

Paper & Paperboard Interlaboratory Testing Program

Summary Report #283S - July 2016

[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:

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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 #2835
 July 2016

WebCode	Data Flag	Sample SA33			Sample SA34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3A8TX4		44.08	1.35	0.42	29.62	0.38	0.17
3ARD6W		45.70	2.97	0.92	27.40	-1.84	-0.82
6TXNLB		42.20	-0.53	-0.17	29.30	0.06	0.03
7M47MQ		45.23	2.50	0.78	33.97	4.74	2.13
8T6HHM		44.00	1.27	0.39	32.56	3.33	1.49
9UXX74		38.84	-3.89	-1.21	27.20	-2.03	-0.91
BGHMTX		39.44	-3.30	-1.03	27.60	-1.64	-0.73
BM8ZUL	*	50.40	7.67	2.38	30.70	1.46	0.66
BN7BN4		50.10	7.37	2.29	32.00	2.76	1.24
C9L8JK		39.89	-2.85	-0.89	29.15	-0.08	-0.04
CYVLDL		41.00	-1.73	-0.54	27.45	-1.79	-0.80
DFZFH2		47.80	5.07	1.58	32.20	2.96	1.33
DZN223		42.97	0.24	0.07	30.38	1.14	0.51
E7UVVY		43.09	0.36	0.11	30.98	1.74	0.78
ERRLQP		40.55	-2.18	-0.68	27.59	-1.65	-0.74
FG8AFC		41.40	-1.33	-0.42	29.10	-0.14	-0.06
JX29TG		42.00	-0.73	-0.23	27.80	-1.44	-0.64
K2HTDB		44.20	1.47	0.46	27.30	-1.94	-0.87
LG4ZLT		43.43	0.69	0.22	32.37	3.13	1.41
U4C2C4		37.20	-5.53	-1.72	26.75	-2.49	-1.12
UHUUZA		41.68	-1.06	-0.33	30.27	1.03	0.46
VGDY9B		43.94	1.21	0.38	30.24	1.01	0.45
WDALPF		43.12	0.39	0.12	29.26	0.03	0.01
WRU2TE		41.41	-1.32	-0.41	28.21	-1.03	-0.46
XCCR6G		41.05	-1.68	-0.52	27.76	-1.48	-0.66
YZEBTK		41.31	-1.42	-0.44	28.31	-0.93	-0.42
ZYKKM7		37.80	-4.94	-1.54	23.90	-5.33	-2.39

	Sample SA33	Summary Statistics	Sample SA34
Grand Means	42.735 psi		29.236 psi
SD Btwn Labs	3.215 psi		2.228 psi
Statistics based on 27 of 27 reporting participants			



Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 305

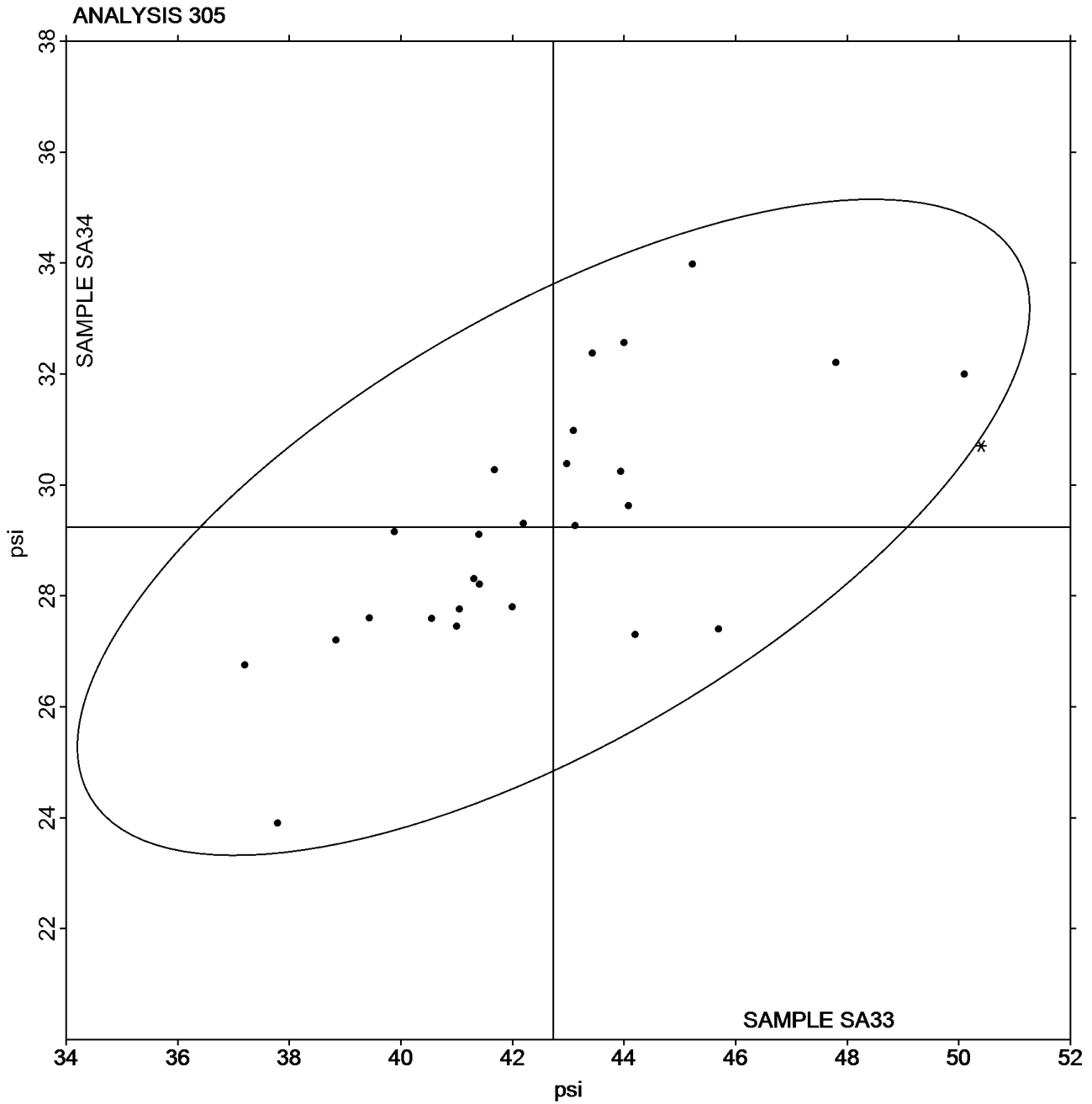
July 2016

Bursting Strength - Printing Papers

TAPPI Official Test Method T403

Grand Mean Sample SA33 = 42.735 psi

Grand Mean Sample SA34 = 29.236 psi





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

Report #2835
 July 2016

WebCode	Data Flag	Sample SB33			Sample SB34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3ENYVD		96.70	11.40	1.79	106.10	15.58	2.56
7M47MQ		82.74	-2.56	-0.40	85.29	-5.23	-0.86
7RYZKR		97.93	12.63	1.98	97.94	7.43	1.22
AWXLZK		80.20	-5.10	-0.80	89.40	-1.12	-0.18
BXAKVT		82.64	-2.66	-0.42	87.75	-2.77	-0.46
C242KR		84.10	-1.20	-0.19	92.60	2.08	0.34
DZPR8L		90.50	5.19	0.82	89.96	-0.56	-0.09
E7UVVY		81.93	-3.37	-0.53	88.98	-1.54	-0.25
EA7XJF		81.85	-3.45	-0.54	84.95	-5.57	-0.92
ED6AEF		83.30	-2.00	-0.31	89.95	-0.57	-0.09
FG8AFC		86.79	1.49	0.23	92.33	1.81	0.30
FXUVVW		78.10	-7.21	-1.13	78.20	-12.32	-2.03
G2RV9Y	*	87.69	2.39	0.38	82.07	-8.45	-1.39
G6AT4G		81.24	-4.07	-0.64	89.63	-0.88	-0.15
JCLNWF		85.74	0.44	0.07	91.64	1.12	0.18
K2G48T		84.50	-0.80	-0.13	88.34	-2.18	-0.36
KWNYFA		83.25	-2.05	-0.32	92.24	1.73	0.28
LN2TUM		88.89	3.59	0.56	96.40	5.88	0.97
LUR34K		90.59	5.29	0.83	97.13	6.62	1.09
MX9PF6		83.45	-1.85	-0.29	86.52	-4.00	-0.66
RYLQMM	*	104.68	19.38	3.05	104.55	14.03	2.31
TQ6WLB		76.60	-8.70	-1.37	85.80	-4.72	-0.78
UHUUZA		84.46	-0.85	-0.13	88.31	-2.21	-0.36
UWNJUL		78.45	-6.85	-1.08	90.34	-0.18	-0.03
VRBXLE		81.21	-4.09	-0.64	90.31	-0.21	-0.03
X8G2Y6		89.90	4.60	0.72	95.90	5.38	0.88
Z7XWFX		80.37	-4.94	-0.78	85.14	-5.38	-0.88
ZCKJB3		80.67	-4.63	-0.73	86.73	-3.78	-0.62

	Sample SB33	Summary Statistics	Sample SB34
Grand Means	85.302 psi		90.518 psi
SD Btwn Labs	6.363 psi		6.084 psi
Statistics based on 28 of 28 reporting participants			



Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 310

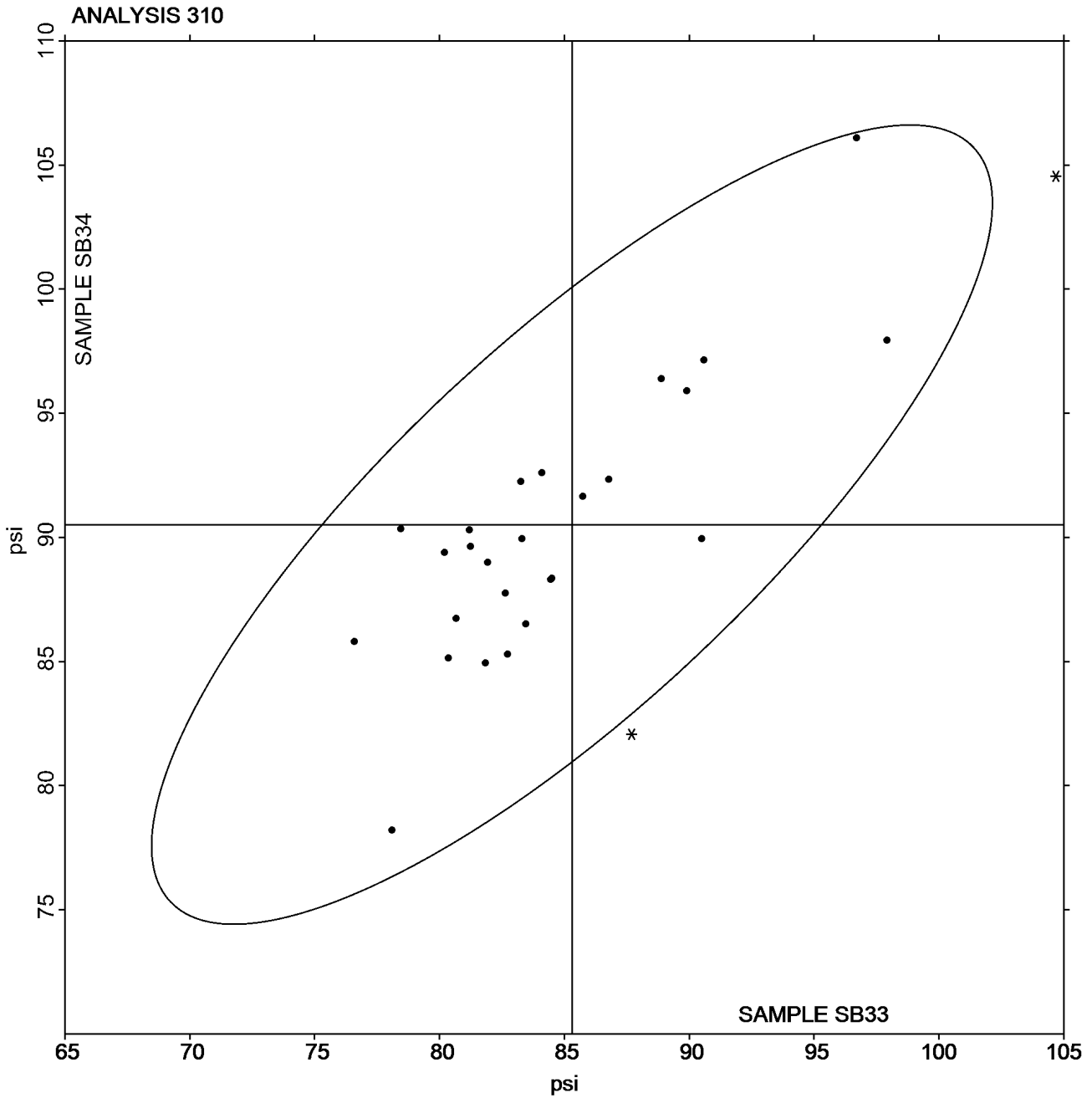
July 2016

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

Grand Mean Sample **SB33** = 85.302 psi

Grand Mean Sample **SB34** = 90.518 psi





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

Report #2835
July 2016

WebCode	Data Flag	Sample SK33			Sample SK34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
KHKWDT		28.85	-0.40	-0.12	33.68	4.14	1.00
MTB7CL		27.20	-2.05	-0.60	26.46	-3.08	-0.75
TVMV2Q		28.36	-0.89	-0.26	27.17	-2.37	-0.57
UHUUZA		26.70	-2.55	-0.75	26.01	-3.53	-0.85
VUET6H		35.14	5.89	1.73	34.40	4.85	1.17

		Summary Statistics			
		Sample SK33		Sample SK34	
Grand Means		29.249 Grams		29.544 Grams	
SD Btwn Labs		3.405 Grams		4.131 Grams	
Statistics based on 5 of 5 reporting participants					



Paper & Paperboard Interlaboratory Testing Program

Report #2835

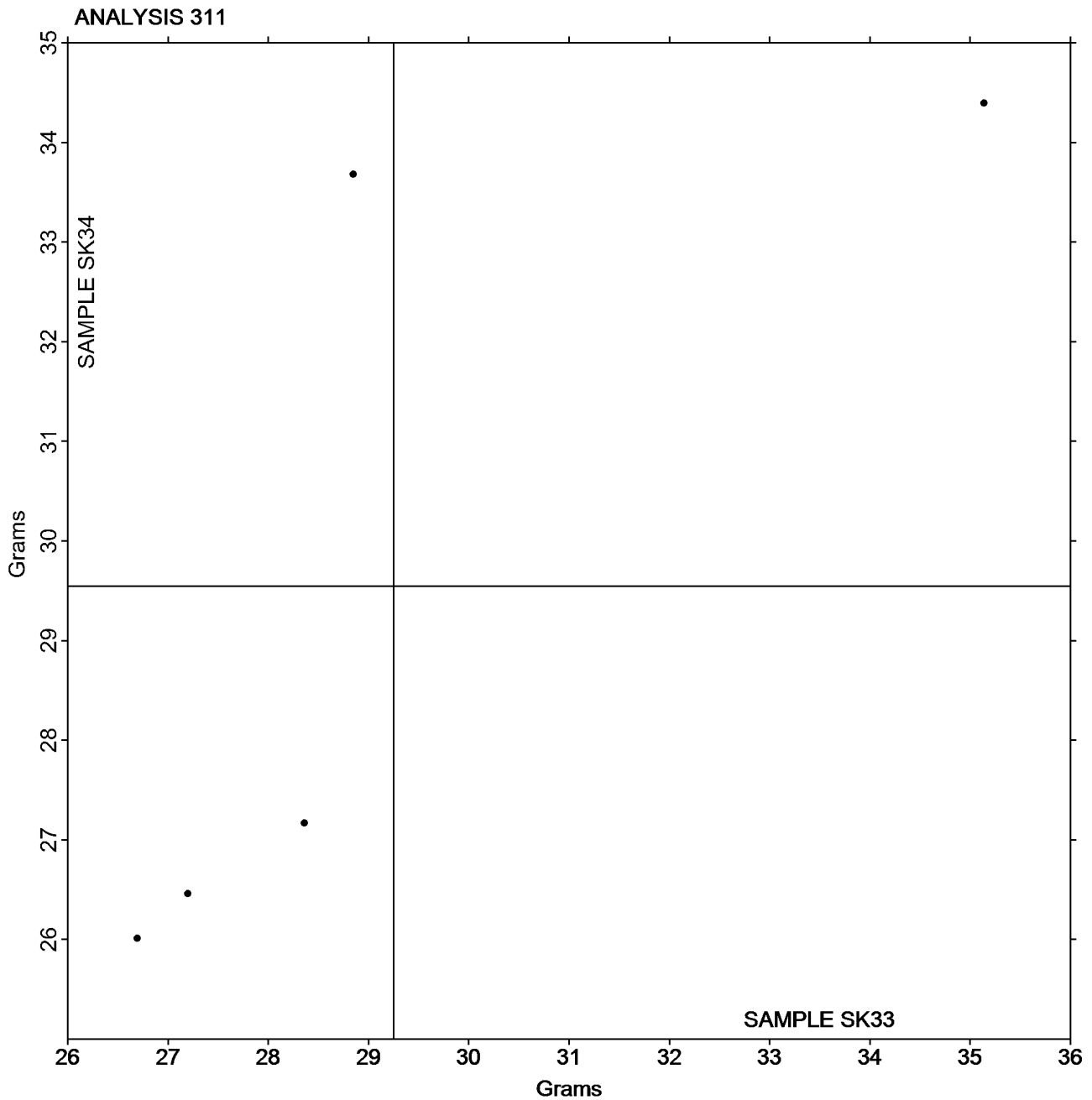
Analysis 311

July 2016

Tearing Strength - Newsprint TAPPI Official Test Method T414

Grand Mean Sample **SK33** = 29.249 Grams

Grand Mean Sample **SK34** = 29.544 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 #2835

Analysis 312

July 2016

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SC33			Sample SC34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2DB6GY		58.78	-5.00	-1.24	46.22	-3.07	-0.92
3A8TX4		63.20	-0.58	-0.14	49.60	0.31	0.09
4R83FF		63.87	0.09	0.02	50.42	1.13	0.34
6D2AN3		63.90	0.12	0.03	45.54	-3.75	-1.13
766UC4		69.21	5.43	1.34	55.56	6.27	1.88
7M47MQ		62.03	-1.75	-0.43	50.16	0.86	0.26
7TD879		63.70	-0.08	-0.02	48.60	-0.69	-0.21
9L4TC3	*	66.71	2.92	0.72	56.34	7.04	2.11
9UXX74		69.58	5.80	1.43	53.79	4.50	1.35
9UZNCM		58.52	-5.26	-1.30	44.60	-4.69	-1.41
ACBWQR	*	74.33	10.55	2.61	55.56	6.27	1.88
B2RKB9		61.42	-2.36	-0.59	50.04	0.75	0.22
BBUZXT		64.14	0.36	0.09	49.85	0.56	0.17
BGHMTX		65.75	1.96	0.49	50.29	0.99	0.30
BM8ZUL		60.04	-3.74	-0.93	44.08	-5.21	-1.56
BN7BN4		63.96	0.18	0.04	50.56	1.27	0.38
BR4RZX		68.21	4.43	1.10	56.34	7.04	2.11
BXAKVT		63.52	-0.27	-0.07	49.15	-0.14	-0.04
C9L8JK		61.40	-2.38	-0.59	47.20	-2.09	-0.63
CEAUC6		62.23	-1.55	-0.38	48.66	-0.63	-0.19
CYVLDL		66.18	2.40	0.59	50.74	1.45	0.43
DFZFH2		66.65	2.87	0.71	53.17	3.88	1.16
DZN223		65.22	1.44	0.36	50.23	0.94	0.28
E7UVVY		64.11	0.32	0.08	47.66	-1.63	-0.49
E86WGX		63.94	0.16	0.04	49.08	-0.21	-0.06
EA7XJF		63.47	-0.31	-0.08	47.56	-1.73	-0.52
ED6AEF		61.63	-2.15	-0.53	46.44	-2.85	-0.86
ERRLQP		64.51	0.72	0.18	50.65	1.36	0.41
FAMBKX		67.50	3.72	0.92	52.40	3.11	0.93
FBHUMY		61.56	-2.22	-0.55	49.02	-0.27	-0.08
FXUVVW		57.36	-6.42	-1.59	45.00	-4.29	-1.29
G6AT4G		66.31	2.53	0.63	52.63	3.34	1.00
GN2YAL		65.20	1.42	0.35	48.80	-0.49	-0.15
HBARRB		56.92	-6.86	-1.70	45.68	-3.61	-1.08
JNCKVT	*	53.40	-10.38	-2.57	41.20	-8.09	-2.43
JX29TG		62.00	-1.78	-0.44	44.20	-5.09	-1.53
K2G48T		58.49	-5.29	-1.31	46.49	-2.80	-0.84
K2HTDB		65.84	2.06	0.51	50.88	1.59	0.48
KP29TE		61.64	-2.14	-0.53	49.36	0.07	0.02
L436PL		73.38	9.59	2.38	56.65	7.35	2.20



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

Report #2835
 July 2016

WebCode	Data Flag	Sample SC33			Sample SC34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
LG4ZLT		61.14	-2.64	-0.65	46.64	-2.65	-0.80
LUR34K		72.20	8.42	2.08	52.60	3.31	0.99
NAFWRV		69.80	6.02	1.49	50.20	0.91	0.27
PKAR6G		59.58	-4.20	-1.04	48.54	-0.75	-0.23
TQ9DKA		61.45	-2.33	-0.58	47.19	-2.10	-0.63
UC3JQC		63.66	-0.12	-0.03	45.69	-3.60	-1.08
UHUUZA		63.13	-0.65	-0.16	48.60	-0.69	-0.21
VRBXLE		67.12	3.33	0.83	52.67	3.38	1.01
WR63ED		62.40	-1.38	-0.34	47.60	-1.69	-0.51
WRU2TE		69.46	5.68	1.41	53.58	4.29	1.29
X8G2Y6	X	59.00	-4.78	-1.18	44.00	-5.29	-1.59
XCCR6G		61.87	-1.91	-0.47	46.31	-2.98	-0.89
XNPR2A	X	60.02	-3.77	-0.93	46.12	-3.18	-0.95
YGY3RJ		58.56	-5.22	-1.29	49.20	-0.09	-0.03
YULAR7		61.68	-2.10	-0.52	48.18	-1.11	-0.33
YZEBTK		62.44	-1.34	-0.33	48.52	-0.77	-0.23
Z7XWFX		65.49	1.70	0.42	49.24	-0.05	-0.02
ZCKJB3		66.31	2.53	0.63	49.55	0.26	0.08
ZYKKM7		59.64	-4.15	-1.03	44.99	-4.30	-1.29

Sample SC33		Summary Statistics	Sample SC34	
Grand Means	63.785 Grams		49.293 Grams	
SD Btwn Labs	4.039 Grams		3.335 Grams	
Statistics based on 57 of 59 reporting participants				

Comments on Assigned Data Flags for Test #312

- XNPR2A (X) - Data appear to be off by a factor of 2. Corrected by CTS (x.5).
- X8G2Y6 (X) - Data appear to be off by a factor of .5. Corrected by CTS (x2).



Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 312

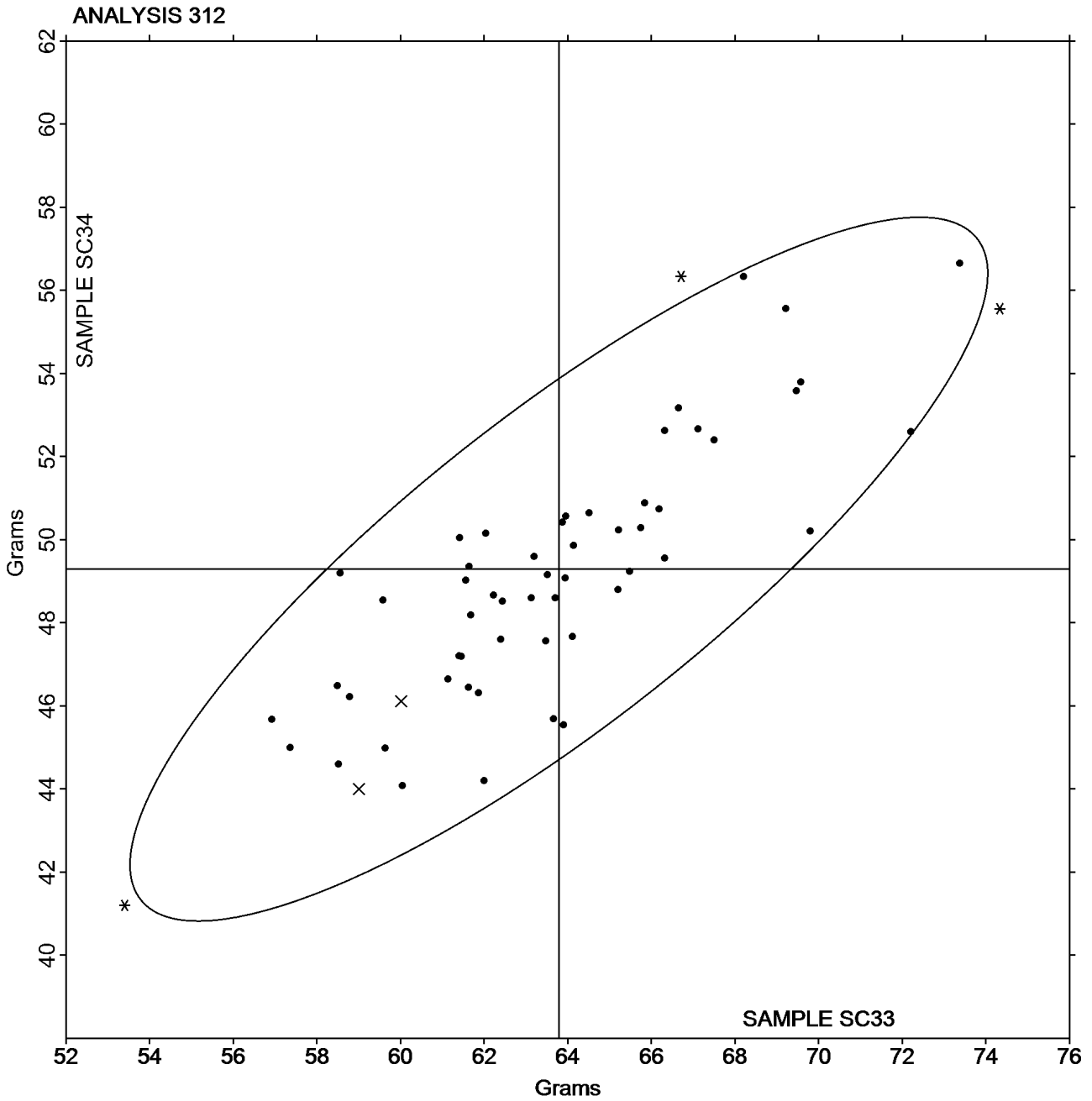
July 2016

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

Grand Mean Sample **SC33** = 63.785 Grams

Grand Mean Sample **SC34** = 49.293 Grams





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

Report #2835
 July 2016

WebCode	Data Flag	Sample SD33			Sample SD34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3ENYVD		198.9	-11.2	-0.86	188.1	-18.2	-1.11
3UFVW9		199.7	-10.3	-0.80	206.5	0.2	0.02
4FDPH4		228.3	18.3	1.41	234.0	27.7	1.70
6TXNLB		212.4	2.4	0.18	194.8	-11.5	-0.70
7BRJXY	X	228.3	18.2	1.41	225.5	19.2	1.18
7RYZKR	X	182.5	-27.5	-2.13	128.6	-77.7	-4.76
AWXLZK		199.6	-10.4	-0.81	213.6	7.3	0.45
BN7BN4		206.8	-3.3	-0.25	214.8	8.5	0.52
C242KR		224.6	14.6	1.12	208.4	2.1	0.13
CDECA4		227.3	17.3	1.33	220.6	14.3	0.88
DZPR8L		191.4	-18.7	-1.44	181.6	-24.6	-1.51
E79G6Z		208.9	-1.2	-0.09	207.4	1.2	0.07
EH2ZLR		211.6	1.6	0.12	217.6	11.3	0.69
FG8AFC		210.8	0.8	0.06	190.8	-15.5	-0.95
FK7TD6		198.8	-11.2	-0.87	175.4	-30.9	-1.89
G2RV9Y		206.9	-3.1	-0.24	210.6	4.4	0.27
H3ERBX		231.2	21.2	1.63	225.9	19.6	1.20
H6KEPM	X	145.2	-64.9	-5.01	155.4	-50.9	-3.12
JCJYPX		217.2	7.2	0.55	207.4	1.1	0.07
JYWP6D		201.4	-8.6	-0.66	211.4	5.2	0.32
K3NH DY	X	206.1	-4.0	-0.31	193.4	-12.9	-0.79
KWNYFA		193.2	-16.8	-1.30	191.6	-14.7	-0.90
L436PL		222.7	12.7	0.98	209.1	2.8	0.17
LN2TUM		219.1	9.1	0.70	210.9	4.6	0.28
M28ZC6		216.4	6.4	0.49	198.8	-7.5	-0.46
MLVMRL		220.1	10.0	0.77	233.0	26.7	1.63
MU7NDM		231.8	21.8	1.68	246.5	40.2	2.46
MX9PF6	X	282.6	72.5	5.60	203.4	-2.9	-0.18
P9KV64		217.3	7.2	0.56	213.0	6.7	0.41
PC4Q7B		204.9	-5.2	-0.40	191.3	-15.0	-0.92
QYAQRD		187.1	-23.0	-1.77	184.3	-22.0	-1.35
TYKCEK		197.4	-12.7	-0.98	191.5	-14.8	-0.90
UHUUZA		216.6	6.5	0.50	211.4	5.1	0.31
UPPW3L		218.3	8.3	0.64	211.6	5.3	0.32
UWNJUL		196.8	-13.2	-1.02	204.4	-1.9	-0.11
VM48H9		184.4	-25.6	-1.98	181.2	-25.0	-1.53
X8G2Y6	X	192.8	-17.2	-1.33	180.8	-25.5	-1.56
YWEZ XK		219.3	9.2	0.71	213.5	7.2	0.44



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

Report #2835
July 2016

	Sample SD33	Summary Statistics	Sample SD34
Grand Means	210.03 Grams		206.28 Grams
SD Btwn Labs	12.95 Grams		16.33 Grams
Statistics based on 32 of 38 reporting participants			

Comments on Assigned Data Flags for Test #314

- K3NHDY (X) - Data appear to be off by a factor of .25. Corrected by CTS (x4).
- 7BRJXY (X) - Data appear to be off by a factor of .25. Corrected by CTS (x4).
- H6KEPM (X) - Data for both samples are low.
- X8G2Y6 (X) - Data appear to be off by a factor of .25. Corrected by CTS (x4).
- 7RYZKR (X) - Data for sample SD34 are low. Inconsistent within the determinations of sample SD33.
- MX9PF6 (X) - Data for sample SD33 are high. Inconsistent within the determinations of sample SD33.



Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 314

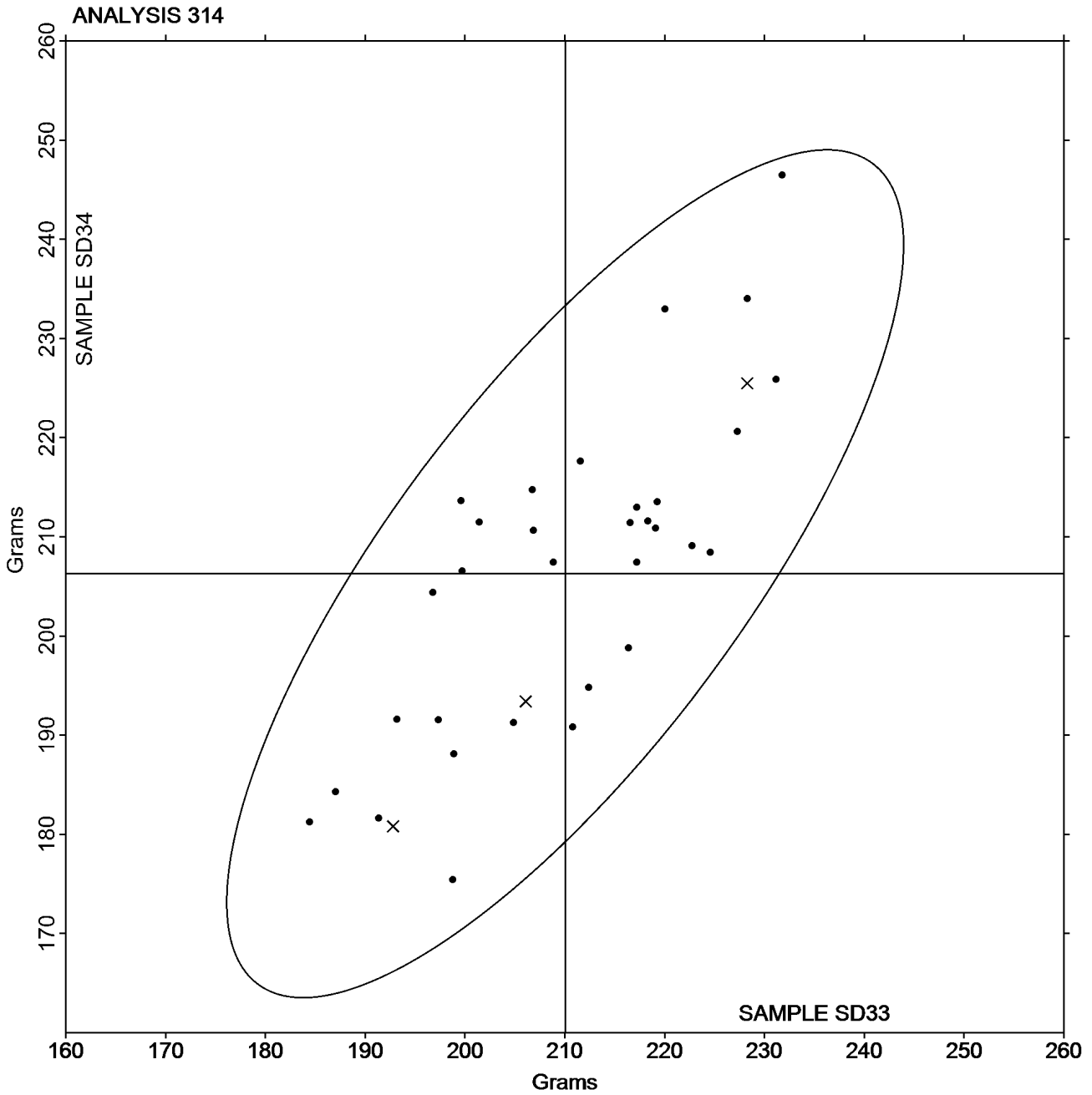
July 2016

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

Grand Mean Sample **SD33** = 210.03 Grams

Grand Mean Sample **SD34** = 206.28 Grams





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

Report #2835
July 2016

WebCode	Data Flag	Sample SR33			Sample SR34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
AXT43L		2.813	-0.074	-0.39	2.541	-0.102	-0.44
E7UVVY		2.831	-0.056	-0.29	2.539	-0.105	-0.45
JGW2EE		3.429	0.542	2.81	2.987	0.343	1.49
JX29TG		2.697	-0.190	-0.98	3.127	0.483	2.09
KHKWDT		2.863	-0.024	-0.12	2.478	-0.166	-0.72
L436PL		2.752	-0.135	-0.70	2.691	0.048	0.21
MTB7CL		2.802	-0.085	-0.44	2.536	-0.108	-0.47
TQ6WLB		2.902	0.015	0.08	2.629	-0.014	-0.06
TVMV2Q		2.905	0.018	0.09	2.513	-0.131	-0.57
VGDX9B		2.828	-0.059	-0.31	2.329	-0.314	-1.36
VUET6H		2.935	0.048	0.25	2.709	0.065	0.28

		Summary Statistics	
		Sample SR33	Sample SR34
Grand Means	2.8870 kN/m	2.6435 kN/m	
SD Btwn Labs	0.1926 kN/m	0.2312 kN/m	
Statistics based on 11 of 11 reporting participants			



Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 320

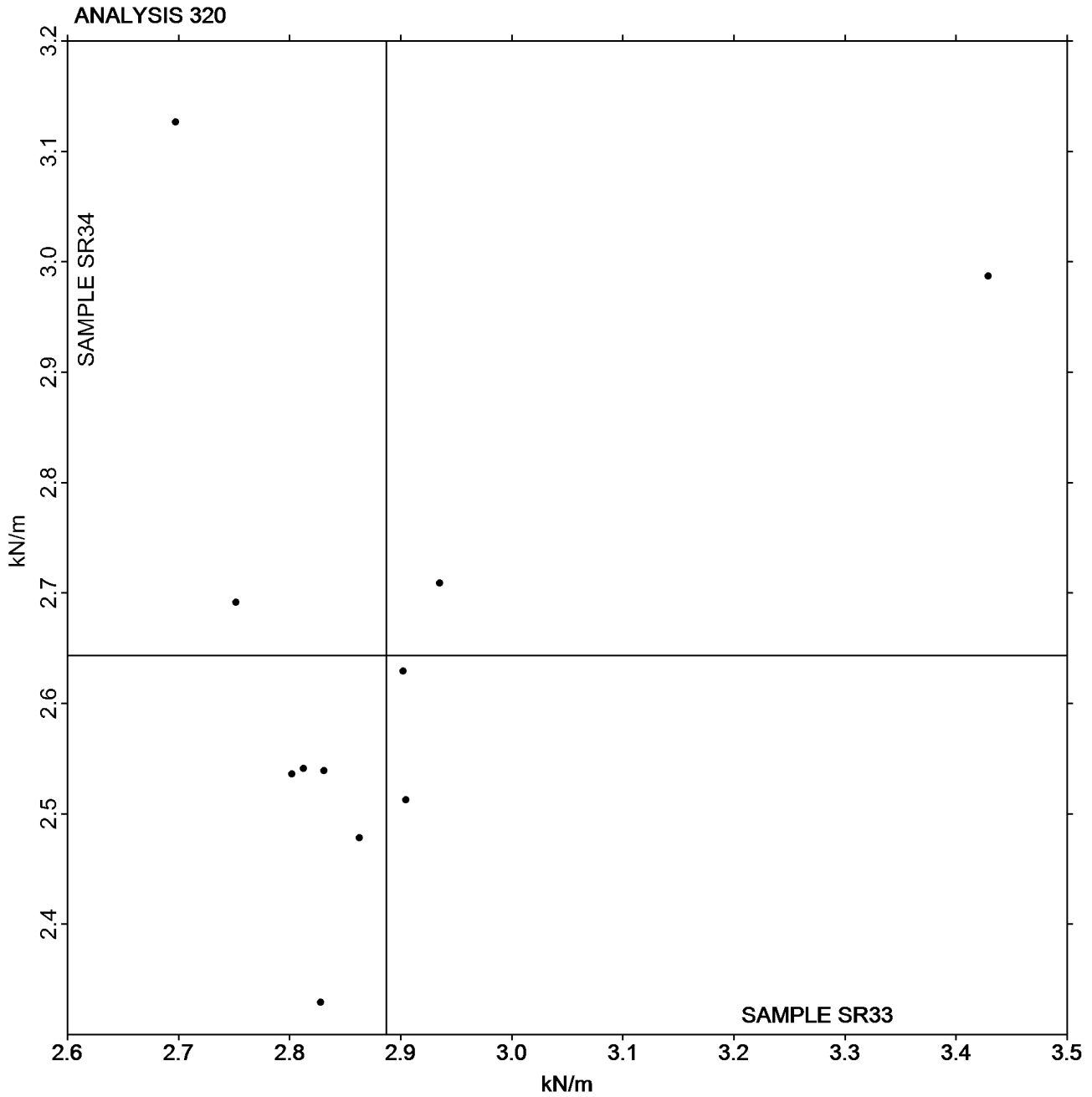
July 2016

Tensile Breaking Strength - Newsprint

TAPPI Official Test Method T494

Grand Mean Sample **SR33** = 2.8870 kN/m

Grand Mean Sample **SR34** = 2.6435 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 #2835
July 2016

WebCode	Data Flag	Sample SR33			Sample SR34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
AXT43L		28.87	5.08	1.70	20.61	2.22	0.50
E7UVVY		22.28	-1.50	-0.50	15.80	-2.58	-0.58
JGW2EE		29.09	5.31	1.77	19.61	1.22	0.27
JX29TG		19.59	-4.19	-1.40	28.90	10.51	2.36
KHKWDT		21.48	-2.31	-0.77	14.33	-4.05	-0.91
L436PL		23.08	-0.70	-0.24	20.12	1.73	0.39
MTB7CL		23.65	-0.14	-0.05	17.68	-0.70	-0.16
TQ6WLB		23.49	-0.30	-0.10	16.62	-1.77	-0.40
VGDX9B		23.08	-0.71	-0.24	12.91	-5.48	-1.23
VUET6H		23.24	-0.55	-0.18	17.29	-1.10	-0.25

		Summary Statistics			
		Sample SR33		Sample SR34	
Grand Means		23.784	Joules/sq m	18.386	Joules/sq m
SD Btwn Labs		2.991	Joules/sq m	4.445	Joules/sq m
Statistics based on 10 of 10 reporting participants					



Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 321

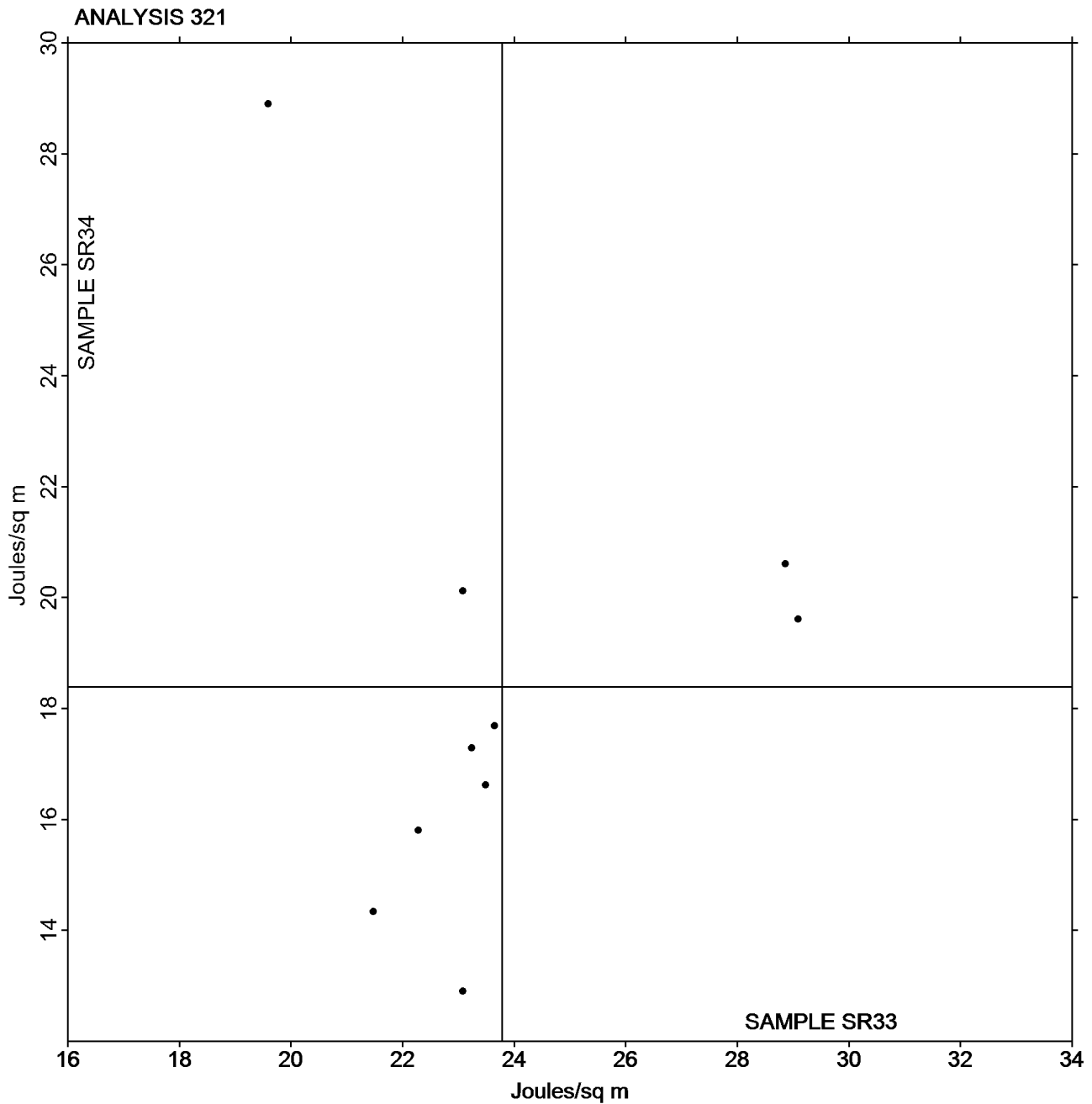
July 2016

Tensile Energy Absorption - Newsprint

TAPPI Official Test Method T494

Grand Mean Sample **SR33** = 23.784 Joules/sq m

Grand Mean Sample **SR34** = 18.386 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 #2835
July 2016

WebCode	Data Flag	Sample SR33			Sample SR34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
AXT43L		1.788	0.404	2.26	1.501	0.312	1.14
E7UVVY		1.280	-0.104	-0.59	1.040	-0.149	-0.55
JGW2EE		1.327	-0.057	-0.32	1.028	-0.161	-0.59
JX29TG		1.539	0.155	0.87	1.786	0.597	2.19
L436PL		1.180	-0.204	-1.15	1.072	-0.117	-0.43
MTB7CL		1.371	-0.013	-0.08	1.160	-0.029	-0.11
TQ6WLB		1.327	-0.057	-0.32	1.073	-0.116	-0.43
VGD9B		1.350	-0.034	-0.19	0.956	-0.233	-0.85
VUET6H		1.298	-0.086	-0.48	1.085	-0.104	-0.38

Sample SR33		Summary Statistics	Sample SR34	
Grand Means	1.3845	Percent	1.1889	Percent
SD Btwn Labs	0.1785	Percent	0.2727	Percent
Statistics based on 9 of 9 reporting participants				



Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 322

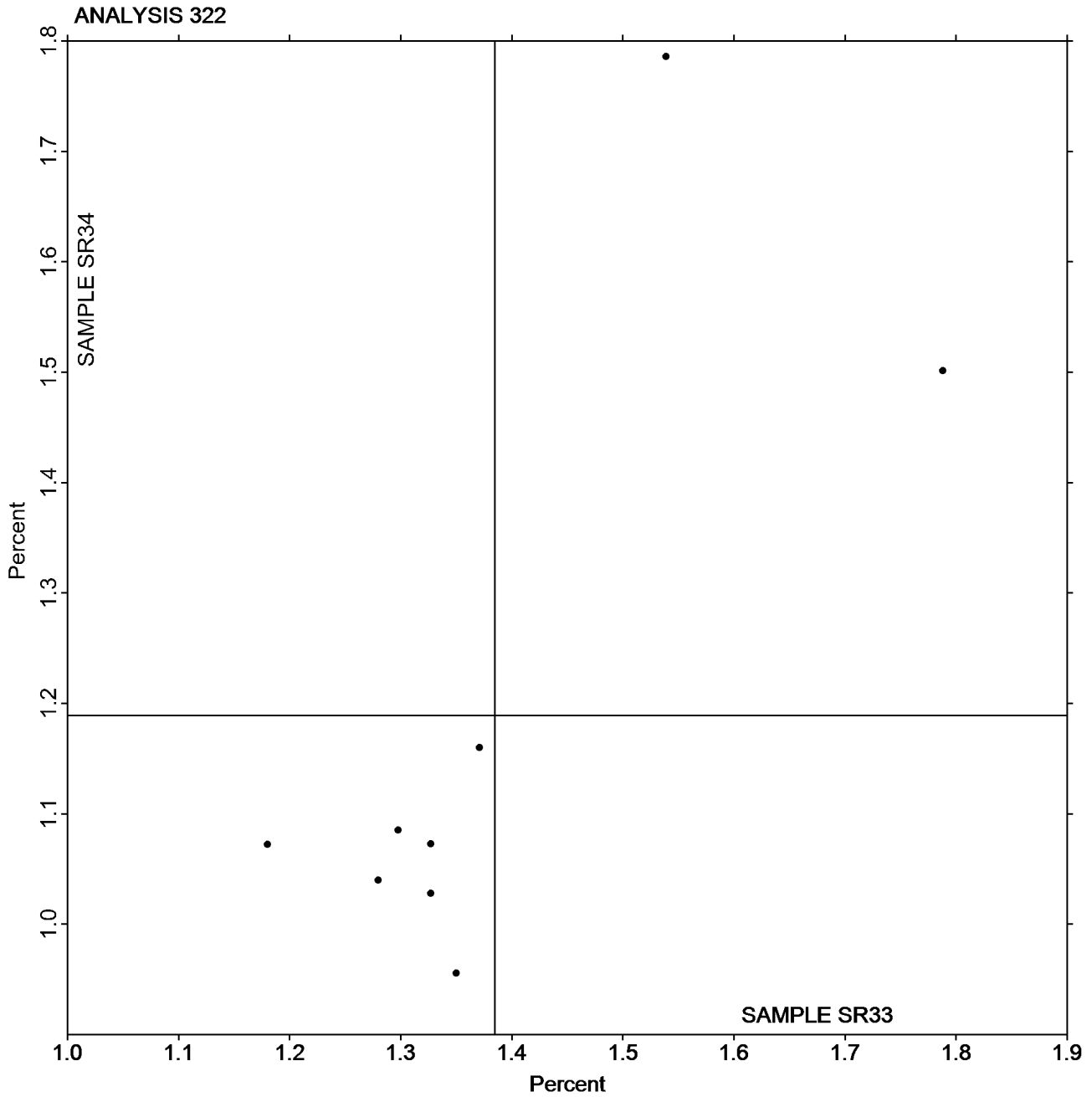
July 2016

Elongation to Break - Newsprint

TAPPI Official Test Method T494

Grand Mean Sample **SR33** = 1.3845 Percent

Grand Mean Sample **SR34** = 1.1889 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 #2835

Analysis 325

July 2016

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF33			Sample SF34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2DB6GY		7.391	0.757	2.22	5.297	0.456	1.76	TB
2ZA9KR		6.478	-0.156	-0.46	4.828	-0.013	-0.05	LA
6D2AN3		6.947	0.313	0.92	4.968	0.127	0.49	XX
766UC4	X	5.214	-1.420	-4.16	7.415	2.574	9.95	LA
7TD879		6.657	0.023	0.07	5.169	0.328	1.27	TJ
83V4NL		6.658	0.024	0.07	5.034	0.192	0.74	XX
8T6HHM		6.334	-0.300	-0.88	4.806	-0.035	-0.14	XX
9L4TC3		5.854	-0.780	-2.28	4.193	-0.649	-2.51	XX
9UXX74	X	9.550	2.916	8.53	7.699	2.858	11.05	LH
9UZNCM		7.127	0.493	1.44	5.293	0.452	1.75	LH
B2RKB9		6.825	0.191	0.56	4.970	0.129	0.50	MR
BBUZXT		6.610	-0.024	-0.07	4.770	-0.071	-0.28	LH
BGHMTX		6.791	0.157	0.46	5.112	0.271	1.05	LH
BM8ZUL		6.525	-0.109	-0.32	4.695	-0.146	-0.56	TO
C8PR8M		5.997	-0.637	-1.86	4.529	-0.312	-1.21	RE
C9L8JK		6.830	0.196	0.57	4.874	0.033	0.13	LH
CEAUC6		6.669	0.035	0.10	4.565	-0.276	-1.07	LF
CYVLDL		6.492	-0.142	-0.42	4.819	-0.022	-0.08	TO
DFZFH2		6.422	-0.212	-0.62	4.521	-0.320	-1.24	LH
DZN223		6.890	0.256	0.75	4.939	0.098	0.38	LH
E7UVVY		6.143	-0.491	-1.44	4.549	-0.292	-1.13	LH
E86WGX		6.746	0.112	0.33	4.953	0.112	0.43	LH
ED6AEF		6.698	0.064	0.19	4.883	0.042	0.16	TX
ERRLQP		6.492	-0.142	-0.42	4.637	-0.204	-0.79	LI
FAMBKX		6.688	0.054	0.16	4.864	0.023	0.09	TC
FBHUMY		6.538	-0.096	-0.28	4.917	0.076	0.29	LE
G6AT4G		6.381	-0.253	-0.74	4.680	-0.161	-0.62	LI
GN2YAL		7.016	0.382	1.12	5.385	0.544	2.10	XX
HAE9PA		6.231	-0.403	-1.18	4.784	-0.057	-0.22	TP
HBARRB		6.597	-0.037	-0.11	5.047	0.206	0.80	LA
HKZDWA		7.277	0.643	1.88	5.281	0.440	1.70	XX
K2G48T		6.671	0.037	0.11	4.681	-0.161	-0.62	XX
K2HTDB		6.580	-0.054	-0.16	4.656	-0.185	-0.71	LX
KP29TE		6.400	-0.233	-0.68	4.452	-0.389	-1.50	TB
LG4ZLT	X	7.490	0.856	2.51	4.858	0.017	0.07	TJ
LUR34K		6.246	-0.388	-1.14	4.694	-0.147	-0.57	DL
M74RHG		6.390	-0.244	-0.71	4.500	-0.341	-1.32	LH
PKAR6G		6.361	-0.273	-0.80	4.505	-0.337	-1.30	TF
RYLQMM		6.633	-0.001	0.00	4.799	-0.042	-0.16	TB
TQ9DKA		6.642	0.008	0.02	4.773	-0.069	-0.27	XX



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

Report #2835
 July 2016

WebCode	Data Flag	Sample SF33			Sample SF34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
UC3JQC		6.917	0.284	0.83	4.840	-0.001	0.00	TP
UHUZA		6.668	0.034	0.10	4.918	0.077	0.30	LH
UWNJUL		6.546	-0.088	-0.26	4.717	-0.124	-0.48	IM
WR63ED		6.688	0.054	0.16	4.929	0.088	0.34	TO
WRU2TE		5.907	-0.727	-2.13	4.419	-0.422	-1.63	LA
XCCR6G		6.619	-0.015	-0.04	4.862	0.021	0.08	IM
XNPR2A	*	7.520	0.886	2.59	5.384	0.542	2.10	TJ
YGY3RJ		6.369	-0.265	-0.77	4.823	-0.018	-0.07	TO
YULAR7		6.815	0.181	0.53	4.711	-0.130	-0.50	LI
YZEBTK		6.456	-0.178	-0.52	4.846	0.005	0.02	TB
Z7XWFX		6.885	0.251	0.73	5.014	0.173	0.67	LI
ZCKJB3		6.843	0.209	0.61	4.951	0.110	0.42	LH
ZYKKM7		7.237	0.603	1.76	5.218	0.377	1.46	LX

Sample SF33		Summary Statistics	Sample SF34	
Grand Means	6.6340 kN/m		4.8412 kN/m	
SD Btwn Labs	0.3416 kN/m		0.2587 kN/m	
Statistics based on 50 of 53 reporting participants				

9UXX74 (X) - Extreme Data.

LG4ZLT (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SF34.

766UC4 (X) - Extreme Data.

7TD879 - One determination removed from the Lab Mean of Sample SF33 per Grubb's Test at 1% risk (TAPPI 1205).

Key to Instrument Codes Reported by Participants

DL EMIC DL500 Universal Testing Machines	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
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

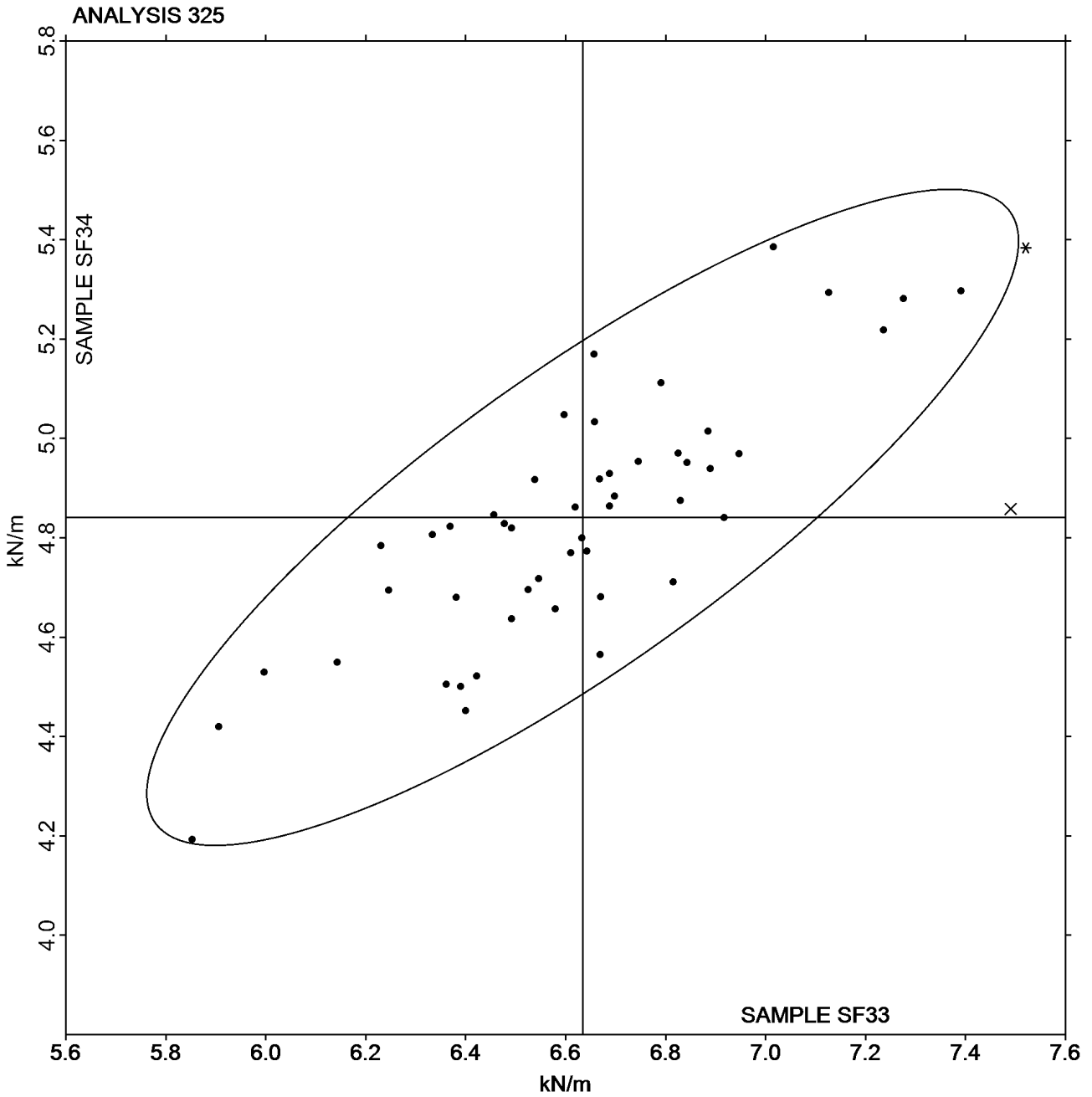


Paper & Paperboard Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers
TAPPI Official Test Method T494

Report #2835
July 2016

Grand Mean Sample **SF33** = 6.6340 kN/m

Grand Mean Sample **SF34** = 4.8412 kN/m





Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 327

July 2016

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF33			Sample SF34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2DB6GY		105.21	12.74	1.28	69.60	1.50	0.22	TB
6D2AN3		112.36	19.88	2.00	82.72	14.62	2.10	XX
766UC4	X	71.46	-21.01	-2.12	110.13	42.04	6.03	LA
8T6HHM		84.35	-8.12	-0.82	69.02	0.93	0.13	XX
9L4TC3		74.27	-18.21	-1.84	53.81	-14.29	-2.05	XX
9UXX74	X	123.64	31.17	3.14	119.53	51.44	7.38	LH
9UZNCM		94.14	1.67	0.17	70.38	2.29	0.33	LH
B2RKB9		90.16	-2.32	-0.23	61.28	-6.81	-0.98	MR
BBUZXT		81.04	-11.44	-1.15	59.18	-8.92	-1.28	LH
BGHMTX		96.65	4.18	0.42	74.89	6.80	0.98	LH
BM8ZUL		108.87	16.40	1.65	81.29	13.19	1.89	TO
C8PR8M		81.85	-10.62	-1.07	63.22	-4.88	-0.70	RE
CEAUC6		84.97	-7.51	-0.76	61.98	-6.11	-0.88	LW
DFZFH2	X	31.86	-60.62	-6.11	31.52	-36.57	-5.25	LH
DZN223		94.57	2.09	0.21	70.07	1.97	0.28	LH
E7UVVY		82.04	-10.43	-1.05	61.35	-6.75	-0.97	LH
E86WGX		79.48	-12.99	-1.31	57.95	-10.15	-1.46	LH
ED6AEF		93.18	0.71	0.07	69.69	1.60	0.23	TA
ERRLQP		92.75	0.27	0.03	66.86	-1.23	-0.18	LI
G6AT4G		86.46	-6.02	-0.61	66.46	-1.63	-0.23	LI
HBARRB		94.35	1.88	0.19	73.23	5.14	0.74	LA
HKZDWA	X	154.84	62.37	6.29	95.25	27.16	3.90	LX
K2G48T		94.88	2.41	0.24	66.28	-1.82	-0.26	XX
K2HTDB		92.20	-0.27	-0.03	65.69	-2.41	-0.35	LX
LUR34K		95.73	3.26	0.33	72.31	4.21	0.60	DL
M74RHG		87.95	-4.53	-0.46	62.67	-5.42	-0.78	LH
UC3JQC	X	33.52	-58.95	-5.94	40.70	-27.39	-3.93	TP
UHUUZA		93.74	1.27	0.13	67.24	-0.85	-0.12	LH
UWNJUL		100.14	7.67	0.77	69.35	1.26	0.18	IM
WR63ED		86.92	-5.56	-0.56	64.81	-3.29	-0.47	TO
WRU2TE		67.41	-25.06	-2.53	52.63	-15.47	-2.22	LA
XCCR6G		98.89	6.41	0.65	75.13	7.04	1.01	IM
XNPR2A	*	113.73	21.26	2.14	76.40	8.30	1.19	TJ
YGY3RJ		97.63	5.16	0.52	73.55	5.46	0.78	TO
YULAR7		90.41	-2.06	-0.21	63.97	-4.12	-0.59	LI
YZEBTK		99.77	7.30	0.74	75.41	7.32	1.05	TB
Z7XWFX		97.27	4.80	0.48	72.69	4.60	0.66	LI
ZCKJB3		94.82	2.34	0.24	73.43	5.33	0.77	LH
ZYKKM7		95.93	3.45	0.35	70.69	2.60	0.37	LX



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

Report #2835
July 2016

		Summary Statistics	
		Sample SF33	Sample SF34
Grand Means	92.474 Joules/sq m	68.094 Joules/sq m	
SD Btwn Labs	9.918 Joules/sq m	6.969 Joules/sq m	
Statistics based on 34 of 39 reporting participants			

Comments on Assigned Data Flags for Test #327

- 766UC4 (X) - Extreme Data for Sample SF34.
- UC3JQC (X) - Data for both samples are low.
- HKZDWA (X) - Extreme Data.
- 9UXX74 (X) - Extreme Data.
- DFZFH2 (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

DL	EMIC DL500 Universal Testing Machines	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	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		

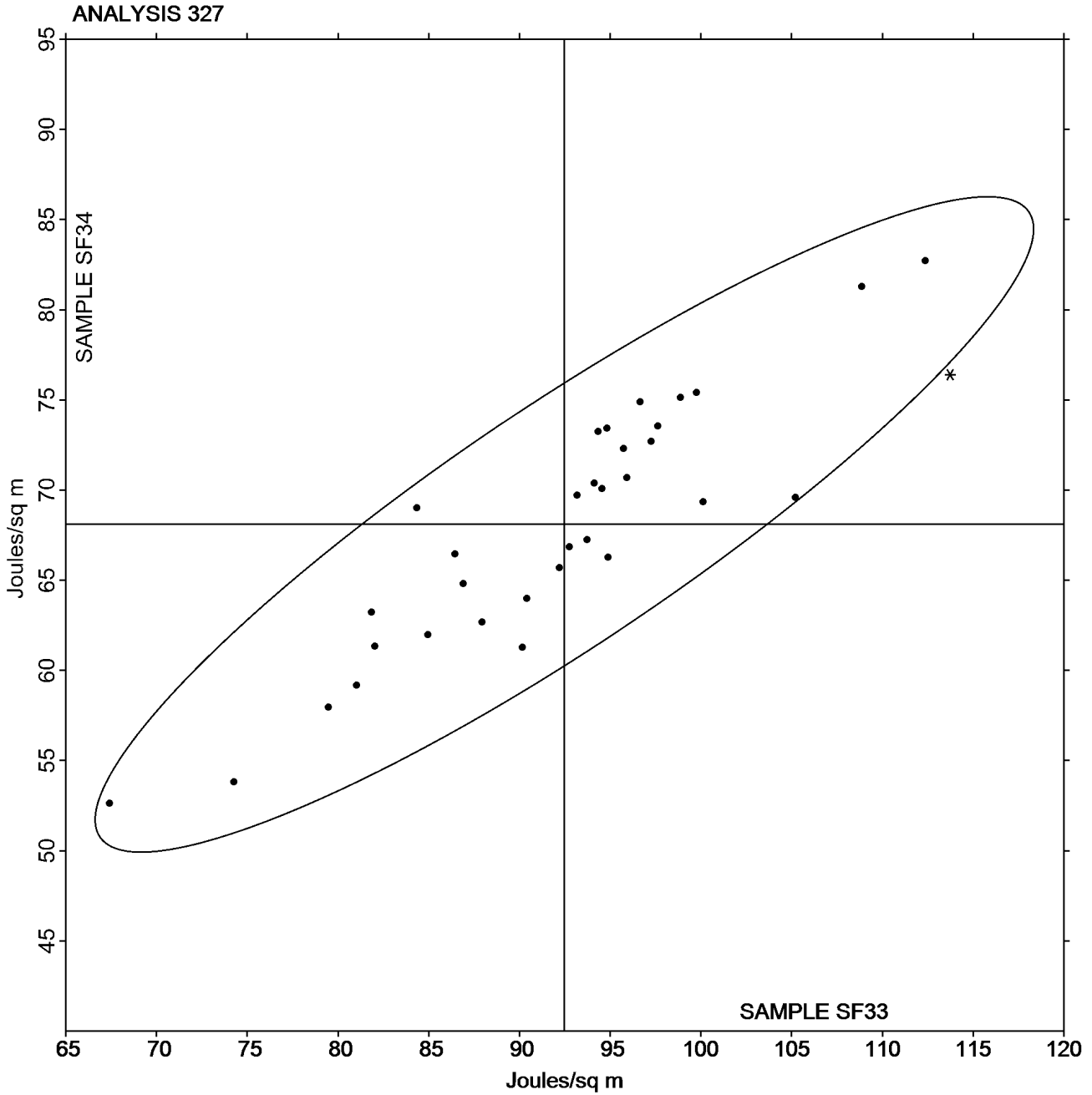


Paper & Paperboard Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers
TAPPI Official Test Method T494

Report #2835
July 2016

Grand Mean Sample **SF33** = 92.474 Joules/sq m

Grand Mean Sample **SF34** = 68.094 Joules/sq m





Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 328

July 2016

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF33			Sample SF34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2DB6GY		2.194	0.036	0.19	1.959	-0.168	-0.91	TB
6D2AN3		2.502	0.344	1.78	2.479	0.352	1.92	XX
766UC4		1.879	-0.278	-1.44	2.074	-0.053	-0.29	LA
7TD879	X	2.660	0.503	2.60	2.100	-0.027	-0.15	LH
8T6HHM		2.045	-0.112	-0.58	2.135	0.008	0.04	XX
9L4TC3		2.455	0.298	1.54	2.438	0.311	1.69	XX
9UXX74	*	1.991	-0.166	-0.86	2.322	0.195	1.06	LH
9UZNCM		2.004	-0.153	-0.79	1.961	-0.166	-0.90	LH
B2RKB9		2.048	-0.110	-0.57	1.871	-0.256	-1.39	MR
BBUZXT		1.753	-0.404	-2.09	1.766	-0.361	-1.97	LH
BGHMTX		2.154	-0.003	-0.02	2.143	0.016	0.09	LH
BM8ZUL	X	2.899	0.742	3.83	2.867	0.740	4.03	TO
C8PR8M		2.174	0.016	0.08	2.148	0.021	0.12	RE
CEAUC6		2.027	-0.130	-0.67	2.066	-0.061	-0.33	LX
DFZFH2	X	6.293	4.136	21.37	4.526	2.399	13.06	LH
DZN223		2.091	-0.066	-0.34	2.098	-0.029	-0.16	LH
E7UVVY		2.032	-0.125	-0.65	1.997	-0.130	-0.71	LH
E86WGX		1.727	-0.430	-2.22	1.692	-0.435	-2.37	LH
ED6AEF		2.264	0.107	0.55	2.239	0.112	0.61	TX
ERRLQP		2.170	0.013	0.06	2.139	0.012	0.07	LI
G6AT4G		2.054	-0.103	-0.53	2.094	-0.033	-0.18	LI
HBARRB		1.992	-0.165	-0.86	1.984	-0.143	-0.78	XX
HKZDWA		2.263	0.106	0.55	1.943	-0.184	-1.00	LX
K2G48T		2.266	0.109	0.56	2.130	0.003	0.02	XX
K2HTDB		2.121	-0.036	-0.19	2.071	-0.056	-0.30	LX
KP29TE		2.190	0.033	0.17	2.340	0.213	1.16	TF
LUR34K		2.539	0.382	1.97	2.452	0.325	1.77	DL
M74RHG		2.124	-0.033	-0.17	2.042	-0.085	-0.46	LH
PKAR6G		2.400	0.243	1.25	2.070	-0.057	-0.31	TF
RYLQMM		2.195	0.037	0.19	2.115	-0.012	-0.07	TB
UC3JQC	X	2.625	0.468	2.42	2.010	-0.117	-0.64	TP
UHUUZA		2.099	-0.058	-0.30	2.049	-0.078	-0.42	LH
UWNJUL		2.370	0.213	1.10	2.211	0.084	0.46	IM
WR63ED		1.956	-0.201	-1.04	1.912	-0.215	-1.17	TG
WRU2TE		2.037	-0.120	-0.62	2.092	-0.035	-0.19	LA
XCCR6G		2.362	0.205	1.06	2.372	0.245	1.33	IM
XNPR2A		2.535	0.378	1.95	2.445	0.318	1.73	TJ
YGY3RJ		2.321	0.164	0.84	2.264	0.137	0.75	TO
YULAR7		2.078	-0.079	-0.41	2.059	-0.068	-0.37	LI
YZEBTK		2.404	0.246	1.27	2.394	0.267	1.46	TB



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

Report #2835
July 2016

WebCode	Data Flag	Sample SF33			Sample SF34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
Z7XWFX		2.157	0.000	0.00	2.143	0.016	0.09	LI
ZCKJB3		2.111	-0.046	-0.24	2.182	0.055	0.30	LH
ZYKKM7		2.060	-0.097	-0.50	2.059	-0.068	-0.37	LX

Sample SF33		Summary Statistics	Sample SF34	
Grand Means	2.1575 Percent		2.1269 Percent	
SD Btwn Labs	0.1936 Percent		0.1836 Percent	
Statistics based on 39 of 43 reporting participants				

Comments on Assigned Data Flags for Test #328

- 7TD879 (X) - Inconsistent in testing between samples.
- DFZFH2 (X) - Extreme Data.
- UC3JQC (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.
- BM8ZUL (X) - Data for both samples are high. Possible Systematic Error.

Key to Instrument Codes Reported by Participants

DL EMIC DL500 Universal Testing Machines	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	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

Report #2835

Analysis 328

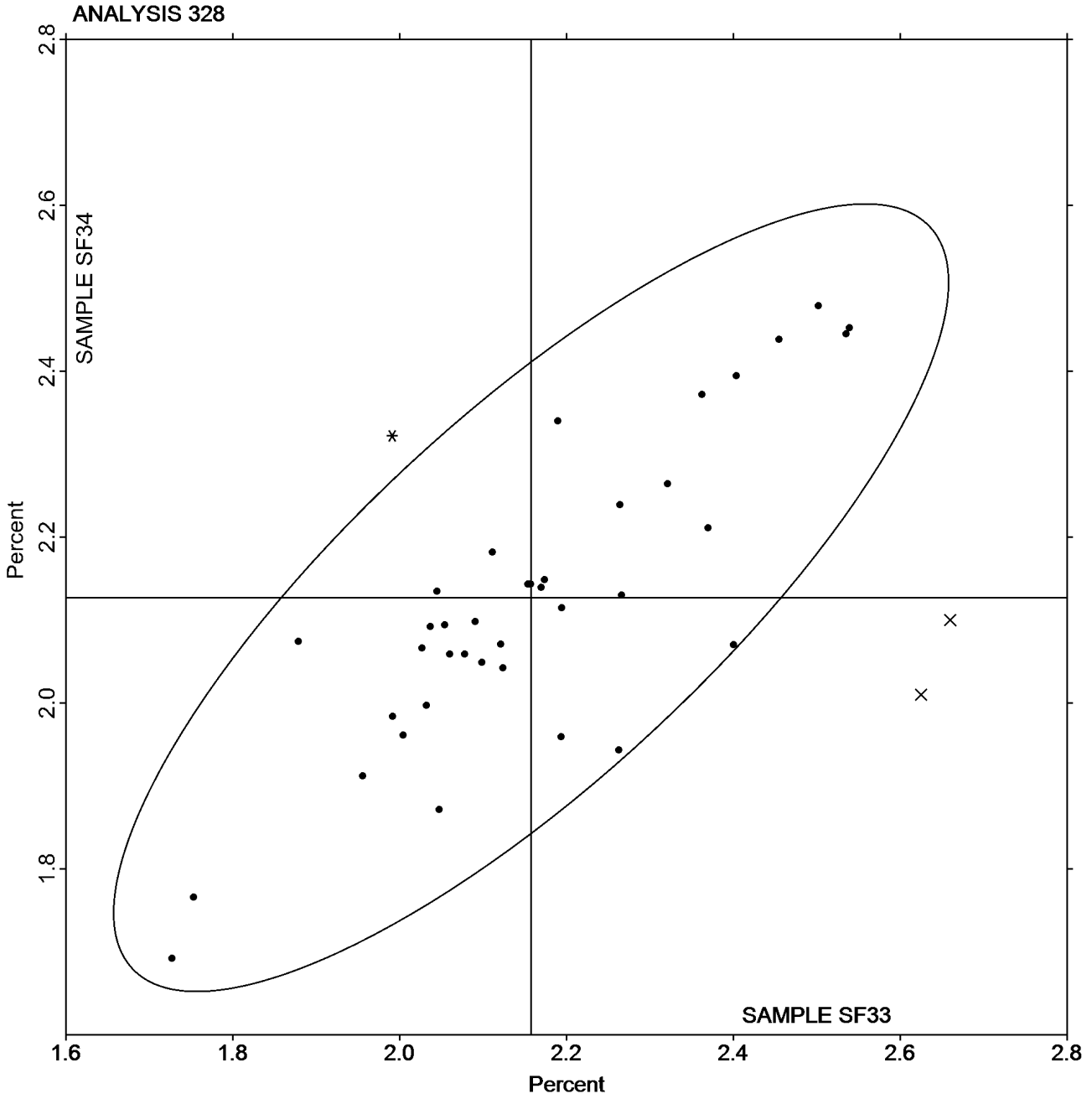
July 2016

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

Grand Mean Sample SF33 = 2.1575 Percent

Grand Mean Sample SF34 = 2.1269 Percent





Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 330

July 2016

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE33			Sample SE34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2P6L7Z		10.40	-0.88	-0.94	8.458	-0.551	-0.78	LI
3ENYVD		12.09	0.80	0.85	9.506	0.497	0.70	LE
3UFVW9		11.60	0.32	0.34	9.107	0.098	0.14	LH
4R83FF		10.57	-0.71	-0.75	8.549	-0.460	-0.65	XX
6CLA4D		10.95	-0.33	-0.35	8.898	-0.110	-0.16	IM
6TXNLB	X	10.67	-0.62	-0.65	6.979	-2.030	-2.87	TK
7M47MQ		11.74	0.46	0.49	9.323	0.314	0.44	TR
7RYZKR	X	17.53	6.25	6.64	14.600	5.592	7.90	TP
AWXLZK	*	10.77	-0.51	-0.55	8.015	-0.993	-1.40	IK
BN7BN4		10.64	-0.65	-0.69	8.651	-0.357	-0.50	TB
CDECA4		10.46	-0.82	-0.87	8.324	-0.685	-0.97	LE
CN36NL	*	11.21	-0.08	-0.08	8.275	-0.734	-1.04	TA
E79G6Z		10.09	-1.19	-1.27	8.602	-0.407	-0.57	TK
ED6AEF		11.50	0.22	0.23	9.089	0.081	0.11	TO
EE2RGG		9.23	-2.05	-2.18	7.787	-1.222	-1.73	IM
EH2ZLR		12.09	0.81	0.86	9.265	0.257	0.36	LH
FG8AFC		12.82	1.54	1.63	10.007	0.998	1.41	TH
FK7TD6		11.95	0.67	0.71	9.240	0.232	0.33	LW
G2RV9Y		11.81	0.53	0.56	9.371	0.362	0.51	LH
H3ERBX		10.58	-0.70	-0.74	8.652	-0.356	-0.50	XX
JCJYPX		12.37	1.09	1.15	10.143	1.134	1.60	TP
JCLNWF		12.45	1.16	1.24	9.720	0.712	1.00	XX
JYWP6D		9.85	-1.43	-1.52	8.003	-1.005	-1.42	IN
K3NHDY		12.14	0.86	0.92	9.507	0.499	0.70	TO
KMXDAB		10.33	-0.96	-1.02	8.150	-0.858	-1.21	ID
LN2TUM	*	9.43	-1.85	-1.97	7.229	-1.780	-2.51	IK
M28ZC6		12.43	1.15	1.22	9.645	0.636	0.90	TH
MU7NDM		10.88	-0.40	-0.43	8.895	-0.113	-0.16	LE
MX9PF6	*	13.81	2.53	2.69	10.965	1.956	2.76	LA
P9KV64		11.35	0.07	0.07	9.491	0.483	0.68	TA
PC4Q7B		11.05	-0.23	-0.25	8.876	-0.132	-0.19	ID
QYAQRD		12.84	1.56	1.66	10.089	1.081	1.53	TO
QYNFT6		11.84	0.56	0.59	9.207	0.199	0.28	TB
R8JHVG		10.48	-0.80	-0.85	8.851	-0.157	-0.22	LA
RBHTQG		10.77	-0.51	-0.54	8.651	-0.357	-0.50	LW
TC8GN3		11.98	0.70	0.74	10.040	1.032	1.46	TX
TYKCEK		11.30	0.02	0.02	9.242	0.234	0.33	LE
UHUUZA		11.37	0.09	0.10	9.095	0.087	0.12	LH
UMPL98		10.34	-0.94	-1.00	8.336	-0.673	-0.95	TH
UPPW3L		11.65	0.37	0.39	9.286	0.277	0.39	IM



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

Report #2835
July 2016

WebCode	Data Flag	Sample SE33			Sample SE34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
VDEJM7	X	13.70	2.42	2.57	11.937	2.928	4.13	LA
VM48H9		10.67	-0.61	-0.65	8.671	-0.338	-0.48	IF
VRBXL		10.79	-0.49	-0.52	8.507	-0.501	-0.71	LE
WG9ZD6		11.72	0.43	0.46	9.352	0.343	0.48	TO
X8G2Y6		11.46	0.18	0.19	9.275	0.267	0.38	IF
YWEZXX		11.33	0.05	0.05	9.021	0.013	0.02	SA

Sample SE33		Summary Statistics	Sample SE34	
Grand Means	11.282 kN/m		9.0085 kN/m	
SD Btwn Labs	0.941 kN/m		0.7082 kN/m	
Statistics based on 43 of 46 reporting participants				

Comments on Assigned Data Flags for Test #330

- 6TXNLB (X) - Data for sample SE34 are low.
- VDEJM7 (X) - Data for sample SE34 are high.
- 7RYZKR (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
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

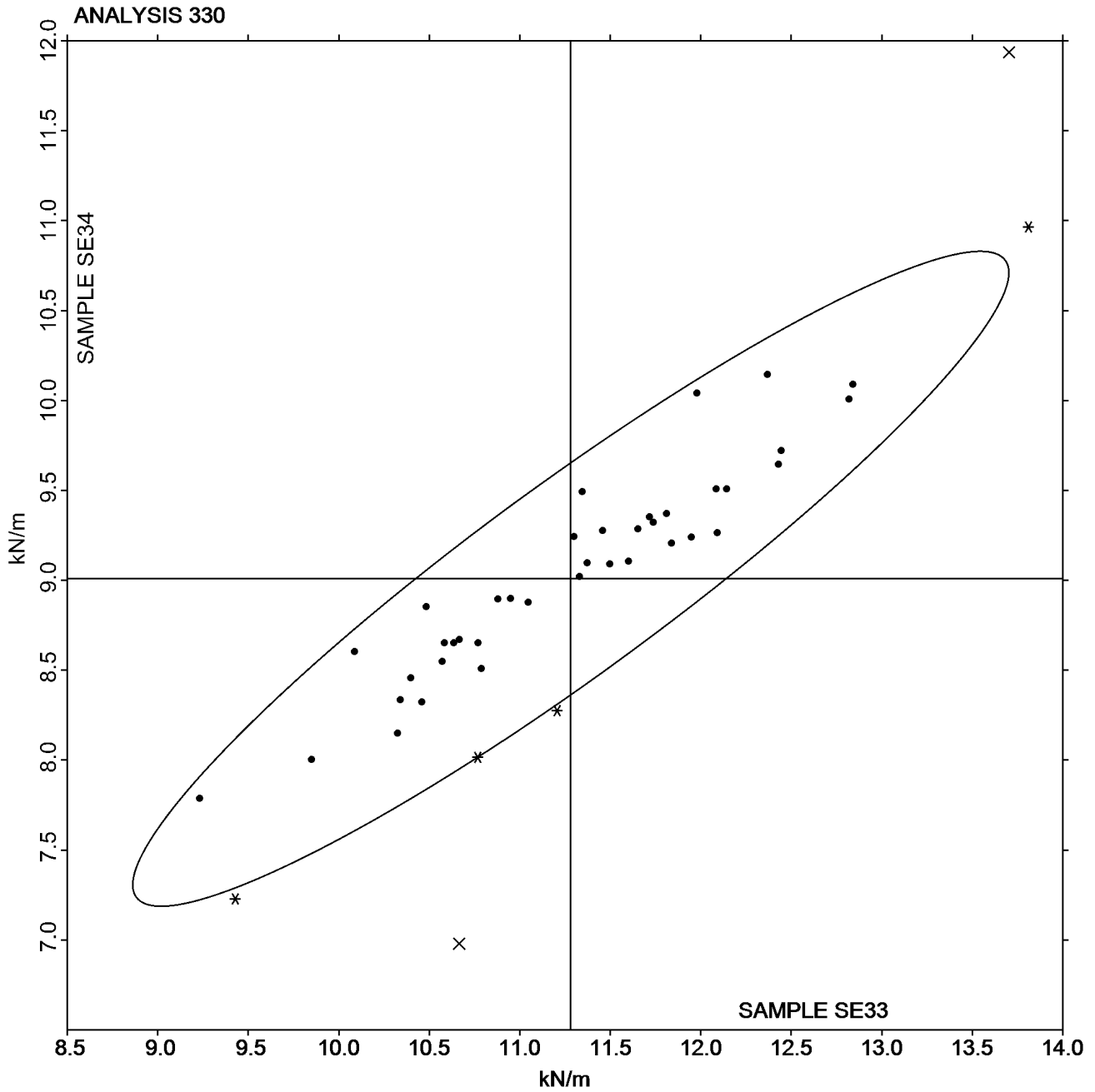


Paper & Paperboard Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers
TAPPI Official Test Method T494

Report #2835
July 2016

Grand Mean Sample **SE33** = 11.282 kN/m

Grand Mean Sample **SE34** = 9.0085 kN/m





Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 331

July 2016

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE33			Sample SE34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3ENYVD		190.7	13.2	0.72	108.3	-0.5	-0.06	LE
3UFVW9		167.2	-10.4	-0.57	103.7	-5.1	-0.57	LH
4R83FF		177.1	-0.5	-0.03	107.9	-0.9	-0.10	XX
6CLA4D		169.5	-8.1	-0.44	107.8	-1.1	-0.12	IM
7M47MQ		188.2	10.7	0.58	113.4	4.5	0.51	TR
7RYZKR		169.6	-7.9	-0.44	105.5	-3.4	-0.38	TP
AWXLZK		156.2	-21.4	-1.17	103.3	-5.6	-0.62	XX
CDECA4		163.6	-14.0	-0.77	97.9	-10.9	-1.22	LE
E79G6Z		166.0	-11.6	-0.64	106.7	-2.2	-0.24	TK
ED6AEF		189.9	12.3	0.67	110.2	1.3	0.15	TO
EE2RGG	*	124.7	-52.8	-2.90	92.5	-16.3	-1.82	IM
EH2ZLR		202.7	25.1	1.38	117.7	8.8	0.98	LH
FG8AFC		217.1	39.6	2.17	120.9	12.0	1.34	TH
FK7TD6		180.1	2.6	0.14	99.6	-9.3	-1.04	LW
G2RV9Y		180.6	3.1	0.17	107.5	-1.4	-0.15	LH
H3ERBX		163.8	-13.8	-0.76	101.4	-7.4	-0.83	XX
JCJYPX	X	108.3	-69.3	-3.80	63.4	-45.5	-5.07	TP
JCLNWF	X	248.2	70.6	3.88	146.3	37.4	4.16	XX
JYWP6D		157.3	-20.3	-1.11	105.4	-3.4	-0.38	IN
K3NHDY		204.9	27.3	1.50	111.7	2.9	0.32	TO
KMXDAB		157.6	-20.0	-1.10	89.1	-19.7	-2.20	ID
LN2TUM		176.3	-1.3	-0.07	106.7	-2.1	-0.24	IK
M28ZC6		209.8	32.2	1.77	117.5	8.6	0.96	TH
MU7NDM		176.7	-0.9	-0.05	119.1	10.2	1.14	LE
MX9PF6		192.5	15.0	0.82	114.0	5.2	0.58	LA
P9KV64	*	186.2	8.6	0.47	129.2	20.3	2.26	TA
QYAQRD		192.2	14.6	0.80	114.6	5.7	0.63	TO
QYNFT6		198.2	20.6	1.13	116.0	7.1	0.79	TB
R8JHVG		165.2	-12.4	-0.68	116.2	7.4	0.82	LA
RBHTQG		162.9	-14.7	-0.81	98.4	-10.4	-1.16	LW
TC8GN3	X	209.0	31.4	1.72	144.1	35.2	3.92	XX
TYKCEK		173.4	-4.2	-0.23	101.3	-7.6	-0.84	LE
UHUUZA		170.7	-6.9	-0.38	106.0	-2.9	-0.32	LH
UMPL98		182.7	5.1	0.28	118.6	9.7	1.08	TH
UPPW3L		181.5	3.9	0.21	107.3	-1.5	-0.17	IM
VDEJM7		189.7	12.1	0.66	125.1	16.2	1.81	LA
VRBXLE		168.1	-9.5	-0.52	96.8	-12.0	-1.34	LE
WG9ZD6		196.0	18.4	1.01	120.0	11.1	1.24	TO
X8G2Y6		152.1	-25.5	-1.40	110.5	1.6	0.18	IN
YWEZXX		169.3	-8.2	-0.45	100.0	-8.9	-0.99	SA



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

Report #2835
July 2016

WebCode	Data Flag	Sample SE33			Sample SE34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	

Sample SE33		Summary Statistics	Sample SE34	
Grand Means	177.58 Joules/sq m		108.86 Joules/sq m	
SD Btwn Labs	18.22 Joules/sq m		8.98 Joules/sq m	
Statistics based on 37 of 40 reporting participants				

Comments on Assigned Data Flags for Test #331

- JCJYPX (X) - Data for both samples are low.
- JCLNWF (X) - Data for both samples are high.
- TC8GN3 (X) - Data for sample SE34 are high.

Key to Instrument Codes Reported by Participants

ID	Instron 4201	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

Report #2835

Analysis 331

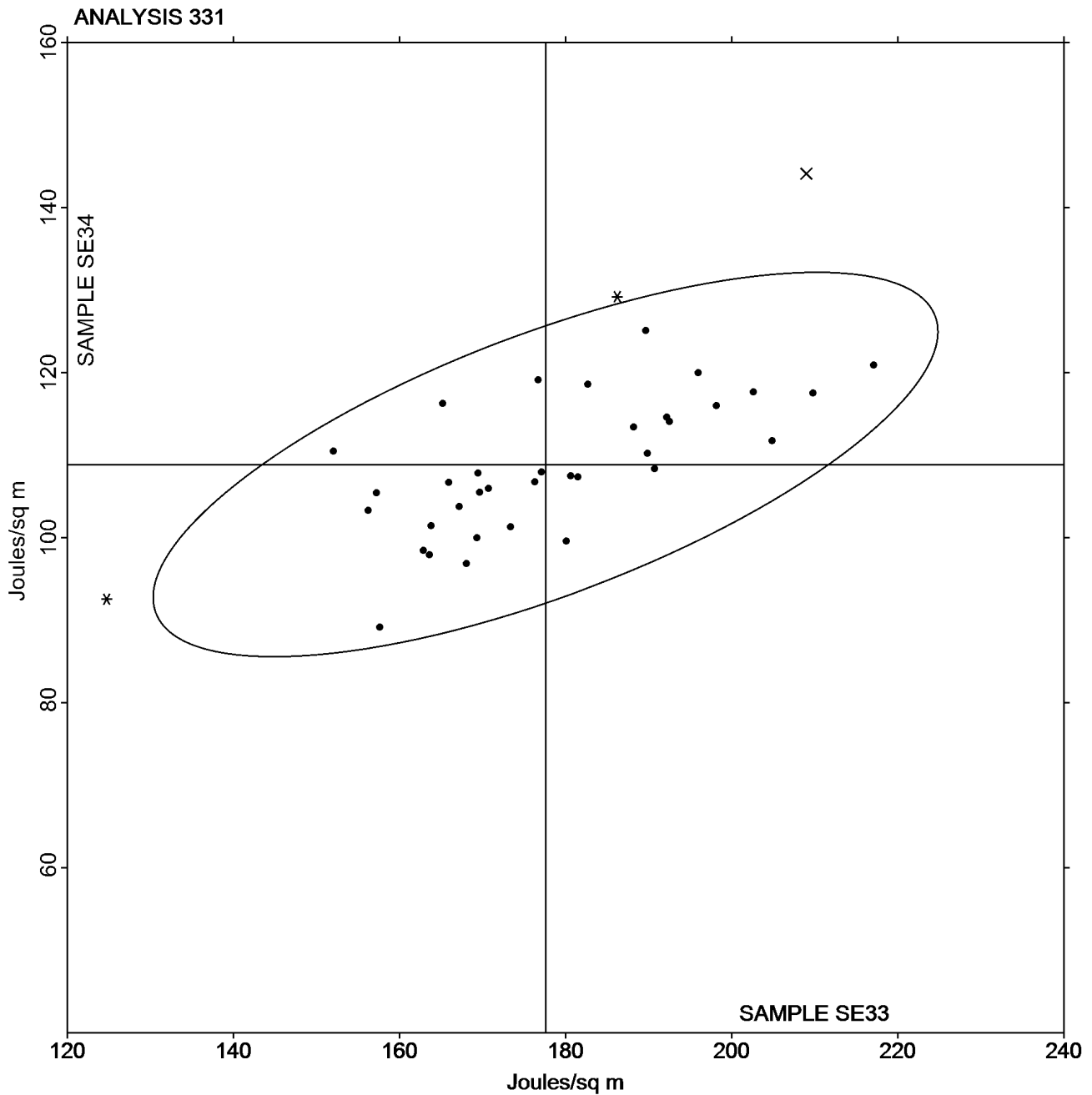
July 2016

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

Grand Mean Sample SE33 = 177.58 Joules/sq m

Grand Mean Sample SE34 = 108.86 Joules/sq m





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

Report #2835
 July 2016

WebCode	Data Flag	Sample SE33			Sample SE34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3ENYVD		2.451	-0.011	-0.04	1.764	-0.164	-0.71	LE
3UFVW9		2.158	-0.304	-1.09	1.744	-0.184	-0.80	LH
4R83FF		2.573	0.111	0.40	2.001	0.073	0.32	XX
6CLA4D		2.587	0.125	0.45	2.096	0.168	0.73	IM
7M47MQ		2.451	-0.011	-0.04	1.906	-0.023	-0.10	TR
7RYZKR		3.014	0.552	1.99	2.265	0.337	1.47	TP
AWXLZK		1.930	-0.532	-1.91	1.630	-0.298	-1.30	XX
BN7BN4		2.332	-0.130	-0.47	1.921	-0.007	-0.03	TB
CDECA4		2.308	-0.154	-0.55	1.769	-0.159	-0.69	LE
E79G6Z		2.498	0.036	0.13	1.926	-0.002	-0.01	TK
ED6AEF		2.509	0.047	0.17	1.925	-0.003	-0.01	TO
EE2RGG		2.196	-0.266	-0.96	1.921	-0.007	-0.03	IM
EH2ZLR		2.458	-0.004	-0.01	1.890	-0.038	-0.17	LH
FG8AFC		2.657	0.195	0.70	1.990	0.062	0.27	TH
FK7TD6		2.254	-0.208	-0.75	1.652	-0.276	-1.20	LW
G2RV9Y		2.284	-0.178	-0.64	1.740	-0.188	-0.82	LH
H3ERBX		2.304	-0.158	-0.57	1.768	-0.160	-0.70	XX
JCJYPX		2.852	0.390	1.41	2.212	0.284	1.23	TP
JCLNWF		3.023	0.561	2.02	2.317	0.389	1.69	XX
JYWP6D		2.620	0.158	0.57	2.160	0.232	1.01	IN
K3NH DY		2.497	0.035	0.13	1.815	-0.113	-0.49	TO
KMXDAB		2.393	-0.069	-0.25	1.791	-0.137	-0.60	ID
LN2TUM		2.969	0.508	1.83	2.347	0.419	1.82	IK
M28ZC6		2.614	0.152	0.55	1.924	-0.004	-0.02	TH
MU7NDM		2.410	-0.052	-0.19	1.998	0.070	0.30	LE
MX9PF6		1.992	-0.470	-1.69	1.597	-0.331	-1.44	LA
P9KV64		2.457	-0.005	-0.02	2.096	0.168	0.73	TA
PC4Q7B		2.377	-0.085	-0.30	1.744	-0.184	-0.80	ID
QYAQRD		2.531	0.069	0.25	1.927	-0.001	0.00	TO
QYNFT6		2.546	0.084	0.30	1.937	0.009	0.04	TB
R8JHVG		1.993	-0.469	-1.69	1.654	-0.274	-1.19	LA
RBHTQG		2.229	-0.233	-0.84	1.714	-0.214	-0.93	LW
TC8GN3		2.780	0.318	1.15	2.353	0.425	1.85	XX
TYKCEK		2.288	-0.174	-0.63	1.670	-0.258	-1.12	LE
UHUUZA		2.245	-0.217	-0.78	1.748	-0.180	-0.78	LH
UMPL98		2.971	0.509	1.83	2.397	0.469	2.04	TH
UPPW3L		2.367	-0.095	-0.34	1.788	-0.140	-0.61	IM
VDEJM7		2.914	0.452	1.63	2.445	0.517	2.25	XX
VRBXLE		2.306	-0.156	-0.56	1.711	-0.217	-0.94	LE
WG9ZD6		2.680	0.218	0.79	2.130	0.202	0.88	TO



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

Report #2835
 July 2016

WebCode	Data Flag	Sample SE33			Sample SE34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
X8G2Y6	*	2.063	-0.399	-1.44	1.845	-0.083	-0.36	IN
YWEZXX		2.309	-0.153	-0.55	1.754	-0.174	-0.76	SA

Sample SE33		Summary Statistics	Sample SE34	
Grand Means	2.4617 Percent		1.9281	Percent
SD Btwn Labs	0.2777 Percent		0.2299	Percent
Statistics based on 42 of 42 reporting participants				

Analysis Notes:

YWEZXX - One determination removed from the Lab Mean of Sample SE34 per Grubb's Test at 1% risk (TAPPI 1205).

Key to Instrument Codes Reported by Participants

ID	Instron 4201	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		

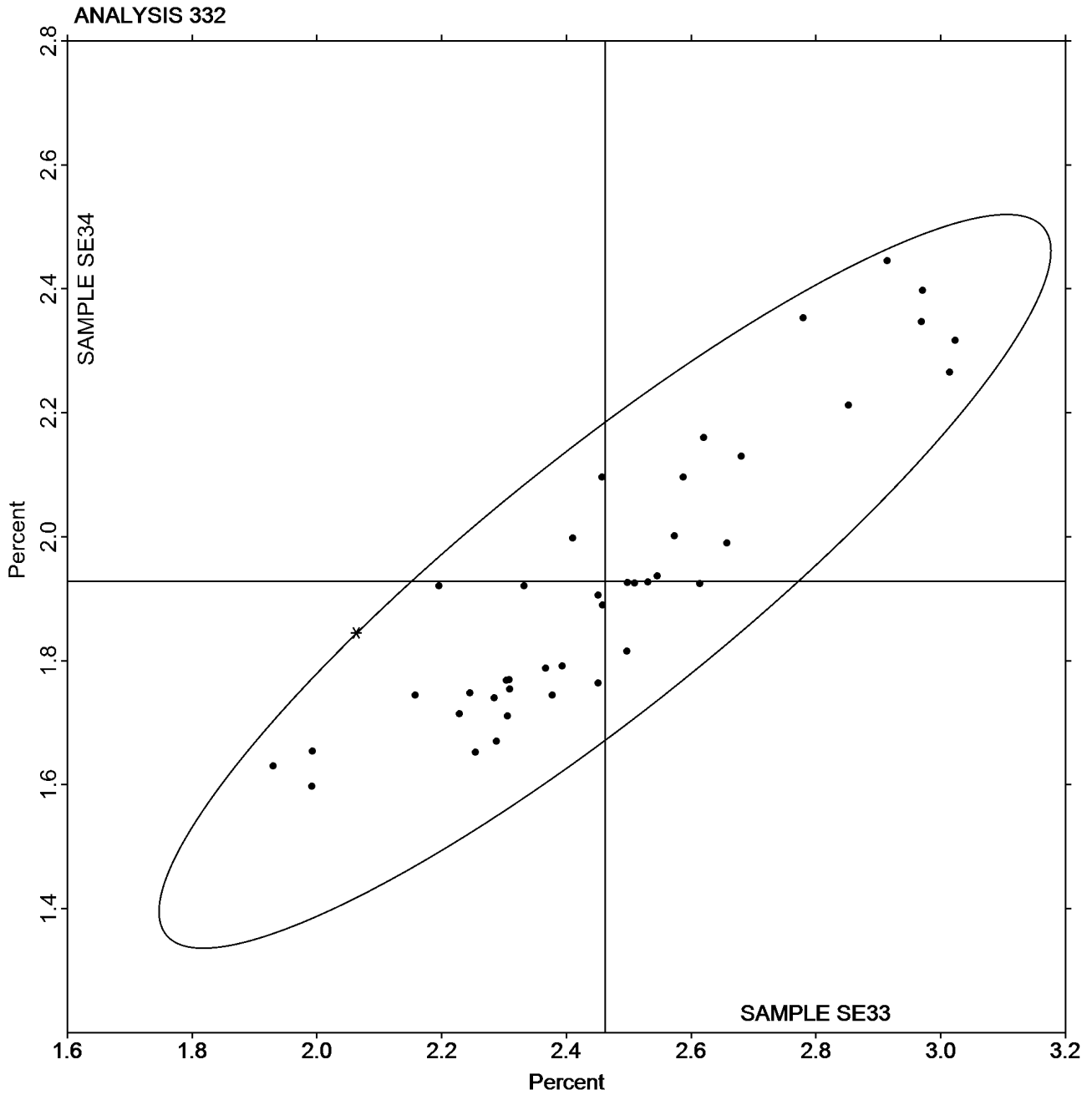


Paper & Paperboard Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers
TAPPI Official Test Method T494

Report #2835
July 2016

Grand Mean Sample **SE33** = 2.4617 Percent

Grand Mean Sample **SE34** = 1.9281 Percent





Paper & Paperboard Interlaboratory Testing Program
Analysis 334
Folding Endurance (MIT) - Double Folds
TAPPI Official Test Method T511

Report #2835
 July 2016

WebCode	Data Flag	Sample SG33			Sample SG34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3ARD6W		209.4	-6.9	-0.14	91.10	-1.99	-0.07	MT
4R83FF		223.4	7.1	0.14	72.20	-20.89	-0.70	MT
6TXNLB		138.3	-78.0	-1.59	63.20	-29.89	-1.00	MT
7TD879	*	202.5	-13.8	-0.28	149.10	56.01	1.87	MT
BN7BN4		218.6	2.3	0.05	90.90	-2.19	-0.07	MT
FBHUMY		296.1	79.8	1.63	133.80	40.71	1.36	MT
LG4ZLT		186.6	-29.7	-0.61	55.20	-37.89	-1.26	XX
PKAR6G		230.1	13.8	0.28	91.10	-1.99	-0.07	MT
RBHTQG		138.8	-77.5	-1.58	56.50	-36.59	-1.22	MT
TVMV2Q		181.5	-34.8	-0.71	84.90	-8.19	-0.27	XX
UMPL98		189.9	-26.4	-0.54	65.60	-27.49	-0.92	MT
VQ4HE9		271.0	54.7	1.12	128.80	35.71	1.19	MT
XCCR6G		285.1	68.8	1.41	116.50	23.41	0.78	MT
YULAR7		257.2	40.9	0.84	104.30	11.21	0.37	MT

Sample SG33			Summary Statistics	Sample SG34		
Grand Means	216.32	Double Folds		93.086	Double Folds	
SD Btwn Labs	48.94	Double Folds		29.978	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

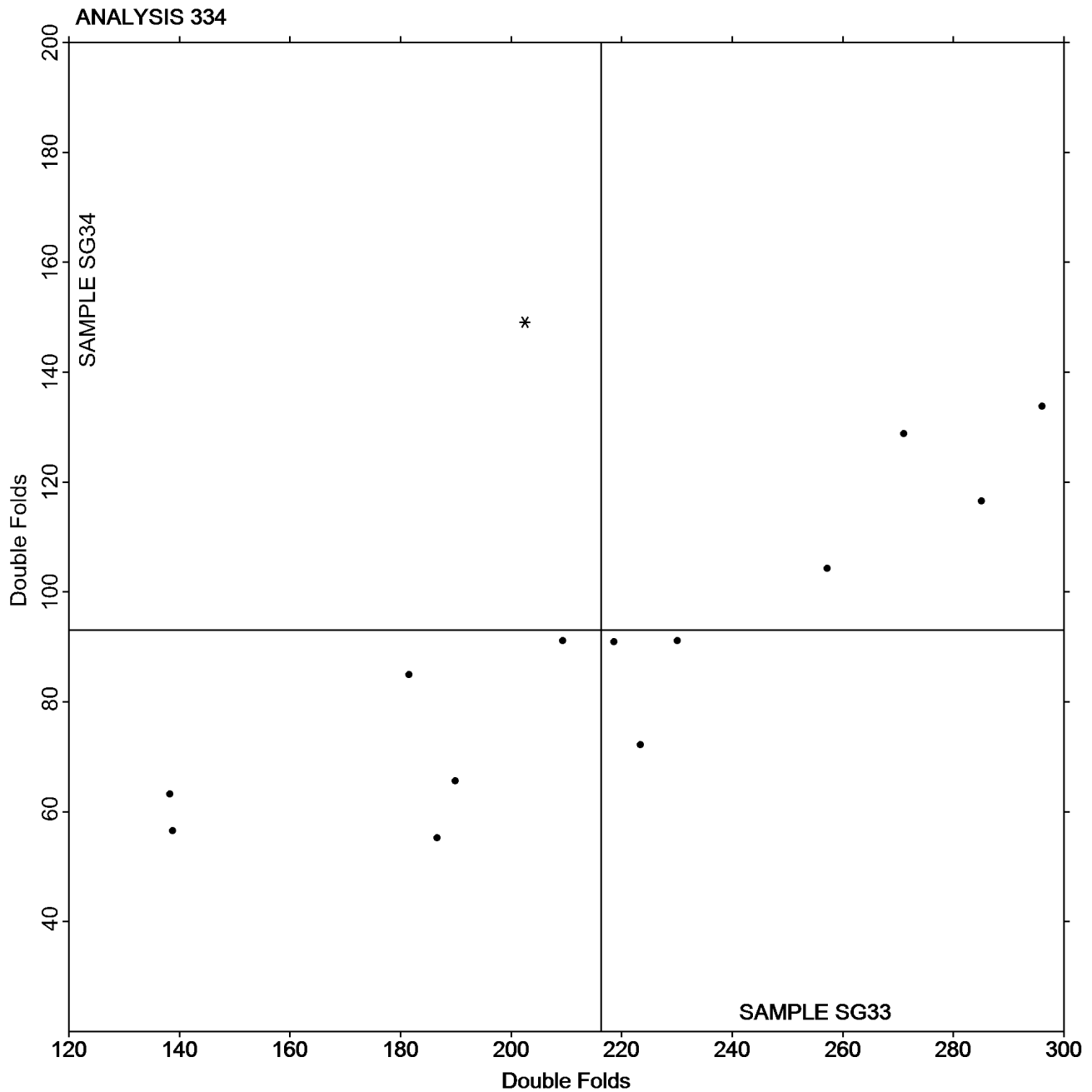


Paper & Paperboard Interlaboratory Testing Program
Analysis 334
Folding Endurance (MIT) - Double Folds
TAPPI Official Test Method T511

Report #2835
July 2016

Grand Mean Sample **SG33** = 216.32 Double Folds

Grand Mean Sample **SG34** = 93.086 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 #2835
 July 2016

WebCode	Data Flag	Sample SH33			Sample SH34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
4R83FF		624.9	71.0	1.67	375.2	27.2	0.94
7TD879		508.4	-45.6	-1.07	328.6	-19.4	-0.67
9UXX74		499.2	-54.8	-1.29	315.6	-32.4	-1.12
9UZNCM		588.1	34.1	0.80	364.0	16.1	0.55
B2RKB9		523.9	-30.0	-0.71	341.9	-6.1	-0.21
BM8ZUL		526.1	-27.8	-0.65	344.1	-3.9	-0.13
BN7BN4		572.8	18.8	0.44	368.5	20.5	0.71
C9L8JK		573.5	19.6	0.46	405.1	57.1	1.97
CYVLDL	X	322.7	-231.2	-5.43	185.6	-162.4	-5.61
DZN223		633.0	79.0	1.86	398.3	50.3	1.74
FAMBKX		482.3	-71.6	-1.68	304.9	-43.1	-1.49
NAFWRV		531.7	-22.3	-0.52	328.5	-19.5	-0.67
RYLQMM		577.8	23.9	0.56	320.3	-27.6	-0.95
TVMV2Q		567.2	13.2	0.31	352.0	4.1	0.14
VGDX9B		549.4	-4.5	-0.11	346.7	-1.3	-0.04
WRU2TE		608.3	54.4	1.28	384.0	36.1	1.24
XCCR6G		532.9	-21.1	-0.50	336.9	-11.1	-0.38
YGY3RJ		521.1	-32.9	-0.77	328.9	-19.1	-0.66
YZEBTK		550.6	-3.4	-0.08	320.2	-27.8	-0.96

Sample SH33		Summary Statistics	Sample SH34	
Grand Means	553.95 Gurley Units		347.99 Gurley Units	
SD Btwn Labs	42.58 Gurley Units		28.96 Gurley Units	
Statistics based on 18 of 19 reporting participants				

Comments on Assigned Data Flags for Test #336

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



Paper & Paperboard Interlaboratory Testing Program

Report #2835

Analysis 336

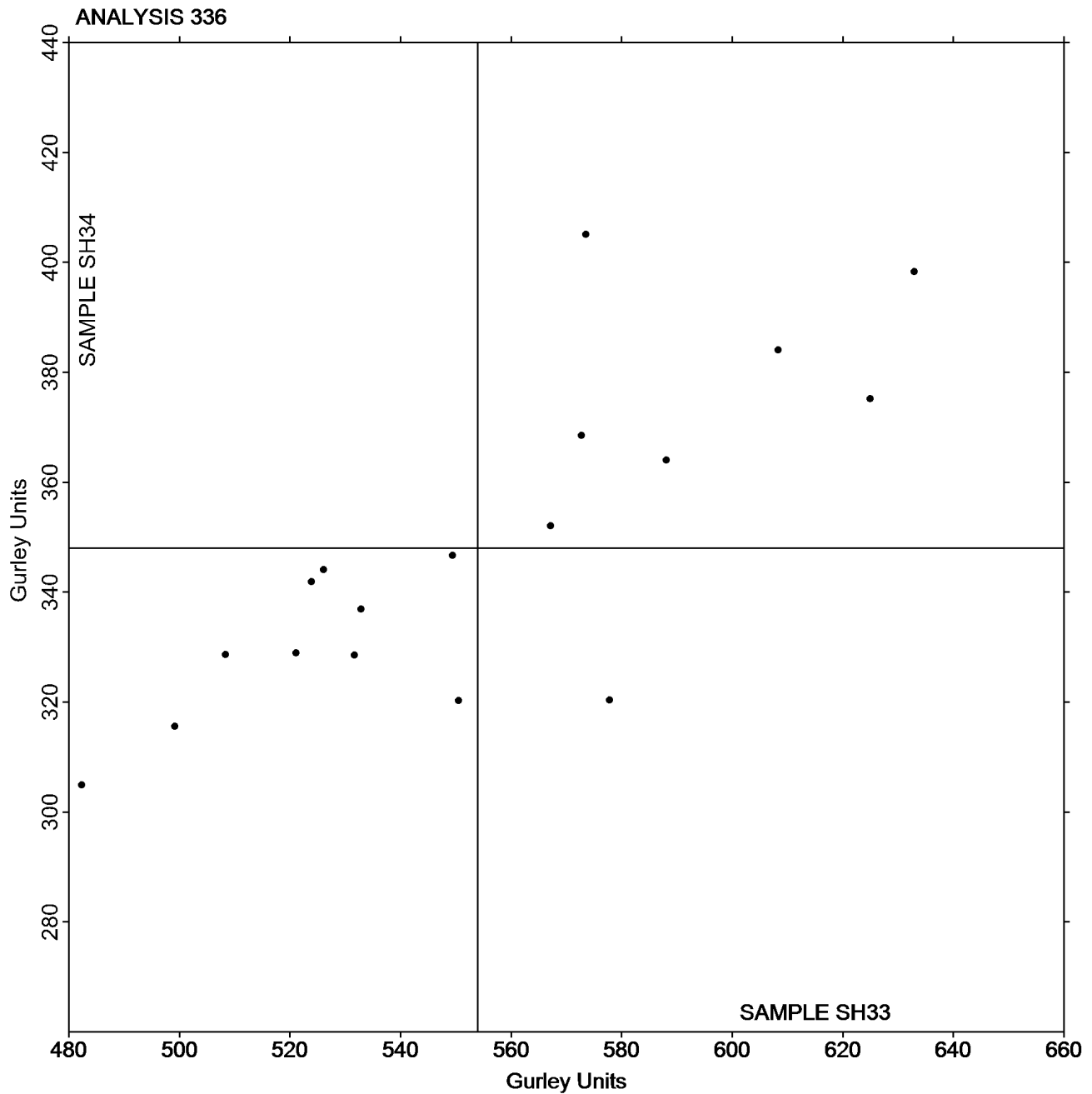
July 2016

Bending Resistance, Gurley Type

TAPPI Official Test Method T543

Grand Mean Sample **SH33** = 553.95 Gurley Units

Grand Mean Sample **SH34** = 347.99 Gurley 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 338
Bending Resistance, Taber Type - 0 to 10 Units
TAPPI Official Test Method T566

Report #2835
July 2016

WebCode	Data Flag	Sample SJ33			Sample SJ34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
766UC4		4.125	0.114	0.17	2.028	0.000	0.00
83V4NL		3.901	-0.110	-0.16	1.937	-0.091	-0.38
DZN223		4.356	0.345	0.51	2.209	0.181	0.75
FK7TD6		3.280	-0.731	-1.07	1.920	-0.108	-0.45
GN2YAL		4.060	0.049	0.07	1.820	-0.208	-0.87
HAE9PA		3.983	-0.028	-0.04	2.012	-0.016	-0.07
HKZDWA	X	0.110	-3.901	-5.72	0.010	-2.018	-8.40
LG4ZLT		2.284	-1.727	-2.53	2.130	0.102	0.43
RYLQMM		3.895	-0.116	-0.17	1.746	-0.282	-1.18
TVMV2Q		5.120	1.109	1.63	2.315	0.287	1.19
X8G2Y6		4.740	0.729	1.07	2.580	0.552	2.30
XCCR6G		4.060	0.049	0.07	1.710	-0.318	-1.32
XNPR2A		4.375	0.364	0.53	2.059	0.031	0.13
YZEBTK		3.966	-0.046	-0.07	1.897	-0.131	-0.54

		Summary Statistics	
	Sample SJ33		Sample SJ34
Grand Means	4.0111 Taber Units		2.0279 Taber Units
SD Btwn Labs	0.6817 Taber Units		0.2403 Taber Units
Statistics based on 13 of 14 reporting participants			

Comments on Assigned Data Flags for Test #338

HKZDWA (X) - Extreme Data.

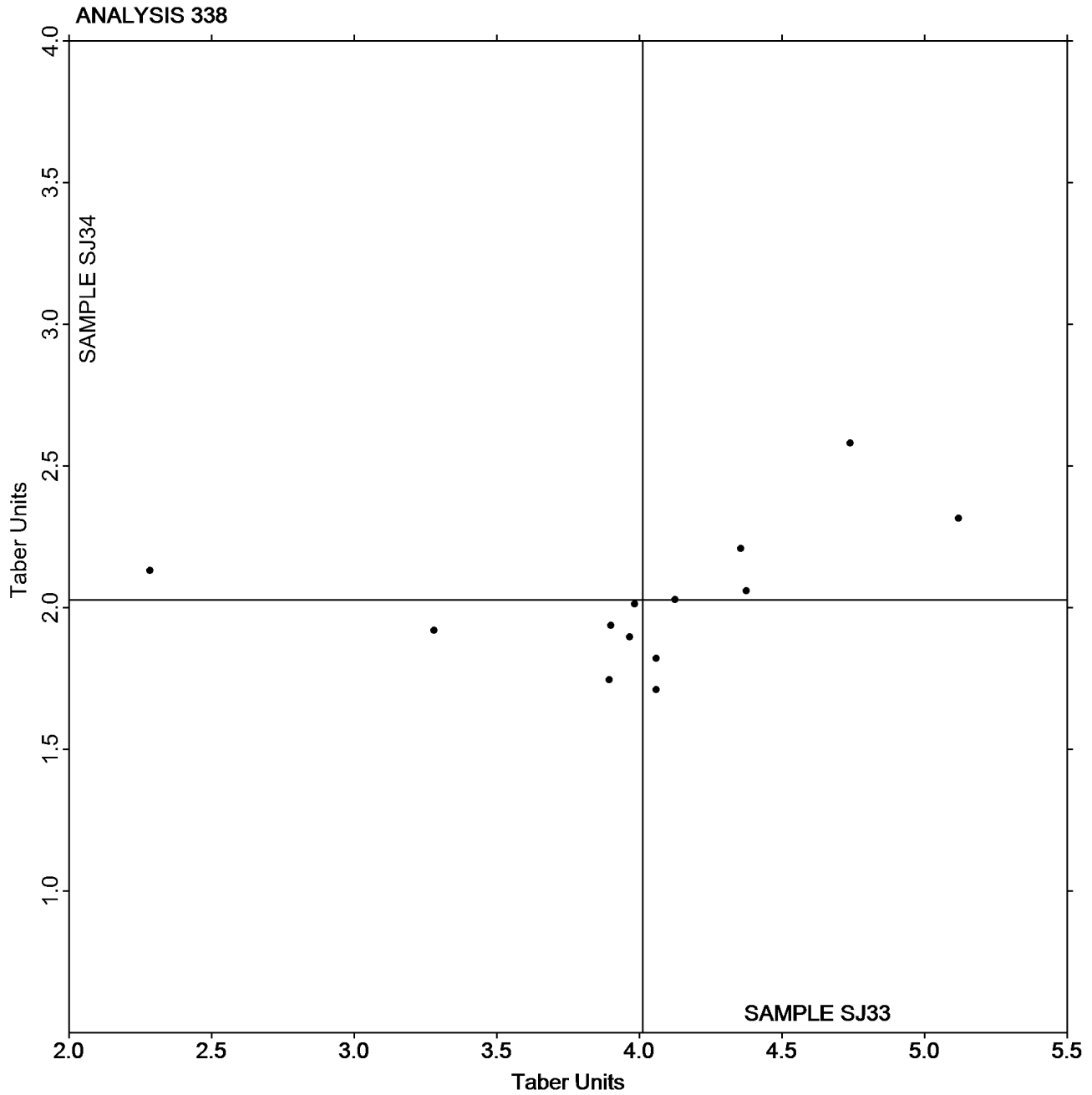


Paper & Paperboard Interlaboratory Testing Program
Analysis 338
Bending Resistance, Taber Type - 0 to 10 Units
TAPPI Official Test Method T566

Report #2835
July 2016

Grand Mean Sample **SJ33** = 4.0111 Taber Units

Grand Mean Sample **SJ34** = 2.0279 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 #2835
July 2016

WebCode	Data Flag	Sample SQ33			Sample SQ34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
6D2AN3		17.10	-1.26	-0.94	18.30	-1.59	-1.23
FK7TD6		17.55	-0.82	-0.61	19.70	-0.20	-0.15
LUR34K		15.68	-2.69	-1.99	17.26	-2.64	-2.03
MU7NDM		20.30	1.93	1.43	21.90	2.00	1.54
QYNFT6		19.67	1.30	0.96	21.18	1.28	0.99
R8JHVG	M	No data reported for this sample			28.53	8.63	6.65
RBHTQG		19.04	0.67	0.50	20.65	0.75	0.58
UC3JQC		20.02	1.65	1.22	20.69	0.79	0.61
UWNJUL		18.30	-0.07	-0.05	20.10	0.20	0.16
VGDX9B		19.02	0.65	0.48	20.40	0.50	0.39
WDALPF		17.16	-1.21	-0.90	18.67	-1.23	-0.94
WR63ED		18.35	-0.02	-0.01	20.35	0.45	0.35
XCCR6G		18.24	-0.13	-0.10	19.55	-0.35	-0.27

	Sample SQ33	Summary Statistics	Sample SQ34
Grand Means	18.369 Taber Units		19.896 Taber Units
SD Btwn Labs	1.348 Taber Units		1.298 Taber Units
Statistics based on 12 of 13 reporting participants			

Comments on Assigned Data Flags for Test #339

R8JHVG (M) - Participant did not submit data for sample SQ33.

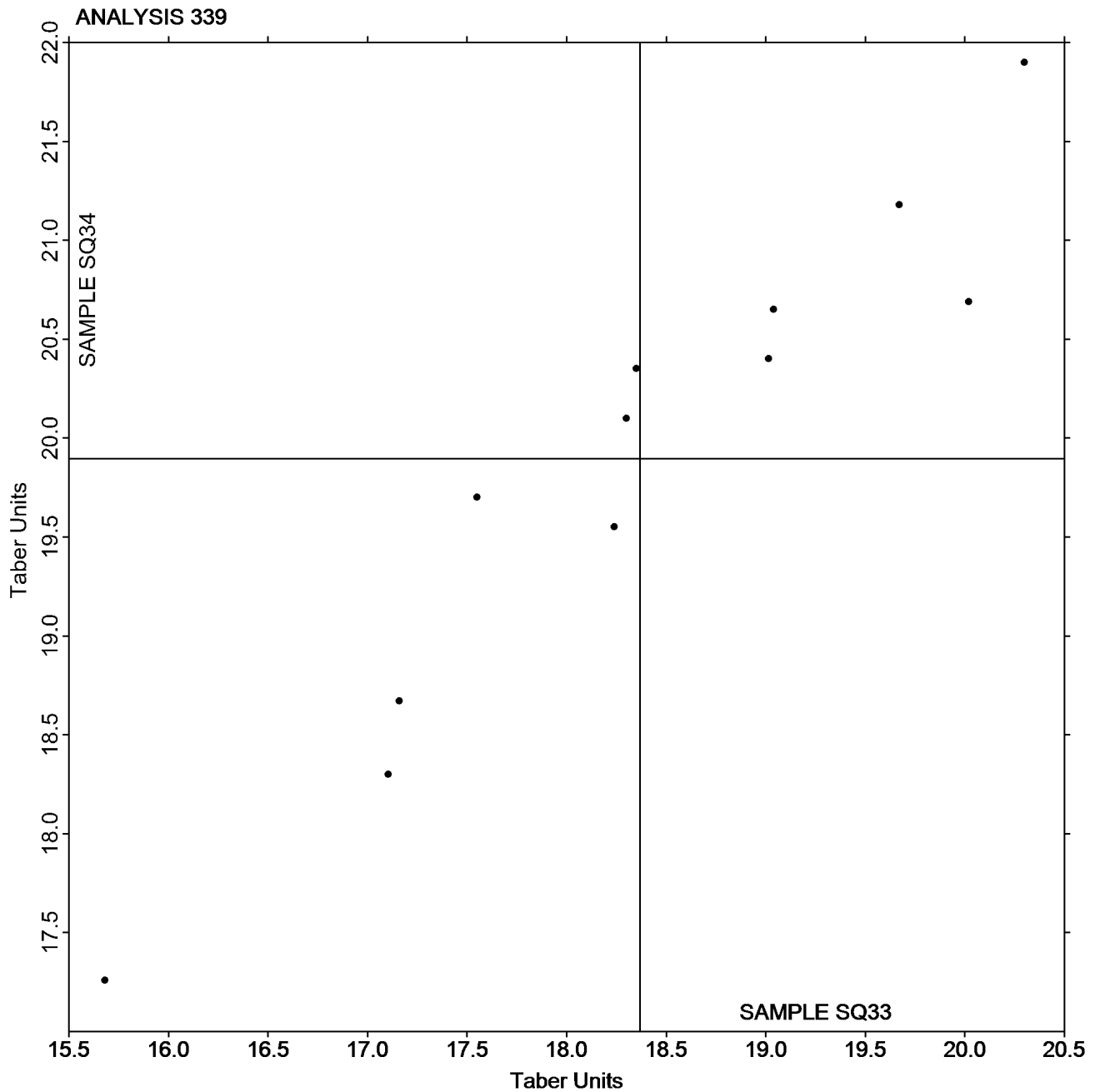


Paper & Paperboard Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units
TAPPI Official Test Method T489

Report #2835
July 2016

Grand Mean Sample **SQ33** = 18.369 Taber Units

Grand Mean Sample **SQ34** = 19.896 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 #2835
 July 2016

WebCode	Data Flag	Sample ST33			Sample ST34		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3N96U3	*	279.4	33.7	2.77	238.0	-1.4	-0.19
4FDPH4		245.0	-0.7	-0.05	238.2	-1.2	-0.16
4R83FF		235.4	-10.2	-0.84	238.4	-1.0	-0.13
7BRJXY		239.4	-6.3	-0.51	241.9	2.5	0.33
7RYZKR		248.9	3.3	0.27	241.1	1.7	0.22
C242KR		241.4	-4.3	-0.35	238.9	-0.5	-0.07
CN36NL		241.0	-4.7	-0.38	221.5	-17.9	-2.37
DZPR8L		242.0	-3.6	-0.30	237.8	-1.6	-0.21
E6VK2G		263.7	18.0	1.48	255.4	16.0	2.11
FK7TD6		228.3	-17.4	-1.43	229.3	-10.2	-1.34
M9NG2T	X	115.3	-130.4	-10.70	90.2	-149.2	-19.72
RBHTQG		235.8	-9.8	-0.81	242.7	3.3	0.43
UMPL98		245.8	0.1	0.01	248.7	9.3	1.23
VGDY9B		245.9	0.3	0.02	240.3	0.9	0.12
VM48H9		248.2	2.5	0.21	237.5	-1.9	-0.25
YWEZXX		244.6	-1.1	-0.09	241.4	2.0	0.26

Summary Statistics		
	Sample ST33	Sample ST34
Grand Means	245.65 Taber Units	239.40 Taber Units
SD Btwn Labs	12.19 Taber Units	7.57 Taber Units
Statistics based on 15 of 16 reporting participants		

Comments on Assigned Data Flags for Test #340

M9NG2T (X) - Extreme Data.

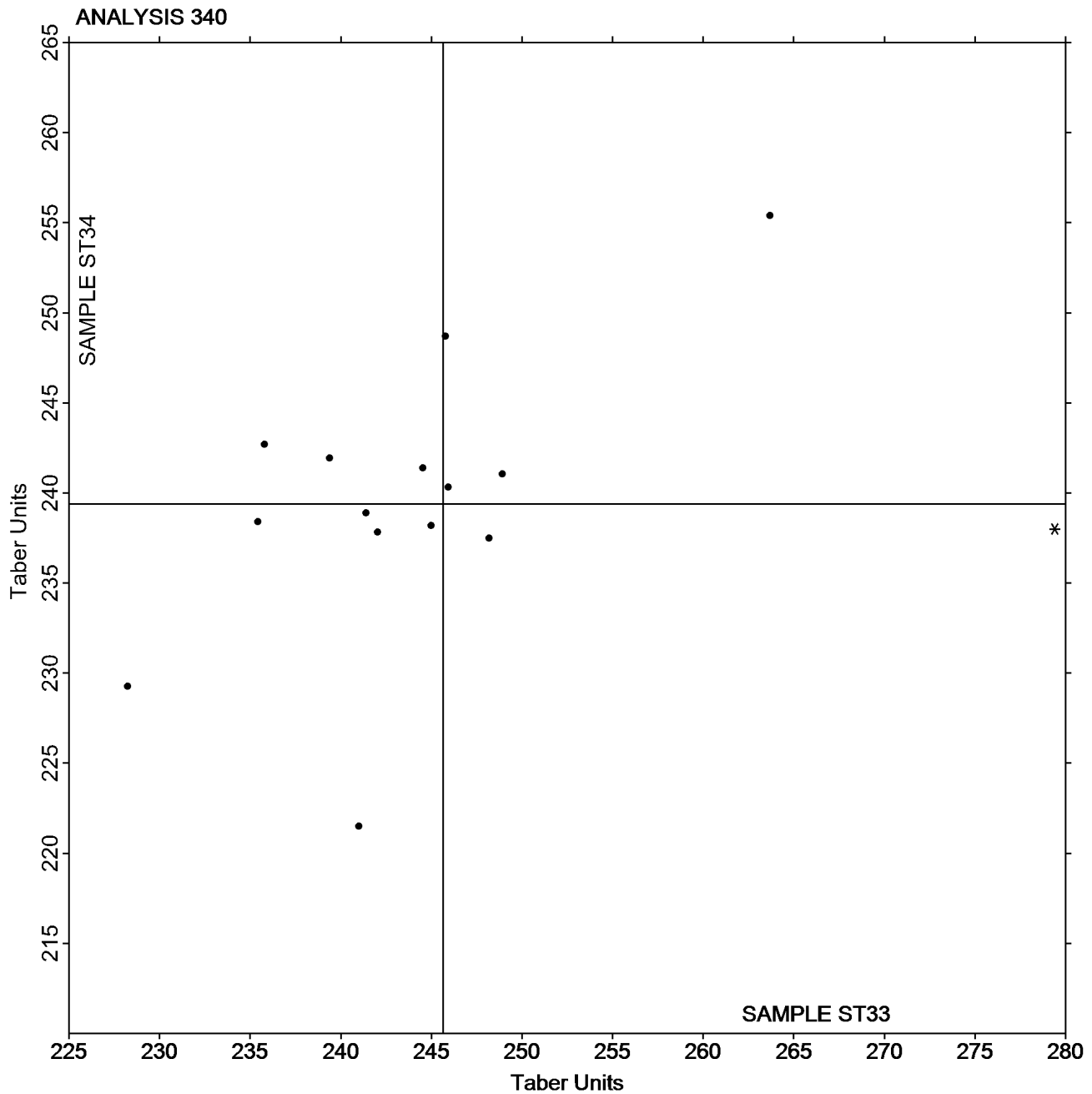


Paper & Paperboard Interlaboratory Testing Program
Analysis 340
Indenting Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
TAPPI Official Test Method T489

Report #2835
July 2016

Grand Mean Sample **ST33** = 245.65 Taber Units

Grand Mean Sample **ST34** = 239.40 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 #2835
July 2016

WebCode	Data Flag	Sample SM33			Sample SM34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4PDCA2		59.12	-6.60	-0.89	84.32	-11.02	-0.93	XX
6D2AN3		69.35	3.64	0.49	111.80	16.47	1.38	LW
7RYZKR		65.70	-0.02	0.00	90.21	-5.12	-0.43	LX
9ZY8CW		66.76	1.04	0.14	91.86	-3.48	-0.29	XX
ERRLQP		49.31	-16.40	-2.22	69.91	-25.43	-2.14	LW
JCLNWF		54.14	-11.58	-1.57	87.62	-7.72	-0.65	DT
JNCKVT		70.40	4.68	0.63	110.80	15.46	1.30	LW
L436PL		64.64	-1.08	-0.15	103.24	7.90	0.66	XX
M9NG2T		78.52	12.80	1.73	115.24	19.90	1.67	CA
MLVMRL		69.86	4.14	0.56	107.24	11.90	1.00	TA
MU7NDM		69.24	3.52	0.48	93.16	-2.18	-0.18	TA
QYNFT6		78.12	12.40	1.68	100.41	5.07	0.43	TA
RBHTQG		67.98	2.26	0.31	102.26	6.92	0.58	LW
UMPL98		63.92	-1.80	-0.24	89.32	-6.02	-0.51	LW
WDALPF		64.99	-0.73	-0.10	86.59	-8.75	-0.74	TZ
WG9ZD6		65.20	-0.52	-0.07	89.00	-6.34	-0.53	TA
XCCR6G		59.94	-5.78	-0.78	87.75	-7.58	-0.64	TZ

Sample SM33		Summary Statistics	Sample SM34	
Grand Means	65.718 psi		95.337 psi	
SD Btwn Labs	7.390 psi		11.898 psi	
Statistics based on 17 of 17 reporting participants				

Analysis Notes:

XCCR6G - Data appear to be transposed between samples. Switched by CTS.

Key to Instrument Codes Reported by Participants

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



Paper & Paperboard Interlaboratory Testing Program

Report #2835

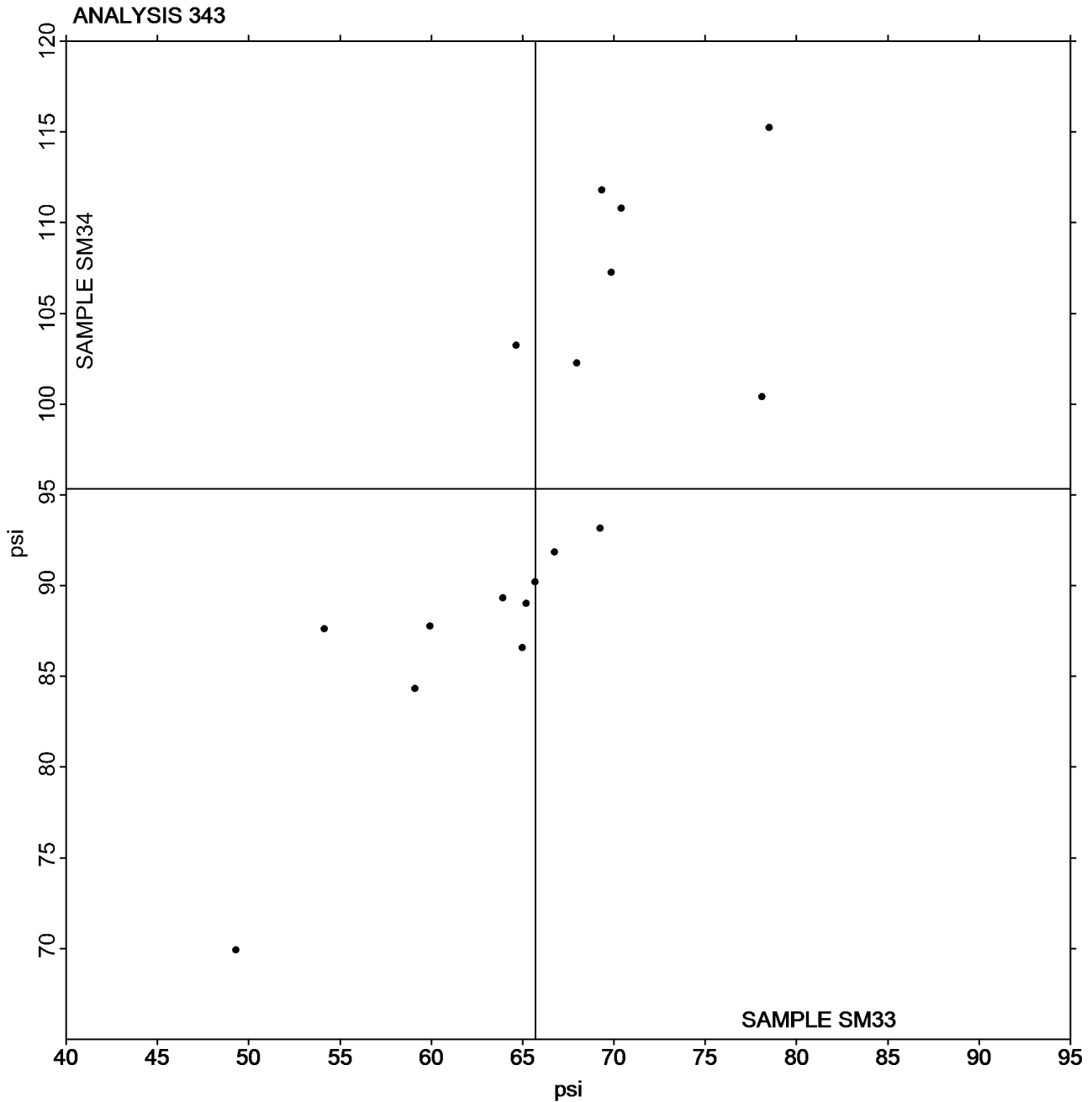
Analysis 343 Z-Direction Tensile

July 2016

TAPPI Official Test Method T541

Grand Mean Sample **SM33** = 65.718 psi

Grand Mean Sample **SM34** = 95.337 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 #2835
 July 2016

WebCode	Data Flag	Sample SZ33			Sample SZ34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2P6L7Z		38.98	0.09	0.02	38.77	-1.22	-0.27	CH
3N96U3		37.00	-1.90	-0.53	39.80	-0.19	-0.04	CA
4FDPH4		37.84	-1.06	-0.29	37.02	-2.97	-0.65	TL
4R83FF		35.64	-3.26	-0.91	35.94	-4.05	-0.88	CA
C242KR		42.60	3.70	1.03	44.40	4.41	0.96	CA
DZPR8L		36.36	-2.54	-0.71	38.76	-1.23	-0.27	TL
E6VK2G		43.40	4.50	1.25	47.60	7.61	1.66	CD
LN2TUM		46.27	7.37	2.05	47.82	7.84	1.71	PG
RCECTH		36.98	-1.92	-0.53	38.92	-1.07	-0.23	TL
VGDX9B		37.60	-1.30	-0.36	35.02	-4.97	-1.08	CA
Z7V7AE		35.20	-3.70	-1.03	35.80	-4.19	-0.91	LW

Sample SZ33		Summary Statistics	Sample SZ34	
Grand Means	38.898 psi		39.986 psi	
SD Btwn Labs	3.594 psi		4.587 psi	
Statistics based on 11 of 11 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	TL	TMI Lab Master

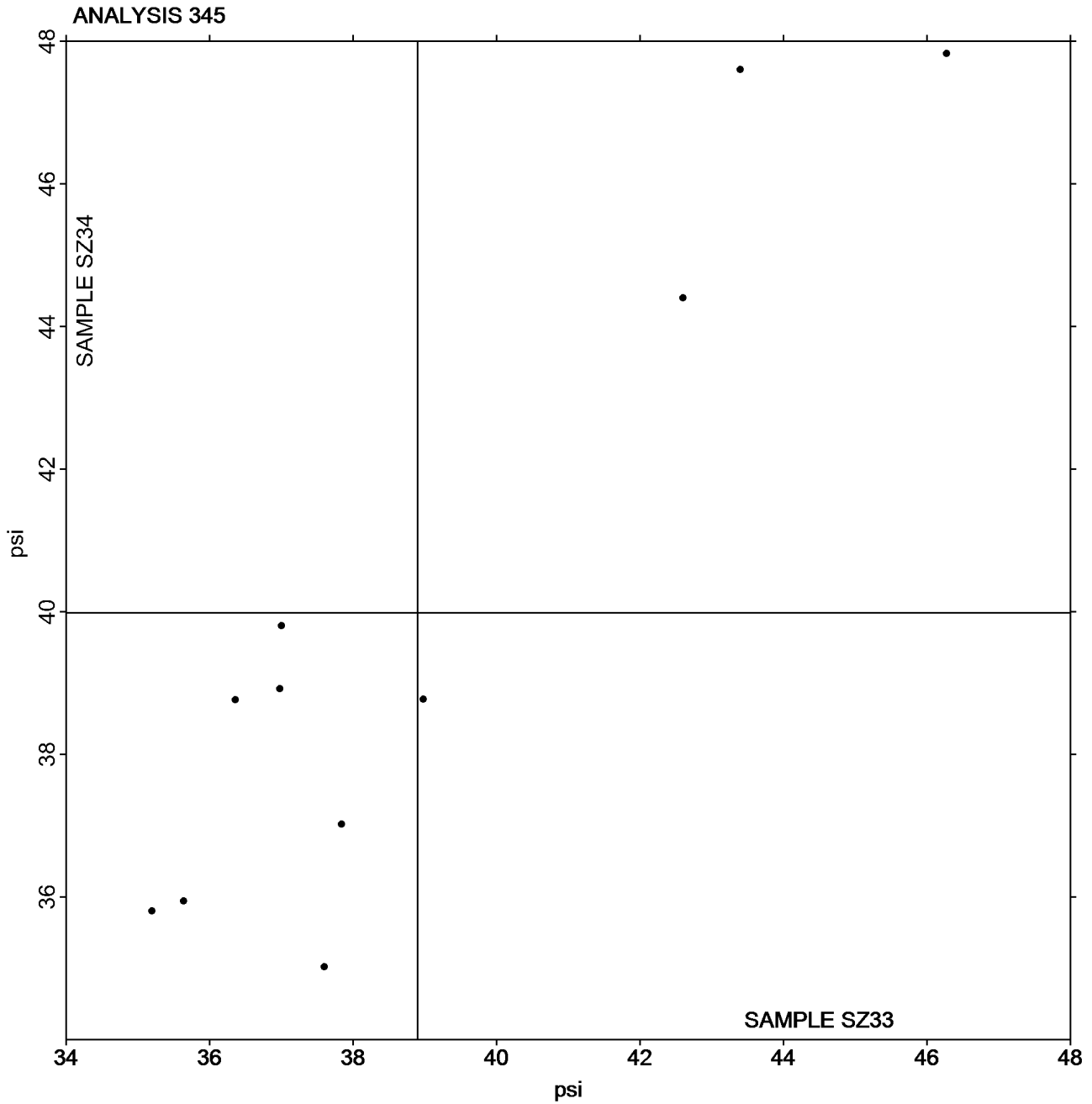


Paper & Paperboard Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard
TAPPI Official Test Method T541

Report #2835
July 2016

Grand Mean Sample **SZ33** = 38.898 psi

Grand Mean Sample **SZ34** = 39.986 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 #2835
July 2016

WebCode	Data Flag	Sample SN33			Sample SN34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4R83FF		100.8	-3.4	-0.46	145.2	-7.1	-0.37	HZ
7TD879		93.6	-10.6	-1.43	135.8	-16.5	-0.85	HY
9UZNCM		101.8	-2.4	-0.32	151.0	-1.3	-0.07	HZ
BM8ZUL		100.8	-3.4	-0.46	154.8	2.5	0.13	HY
CYVLDL		108.0	3.8	0.52	143.6	-8.7	-0.45	HY
DZN223		96.2	-7.9	-1.07	140.8	-11.5	-0.59	KR
DZPR8L		122.4	18.2	2.47	189.8	37.5	1.94	HZ
K2HTDB		105.0	0.8	0.11	157.0	4.7	0.24	HY
K3NHDY		105.0	0.8	0.11	150.6	-1.7	-0.09	HY
MLVMRL		114.6	10.4	1.42	160.2	7.9	0.41	HY
MU7NDM		108.0	3.8	0.52	158.0	5.7	0.29	HY
QYAQRD		113.8	9.6	1.31	151.2	-1.1	-0.06	HZ
QYNFT6		106.3	2.1	0.29	185.2	32.8	1.70	HZ
RBHTQG		103.8	-0.4	-0.05	155.4	3.1	0.16	HY
RYLQMM		102.7	-1.4	-0.20	157.8	5.5	0.28	HY
UMPL98	*	95.0	-9.2	-1.24	99.8	-52.5	-2.71	HZ
WDALPF		97.8	-6.4	-0.86	138.2	-14.1	-0.73	HY
XCCR6G		99.2	-5.0	-0.67	167.4	15.1	0.78	HY

		Summary Statistics			
		Sample SN33		Sample SN34	
Grand Means		104.16	1000th ft-lbs	152.32	1000th ft-lbs
SD Btwn Labs		7.37	1000th ft-lbs	19.35	1000th ft-lbs
Statistics based on 18 of 18 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

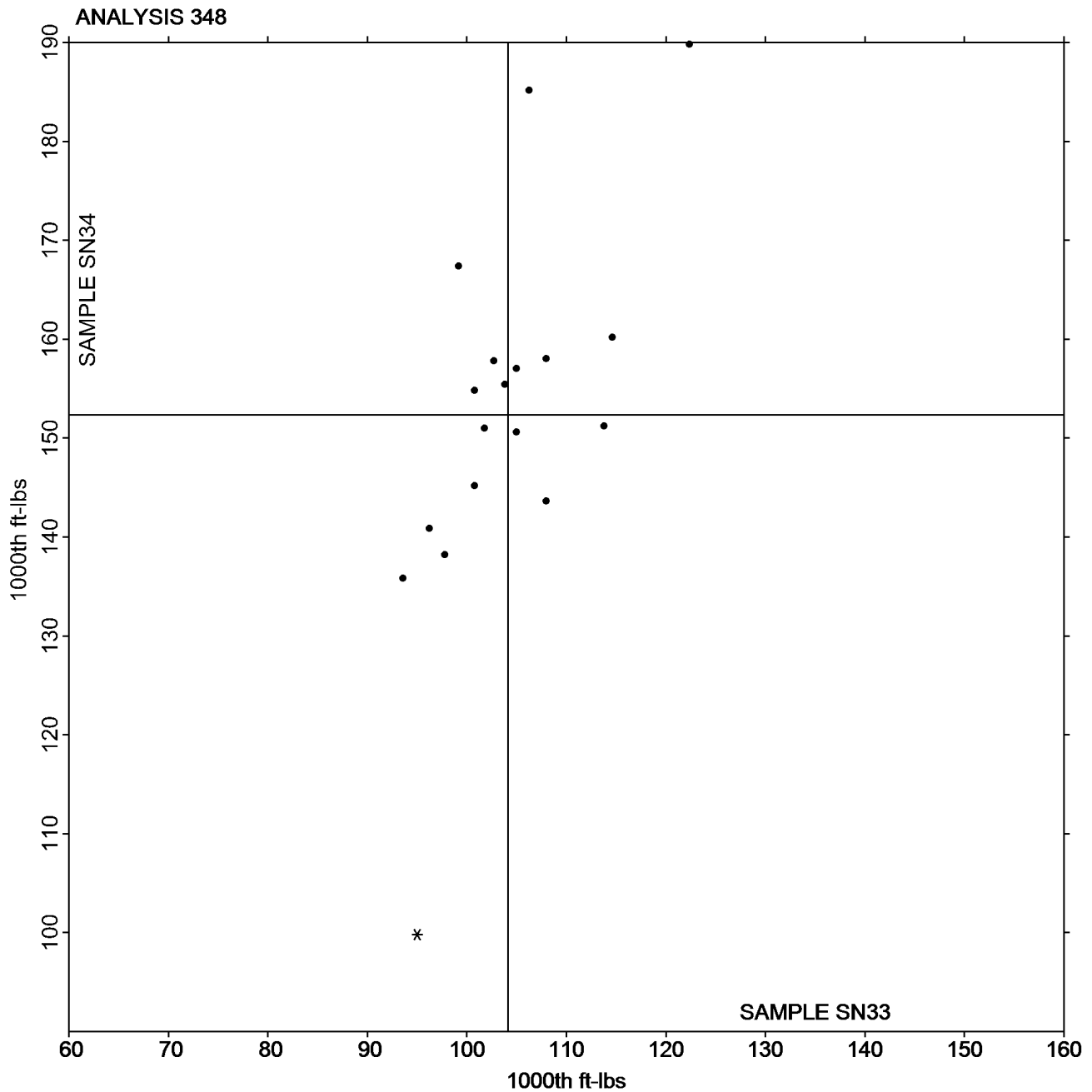


Paper & Paperboard Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics
TAPPI Provisional Test Method T569

Report #2835
July 2016

Grand Mean Sample **SN33** = 104.16 1000th ft-lbs

Grand Mean Sample **SN34** = 152.32 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 #2835
July 2016

WebCode	Data Flag	Sample SP33			Sample SP34			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2P6L7Z		89.20	-2.30	-0.24	127.0	-9.0	-0.40	TM
3Z79XW	X	93.60	2.10	0.22	151.6	15.6	0.69	XX
7RYZKR		75.18	-16.32	-1.69	99.9	-36.1	-1.59	TM
E7UVVY		89.55	-1.95	-0.20	118.2	-17.8	-0.78	XX
FK7TD6		89.38	-2.12	-0.22	160.7	24.7	1.09	XX
HBARRB		104.40	12.90	1.33	145.6	9.6	0.42	SC
JCLNWF	X	105.40	13.90	1.44	124.2	-11.8	-0.52	XX
L8ZL3F		91.60	0.10	0.01	136.8	0.8	0.03	SC
LN2TUM		82.20	-9.30	-0.96	132.6	-3.4	-0.15	TM
U4C2C4		105.20	13.70	1.42	176.4	40.4	1.78	SC
UHUUZA		96.80	5.30	0.55	127.0	-9.0	-0.40	TM

Sample SP33		Summary Statistics	Sample SP34	
Grand Means	91.502	1000th ft-lbs	136.02	1000th ft-lbs
SD Btwn Labs	9.672	1000th ft-lbs	22.71	1000th ft-lbs
Statistics based on 9 of 11 reporting participants				

Comments on Assigned Data Flags for Test #349

- JCLNWF (X) - Data appear to be off by a factor of .001 . Corrected by CTS (x1000).
- 3Z79XW (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

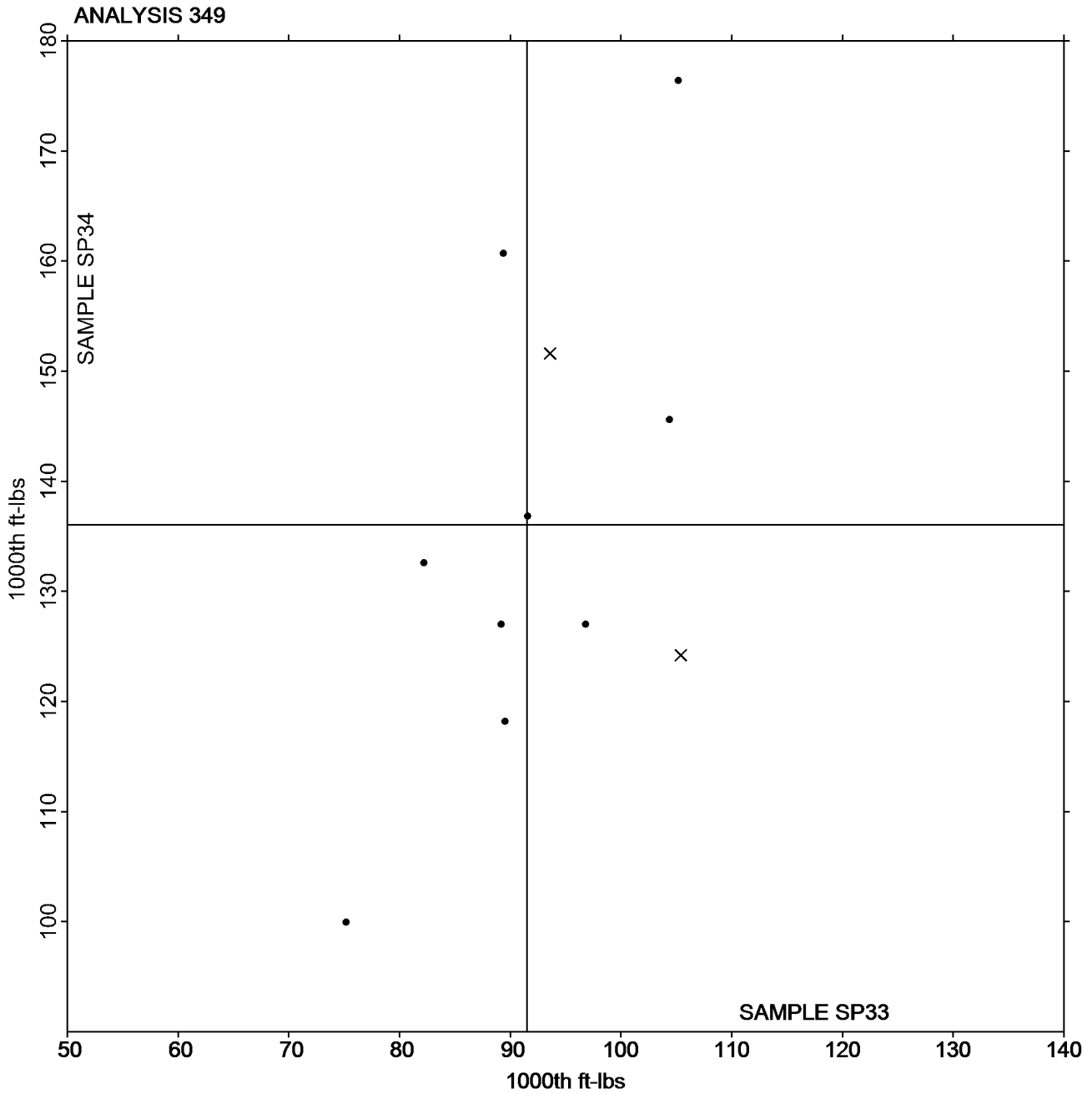


Paper & Paperboard Interlaboratory Testing Program
Analysis 349
Internal Bond Strength - Scott Bond Models
TAPPI Provisional Test Method T569

Report #2835
July 2016

Grand Mean Sample **SP33** = 91.502 1000th ft-lbs

Grand Mean Sample **SP34** = 136.02 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.