65 | LE |
| 4ZTR26 | | 9.238 | 0.322 | 0.52 | 14.58 | 0.83 | 0.86 | LI |
| 6J2CCY | | 8.373 | -0.543 | -0.87 | 13.08 | -0.67 | -0.70 | LA |
| 7VTTNY | | 9.250 | 0.334 | 0.54 | 13.76 | 0.00 | 0.00 | IM |
| 86ZP8V | | 8.618 | -0.298 | -0.48 | 13.16 | -0.59 | -0.61 | XX |
| 92RNDV | | 8.727 | -0.189 | -0.30 | 13.20 | -0.55 | -0.57 | LW |
| 98HWZB | | 9.719 | 0.803 | 1.29 | 15.11 | 1.36 | 1.42 | TH |
| ATCYYZ | | 8.289 | -0.627 | -1.01 | 12.93 | -0.82 | -0.86 | XX |
| BKTJXX | | 9.142 | 0.226 | 0.36 | 13.50 | -0.25 | -0.26 | TO |
| BMM6TA | | 7.975 | -0.941 | -1.51 | 12.41 | -1.34 | -1.40 | IM |
| BZNBRR | | 8.641 | -0.275 | -0.44 | 13.51 | -0.25 | -0.26 | LE |
| CAQHXY | | 9.313 | 0.397 | 0.64 | 14.87 | 1.11 | 1.16 | TR |
| EWXFUW | | 8.884 | -0.032 | -0.05 | 13.62 | -0.13 | -0.13 | TH |
| FNJBYH | | 9.229 | 0.313 | 0.50 | 14.36 | 0.61 | 0.63 | IF |
| FU66C3 | | 9.347 | 0.431 | 0.69 | 13.90 | 0.15 | 0.16 | TO |
| HHL CXR | | 7.820 | -1.096 | -1.76 | 11.81 | -1.94 | -2.02 | TP |
| HZN79X | | 9.053 | 0.137 | 0.22 | 13.52 | -0.24 | -0.25 | TB |
| JGTA FM | | 9.712 | 0.796 | 1.28 | 14.56 | 0.81 | 0.84 | TP |
| JXVHLV | | 8.586 | -0.330 | -0.53 | 13.39 | -0.36 | -0.38 | ID |
| KGJKGM | | 9.542 | 0.626 | 1.01 | 14.21 | 0.46 | 0.48 | TP |
| KJBG7G | | 8.532 | -0.384 | -0.62 | 13.61 | -0.15 | -0.15 | TB |
| L8RW9J | | 8.705 | -0.211 | -0.34 | 13.06 | -0.69 | -0.72 | LE |
| MEUXZJ | | 8.288 | -0.628 | -1.01 | 12.96 | -0.79 | -0.83 | TH |
| N3D9YT | | 9.637 | 0.721 | 1.16 | 14.55 | 0.80 | 0.83 | TO |
| NE6PCD | | 8.226 | -0.690 | -1.11 | 13.13 | -0.63 | -0.65 | LE |
| NNEJMT | | 9.845 | 0.929 | 1.50 | 15.39 | 1.64 | 1.70 | TX |
| P8MJDL | | 8.471 | -0.445 | -0.72 | 13.59 | -0.17 | -0.17 | IM |
| PHLEBG | | 8.949 | 0.033 | 0.05 | 14.10 | 0.35 | 0.36 | TK |
| PRPW38 | | 7.672 | -1.244 | -2.00 | 12.52 | -1.24 | -1.29 | IK |
| PUVJDQ | | 8.897 | -0.019 | -0.03 | 14.02 | 0.27 | 0.28 | LH |
| QCUU2T | | 9.977 | 1.061 | 1.71 | 15.48 | 1.72 | 1.79 | TH |
| RETZZC | | 9.448 | 0.532 | 0.86 | 14.97 | 1.22 | 1.27 | LH |
| RJAWJF | X | 12.067 | 3.151 | 5.07 | 16.23 | 2.48 | 2.58 | LA |
| TERR7J | | 9.046 | 0.130 | 0.21 | 13.48 | -0.28 | -0.29 | LW |
| TKFYLP | * | 10.581 | 1.665 | 2.68 | 16.67 | 2.92 | 3.03 | LA |
| UHJF3G | | 8.999 | 0.083 | 0.13 | 14.21 | 0.46 | 0.48 | TO |
| UP4EVA | | 8.192 | -0.724 | -1.17 | 13.18 | -0.57 | -0.59 | TK |
| UUGJKC | | 8.696 | -0.220 | -0.35 | 12.89 | -0.86 | -0.90 | LH |



Paper & Paperboard Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers
TAPPI Official Test Method T494

Report #2845
 September 2016

| WebCode | Data Flag | Sample SE35 | | | Sample SE36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| VKCUKL | | 8.065 | -0.851 | -1.37 | 12.22 | -1.54 | -1.60 | IN |
| VQWWNH | | 8.310 | -0.606 | -0.98 | 13.21 | -0.55 | -0.57 | ID |
| WEZ3DD | | 8.371 | -0.545 | -0.88 | 12.75 | -1.00 | -1.04 | SA |
| WVPDGN | | 9.169 | 0.254 | 0.41 | 14.57 | 0.82 | 0.85 | TA |
| XZEBJJ | | 8.502 | -0.414 | -0.67 | 13.04 | -0.71 | -0.74 | ID |
| YFMLNH | | 9.172 | 0.257 | 0.41 | 14.22 | 0.47 | 0.49 | IK |
| YQHVK9 | | 10.007 | 1.091 | 1.76 | 15.12 | 1.37 | 1.42 | LA |
| ZKX2RE | * | 8.935 | 0.019 | 0.03 | 12.64 | -1.11 | -1.16 | IF |

| Sample SE35 | | Summary Statistics | Sample SE36 | |
|-----------------------------------------------------|-------------|--------------------|-------------|--|
| Grand Means | 8.9159 kN/m | | 13.753 kN/m | |
| SD Btwn Labs | 0.6212 kN/m | | 0.962 kN/m | |
| Statistics based on 47 of 48 reporting participants | | | | |

Comments on Assigned Data Flags for Test #330

RJAWJF (X) - Data for sample SE35 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 |
| LE | L & W Tensile Tester 066 | LH | L & W Alwetron TH1 (Horizontal) SE 060 |
| LI | Lloyds Instruments | LW | L & W Tensile Tester SE062 |
| SA | Shimadzu Autograph AG 2000 A | 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 |
| TX | Thwing-Albert (model not specified) | XX | Instrument make/model not specified by lab |

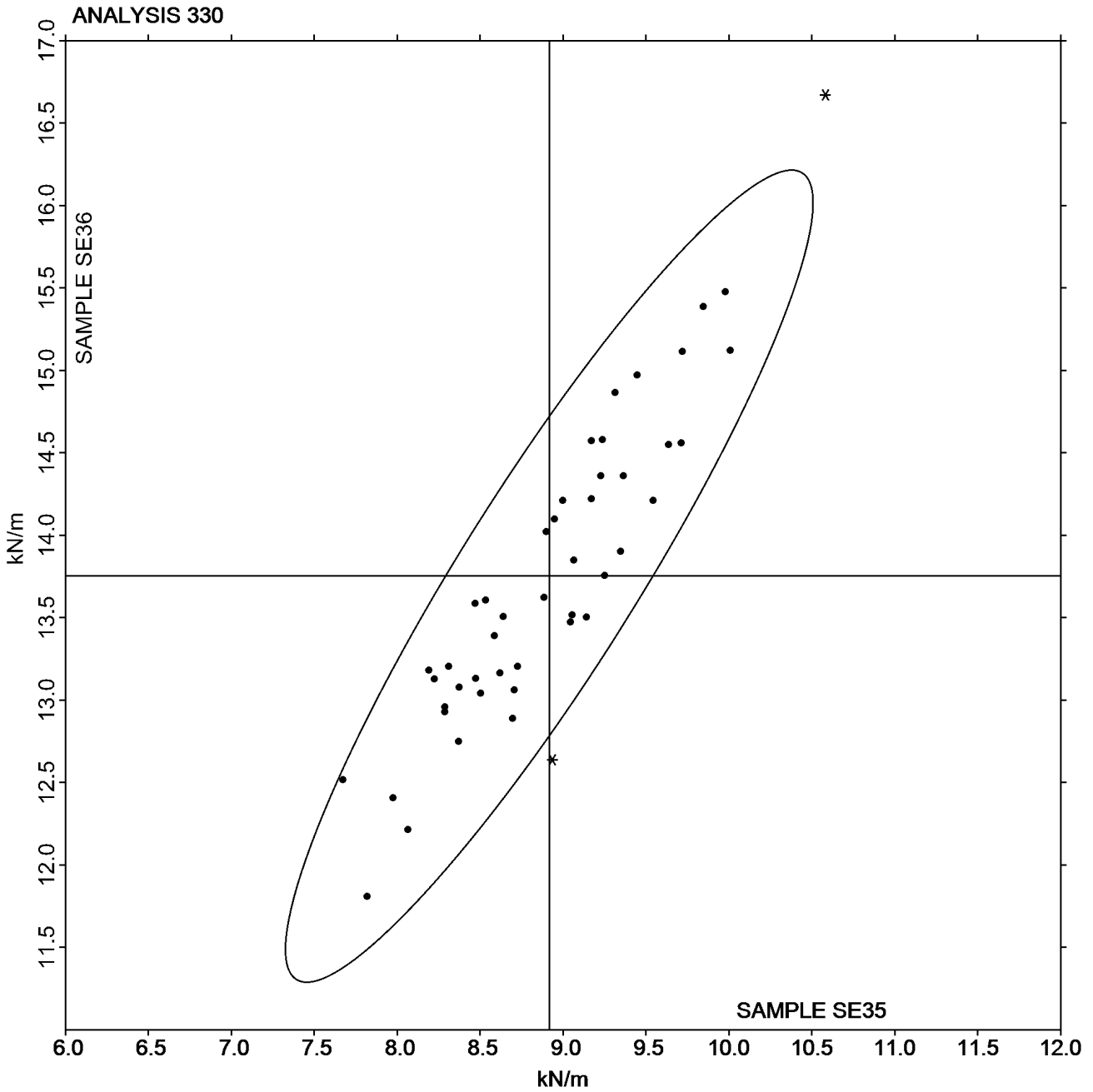


Paper & Paperboard Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SE35** = 8.9159 kN/m

Grand Mean Sample **SE36** = 13.753 kN/m





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 331

September 2016

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SE35 | | | Sample SE36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 3MTTD9 | * | 129.2 | 26.4 | 2.43 | 272.5 | 74.5 | 3.00 | XX |
| 3V6NVW | | 105.2 | 2.5 | 0.23 | 206.2 | 8.2 | 0.33 | LE |
| 43KNQY | | 88.6 | -14.2 | -1.30 | 178.0 | -20.0 | -0.81 | LE |
| 6J2CCY | | 106.8 | 4.0 | 0.37 | 199.0 | 1.0 | 0.04 | LA |
| 7VTTNY | | 99.2 | -3.5 | -0.33 | 189.6 | -8.4 | -0.34 | IM |
| 86ZP8V | | 94.8 | -8.0 | -0.73 | 171.6 | -26.4 | -1.06 | XX |
| 92RNDV | | 96.9 | -5.9 | -0.54 | 175.1 | -22.9 | -0.92 | LW |
| 98HWZB | | 107.6 | 4.9 | 0.45 | 221.7 | 23.7 | 0.95 | TH |
| ATCYYZ | | 100.7 | -2.0 | -0.19 | 196.8 | -1.2 | -0.05 | XX |
| BKTJXX | | 112.7 | 9.9 | 0.91 | 199.8 | 1.8 | 0.07 | TO |
| BMM6TA | | 90.3 | -12.5 | -1.15 | 189.1 | -8.9 | -0.36 | IM |
| BZNBRR | | 98.1 | -4.6 | -0.43 | 191.6 | -6.4 | -0.26 | LE |
| CAQHXY | | 106.1 | 3.4 | 0.31 | 216.6 | 18.6 | 0.75 | TR |
| FNJBYH | | 111.4 | 8.7 | 0.80 | 204.1 | 6.1 | 0.25 | IF |
| FU66C3 | * | 114.9 | 12.1 | 1.11 | 172.6 | -25.4 | -1.02 | TO |
| HHL CXR | | 93.6 | -9.1 | -0.84 | 165.7 | -32.3 | -1.30 | TP |
| HZN79X | | 103.1 | 0.4 | 0.04 | 187.1 | -10.9 | -0.44 | TB |
| JGTAFM | X | 48.9 | -53.8 | -4.95 | 33.4 | -164.6 | -6.63 | TP |
| L8RW9J | | 87.0 | -15.8 | -1.45 | 164.3 | -33.7 | -1.36 | LE |
| MEUXZJ | | 105.2 | 2.4 | 0.22 | 206.4 | 8.4 | 0.34 | TH |
| N3D9YT | | 121.2 | 18.5 | 1.70 | 211.2 | 13.2 | 0.53 | TO |
| NE6PCD | | 85.8 | -17.0 | -1.56 | 182.1 | -15.9 | -0.64 | LE |
| NNEJMT | * | 133.5 | 30.8 | 2.83 | 252.9 | 54.9 | 2.21 | XX |
| P8MJDL | | 91.7 | -11.0 | -1.02 | 195.4 | -2.6 | -0.10 | IM |
| PRPW38 | | 113.8 | 11.1 | 1.02 | 237.8 | 39.8 | 1.60 | IK |
| PUVJDQ | | 100.2 | -2.5 | -0.23 | 198.0 | 0.0 | 0.00 | LH |
| QCUU2T | | 118.0 | 15.3 | 1.41 | 241.7 | 43.7 | 1.76 | TH |
| RETZZC | | 102.5 | -0.2 | -0.02 | 200.9 | 2.9 | 0.12 | LH |
| RJAWJF | | 108.7 | 6.0 | 0.55 | 179.7 | -18.3 | -0.74 | LA |
| TERR7J | | 93.4 | -9.3 | -0.86 | 170.0 | -28.0 | -1.13 | LW |
| TKFYLP | | 100.5 | -2.2 | -0.20 | 209.8 | 11.8 | 0.48 | LA |
| UHJF3G | | 97.0 | -5.7 | -0.53 | 200.9 | 2.9 | 0.12 | TO |
| UP4EVA | | 98.8 | -3.9 | -0.36 | 197.5 | -0.5 | -0.02 | TK |
| UUGJKC | | 96.3 | -6.4 | -0.59 | 163.0 | -35.0 | -1.41 | LH |
| VKCUKL | | 95.4 | -7.3 | -0.67 | 188.4 | -9.6 | -0.39 | IN |
| VQWWNH | | 100.3 | -2.4 | -0.22 | 232.9 | 34.9 | 1.41 | ID |
| WEZ3DD | | 93.7 | -9.1 | -0.83 | 173.7 | -24.3 | -0.98 | SA |
| WVPDGN | | 96.1 | -6.6 | -0.61 | 210.5 | 12.5 | 0.50 | TA |
| XZEBJJ | | 95.3 | -7.5 | -0.69 | 167.1 | -30.9 | -1.25 | ID |
| YFMLNH | | 99.7 | -3.0 | -0.28 | 189.9 | -8.1 | -0.33 | XX |



Paper & Paperboard Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers
TAPPI Official Test Method T494

Report #2845
September 2016

| WebCode | Data Flag | Sample SE35 | | | Sample SE36 | | | Instr Code |
|---------|-----------|-------------|----------------------|------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| YQHYK9 | | 116.1 | 13.3 | 1.23 | 209.0 | 11.0 | 0.44 | LA |
| ZKX2RE | X | 171.8 | 69.1 | 6.35 | 105.3 | -92.7 | -3.73 | IN |

| Sample SE35 | | Summary Statistics | Sample SE36 | |
|-----------------------------------------------------|--------------------|--------------------|--------------------|--|
| Grand Means | 102.74 Joules/sq m | | 198.00 Joules/sq m | |
| SD Btwn Labs | 10.87 Joules/sq m | | 24.82 Joules/sq m | |
| Statistics based on 40 of 42 reporting participants | | | | |

Comments on Assigned Data Flags for Test #331

- JGTAFM (X) - Extreme Data.
- ZKX2RE (X) - Extreme Data.

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 | SA | Shimadzu Autograph AG 2000 A |
| 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 | XX | Instrument make/model not specified by lab |

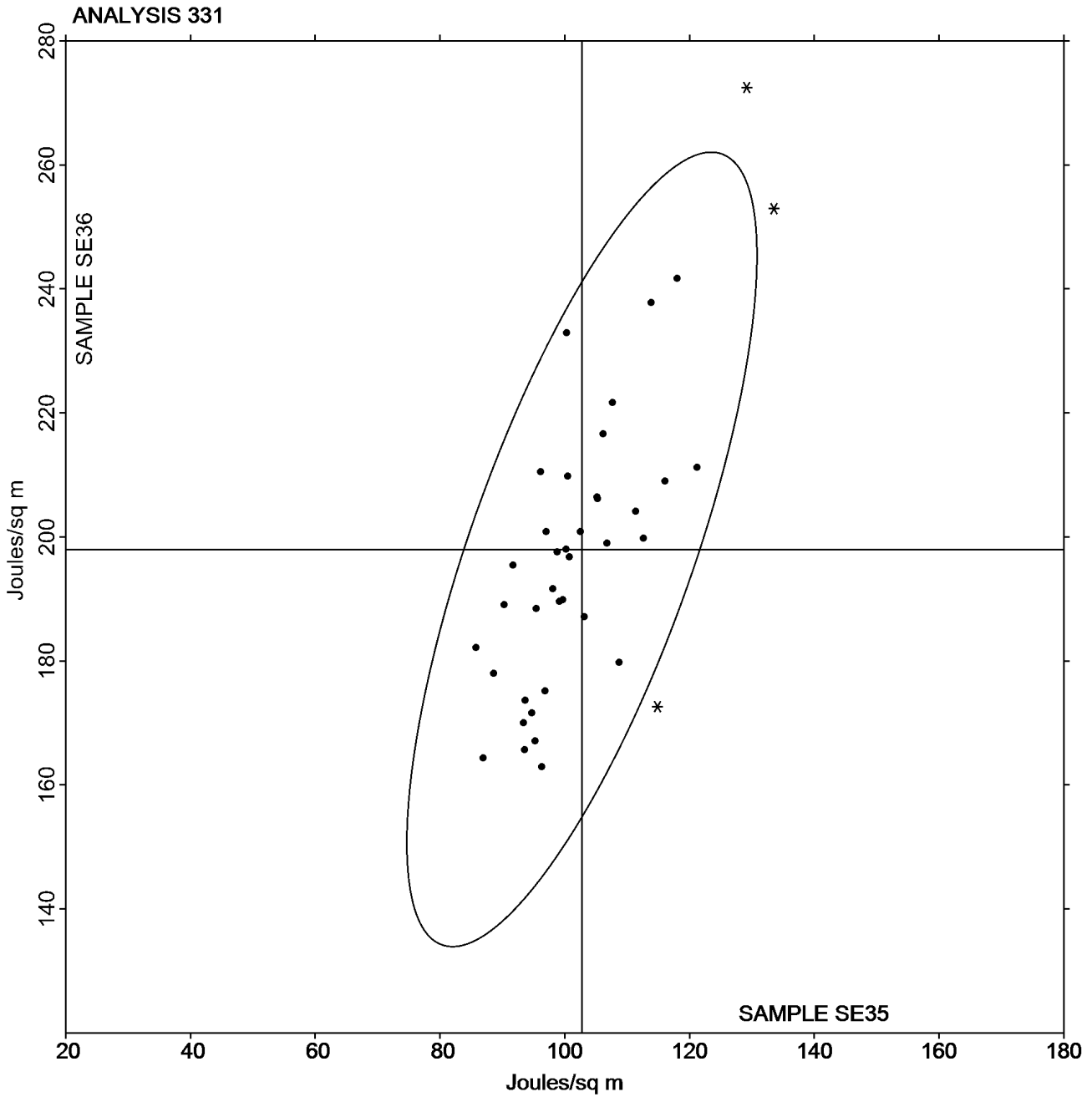


Paper & Paperboard Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SE35** = 102.74 Joules/sq m

Grand Mean Sample **SE36** = 198.00 Joules/sq m





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 332

September 2016

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

| WebCode | Data Flag | Sample SE35 | | | Sample SE36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 3MTTD9 | * | 2.168 | 0.351 | 1.55 | 2.954 | 0.681 | 2.48 | XX |
| 3V6NVW | | 1.756 | -0.062 | -0.27 | 2.283 | 0.011 | 0.04 | LE |
| 43KNQY | | 1.582 | -0.236 | -1.04 | 2.058 | -0.214 | -0.78 | LE |
| 6J2CCY | | 1.625 | -0.193 | -0.85 | 1.978 | -0.294 | -1.07 | LA |
| 7VTTNY | | 1.668 | -0.150 | -0.66 | 2.142 | -0.130 | -0.47 | IM |
| 86ZP8V | | 1.672 | -0.146 | -0.64 | 2.018 | -0.254 | -0.92 | XX |
| 92RNDV | | 1.678 | -0.140 | -0.62 | 2.028 | -0.244 | -0.89 | LW |
| 98HWZB | | 1.845 | 0.027 | 0.12 | 2.410 | 0.138 | 0.50 | TH |
| ATCYYZ | | 1.889 | 0.071 | 0.31 | 2.428 | 0.156 | 0.57 | XX |
| BKTJXX | | 2.060 | 0.242 | 1.07 | 2.460 | 0.188 | 0.68 | TO |
| BMM6TA | | 1.824 | 0.006 | 0.03 | 2.412 | 0.140 | 0.51 | IM |
| CAQHXY | | 1.795 | -0.022 | -0.10 | 2.337 | 0.065 | 0.24 | TR |
| FNJBYH | | 1.998 | 0.180 | 0.80 | 2.422 | 0.150 | 0.54 | IF |
| FU66C3 | | 1.920 | 0.102 | 0.45 | 2.047 | -0.225 | -0.82 | TO |
| HHL CXR | | 2.210 | 0.392 | 1.73 | 2.750 | 0.478 | 1.74 | TP |
| HZN79X | | 1.776 | -0.042 | -0.18 | 2.168 | -0.104 | -0.38 | TB |
| JGTAFM | | 2.063 | 0.245 | 1.08 | 2.288 | 0.016 | 0.06 | TP |
| JXVHLV | | 1.652 | -0.166 | -0.73 | 2.142 | -0.130 | -0.47 | ID |
| KJBG7G | | 1.597 | -0.221 | -0.98 | 2.209 | -0.063 | -0.23 | TB |
| L8RW9J | | 1.524 | -0.294 | -1.30 | 1.924 | -0.348 | -1.27 | LE |
| MEUXZJ | | 2.154 | 0.336 | 1.48 | 2.743 | 0.471 | 1.71 | TH |
| N3D9YT | | 2.111 | 0.293 | 1.29 | 2.351 | 0.079 | 0.29 | TO |
| NE6PCD | | 1.587 | -0.231 | -1.02 | 2.118 | -0.154 | -0.56 | LE |
| NNEJMT | | 2.206 | 0.388 | 1.71 | 2.711 | 0.439 | 1.60 | XX |
| P8MJDL | | 1.970 | 0.152 | 0.67 | 2.563 | 0.291 | 1.06 | IM |
| PRPW38 | X | 2.632 | 0.814 | 3.60 | 3.364 | 1.091 | 3.97 | IK |
| PUVJDQ | | 1.761 | -0.057 | -0.25 | 2.182 | -0.090 | -0.33 | LH |
| QCUU2T | | 2.007 | 0.189 | 0.84 | 2.585 | 0.313 | 1.14 | TH |
| RETZZC | | 1.662 | -0.156 | -0.69 | 2.076 | -0.196 | -0.71 | LH |
| RJAWJF | | 2.161 | 0.343 | 1.52 | 2.412 | 0.140 | 0.51 | XX |
| TERR7J | | 1.601 | -0.217 | -0.96 | 1.955 | -0.317 | -1.15 | LW |
| TKFYLP | | 1.486 | -0.332 | -1.47 | 1.868 | -0.404 | -1.47 | LA |
| UHJF3G | | 1.640 | -0.178 | -0.79 | 2.213 | -0.059 | -0.22 | TO |
| UP4EVA | | 1.881 | 0.063 | 0.28 | 2.354 | 0.081 | 0.30 | TK |
| UUGJKC | | 1.685 | -0.133 | -0.59 | 1.957 | -0.315 | -1.15 | LH |
| VKCUKL | | 1.980 | 0.162 | 0.72 | 2.560 | 0.288 | 1.05 | IN |
| VQWWNH | | 2.123 | 0.305 | 1.35 | 2.771 | 0.499 | 1.81 | ID |
| WEZ3DD | | 1.767 | -0.051 | -0.22 | 2.185 | -0.087 | -0.32 | SA |
| WVPDGN | | 1.504 | -0.314 | -1.39 | 2.070 | -0.202 | -0.74 | TA |
| XZEBJJ | | 1.888 | 0.070 | 0.31 | 2.165 | -0.107 | -0.39 | ID |



Paper & Paperboard Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers
TAPPI Official Test Method T494

Report #2845
 September 2016

| WebCode | Data Flag | Sample SE35 | | | Sample SE36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| YFMLNH | | 1.340 | -0.478 | -2.11 | 1.790 | -0.482 | -1.75 | XX |
| YQHVK9 | | 1.716 | -0.102 | -0.45 | 2.076 | -0.196 | -0.71 | LA |
| ZKX2RE | X | 1.986 | 0.168 | 0.74 | 1.655 | -0.617 | -2.24 | IN |

| Sample SE35 | | Summary Statistics | Sample SE36 | |
|-----------------------------------------------------|--------|--------------------|-------------|---------|
| Grand Means | 1.8179 | Percent | 2.2722 | Percent |
| SD Btwn Labs | 0.2264 | Percent | 0.2749 | Percent |
| Statistics based on 41 of 43 reporting participants | | | | |

Comments on Assigned Data Flags for Test #332

- PRPW38 (X) - Data for both samples are high.
- ZKX2RE (X) - Inconsistent in testing between samples.

Analysis Notes:

CAQHXY - One determination removed from the Lab Mean of Sample SE35 per Grubb's Test at 1% risk (TAPPI 1205).

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 | SA | Shimadzu Autograph AG 2000 A |
| 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 | XX | Instrument make/model not specified by lab |

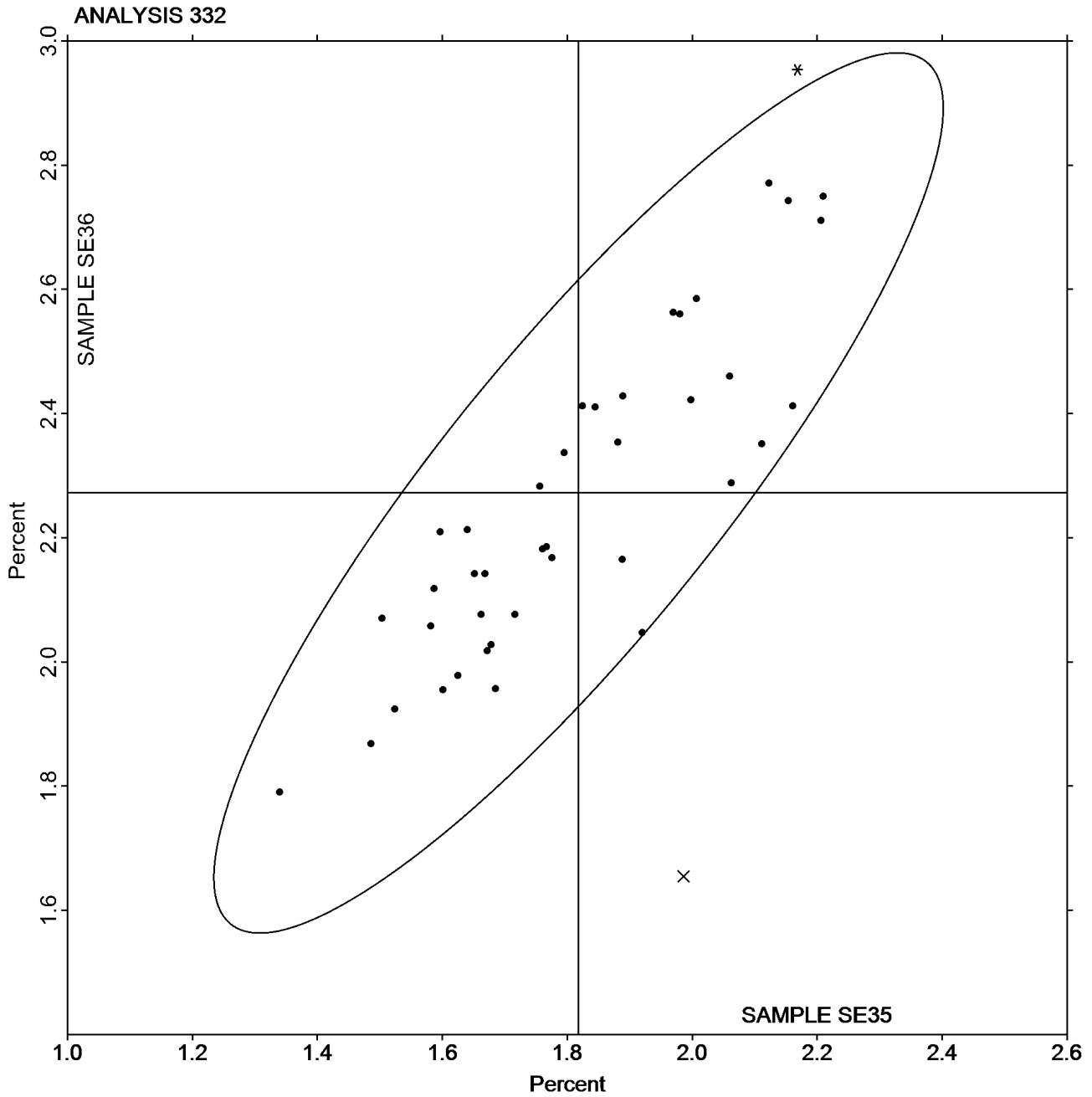


Paper & Paperboard Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SE35** = 1.8179 Percent

Grand Mean Sample **SE36** = 2.2722 Percent





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 334

September 2016

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

| WebCode | Data Flag | Sample SG35 | | | Sample SG36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 373N8Z | | 341.5 | 86.4 | 0.92 | 226.2 | 9.1 | 0.17 | MT |
| 7TPZUZ | | 329.1 | 74.0 | 0.79 | 192.8 | -24.3 | -0.46 | MT |
| 92RNDV | | 171.4 | -83.7 | -0.89 | 175.1 | -42.0 | -0.79 | MT |
| ATCYYZ | | 364.1 | 109.0 | 1.16 | 268.1 | 51.0 | 0.96 | MT |
| DB64AL | * | 158.3 | -96.8 | -1.03 | 346.0 | 128.9 | 2.42 | MT |
| KGJKGM | | 182.1 | -73.0 | -0.78 | 157.2 | -59.9 | -1.12 | MT |
| KJBG7G | | 168.8 | -86.3 | -0.92 | 145.8 | -71.3 | -1.34 | MT |
| LXBHJH | | 332.1 | 77.0 | 0.82 | 272.3 | 55.2 | 1.03 | MT |
| MEUXZJ | | 244.8 | -10.3 | -0.11 | 243.9 | 26.8 | 0.50 | MT |
| MVW8QN | | 223.3 | -31.8 | -0.34 | 200.7 | -16.4 | -0.31 | XX |
| P839RE | | 321.6 | 66.5 | 0.71 | 226.0 | 8.9 | 0.17 | MT |
| P9XN6C | | 374.9 | 119.8 | 1.27 | 268.4 | 51.3 | 0.96 | MT |
| PB3GWP | | 126.6 | -128.5 | -1.37 | 169.1 | -48.0 | -0.90 | MT |
| PHLEBG | | 393.1 | 138.0 | 1.47 | 160.5 | -56.6 | -1.06 | MT |
| RLDT3H | | 221.0 | -34.1 | -0.36 | 214.8 | -2.3 | -0.04 | MT |
| UQKXT9 | | 128.9 | -126.2 | -1.34 | 206.6 | -10.5 | -0.20 | XX |

| Summary Statistics | | | |
|-----------------------------------------------------|-------------|--------------|-------------|
| | Sample SG35 | | Sample SG36 |
| Grand Means | 255.10 | Double Folds | 217.09 |
| SD Btwn Labs | 93.96 | Double Folds | 53.35 |
| Statistics based on 16 of 16 reporting participants | | | |

Key to Instrument Codes Reported by Participants

MT MIT - Tinius Olsen

XX Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 334

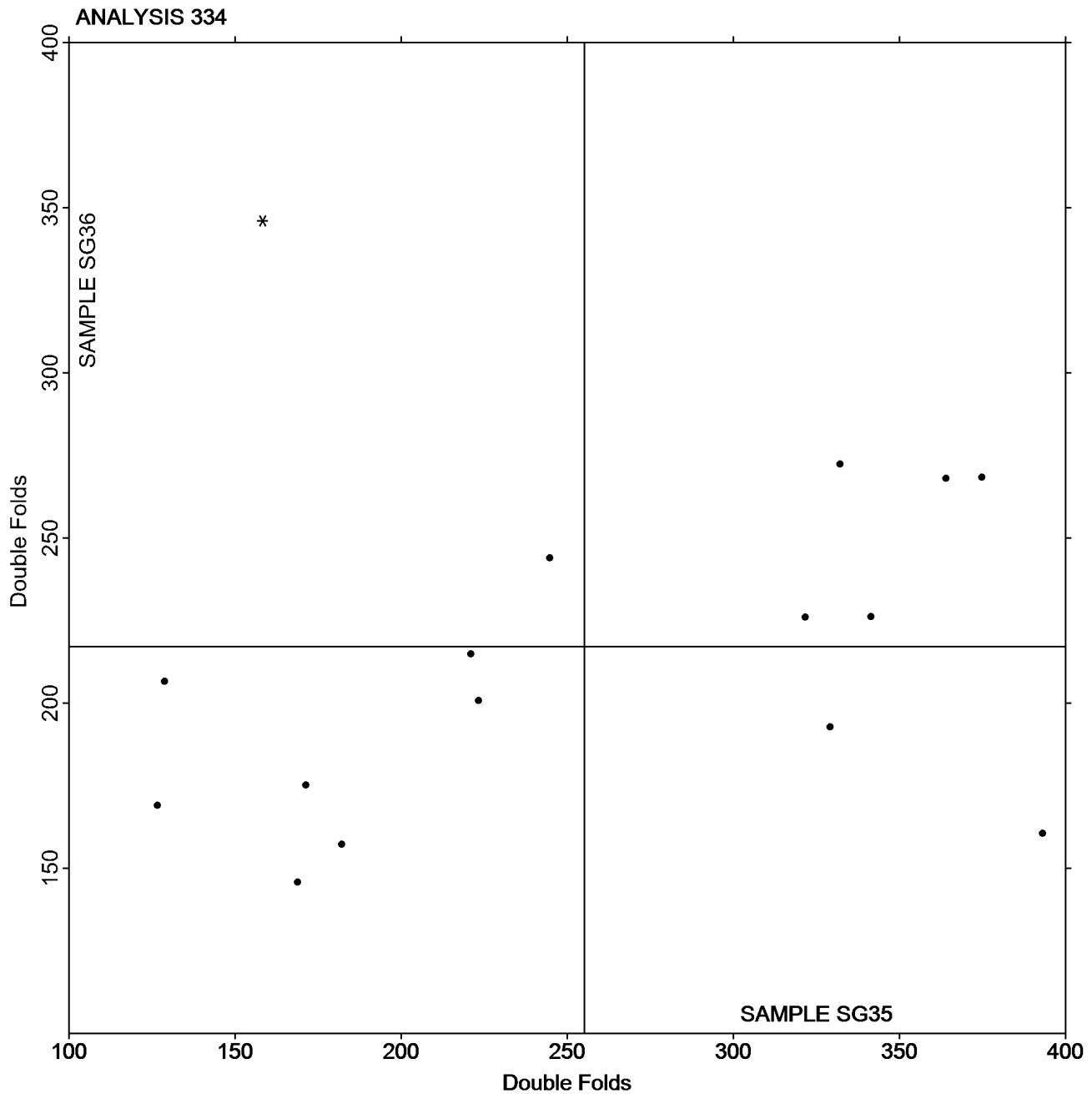
September 2016

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

Grand Mean Sample **SG35** = 255.10 Double Folds

Grand Mean Sample **SG36** = 217.09 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

Report #2845
 September 2016

| WebCode | Data Flag | Sample SH35 | | | Sample SH36 | | |
|---------|-----------|-------------|----------------------|--------|-------------|----------------------|--------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 2VPEDA | | 346.3 | 14.0 | 0.57 | 297.8 | 1.5 | 0.07 |
| 373N8Z | | 344.0 | 11.8 | 0.48 | 291.6 | -4.7 | -0.21 |
| 3HELY3 | | 290.7 | -41.6 | -1.68 | 268.6 | -27.7 | -1.23 |
| 4V4MFA | | 324.9 | -7.4 | -0.30 | 289.7 | -6.6 | -0.29 |
| 4WEP28 | | 310.0 | -22.3 | -0.90 | 290.5 | -5.8 | -0.26 |
| 63YREB | X | 61.7 | -270.5 | -10.95 | 54.2 | -242.1 | -10.77 |
| 9EEQX9 | | 326.5 | -5.8 | -0.23 | 308.5 | 12.2 | 0.54 |
| ATCYYZ | | 368.0 | 35.8 | 1.45 | 294.3 | -2.0 | -0.09 |
| CRP6BV | | 297.8 | -34.4 | -1.39 | 266.7 | -29.6 | -1.32 |
| EA6QYX | | 358.7 | 26.5 | 1.07 | 315.1 | 18.9 | 0.84 |
| FNJBYH | | 376.3 | 44.0 | 1.78 | 328.6 | 32.3 | 1.44 |
| HAP7QN | | 349.4 | 17.1 | 0.69 | 325.4 | 29.1 | 1.29 |
| KJBG7G | | 301.3 | -30.9 | -1.25 | 268.0 | -28.2 | -1.26 |
| MVW8QN | | 336.9 | 4.7 | 0.19 | 298.8 | 2.5 | 0.11 |
| N3UKED | | 298.1 | -34.1 | -1.38 | 248.4 | -47.9 | -2.13 |
| P839RE | | 312.5 | -19.8 | -0.80 | 270.7 | -25.6 | -1.14 |
| Q6AYVJ | | 336.8 | 4.6 | 0.18 | 303.6 | 7.3 | 0.33 |
| QCADKQ | | 359.6 | 27.4 | 1.11 | 321.9 | 25.6 | 1.14 |
| R7MPLE | | 347.4 | 15.2 | 0.61 | 323.5 | 27.2 | 1.21 |
| XBQAX6 | | 329.0 | -3.3 | -0.13 | 311.0 | 14.7 | 0.66 |
| ZACXLZ | | 330.7 | -1.5 | -0.06 | 302.8 | 6.5 | 0.29 |

| | Sample SH35 | Summary Statistics | Sample SH36 |
|-----------------------------------------------------|---------------------|--------------------|---------------------|
| Grand Means | 332.25 Gurley Units | | 296.28 Gurley Units |
| SD Btwn Labs | 24.70 Gurley Units | | 22.48 Gurley Units |
| Statistics based on 20 of 21 reporting participants | | | |

Comments on Assigned Data Flags for Test #336

63YREB (X) - Extreme Data.



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 336

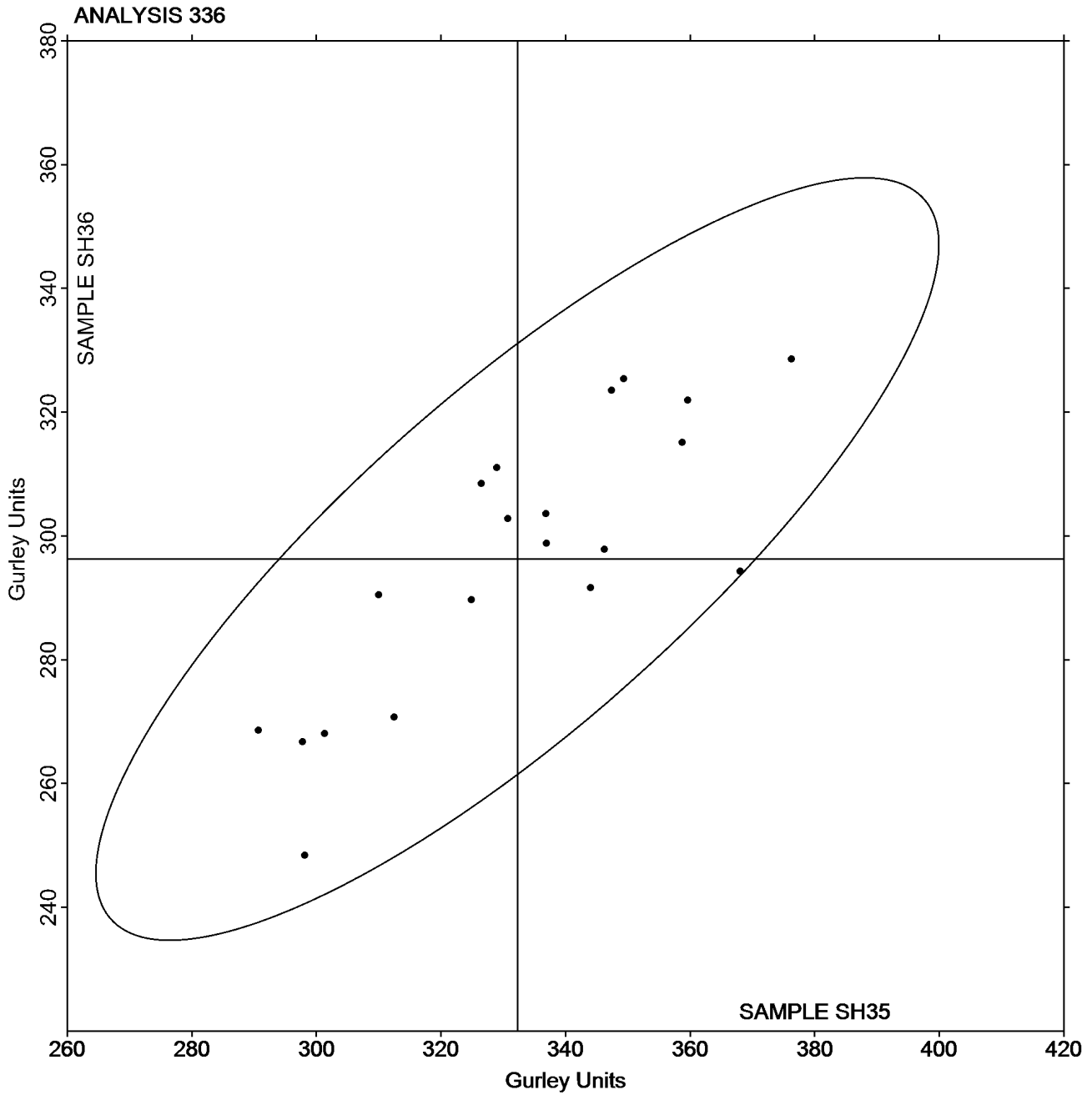
September 2016

Bending Resistance, Gurley Type

TAPPI Official Test Method T543

Grand Mean Sample **SH35** = 332.25 Gurley Units

Grand Mean Sample **SH36** = 296.28 Gurley Units





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 338

September 2016

Bending Resistance, Taber Type - 0 to 10 Units

TAPPI Official Test Method T566

| WebCode | Data Flag | Sample SJ35 | | | Sample SJ36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 2VPEDA | | 4.361 | 0.201 | 0.22 | 3.993 | 0.213 | 0.24 |
| 373N8Z | | 4.566 | 0.406 | 0.44 | 4.363 | 0.583 | 0.64 |
| 3PG3MA | * | 3.060 | -1.100 | -1.20 | 2.073 | -1.707 | -1.89 |
| 7TPZUZ | | 4.276 | 0.116 | 0.13 | 3.923 | 0.143 | 0.16 |
| FNJBYH | | 4.252 | 0.092 | 0.10 | 3.727 | -0.053 | -0.06 |
| HAP7QN | | 2.094 | -2.066 | -2.25 | 1.905 | -1.875 | -2.07 |
| L98LMC | | 5.074 | 0.914 | 1.00 | 4.666 | 0.886 | 0.98 |
| MVW8QN | | 5.570 | 1.410 | 1.54 | 5.070 | 1.290 | 1.43 |
| N3UKED | | 4.416 | 0.256 | 0.28 | 4.130 | 0.350 | 0.39 |
| RGJTRU | | 3.846 | -0.314 | -0.34 | 3.424 | -0.356 | -0.39 |
| TERR7J | | 3.800 | -0.360 | -0.39 | 3.630 | -0.150 | -0.17 |
| U9HFKP | | 3.150 | -1.010 | -1.10 | 3.250 | -0.530 | -0.59 |
| UQKXT9 | | 4.726 | 0.566 | 0.62 | 4.171 | 0.391 | 0.43 |
| ZKX2RE | | 5.050 | 0.890 | 0.97 | 4.590 | 0.810 | 0.90 |

| | | Summary Statistics | |
|-----------------------------------------------------|--------------------|--------------------|--------------------|
| | Sample SJ35 | | Sample SJ36 |
| Grand Means | 4.1599 Taber Units | | 3.7796 Taber Units |
| SD Btwn Labs | 0.9181 Taber Units | | 0.9050 Taber Units |
| Statistics based on 14 of 14 reporting participants | | | |

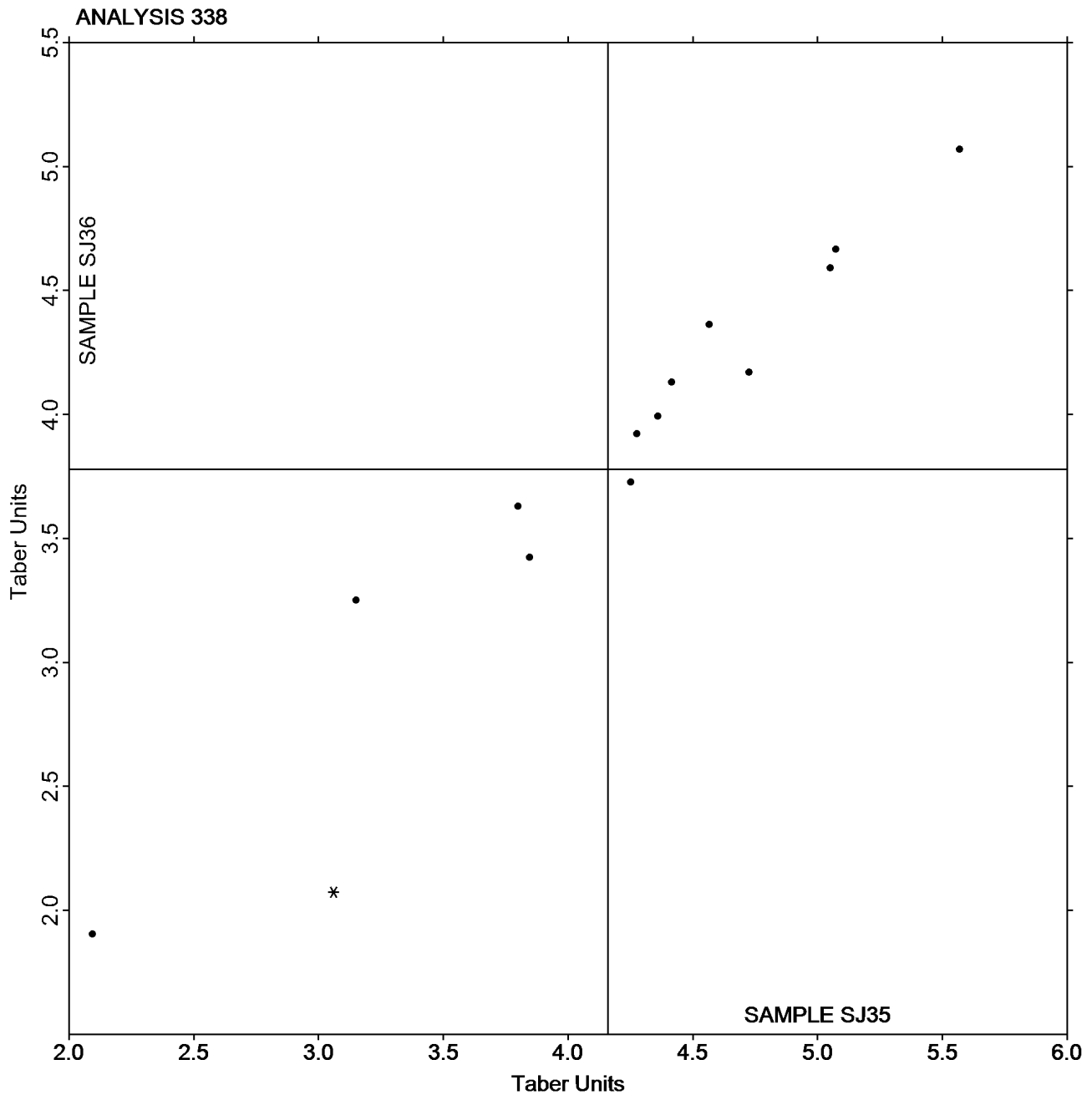


Paper & Paperboard Interlaboratory Testing Program
Analysis 338
Bending Resistance, Taber Type - 0 to 10 Units
TAPPI Official Test Method T566

Report #2845
September 2016

Grand Mean Sample **SJ35** = 4.1599 Taber Units

Grand Mean Sample **SJ36** = 3.7796 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

Report #2845
 September 2016

| WebCode | Data Flag | Sample SQ35 | | | Sample SQ36 | | |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 373N8Z | | 35.26 | 2.09 | 1.15 | 38.11 | 0.76 | 0.42 |
| 3V6NVW | X | 39.40 | 6.23 | 3.44 | 42.30 | 4.95 | 2.76 |
| 6J2CCY | | 34.40 | 1.23 | 0.68 | 38.12 | 0.77 | 0.43 |
| 92RNDV | | 34.83 | 1.66 | 0.91 | 38.75 | 1.40 | 0.78 |
| BC6X2T | | 34.20 | 1.03 | 0.57 | 38.60 | 1.25 | 0.70 |
| EA6QYX | | 31.03 | -2.14 | -1.18 | 35.01 | -2.34 | -1.30 |
| HZN79X | | 32.06 | -1.11 | -0.61 | 35.85 | -1.50 | -0.84 |
| KQVHNE | | 30.80 | -2.37 | -1.31 | 35.59 | -1.76 | -0.98 |
| T66YB9 | | 33.90 | 0.73 | 0.40 | 39.55 | 2.20 | 1.23 |
| TERR7J | | 33.60 | 0.43 | 0.24 | 37.70 | 0.35 | 0.20 |
| UZ9Q67 | | 34.24 | 1.07 | 0.59 | 38.80 | 1.45 | 0.81 |
| YYYDPY | | 29.67 | -3.50 | -1.93 | 33.88 | -3.47 | -1.93 |
| ZACXLZ | | 34.09 | 0.92 | 0.51 | 38.24 | 0.89 | 0.49 |

| | | Summary Statistics | |
|-----------------------------------------------------|--------------------|--------------------|--------------------|
| | Sample SQ35 | | Sample SQ36 |
| Grand Means | 33.173 Taber Units | | 37.350 Taber Units |
| SD Btwn Labs | 1.811 Taber Units | | 1.794 Taber Units |
| Statistics based on 12 of 13 reporting participants | | | |

Comments on Assigned Data Flags for Test #339

3V6NVW (X) - Data for both samples are high. Possible Systematic Error.

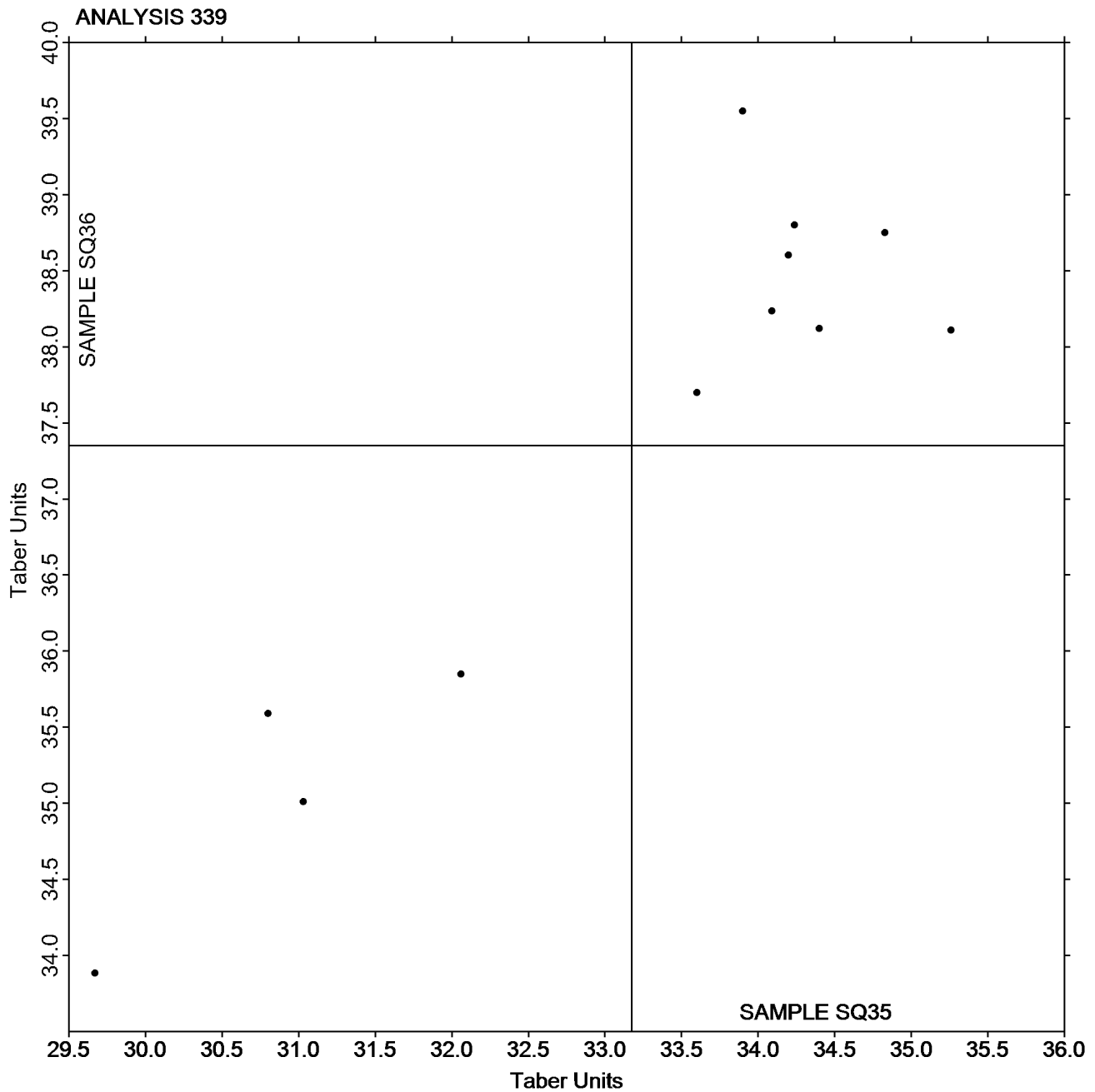


Paper & Paperboard Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units
TAPPI Official Test Method T489

Report #2845
September 2016

Grand Mean Sample **SQ35** = 33.173 Taber Units

Grand Mean Sample **SQ36** = 37.350 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
Enduring Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
TAPPI Official Test Method T489

Report #2845
 September 2016

| WebCode | Data Flag | Sample ST35 | | | Sample ST36 | | |
|---------|-----------|-------------|----------------------|--------|-------------|----------------------|-------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV |
| 2E2UNW | | 284.2 | -1.1 | -0.08 | 261.0 | 19.5 | 1.31 |
| 34G63W | | 286.8 | 1.5 | 0.11 | 238.2 | -3.3 | -0.22 |
| 47H8RX | | 293.0 | 7.7 | 0.56 | 247.4 | 5.9 | 0.40 |
| 6GDZB9 | | 287.0 | 1.7 | 0.12 | 238.5 | -3.0 | -0.20 |
| 8P38A4 | | 280.8 | -4.5 | -0.33 | 232.4 | -9.1 | -0.61 |
| 92RNDV | | 287.3 | 1.9 | 0.14 | 237.8 | -3.7 | -0.25 |
| ATCYYZ | | 276.0 | -9.3 | -0.68 | 231.4 | -10.2 | -0.68 |
| EWXFUW | | 279.0 | -6.3 | -0.46 | 251.0 | 9.5 | 0.64 |
| HHL CXR | | 262.1 | -23.2 | -1.70 | 210.6 | -30.9 | -2.08 |
| MEUXZJ | | 316.7 | 31.4 | 2.30 | 265.5 | 24.0 | 1.61 |
| T3FP28 | | 303.3 | 18.0 | 1.32 | 253.4 | 11.9 | 0.80 |
| T9ZKNA | X | 122.2 | -163.1 | -11.96 | 119.6 | -121.9 | -8.20 |
| TERR7J | | 283.0 | -2.3 | -0.17 | 243.8 | 2.2 | 0.15 |
| WEZ3DD | | 266.9 | -18.4 | -1.35 | 221.2 | -20.3 | -1.37 |
| ZACXLZ | | 288.5 | 3.1 | 0.23 | 249.2 | 7.7 | 0.52 |

| Sample ST35 | | Summary Statistics | Sample ST36 | |
|-----------------------------------------------------|--------------------|--------------------|--------------------|--|
| Grand Means | 285.32 Taber Units | | 241.53 Taber Units | |
| SD Btwn Labs | 13.64 Taber Units | | 14.87 Taber Units | |
| Statistics based on 14 of 15 reporting participants | | | | |

Comments on Assigned Data Flags for Test #340

T9ZKNA (X) - Extreme Data.

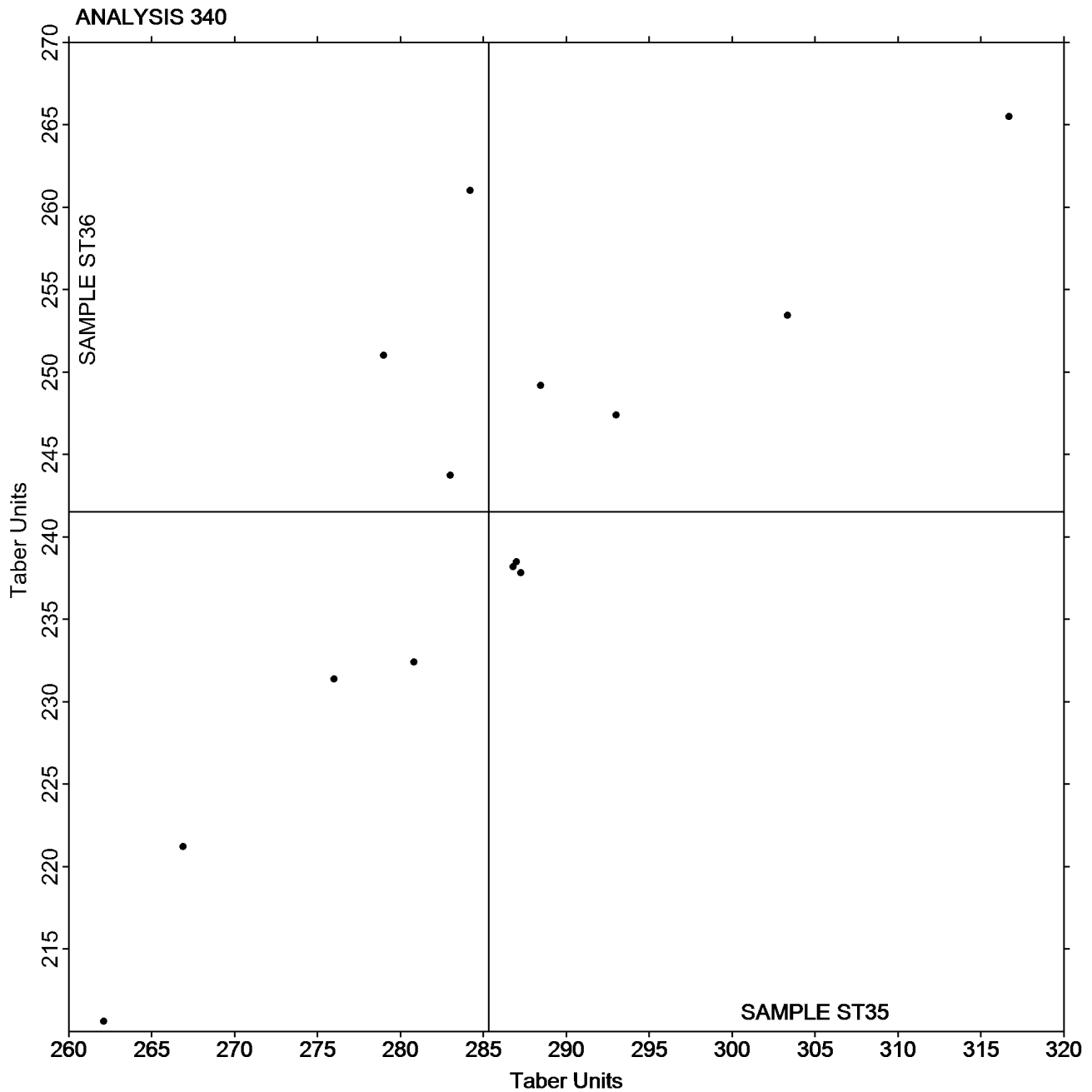


Paper & Paperboard Interlaboratory Testing Program
Analysis 340
Indenting Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
TAPPI Official Test Method T489

Report #2845
September 2016

Grand Mean Sample **ST35** = 285.32 Taber Units

Grand Mean Sample **ST36** = 241.53 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

Report #2845

**Analysis 343
Z-Direction Tensile**

September 2016

TAPPI Official Test Method T541

| WebCode | Data Flag | Sample SM35 | | | Sample SM36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 373N8Z | | 62.04 | -3.17 | -0.37 | 75.27 | -4.59 | -0.46 | TZ |
| 3MTTD9 | | 55.14 | -10.07 | -1.18 | 75.50 | -4.36 | -0.43 | DT |
| 3V6NVW | | 70.00 | 4.79 | 0.56 | 87.00 | 7.14 | 0.71 | TA |
| 7TPZUZ | | 54.46 | -10.75 | -1.26 | 75.12 | -4.74 | -0.47 | CD |
| 92RNDV | | 65.80 | 0.59 | 0.07 | 83.08 | 3.22 | 0.32 | LW |
| BKTJXX | | 67.80 | 2.59 | 0.30 | 78.80 | -1.06 | -0.11 | TA |
| C3GWCP | | 63.70 | -1.51 | -0.18 | 77.28 | -2.58 | -0.26 | XX |
| DWMEBJ | | 66.46 | 1.25 | 0.15 | 83.68 | 3.82 | 0.38 | TA |
| DYQAUL | | 64.20 | -1.01 | -0.12 | 74.60 | -5.26 | -0.52 | XX |
| FNJBYH | | 80.02 | 14.81 | 1.74 | 90.92 | 11.06 | 1.10 | TL |
| HHL CXR | | 52.59 | -12.62 | -1.48 | 67.39 | -12.47 | -1.24 | LX |
| HVADDY | | 51.37 | -13.83 | -1.63 | 59.76 | -20.10 | -2.00 | LW |
| HZN79X | | 77.49 | 12.28 | 1.44 | 91.99 | 12.13 | 1.21 | TA |
| MEUXZJ | | 62.28 | -2.93 | -0.34 | 68.16 | -11.70 | -1.16 | LW |
| QLUJFA | | 70.40 | 5.19 | 0.61 | 87.34 | 7.48 | 0.75 | XX |
| T9ZKNA | | 76.72 | 11.51 | 1.35 | 100.22 | 20.36 | 2.03 | CA |
| YYYPY | | 68.05 | 2.84 | 0.33 | 81.46 | 1.61 | 0.16 | LW |

| Sample SM35 | | Summary Statistics | Sample SM36 | |
|-----------------------------------------------------|------------|--------------------|-------------|--|
| Grand Means | 65.207 psi | | 79.856 psi | |
| SD Btw Labs | 8.510 psi | | 10.041 psi | |
| Statistics based on 17 of 17 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 | | |

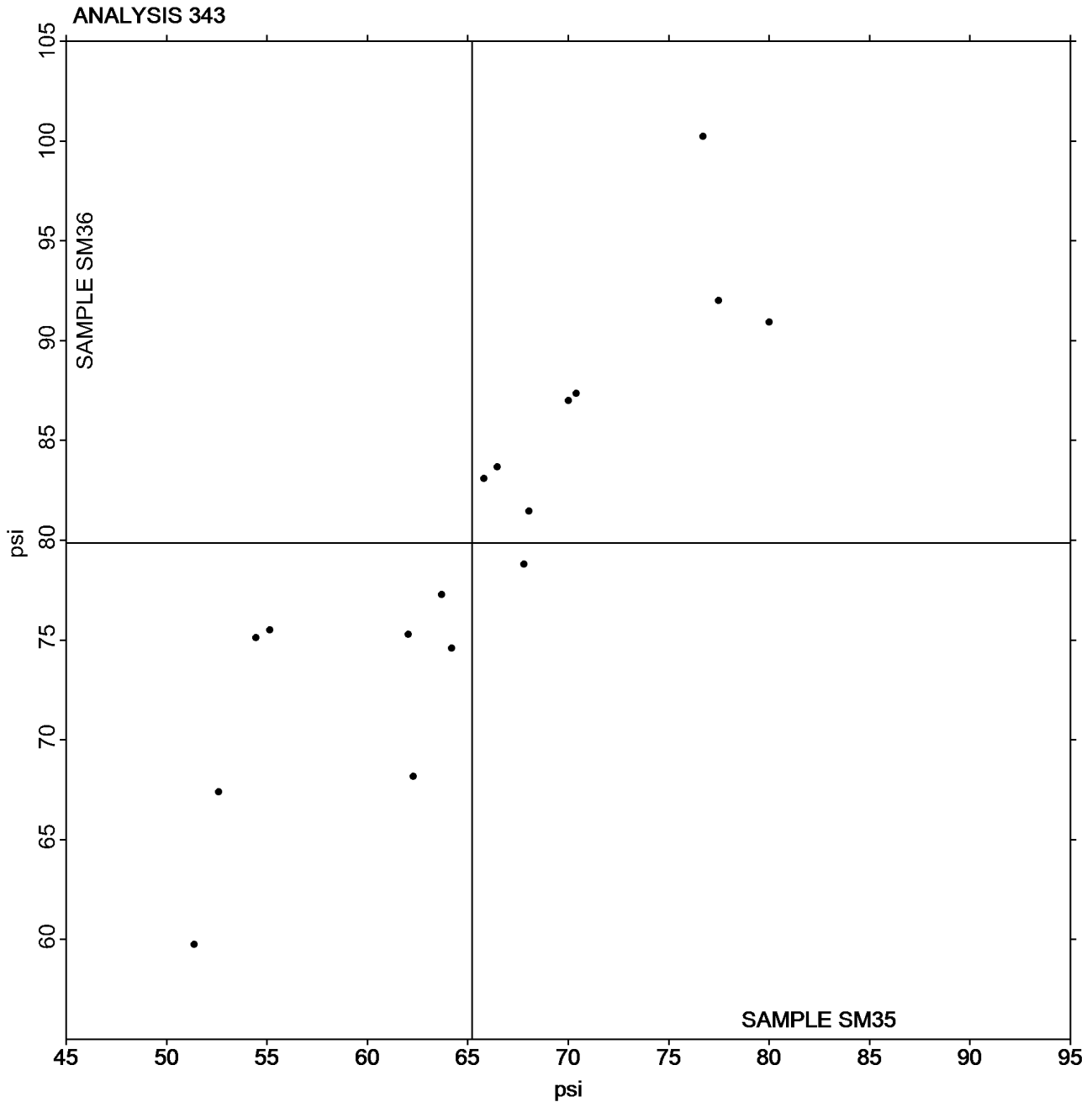


Paper & Paperboard Interlaboratory Testing Program
Analysis 343
Z-Direction Tensile
TAPPI Official Test Method T541

Report #2845
September 2016

Grand Mean Sample **SM35** = 65.207 psi

Grand Mean Sample **SM36** = 79.856 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

Report #2845
September 2016

| WebCode | Data Flag | Sample SZ35 | | | Sample SZ36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 2E2UNW | | 36.20 | 0.93 | 0.27 | 40.80 | 1.04 | 0.33 | TL |
| 34G63W | | 37.60 | 2.33 | 0.67 | 40.80 | 1.04 | 0.33 | CA |
| 47H8RX | | 36.00 | 0.73 | 0.21 | 40.20 | 0.44 | 0.14 | CA |
| 4ZTR26 | | 38.83 | 3.56 | 1.02 | 42.29 | 2.54 | 0.80 | CH |
| 6GDZB9 | | 35.94 | 0.67 | 0.19 | 40.74 | 0.98 | 0.31 | TL |
| 7TN3J6 | | 32.96 | -2.31 | -0.66 | 35.96 | -3.80 | -1.19 | LW |
| 8P38A4 | | 28.30 | -6.97 | -1.99 | 34.64 | -5.12 | -1.60 | TL |
| 9MQKV4 | | 31.50 | -3.77 | -1.08 | 37.06 | -2.70 | -0.85 | LW |
| AFRPQW | | 35.32 | 0.05 | 0.01 | 39.72 | -0.04 | -0.01 | DP |
| ATCYYZ | | 32.60 | -2.67 | -0.76 | 37.56 | -2.20 | -0.69 | CA |
| ATVJ7T | X | 69.60 | 34.33 | 9.82 | 79.00 | 39.24 | 12.31 | LW |
| PRPW38 | | 42.66 | 7.39 | 2.11 | 46.27 | 6.52 | 2.04 | PG |
| XX7ZP2 | | 37.12 | 1.85 | 0.53 | 42.48 | 2.72 | 0.85 | TL |
| YQHYK9 | | 35.83 | 0.56 | 0.16 | 42.10 | 2.34 | 0.73 | TA |
| ZACXLZ | | 32.94 | -2.33 | -0.67 | 35.96 | -3.80 | -1.19 | CA |

| Sample SZ35 | | Summary Statistics | Sample SZ36 | |
|-----------------------------------------------------|------------|--------------------|-------------|--|
| Grand Means | 35.271 psi | | 39.756 psi | |
| SD Btwn Labs | 3.496 psi | | 3.189 psi | |
| Statistics based on 14 of 15 reporting participants | | | | |

Comments on Assigned Data Flags for Test #345

ATVJ7T (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 345

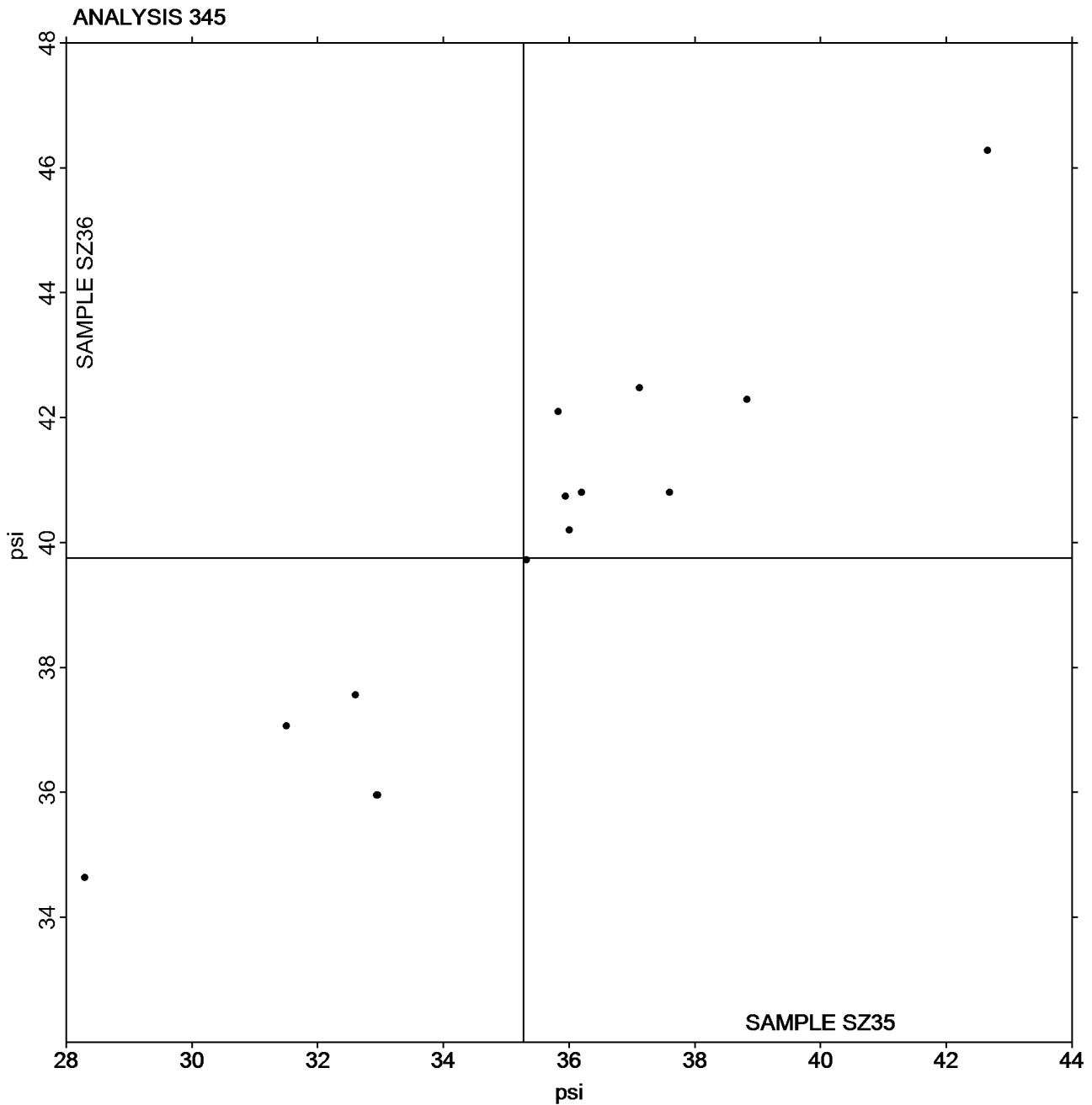
September 2016

Z-Direction Tensile, Recycled Paperboard

TAPPI Official Test Method T541

Grand Mean Sample **SZ35** = 35.271 psi

Grand Mean Sample **SZ36** = 39.756 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 348
Internal Bond Strength - Modified Scott Mechanics
TAPPI Provisional Test Method T569

Report #2845
September 2016

| WebCode | Data Flag | Sample SN35 | | | Sample SN36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 373N8Z | | 101.0 | 0.4 | 0.06 | 103.8 | -1.3 | -0.18 | HY |
| 3V6NVW | | 109.4 | 8.8 | 1.31 | 111.2 | 6.1 | 0.84 | HY |
| 63YREB | | 95.8 | -4.8 | -0.71 | 105.6 | 0.5 | 0.07 | HY |
| 7TPZUZ | | 100.6 | 0.0 | 0.00 | 107.6 | 2.5 | 0.35 | HY |
| 8P38A4 | * | 106.6 | 6.0 | 0.89 | 121.2 | 16.1 | 2.22 | HZ |
| 92RNDV | | 110.8 | 10.2 | 1.52 | 113.8 | 8.7 | 1.20 | HY |
| ATCYYZ | | 96.6 | -4.0 | -0.59 | 103.4 | -1.7 | -0.23 | HZ |
| DWMEBJ | | 104.0 | 3.4 | 0.51 | 109.2 | 4.1 | 0.57 | HY |
| HAP7QN | | 96.7 | -3.9 | -0.57 | 102.0 | -3.0 | -0.42 | KR |
| HZN79X | | 103.3 | 2.7 | 0.40 | 100.8 | -4.2 | -0.58 | HZ |
| MEUXZJ | | 91.2 | -9.4 | -1.39 | 92.0 | -13.1 | -1.80 | HZ |
| N3D9YT | | 98.0 | -2.6 | -0.38 | 102.8 | -2.3 | -0.31 | HZ |
| N3UKED | | 103.0 | 2.5 | 0.37 | 100.5 | -4.6 | -0.63 | HY |
| N79UEF | | 83.0 | -17.6 | -2.61 | 87.8 | -17.3 | -2.38 | XX |
| P839RE | | 94.6 | -6.0 | -0.89 | 104.8 | -0.3 | -0.04 | HY |
| Q6AYVJ | | 96.4 | -4.2 | -0.62 | 101.6 | -3.5 | -0.48 | HY |
| QCADKQ | | 104.3 | 3.7 | 0.55 | 111.2 | 6.2 | 0.85 | HZ |
| UHJF3G | | 101.8 | 1.2 | 0.18 | 105.0 | -0.1 | -0.01 | HY |
| WJD97L | | 105.8 | 5.3 | 0.78 | 106.9 | 1.8 | 0.25 | HY |
| ZVU6V9 | | 108.6 | 8.0 | 1.19 | 110.3 | 5.2 | 0.72 | HY |

| | | Summary Statistics | |
|-----------------------------------------------------|-------------|--------------------|----------------------|
| | Sample SN35 | | Sample SN36 |
| Grand Means | 100.58 | 1000th ft-lbs | 105.08 1000th ft-lbs |
| SD Btwn Labs | 6.73 | 1000th ft-lbs | 7.27 1000th ft-lbs |
| Statistics based on 20 of 20 reporting participants | | | |

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 | XX | Instrument make/model not specified by lab |

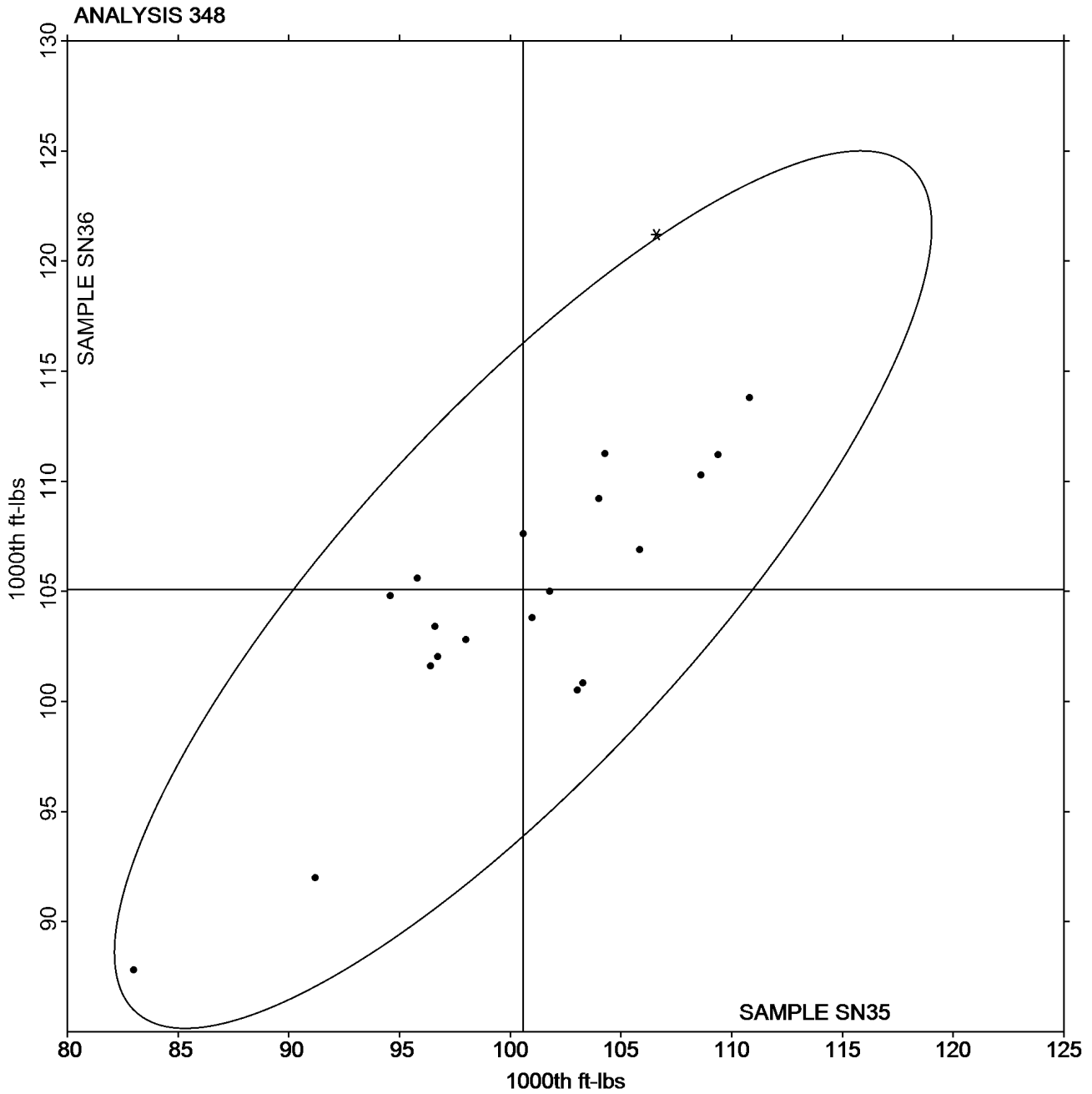


Paper & Paperboard Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics
TAPPI Provisional Test Method T569

Report #2845
September 2016

Grand Mean Sample **SN35** = 100.58 1000th ft-lbs

Grand Mean Sample **SN36** = 105.08 1000th ft-lbs





Paper & Paperboard Interlaboratory Testing Program
Analysis 349
Internal Bond Strength - Scott Bond Models
TAPPI Provisional Test Method T569

Report #2845
 September 2016

| WebCode | Data Flag | Sample SP35 | | | Sample SP36 | | | Instr Code |
|---------|-----------|-------------|----------------------|-------|-------------|----------------------|-------|------------|
| | | Lab Mean | Diff from Grand Mean | CPV | Lab Mean | Diff from Grand Mean | CPV | |
| 3MTTD9 | X | 110.20 | 17.50 | 2.15 | 99.40 | 1.58 | 0.15 | XX |
| 4PC6R6 | | 92.80 | 0.10 | 0.01 | 88.40 | -9.42 | -0.90 | SC |
| 4ZTR26 | | 79.60 | -13.10 | -1.61 | 87.00 | -10.82 | -1.03 | TM |
| 7TN3J6 | | 97.00 | 4.30 | 0.53 | 97.60 | -0.22 | -0.02 | XX |
| AX6YDV | | 83.94 | -8.76 | -1.08 | 88.13 | -9.70 | -0.92 | XX |
| HHLCXR | | 87.08 | -5.62 | -0.69 | 84.51 | -13.31 | -1.27 | TM |
| M89ZBW | | 102.00 | 9.30 | 1.14 | 107.60 | 9.78 | 0.93 | SC |
| PRPW38 | | 102.00 | 9.30 | 1.14 | 113.40 | 15.58 | 1.48 | TM |
| PUVJDQ | | 93.78 | 1.08 | 0.13 | 97.40 | -0.43 | -0.04 | TM |
| QBZ96G | | 102.00 | 9.30 | 1.14 | 109.00 | 11.18 | 1.06 | SC |
| TERR7J | | 86.84 | -5.86 | -0.72 | 105.20 | 7.38 | 0.70 | XX |
| Y49Q6C | X | 80.40 | -12.30 | -1.52 | 85.20 | -12.62 | -1.20 | XX |

| Sample SP35 | | Summary Statistics | Sample SP36 | |
|-----------------------------------------------------|----------------------|--------------------|----------------------|--|
| Grand Means | 92.704 1000th ft-lbs | | 97.823 1000th ft-lbs | |
| SD Btwn Labs | 8.120 1000th ft-lbs | | 10.514 1000th ft-lbs | |
| Statistics based on 10 of 12 reporting participants | | | | |

Comments on Assigned Data Flags for Test #349

- 3MTTD9 (X) - Data appear to be off by a factor of .001. Corrected by CTS (x1000).
- Y49Q6C (X) - Data appear to be off by a factor of .001. Corrected by CTS (x1000).

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

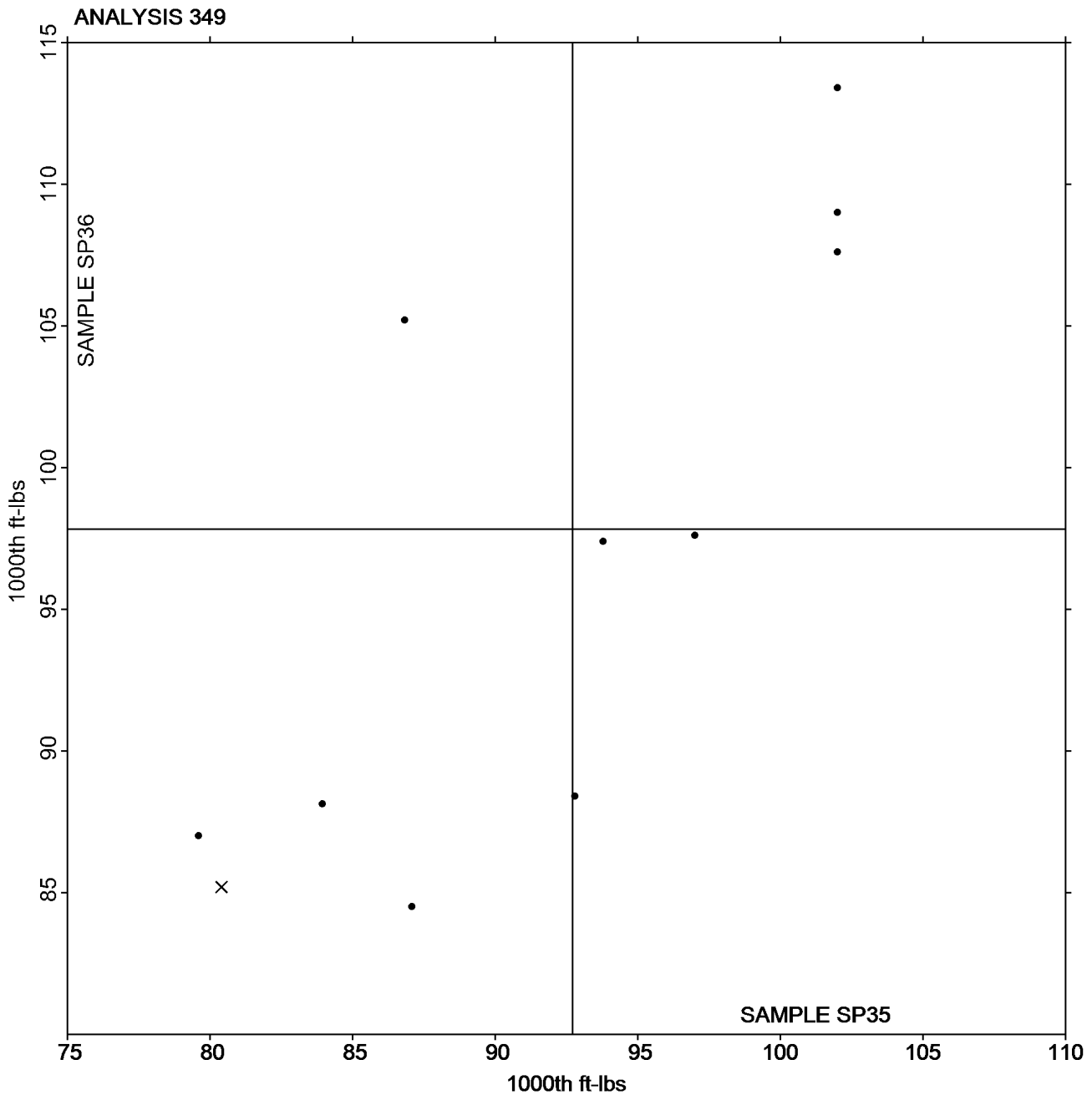


Paper & Paperboard Interlaboratory Testing Program
Analysis 349
Internal Bond Strength - Scott Bond Models
TAPPI Provisional Test Method T569

Report #2845
September 2016

Grand Mean Sample **SP35** = 92.704 1000th ft-lbs

Grand Mean Sample **SP36** = 97.823 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.