

Paper & Paperboard Interlaboratory Testing Program

Summary Report #288S - May 2017

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

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

Analysis	Analysis Name
305	Bursting Strength - Printing Papers
310	Bursting Strength - Packaging Papers
311	Tearing Strength - Newsprint
312	Tearing Strength - Printing Papers
314	Tearing Strength - Packaging Papers
320	Tensile Breaking Strength - Newsprint
321	Tensile Energy Absorption - Newsprint
322	Elongation to Break - Newsprint
325	Tensile Breaking Strength - Printing Papers
327	Tensile Energy Absorption - Printing Papers
328	Elongation to Break - Printing Papers
330	Tensile Breaking Strength - Packaging Papers
331	Tensile Energy Absorption - Packaging Papers
332	Elongation to Break - Packaging Papers
334	Folding Endurance (MIT) - Double Folds
336	Bending Resistance, Gurley Type
338	Bending Resistance, Taber Type - 0 to 10 Units
339	Bending Resistance, Taber Type - 10 to 100 Taber Units
340	Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
343	Z-Direction Tensile
345	Z-Direction Tensile, Recycled Paperboard
348	Internal Bond Strength - Modified Scott Mechanics
349	Internal Bond Strength - Scott Bond Models

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:

Collaborative Testing Services, Inc.
21331 Gentry Drive
Sterling, Virginia 20166 USA
+1-571-434-1925
FAX #: +1-571-434-1937
paper@cts-interlab.com

(Toll-free fax within the U.S.: 1-866-fax-2cts)
Office Hours: 8:00 a.m. - 4:30 p.m. ET

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 #2885
 May 2017

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

	Sample SA43	Summary Statistics	Sample SA44
Grand Means	26.169 psi		29.033 psi
SD Btwn Labs	2.692 psi		2.380 psi
Statistics based on 28 of 28 reporting participants			

Analysis Notes:

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



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 305

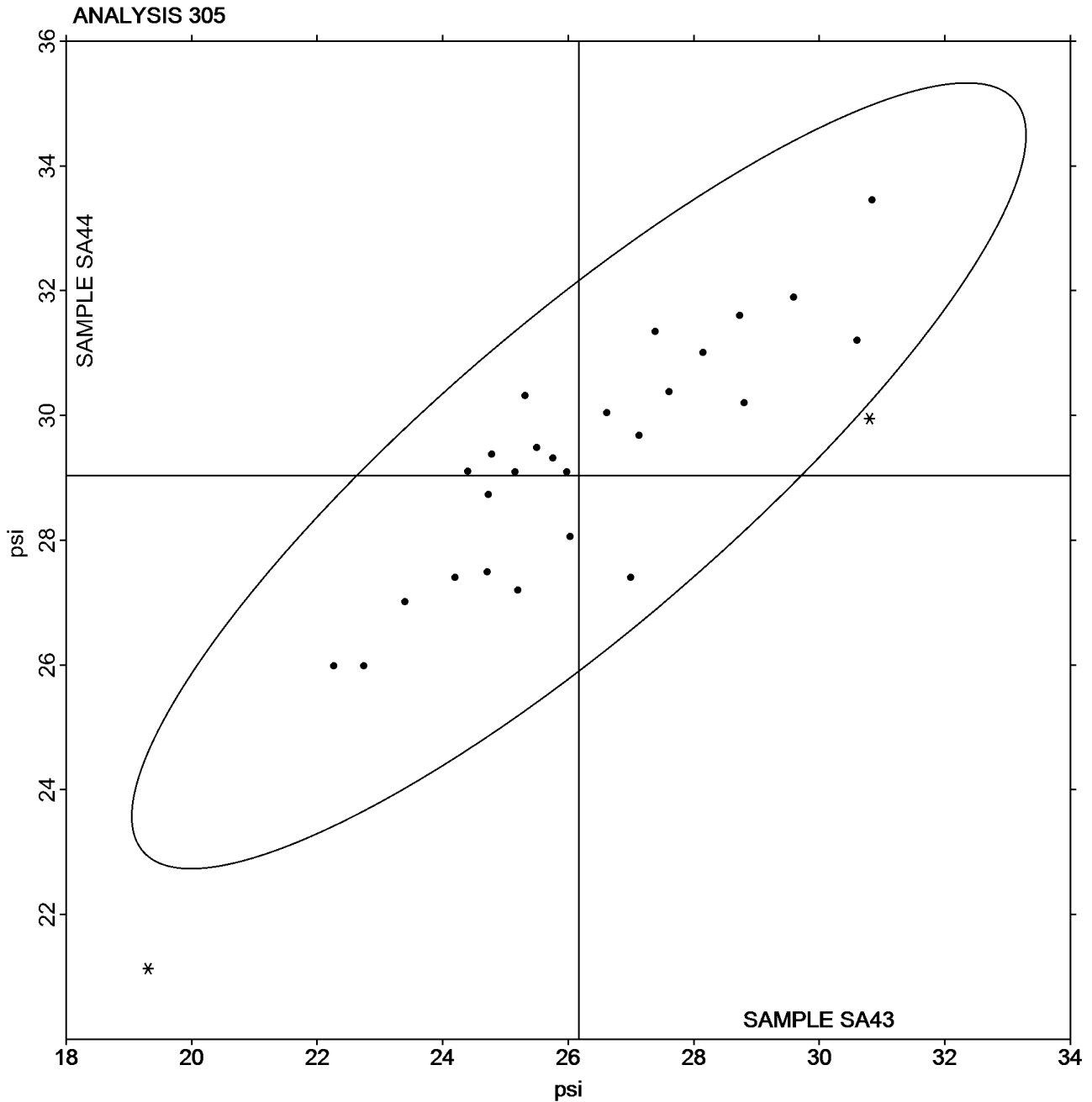
May 2017

Bursting Strength - Printing Papers

TAPPI Official Test Method T403

Grand Mean Sample SA43 = 26.169 psi

Grand Mean Sample SA44 = 29.033 psi





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

Report #2885
 May 2017

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

Sample SB43		Summary Statistics	Sample SB44	
Grand Means	93.638 psi		88.494 psi	
SD Btwn Labs	4.115 psi		5.003 psi	
Statistics based on 29 of 30 reporting participants				

Comments on Assigned Data Flags for Test #310

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



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

Report #288S
May 2017

Analysis Notes:

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

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

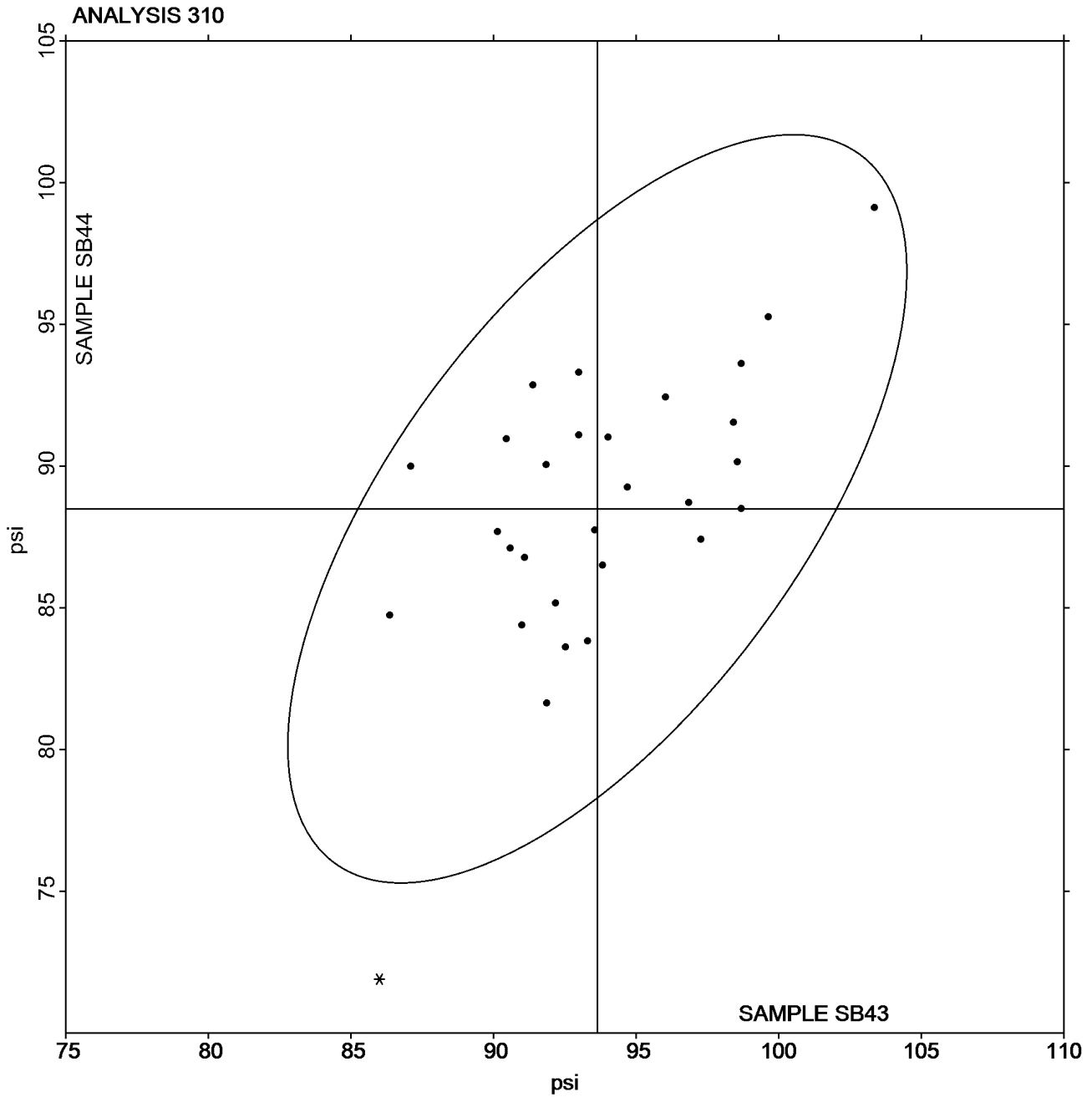


Paper & Paperboard Interlaboratory Testing Program
Analysis 310
Bursting Strength - Packaging Papers
TAPPI Official Test Method T403

Report #2885
May 2017

Grand Mean Sample **SB43** = 93.638 psi

Grand Mean Sample **SB44** = 88.494 psi





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

Report #2885
May 2017

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

Sample SK43		Summary Statistics	Sample SK44	
Grand Means	23.416 Grams		31.262 Grams	
SD Btwn Labs	4.310 Grams		5.688 Grams	
Statistics based on 6 of 7 reporting participants				

Comments on Assigned Data Flags for Test #311

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

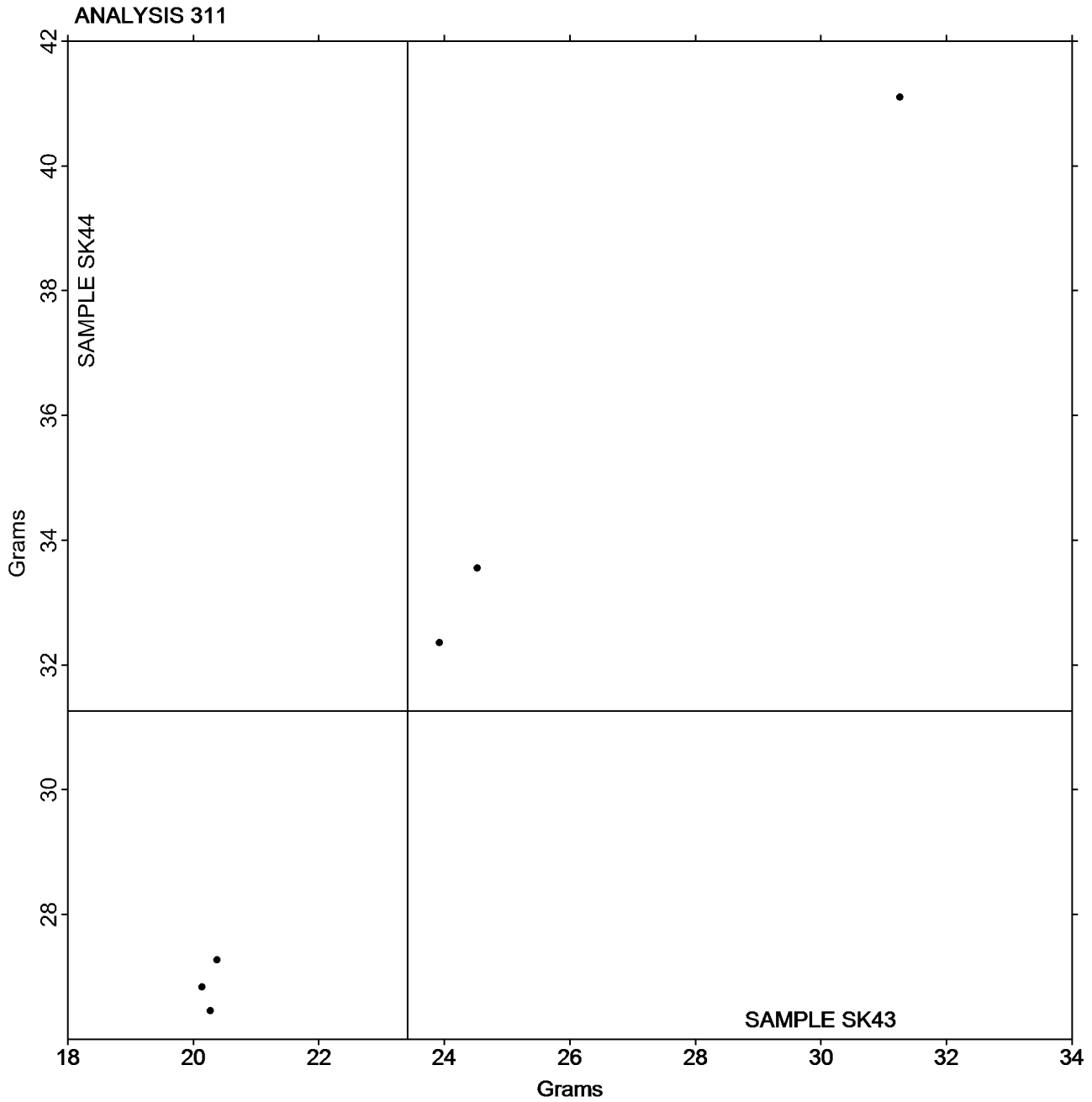


Paper & Paperboard Interlaboratory Testing Program
Analysis 311
Tearing Strength - Newsprint
TAPPI Official Test Method T414

Report #2885
May 2017

Grand Mean Sample **SK43** = 23.416 Grams

Grand Mean Sample **SK44** = 31.262 Grams



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



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

Report #2885
 May 2017

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



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

Report #2885
 May 2017

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

Sample SC43		Summary Statistics	Sample SC44	
Grand Means	62.614 Grams		64.063 Grams	
SD Btwn Labs	3.952 Grams		3.772 Grams	
Statistics based on 48 of 56 reporting participants				

Comments on Assigned Data Flags for Test #312

- 2N3TVA (X) - Extreme Data.
- KC3URJ (X) - Data for sample SC43 are high.
- FXHL3Y (X) - Data for sample SC43 are high.
- D9MR42 (X) - Extreme Data.
- EJZBZ3 (X) - Data for sample SC44 are low.
- LFXQ8C (X) - Data for sample SC43 are high.
- EJJ6VK (X) - Data for sample SC43 are high.
- H8FAPD (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample SC43.

Analysis Notes:

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



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 312

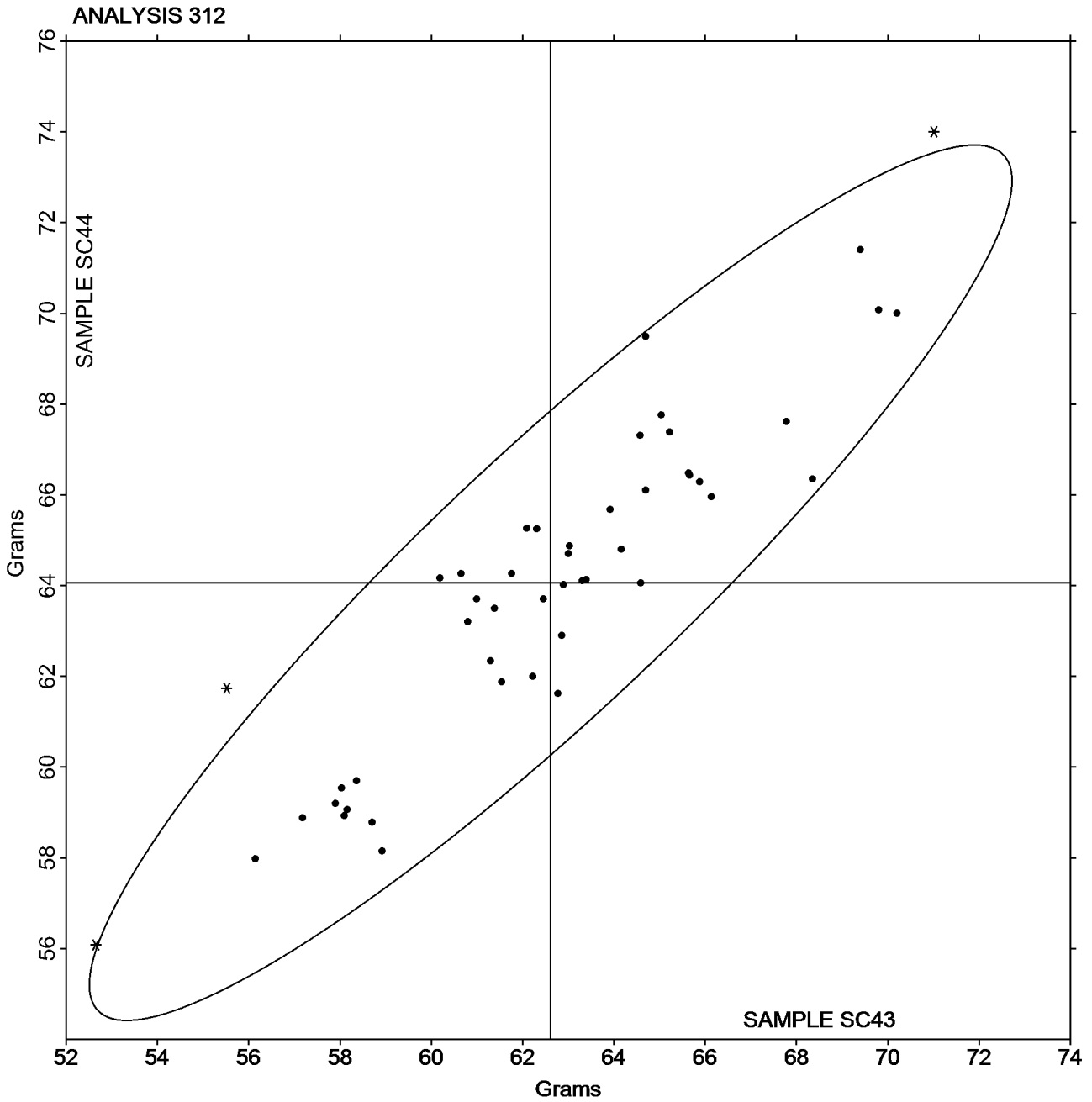
May 2017

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

Grand Mean Sample **SC43** = 62.614 Grams

Grand Mean Sample **SC44** = 64.063 Grams





Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 314

May 2017

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

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



Paper & Paperboard Interlaboratory Testing Program
Analysis 314
Tearing Strength - Packaging Papers
TAPPI Official Test Method T414

Report #2885
May 2017

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

Sample SD43		Summary Statistics	Sample SD44	
Grand Means	199.77 Grams		203.59 Grams	
SD Btwn Labs	14.95 Grams		15.58 Grams	
Statistics based on 37 of 40 reporting participants				

Comments on Assigned Data Flags for Test #314

- NAMAWE (X) - Data for sample SD43 are low.
- EYEGC2 (X) - Data for both samples are high. Possible Systematic Error.
- XD8TKE (X) - Data for sample SD43 are high. Inconsistent within the determinations of sample SD43.

Analysis Notes:

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



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 314

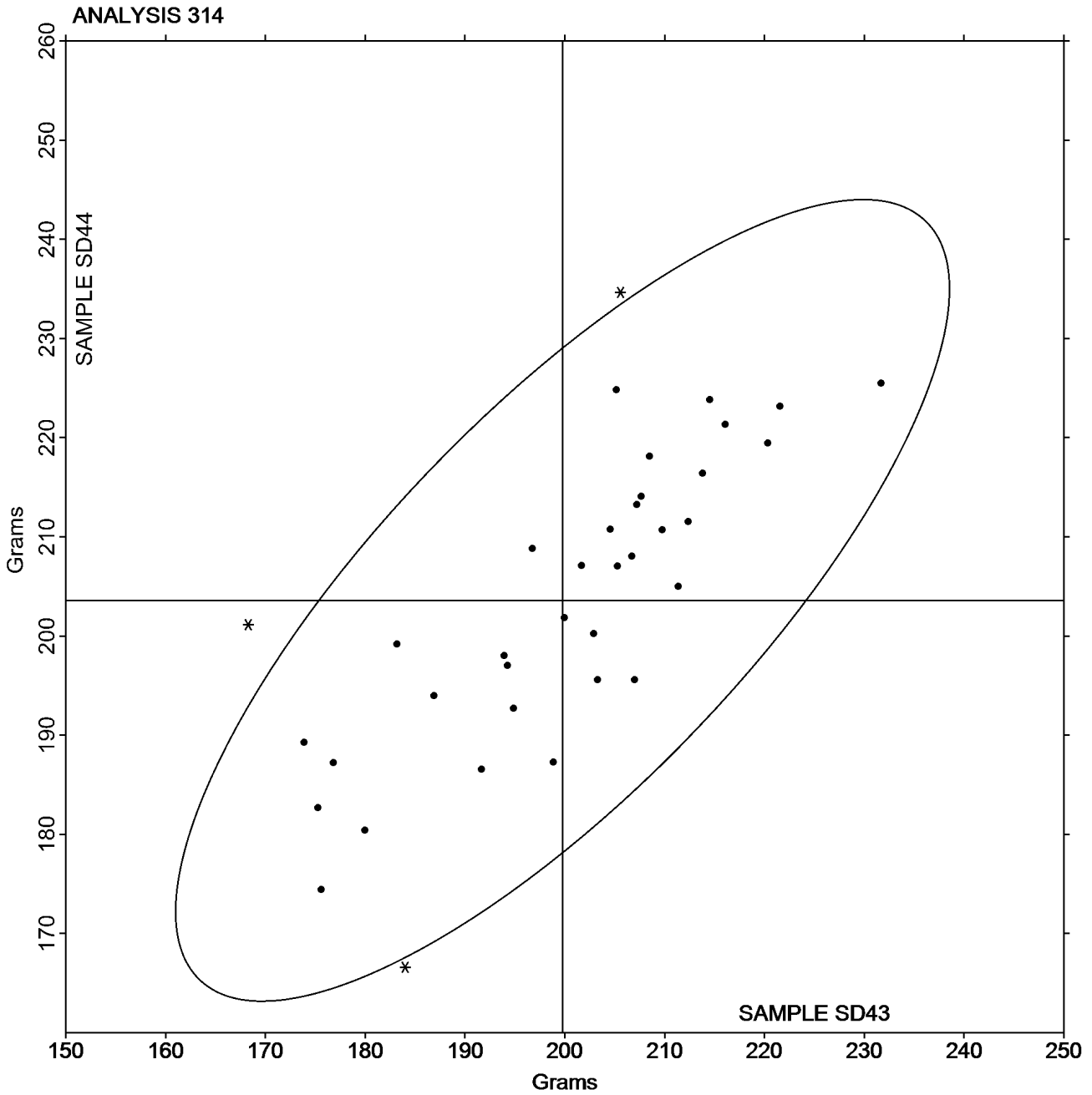
May 2017

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

Grand Mean Sample **SD43** = 199.77 Grams

Grand Mean Sample **SD44** = 203.59 Grams





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

Report #2885
May 2017

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

		Summary Statistics			
		Sample SR43		Sample SR44	
Grand Means		2.1345 kN/m		2.9776 kN/m	
SD Btwn Labs		0.1196 kN/m		0.2098 kN/m	
Statistics based on 13 of 13 reporting participants					



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 320

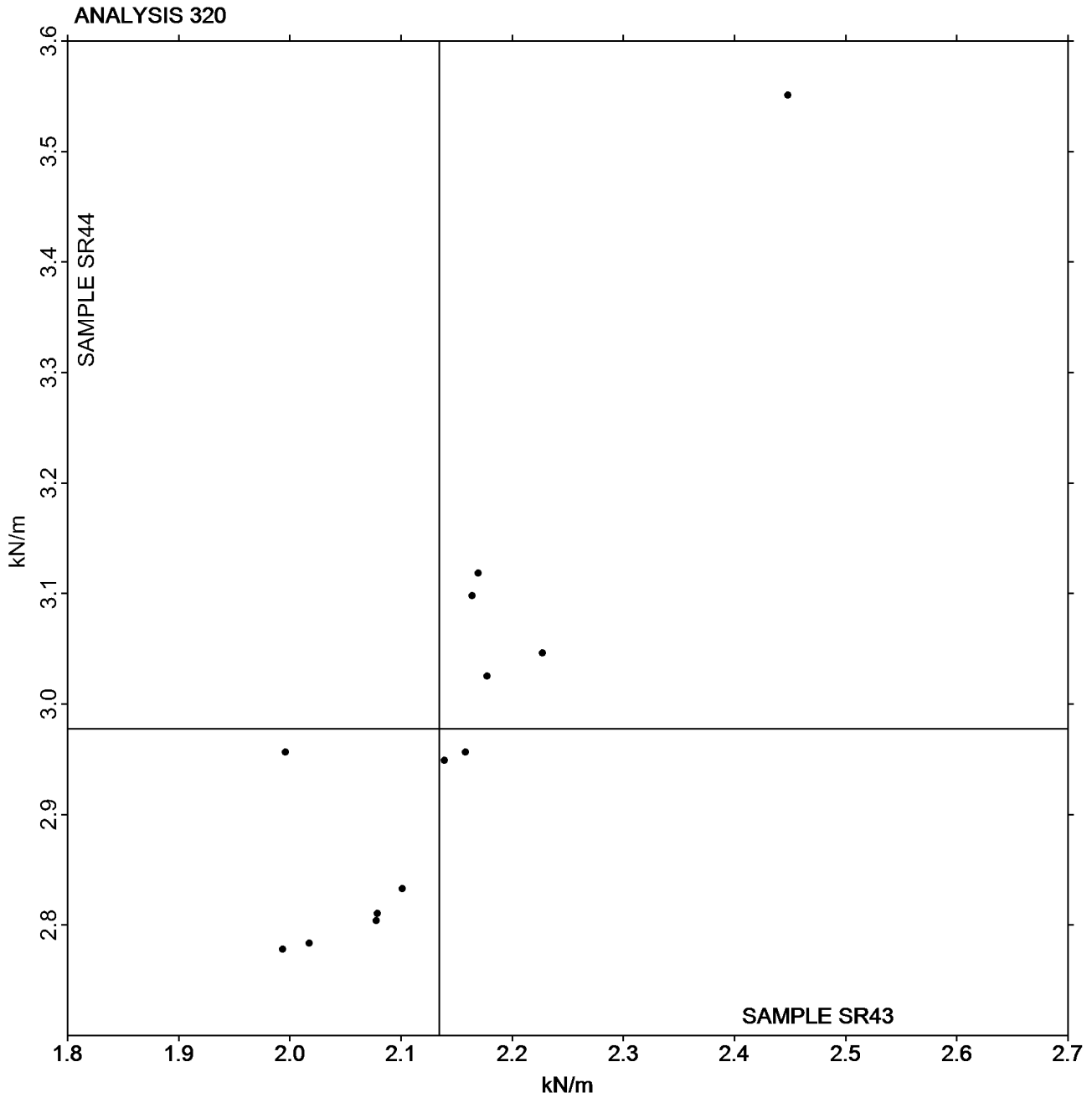
May 2017

Tensile Breaking Strength - Newsprint

TAPPI Official Test Method T494

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

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



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



Paper & Paperboard Interlaboratory Testing Program
Analysis 321
Tensile Energy Absorption - Newsprint
TAPPI Official Test Method T494

Report #2885
May 2017

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

		Summary Statistics	
	Sample SR43		Sample SR44
Grand Means	14.502 Joules/sq m		24.851 Joules/sq m
SD Btwn Labs	1.329 Joules/sq m		2.639 Joules/sq m
Statistics based on 12 of 12 reporting participants			



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 321

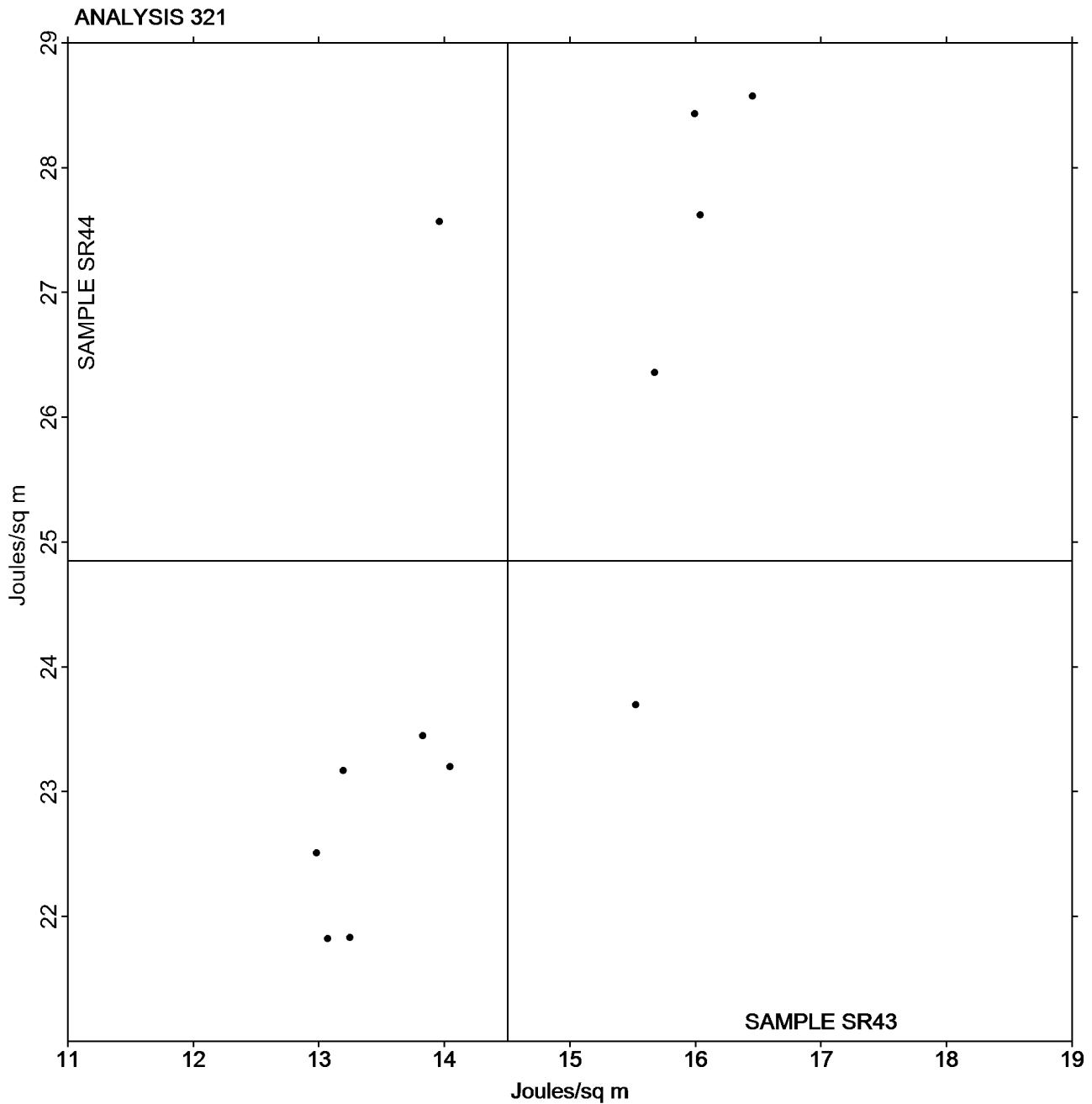
May 2017

Tensile Energy Absorption - Newsprint

TAPPI Official Test Method T494

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

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



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



Paper & Paperboard Interlaboratory Testing Program
Analysis 322
Elongation to Break - Newsprint
TAPPI Official Test Method T494

Report #2885
May 2017

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

		Summary Statistics			
		Sample SR43		Sample SR44	
Grand Means		1.1707	Percent	1.4087	Percent
SD Btwn Labs		0.1435	Percent	0.2158	Percent
Statistics based on 11 of 11 reporting participants					



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 322

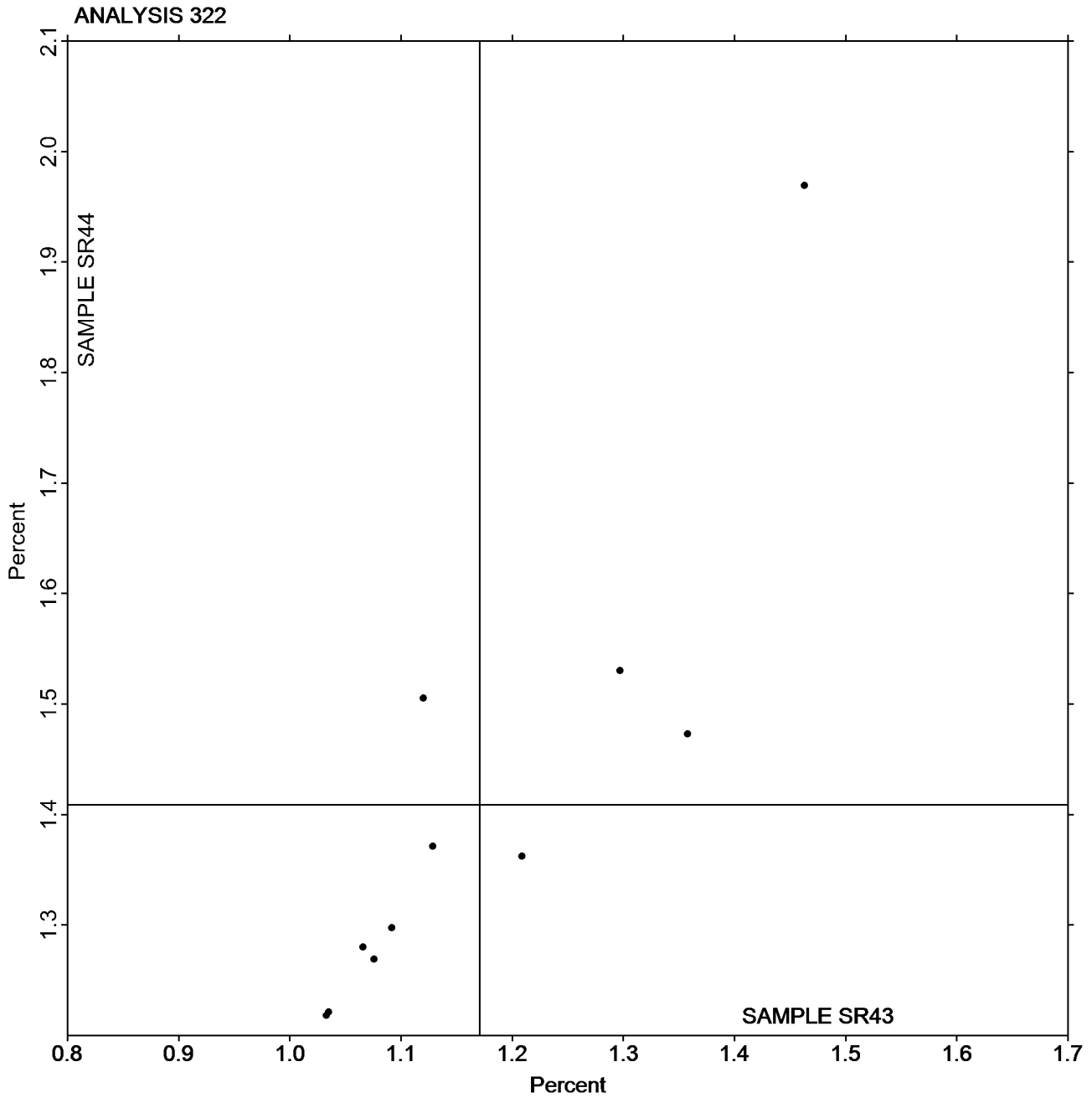
May 2017

Elongation to Break - Newsprint

TAPPI Official Test Method T494

Grand Mean Sample **SR43** = 1.1707 Percent

Grand Mean Sample **SR44** = 1.4087 Percent



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



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 325

May 2017

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

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



Paper & Paperboard Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers
TAPPI Official Test Method T494

Report #2885
May 2017

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

	Sample SF43	Summary Statistics	Sample SF44
Grand Means	6.7403 kN/m		4.2910 kN/m
SD Btwn Labs	0.4449 kN/m		0.3256 kN/m
Statistics based on 45 of 46 reporting participants			

Comments on Assigned Data Flags for Test #325

KC3URJ (X) - Extreme Data.

Analysis Notes:

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

Key to Instrument Codes Reported by Participants

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

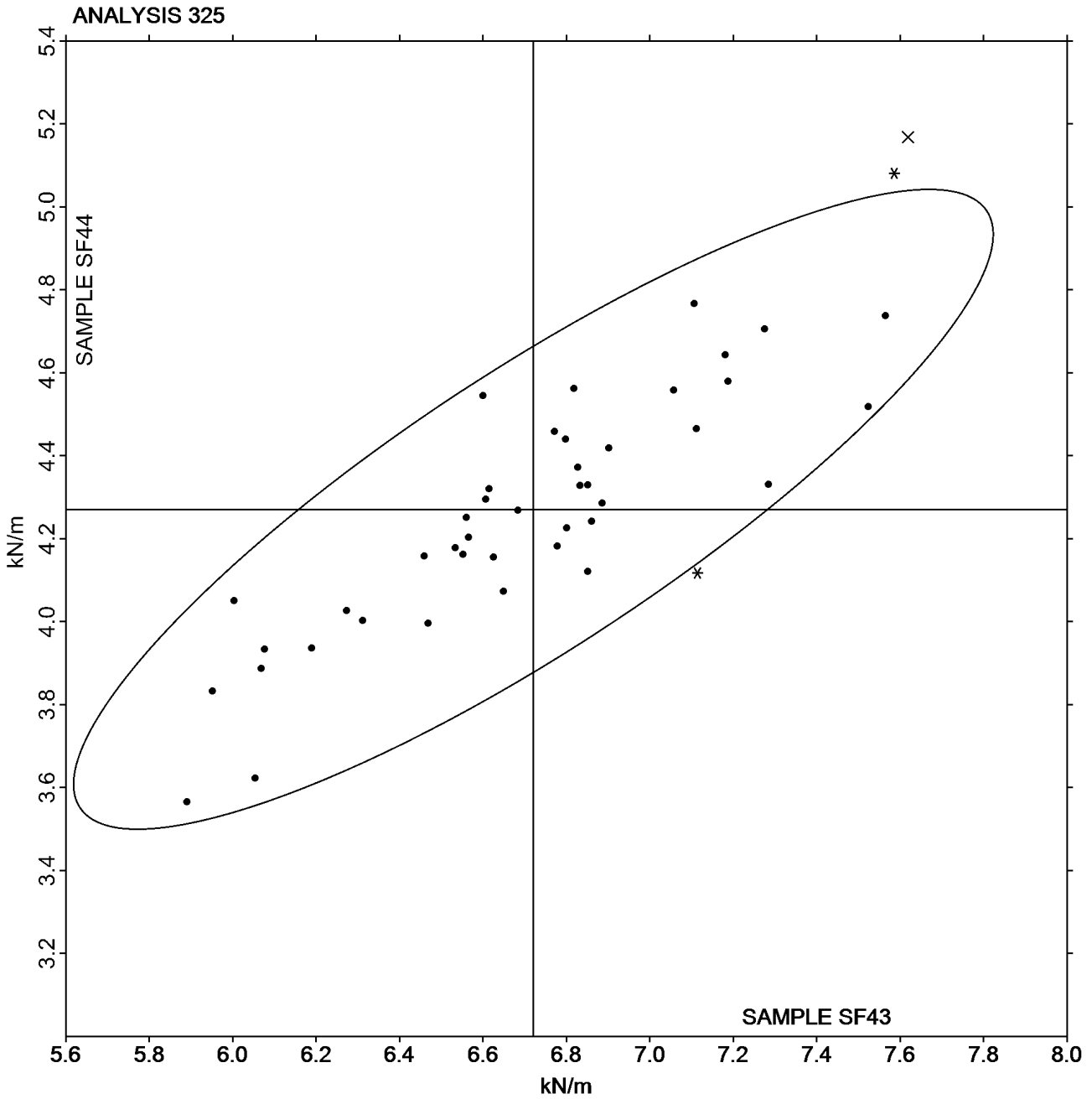


Paper & Paperboard Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers
TAPPI Official Test Method T494

Report #2885
May 2017

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

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





Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 327

May 2017

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF43			Sample SF44			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2C4BZ2		88.79	-7.22	-0.77	40.96	-1.27	-0.28	MR
2NXLK2		93.79	-2.22	-0.24	38.64	-3.59	-0.79	RE
36F4Q8		114.85	18.84	2.00	49.77	7.54	1.67	TO
3F3VLC		98.51	2.49	0.26	44.47	2.24	0.50	LH
3TTM7F	X	31.00	-65.02	-6.90	21.16	-21.07	-4.66	LH
484Q6F		92.21	-3.81	-0.40	40.36	-1.86	-0.41	TO
4VCW2Y		96.61	0.60	0.06	40.72	-1.51	-0.33	TO
6ARJHB		98.62	2.61	0.28	42.56	0.33	0.07	LH
6V7872		95.12	-0.90	-0.10	45.22	2.99	0.66	LH
73KCFD		95.94	-0.07	-0.01	39.56	-2.67	-0.59	TB
83DRYM		84.84	-11.17	-1.19	35.82	-6.41	-1.42	LI
84TQFR		92.75	-3.26	-0.35	45.03	2.81	0.62	LH
8TFKNX		95.49	-0.52	-0.06	38.05	-4.18	-0.92	LH
BCVA6R		102.56	6.55	0.69	43.40	1.17	0.26	TB
BRM88M		92.48	-3.53	-0.37	39.73	-2.50	-0.55	LX
D99A3G		85.04	-10.97	-1.16	42.91	0.68	0.15	TF
D9MR42		96.74	0.72	0.08	42.76	0.54	0.12	LX
DDGNTR		98.98	2.97	0.31	42.96	0.73	0.16	IM
DGEGFV		92.95	-3.07	-0.33	40.48	-1.74	-0.39	PP
DNKY4N		105.93	9.92	1.05	42.57	0.35	0.08	TB
EJ6VK		91.58	-4.44	-0.47	45.08	2.85	0.63	LI
F88CNQ		76.06	-19.95	-2.12	35.57	-6.66	-1.47	LW
FZJRG4		112.28	16.26	1.73	50.89	8.66	1.91	XX
JJ3UPZ		115.69	19.67	2.09	53.63	11.40	2.52	TJ
JVHQNC		92.57	-3.45	-0.37	48.10	5.87	1.30	TF
JX7YGL		101.98	5.96	0.63	38.20	-4.03	-0.89	ID
KC3URJ	X	161.61	65.59	6.96	75.74	33.51	7.41	LH
KPAH33		82.66	-13.36	-1.42	34.78	-7.45	-1.65	IM
LFXQ8C		101.22	5.20	0.55	45.91	3.68	0.81	LI
NAMAWE	X	1,948.27	1,852.26	196.51	884.99	842.76	186.39	IM
QXJZ4M		93.31	-2.71	-0.29	40.61	-1.62	-0.36	LI
RCENNK		95.28	-0.73	-0.08	43.27	1.04	0.23	LX
RWM23T		77.96	-18.05	-1.92	33.58	-8.65	-1.91	XX
T3MNN2		92.64	-3.37	-0.36	41.80	-0.43	-0.10	LI
X3QWNN	X	30.02	-66.00	-7.00	20.23	-22.00	-4.87	LA
X83PW2		113.06	17.04	1.81	46.25	4.02	0.89	LI
Z4W2EH		100.00	3.99	0.42	39.91	-2.32	-0.51	DL



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

Report #2885
May 2017

	Sample SF43	Summary Statistics	Sample SF44
Grand Means	96.016 Joules/sq m		42.228 Joules/sq m
SD Btwn Labs	9.426 Joules/sq m		4.522 Joules/sq m
Statistics based on 33 of 37 reporting participants			

Comments on Assigned Data Flags for Test #327

- NAMAWE (X) - Extreme Data.
- KC3URJ (X) - Extreme Data.
- 3TTM7F (X) - Extreme Data.
- X3QWNN (X) - Extreme Data.

Analysis Notes:

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

Key to Instrument Codes Reported by Participants

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

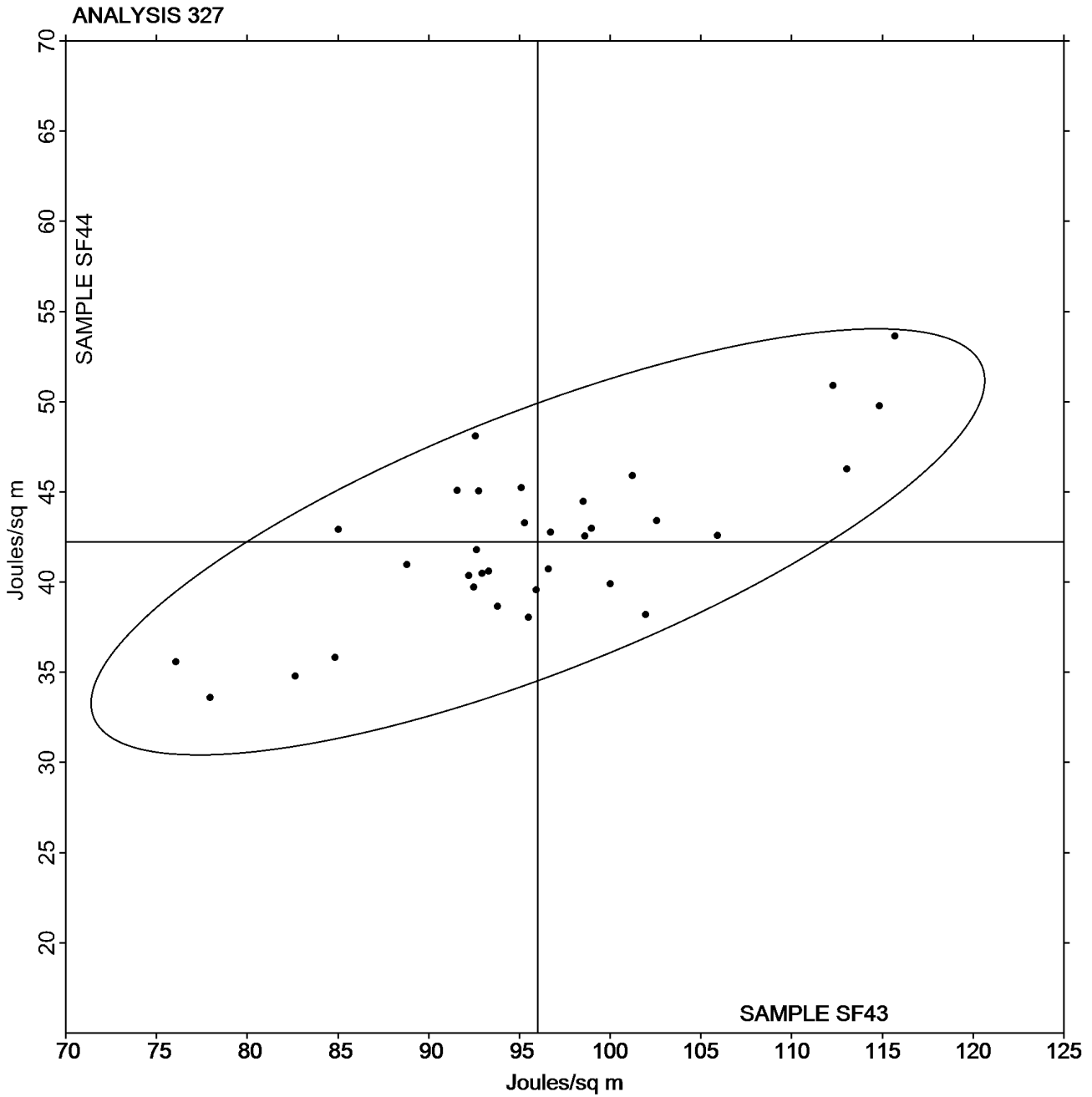


Paper & Paperboard Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers
TAPPI Official Test Method T494

Report #2885
May 2017

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

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





Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 328

May 2017

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

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



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

Report #2885
May 2017

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

Sample SF43		Summary Statistics	Sample SF44	
Grand Means	2.2170 Percent		1.5318 Percent	
SD Btwn Labs	0.2159 Percent		0.1551 Percent	
Statistics based on 37 of 40 reporting participants				

Comments on Assigned Data Flags for Test #328

- 3TTM7F (X) - Extreme Data.
- X3QWNN (X) - Extreme Data.
- 36F4Q8 (X) - Data for both samples are high.

Key to Instrument Codes Reported by Participants

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



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 328

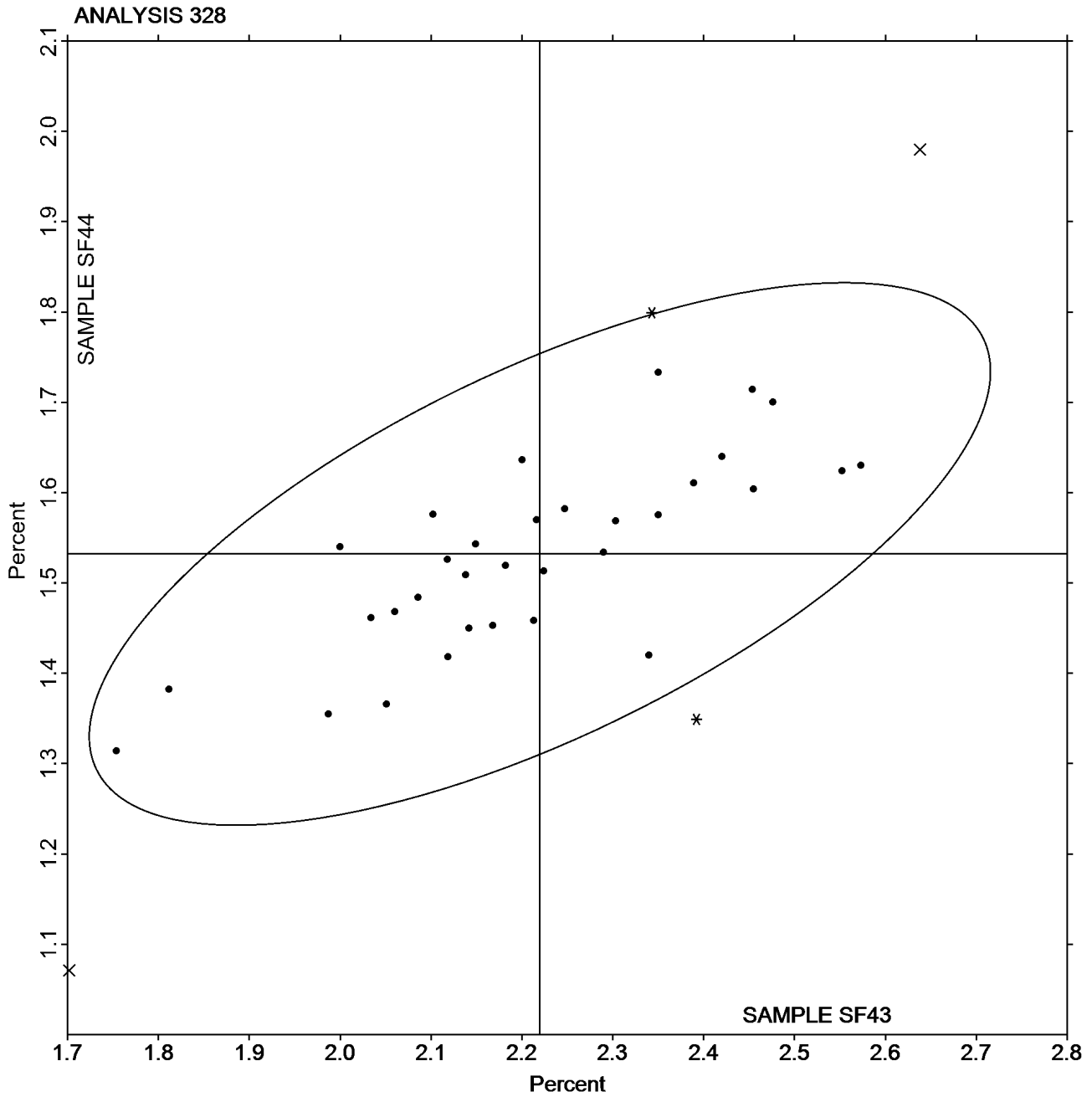
May 2017

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

Grand Mean Sample SF43 = 2.2170 Percent

Grand Mean Sample SF44 = 1.5318 Percent





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

Report #2885
 May 2017

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



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

Report #2885
May 2017

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

Sample SE43		Summary Statistics	Sample SE44	
Grand Means	9.1254 kN/m		12.750 kN/m	
SD Btwn Labs	0.6393 kN/m		0.858 kN/m	
Statistics based on 41 of 44 reporting participants				

Comments on Assigned Data Flags for Test #330

- ZD4XXE (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SE43.
- B8DAMQ (X) - Extreme Data.
- QQHTF8 (X) - Data for both samples are low.

Analysis Notes:

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

Key to Instrument Codes Reported by Participants

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

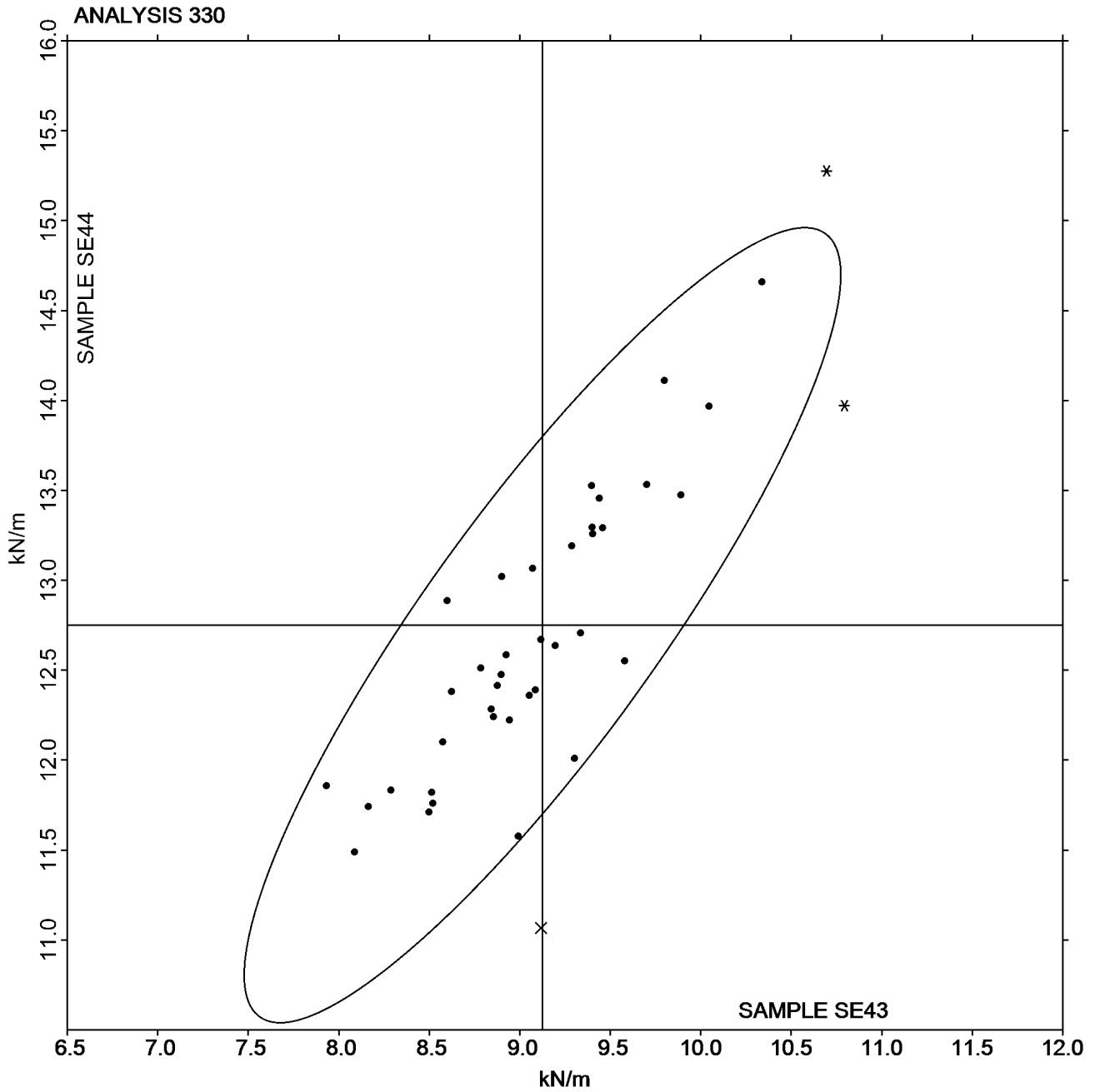


Paper & Paperboard Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers
TAPPI Official Test Method T494

Report #2885
May 2017

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

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





Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 331

May 2017

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

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



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 331

May 2017

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

	Sample SE43	Summary Statistics	Sample SE44
Grand Means	103.87 Joules/sq m		162.46 Joules/sq m
SD Btwn Labs	10.37 Joules/sq m		17.21 Joules/sq m
Statistics based on 38 of 39 reporting participants			

Comments on Assigned Data Flags for Test #331

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

Analysis Notes:

Z2UNMA - Data appear to be reported as ft-lb/sq ft, not J/sq as indicated on datasheet. Units corrected by CTS.

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

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

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

Key to Instrument Codes Reported by Participants

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



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 331

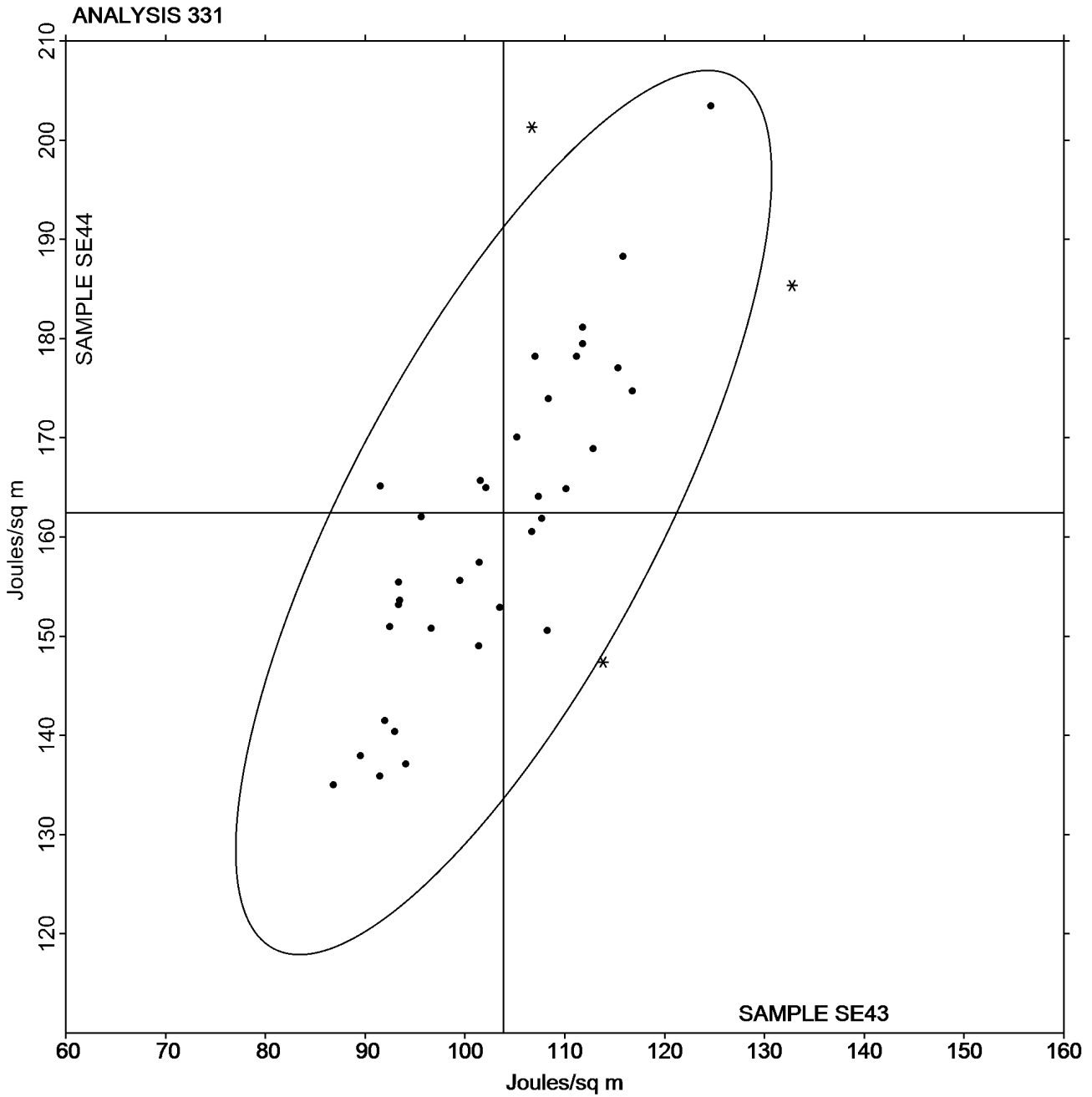
May 2017

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

Grand Mean Sample SE43 = 103.87 Joules/sq m

Grand Mean Sample SE44 = 162.46 Joules/sq m





Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 332

May 2017

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

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



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

Report #2885
 May 2017

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

Sample SE43		Summary Statistics	Sample SE44	
Grand Means	1.7541 Percent		1.9832 Percent	
SD Btwn Labs	0.2139 Percent		0.2726 Percent	
Statistics based on 38 of 41 reporting participants				

Comments on Assigned Data Flags for Test #332

- T4ZKT7 (X) - Data for both samples are high. Inconsistent within the determinations of sample SE43.
- ZAMFWW (X) - Inconsistent in testing between samples.
- QQHTF8 (X) - Data for sample SE44 are high.

Key to Instrument Codes Reported by Participants

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

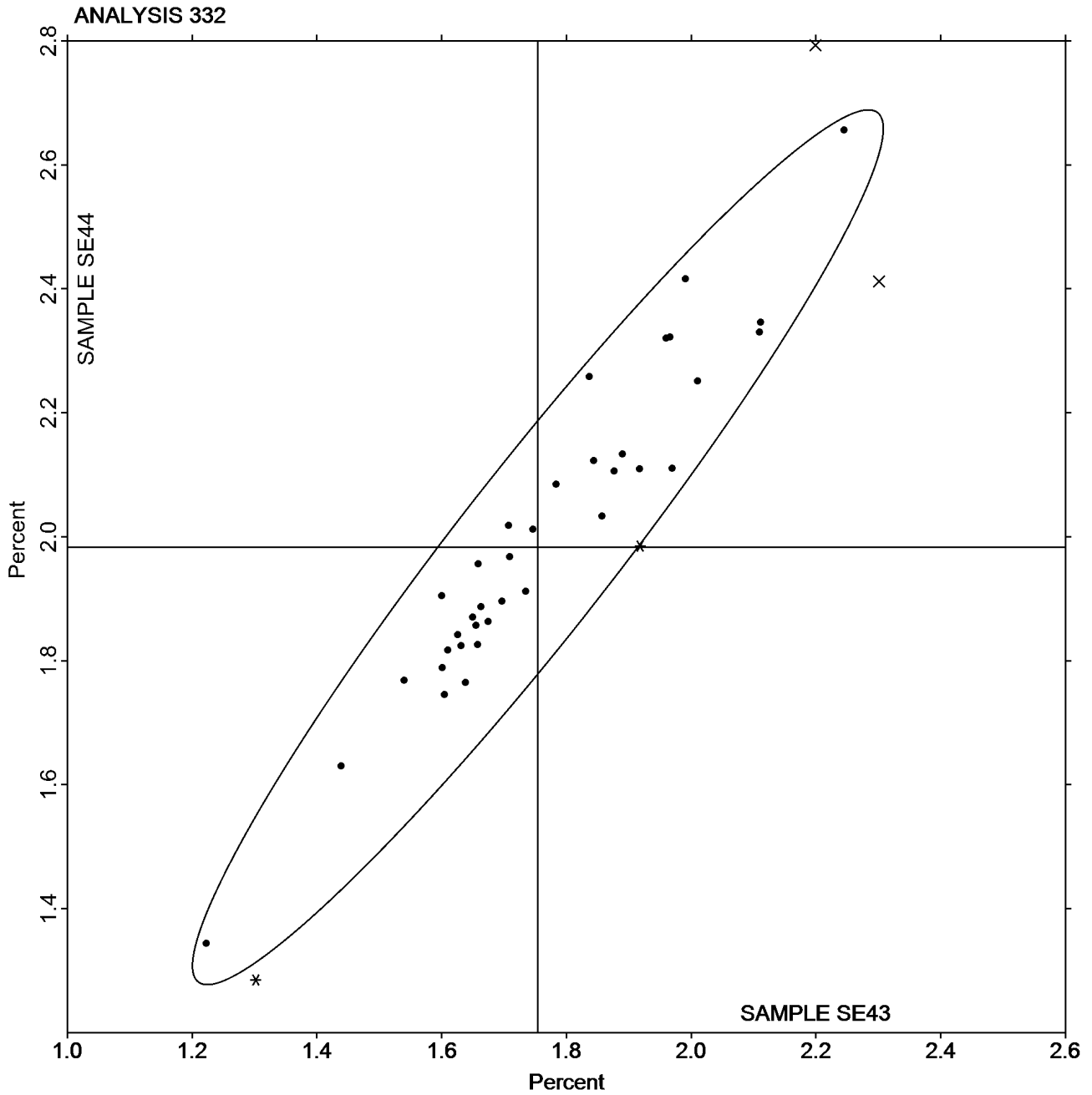


Paper & Paperboard Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers
TAPPI Official Test Method T494

Report #2885
May 2017

Grand Mean Sample **SE43** = 1.7541 Percent

Grand Mean Sample **SE44** = 1.9832 Percent





Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 334

May 2017

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

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

		Summary Statistics			
		Sample SG43		Sample SG44	
Grand Means		205.56	Double Folds	261.49	Double Folds
SD Btwn Labs		63.51	Double Folds	94.02	Double Folds
Statistics based on 14 of 14 reporting participants					

Key to Instrument Codes Reported by Participants

MT MIT - Tinius Olsen

XX Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 334

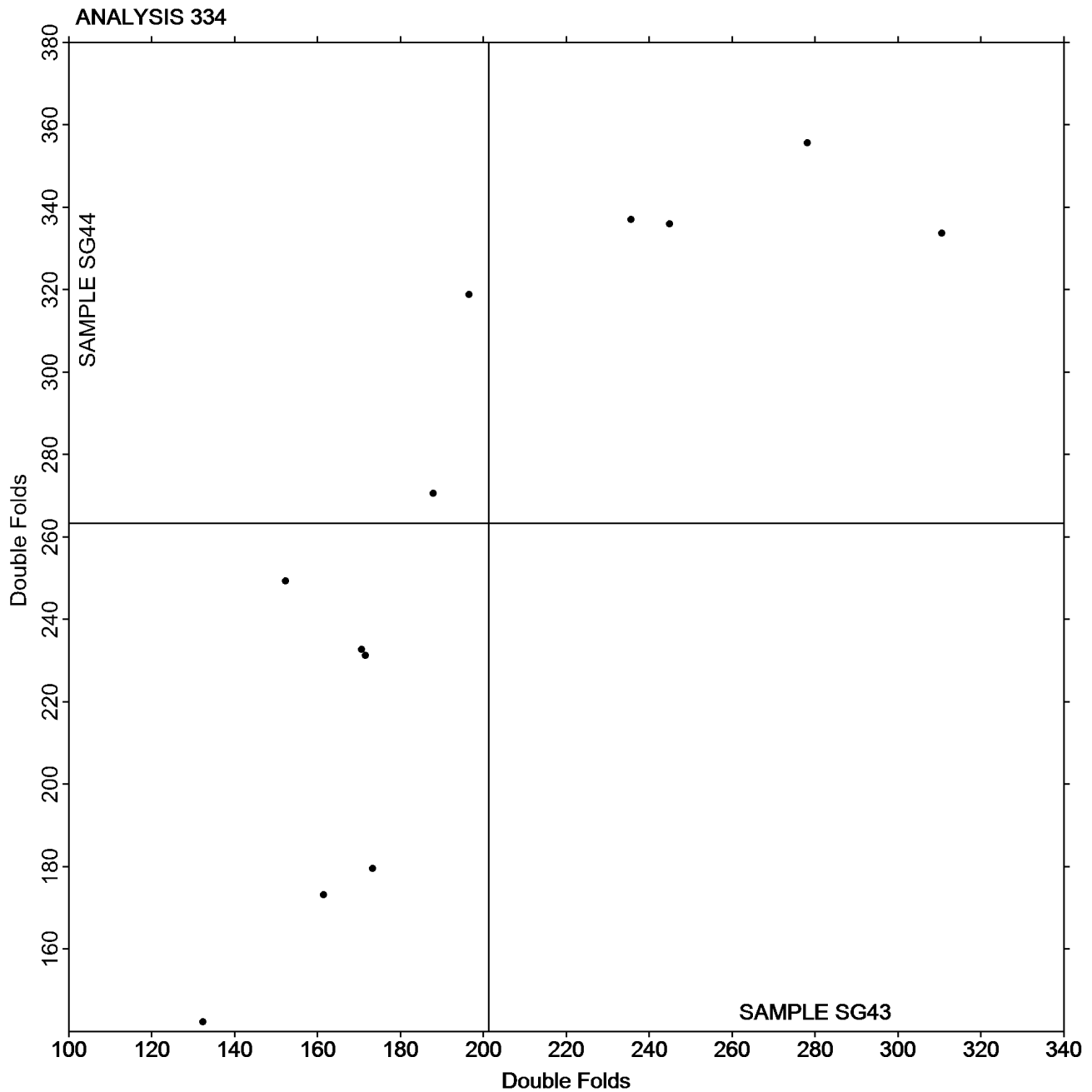
May 2017

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

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

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



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



Paper & Paperboard Interlaboratory Testing Program
Analysis 336
Bending Resistance, Gurley Type
TAPPI Official Test Method T543

Report #2885
May 2017

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

	Sample SH43	Summary Statistics	Sample SH44
Grand Means	297.04 Gurley Units		243.40 Gurley Units
SD Btwn Labs	30.73 Gurley Units		21.16 Gurley Units
Statistics based on 21 of 21 reporting participants			



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 336

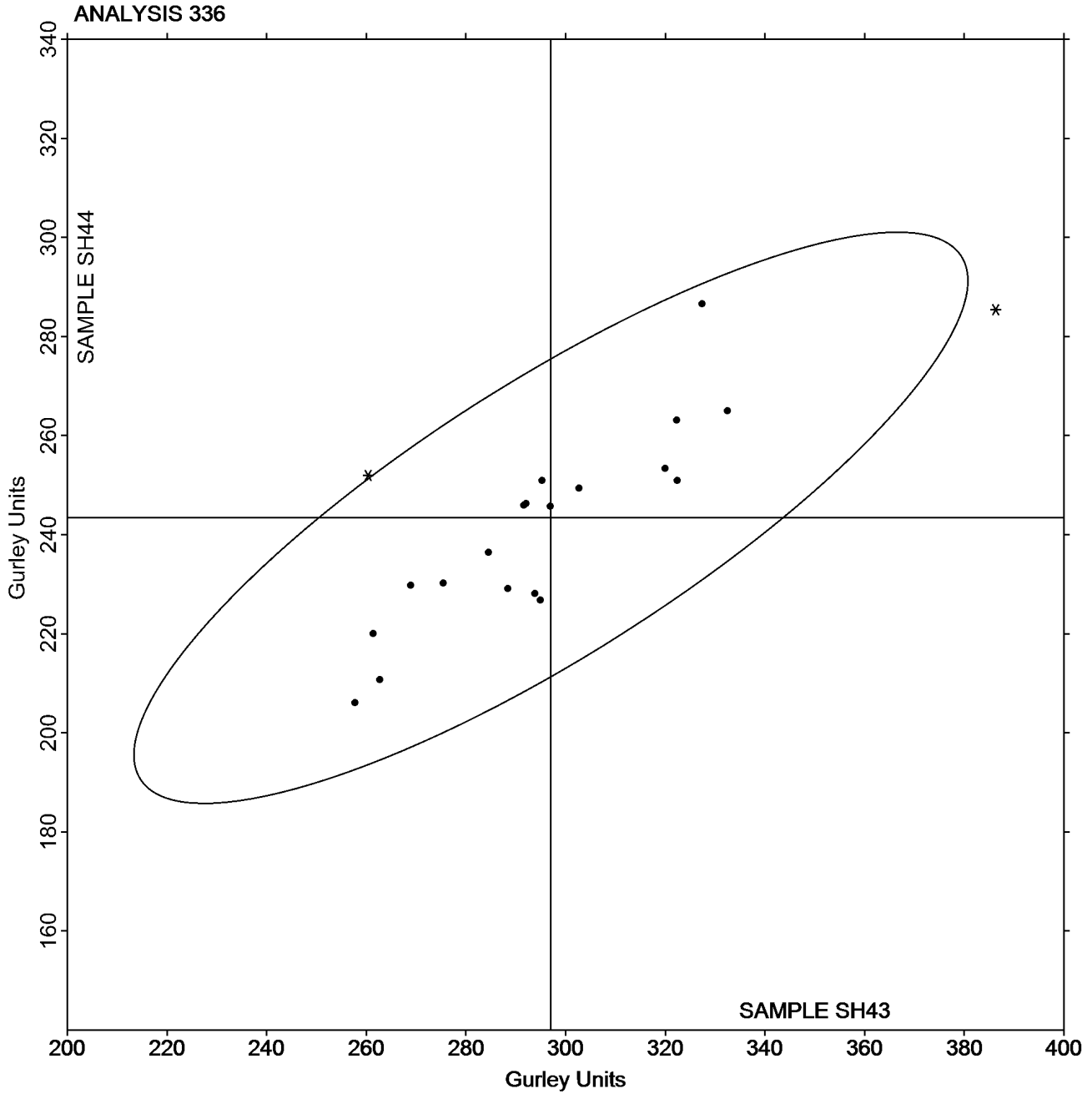
May 2017

Bending Resistance, Gurley Type

TAPPI Official Test Method T543

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

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





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

Report #2885
May 2017

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

		Summary Statistics			
		Sample SJ43		Sample SJ44	
Grand Means		4.1664 Taber Units		3.6223 Taber Units	
SD Btwn Labs		0.5299 Taber Units		0.7246 Taber Units	
Statistics based on 11 of 12 reporting participants					

Comments on Assigned Data Flags for Test #338

JJ3UPZ (X) - Extreme Data.



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 338

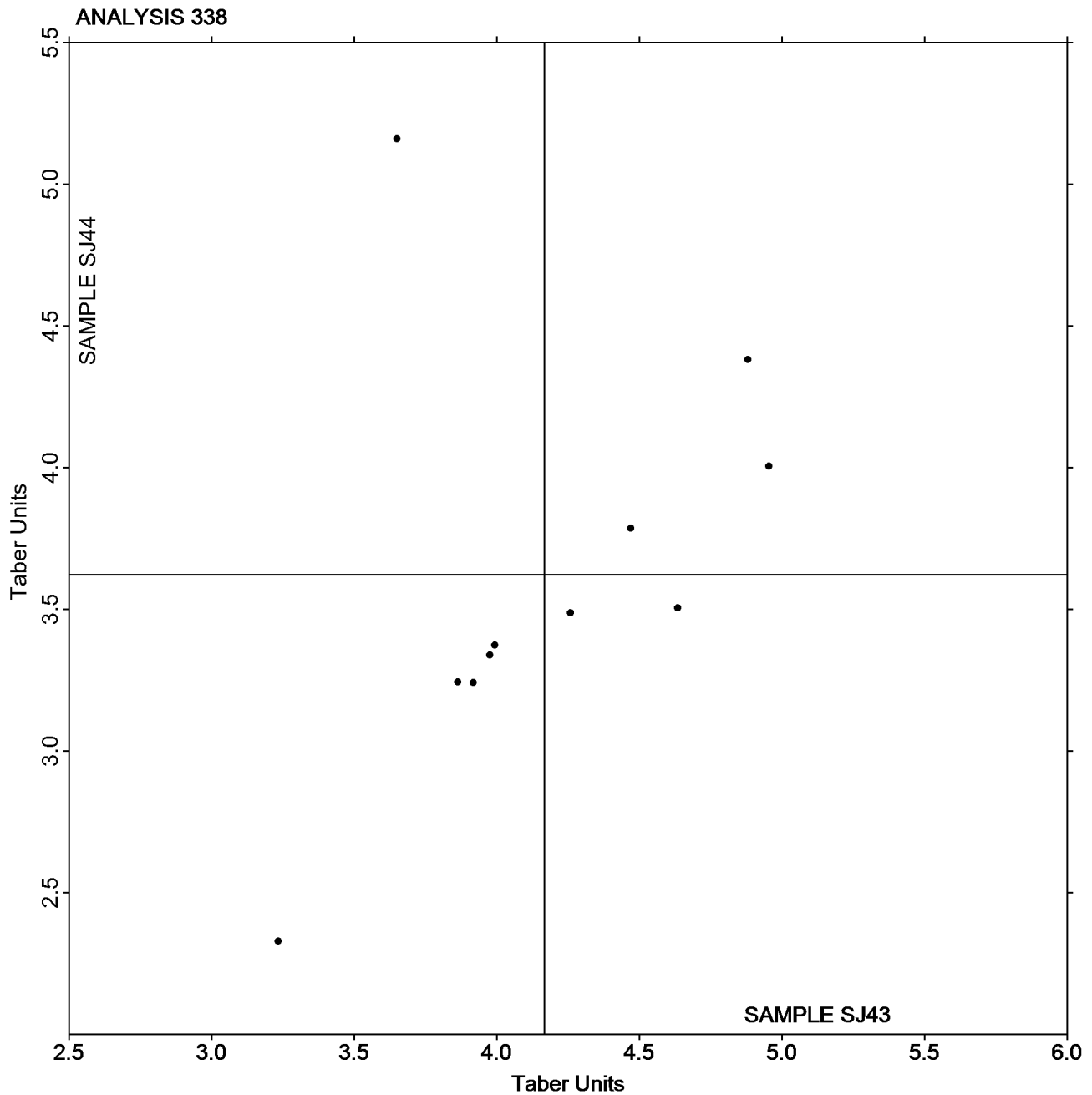
May 2017

Bending Resistance, Taber Type - 0 to 10 Units

TAPPI Official Test Method T566

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

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



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



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

Report #2885
May 2017

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

		Summary Statistics	
	Sample SQ43		Sample SQ44
Grand Means	21.918 Taber Units		36.760 Taber Units
SD Btwn Labs	1.730 Taber Units		2.018 Taber Units
Statistics based on 12 of 15 reporting participants			

Comments on Assigned Data Flags for Test #339

- NAMAWE (X) - Extreme Data.
- VZCH8H (X) - Extreme Data.
- 9BP97M (X) - Data for both samples are high.

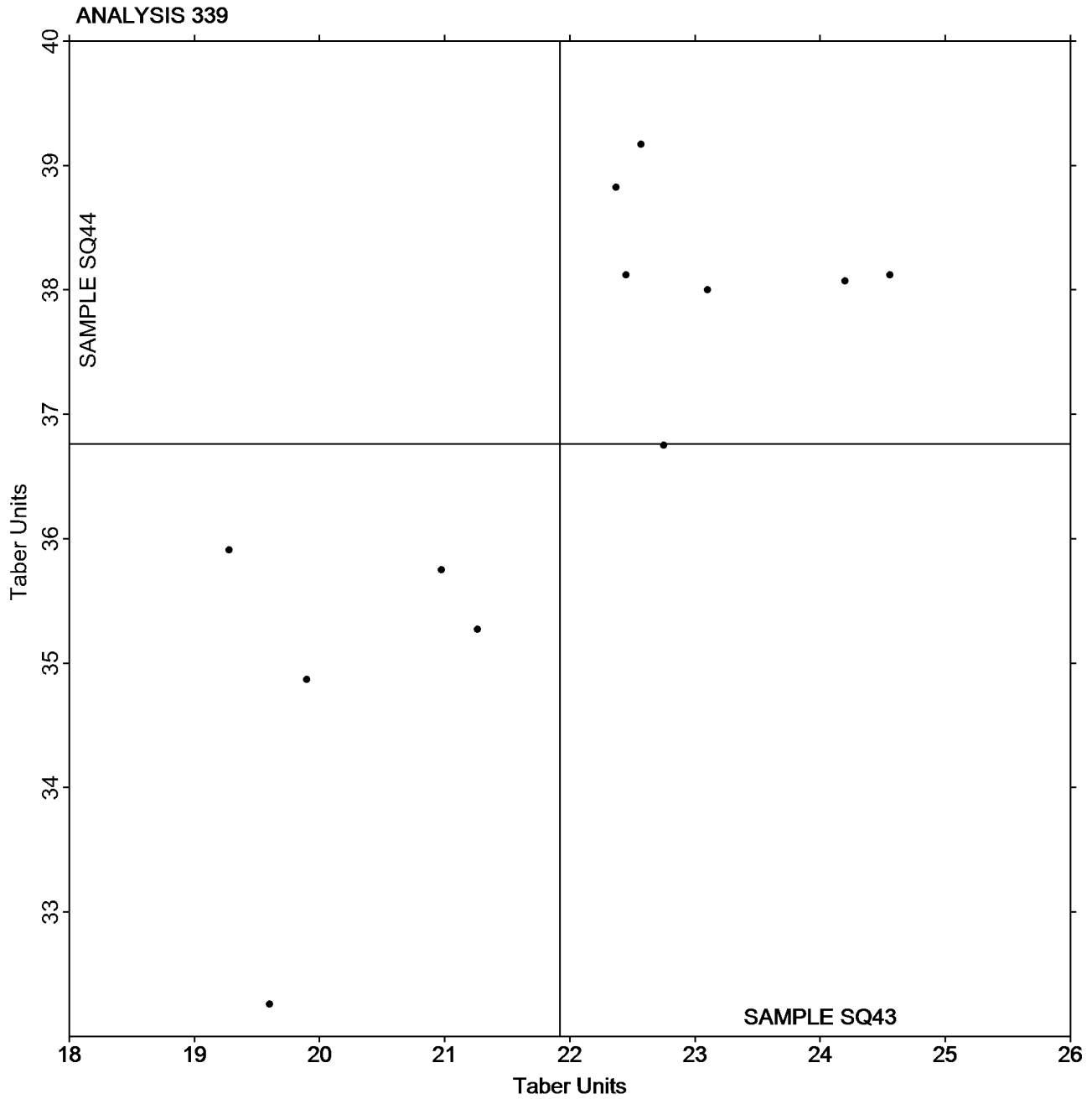


Paper & Paperboard Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units
TAPPI Official Test Method T489

Report #2885
May 2017

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

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



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



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

Report #2885
May 2017

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

		Summary Statistics	
	Sample ST43		Sample ST44
Grand Means	286.56 Taber Units		278.47 Taber Units
SD Btwn Labs	10.55 Taber Units		11.55 Taber Units
Statistics based on 16 of 17 reporting participants			

Comments on Assigned Data Flags for Test #340

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

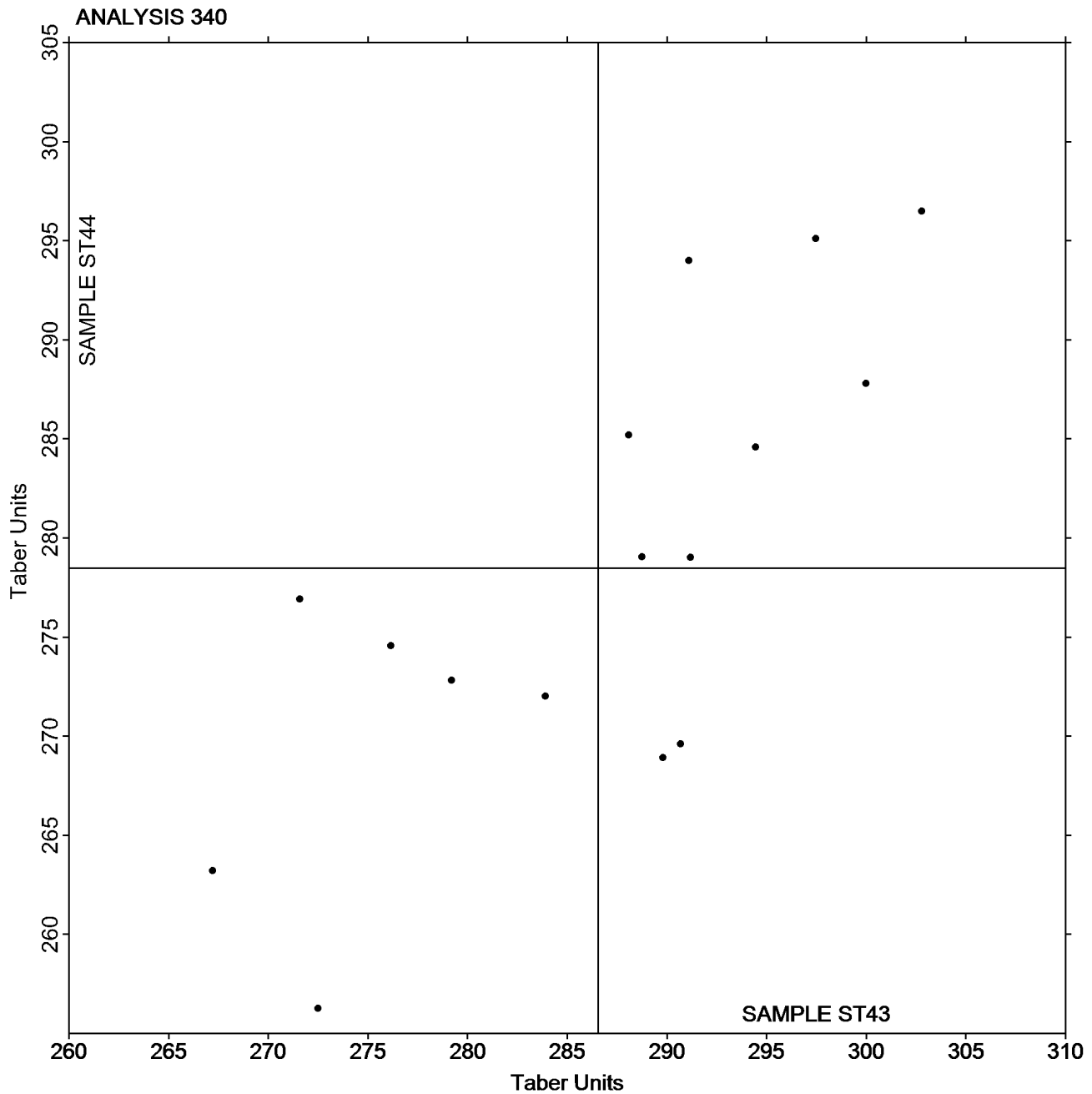


Paper & Paperboard Interlaboratory Testing Program
Analysis 340
Indenting Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
TAPPI Official Test Method T489

Report #2885
May 2017

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

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



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



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

Report #2885
May 2017

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

Sample SM43		Summary Statistics	Sample SM44	
Grand Means	92.644 psi		69.462 psi	
SD Btwn Labs	16.529 psi		8.402 psi	
Statistics based on 18 of 18 reporting participants				

Key to Instrument Codes Reported by Participants

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



Paper & Paperboard Interlaboratory Testing Program

Report #2885

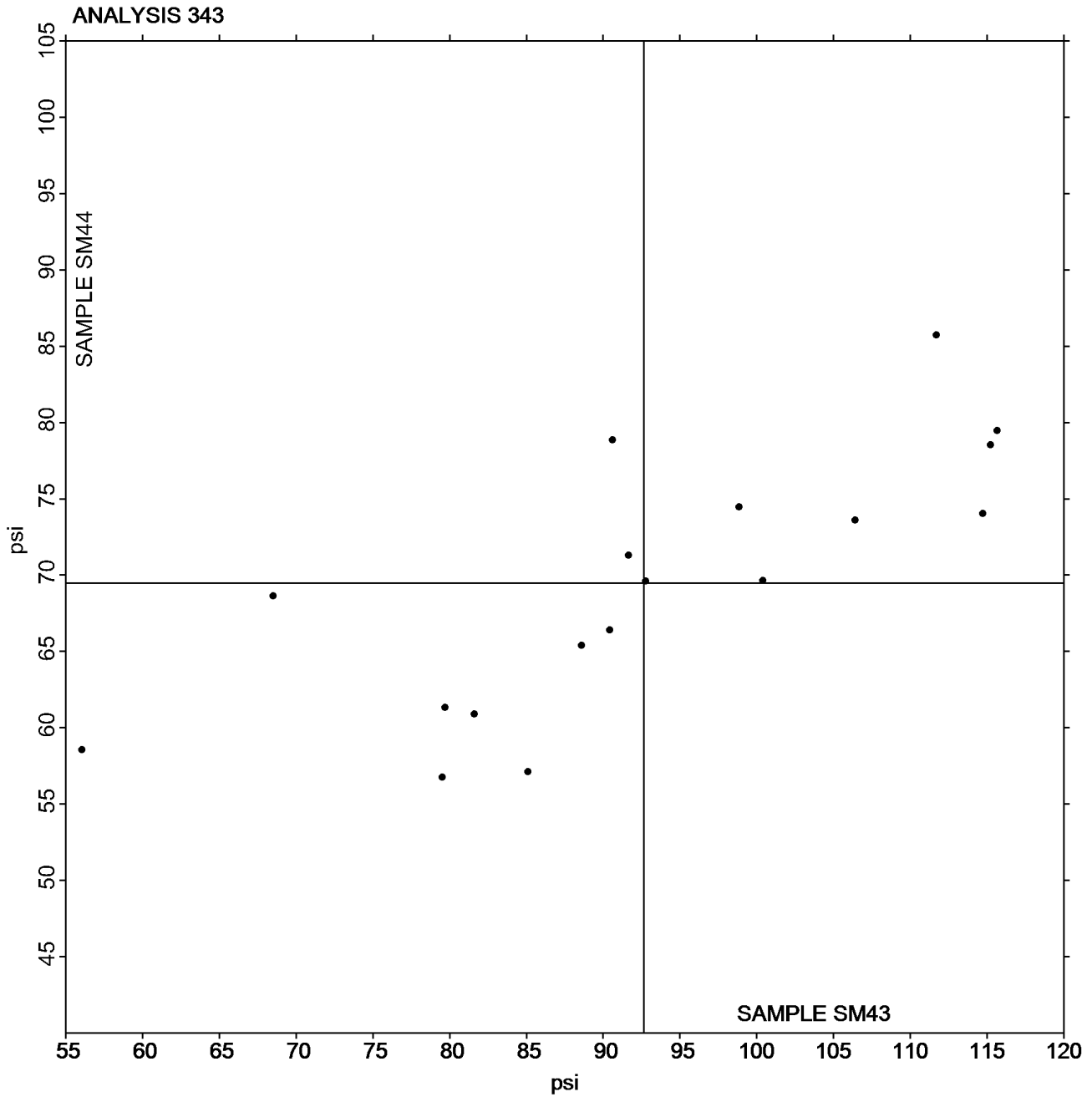
Analysis 343 Z-Direction Tensile

May 2017

TAPPI Official Test Method T541

Grand Mean Sample **SM43** = 92.644 psi

Grand Mean Sample **SM44** = 69.462 psi



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



Paper & Paperboard Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard
TAPPI Official Test Method T541

Report #2885
May 2017

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

		Summary Statistics	
	Sample SZ43		Sample SZ44
Grand Means	35.677 psi		35.483 psi
SD Btwn Labs	2.320 psi		2.119 psi
Statistics based on 15 of 15 reporting participants			

Key to Instrument Codes Reported by Participants

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

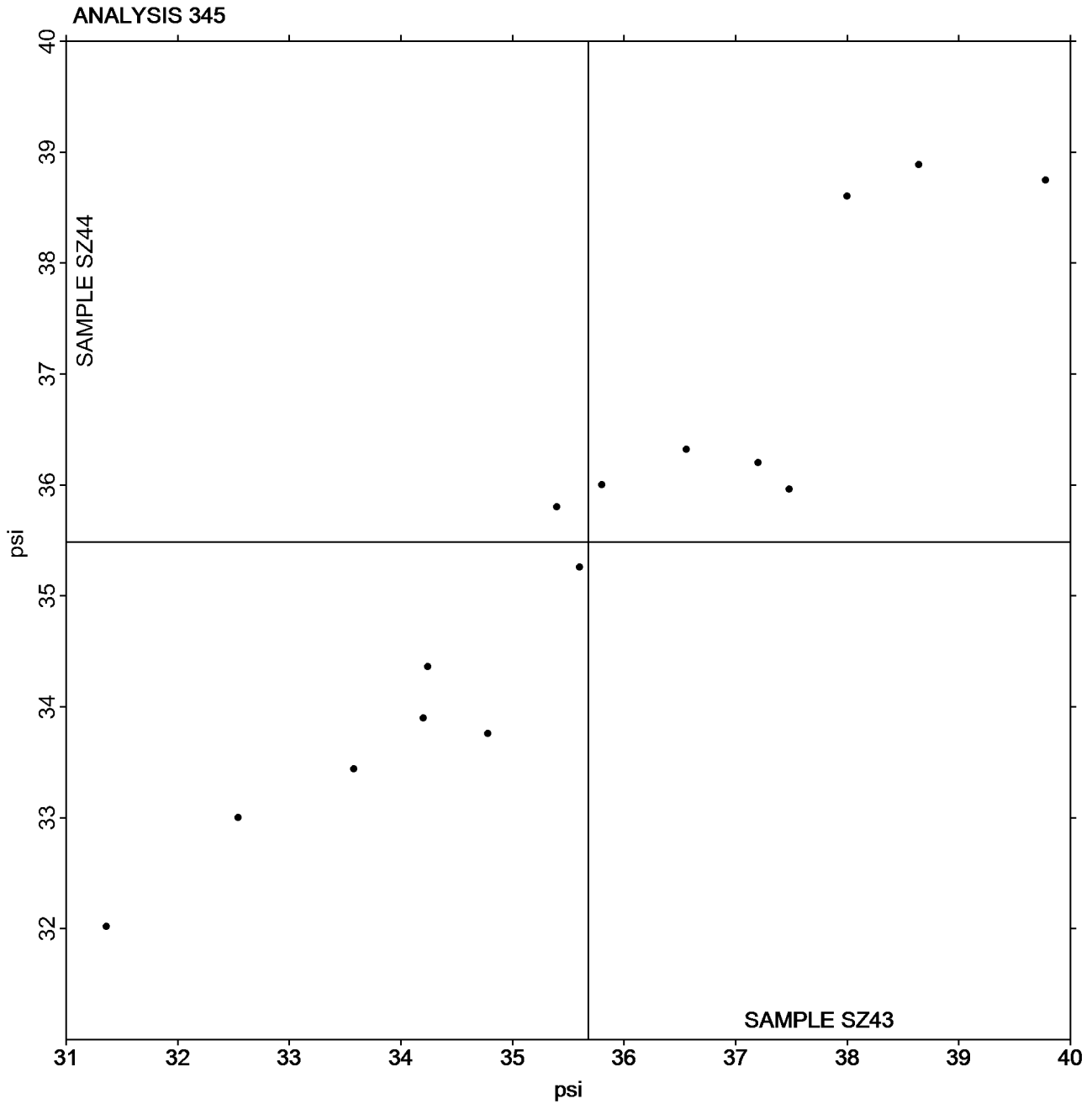


Paper & Paperboard Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard
TAPPI Official Test Method T541

Report #2885
May 2017

Grand Mean Sample **SZ43** = 35.677 psi

Grand Mean Sample **SZ44** = 35.483 psi



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



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

Report #2885
May 2017

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

		Summary Statistics			
		Sample SN43		Sample SN44	
Grand Means		150.69	1000th ft-lbs	82.697	1000th ft-lbs
SD Btwn Labs		8.59	1000th ft-lbs	5.311	1000th ft-lbs
Statistics based on 19 of 19 reporting participants					

Analysis Notes:

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

Key to Instrument Codes Reported by Participants

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

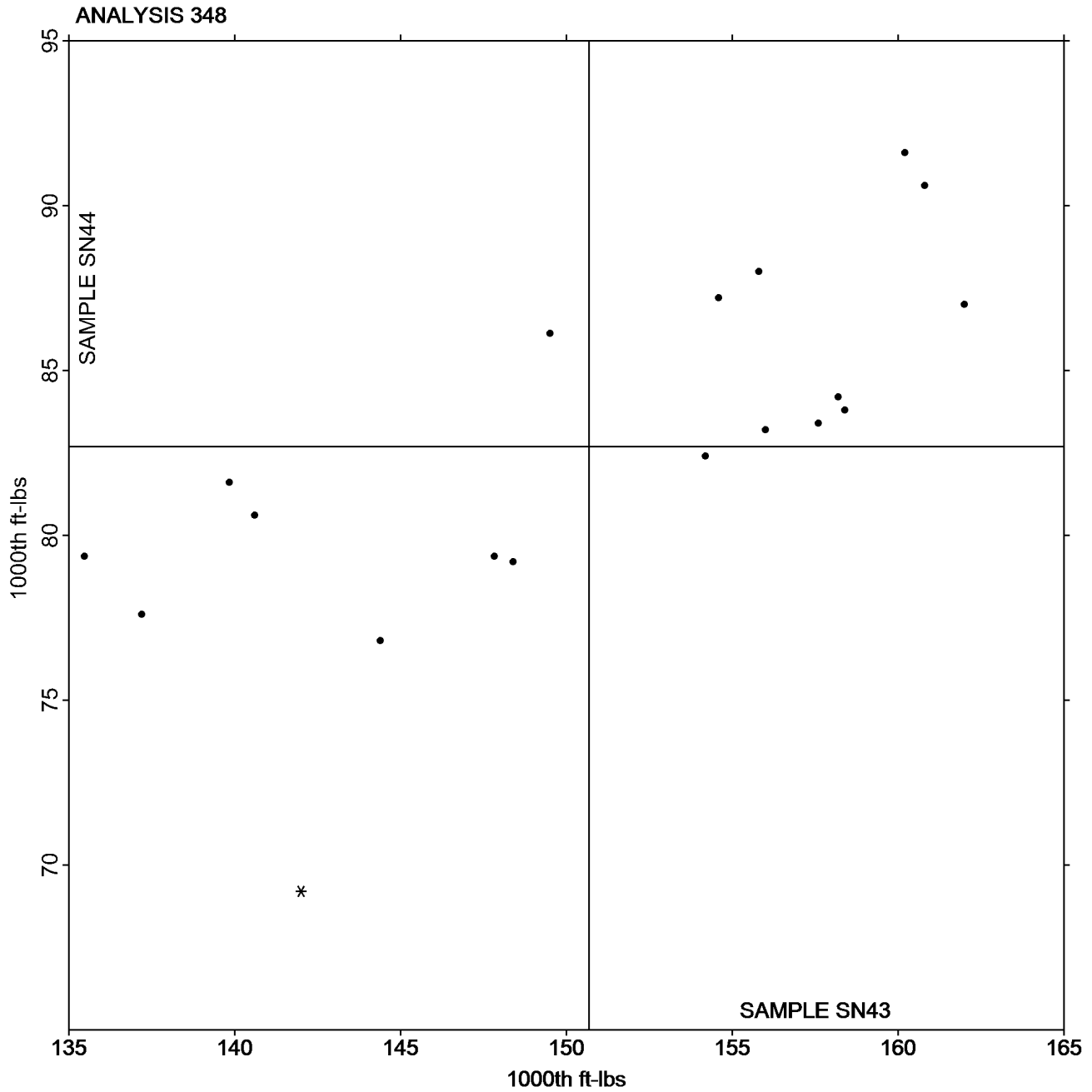


Paper & Paperboard Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics
TAPPI Provisional Test Method T569

Report #2885
May 2017

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

Grand Mean Sample **SN44** = 82.697 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.



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

Report #2885
May 2017

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

		Summary Statistics			
		Sample SP43		Sample SP44	
Grand Means		138.32	1000th ft-lbs	92.380	1000th ft-lbs
SD Btwn Labs		30.69	1000th ft-lbs	12.992	1000th ft-lbs
Statistics based on 9 of 10 reporting participants					

Comments on Assigned Data Flags for Test #349

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

Key to Instrument Codes Reported by Participants

- SC Scott Internal Bond Tester (Manual) TM TMI Monitor/Internal Bond Tester
 XX Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Report #2885

Analysis 349

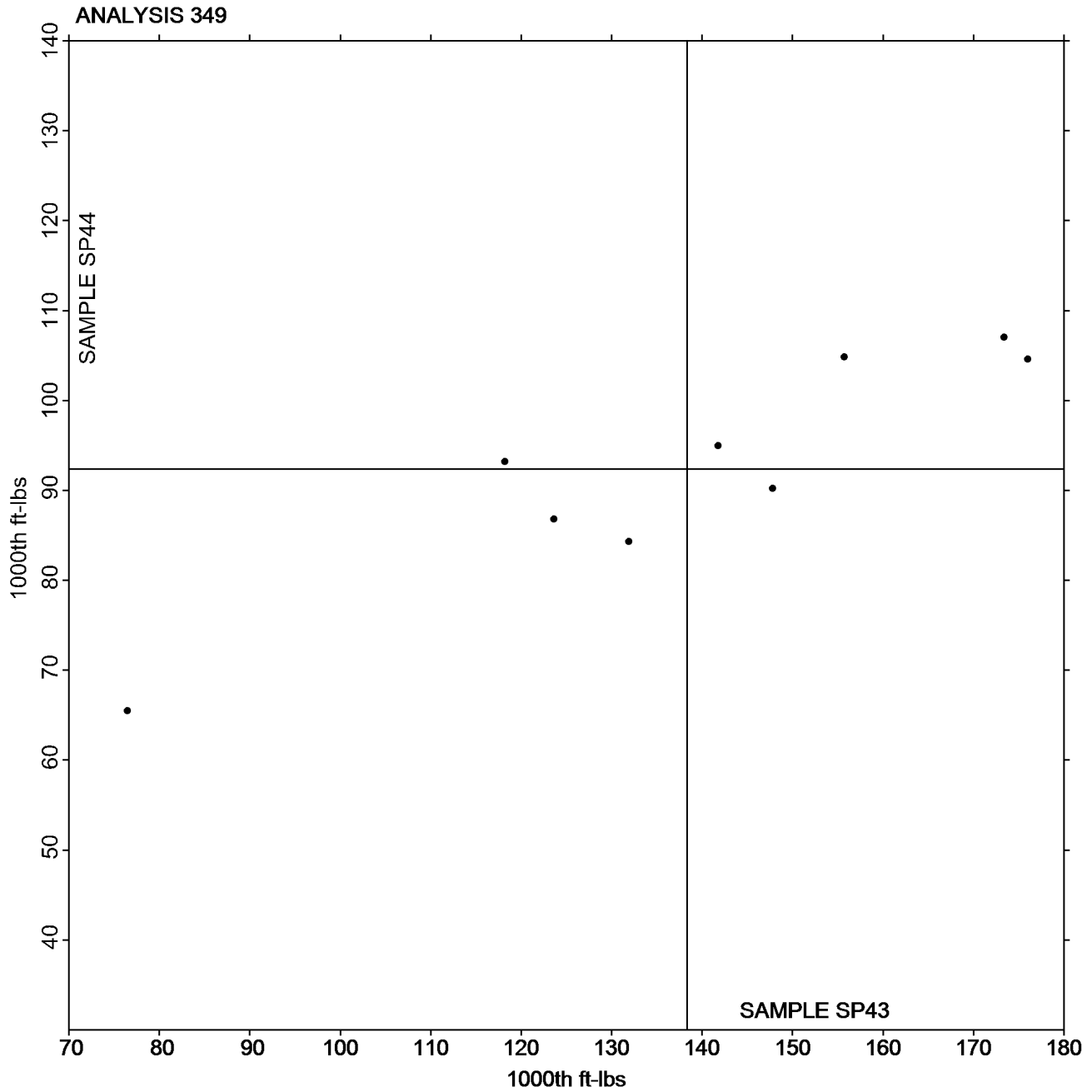
May 2017

Internal Bond Strength - Scott Bond Models

TAPPI Provisional Test Method T569

Grand Mean Sample SP43 = 138.32 1000th ft-lbs

Grand Mean Sample SP44 = 92.380 1000th ft-lbs



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