

Paper & Paperboard Interlaboratory Testing Program

Summary Report #289S - July 2017

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

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

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305	Bursting Strength - Printing Papers
310	Bursting Strength - Packaging Papers
311	Tearing Strength - Newsprint
312	Tearing Strength - Printing Papers
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320	Tensile Breaking Strength - Newsprint
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322	Elongation to Break - Newsprint
325	Tensile Breaking Strength - Printing Papers
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The CTS Paper & Paperboard Interlaboratory Fiberboard Program

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

About CTS

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

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 #289S
July 2017

WebCode	Data Flag	Sample SA45			Sample SA46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3UUZ4H		45.90	2.96	1.09	25.15	-0.71	-0.32
42QXT7		43.28	0.34	0.12	25.64	-0.21	-0.10
436EUQ		47.30	4.36	1.60	26.50	0.64	0.29
6DG2JG		41.57	-1.38	-0.51	25.05	-0.81	-0.36
8H6M3F		42.59	-0.35	-0.13	26.70	0.85	0.38
8MH9BM		43.38	0.44	0.16	28.26	2.40	1.07
9K636C		40.40	-2.54	-0.94	23.70	-2.16	-0.96
9NP6VG		46.96	4.01	1.48	28.98	3.12	1.39
APYG8R		43.66	0.72	0.26	26.34	0.48	0.22
BF4ZT8		44.30	1.36	0.50	24.80	-1.06	-0.47
DU2KRA	*	35.98	-6.96	-2.56	19.83	-6.03	-2.69
FU8VD4		39.71	-3.24	-1.19	24.28	-1.57	-0.70
GBE8KN		44.06	1.12	0.41	23.63	-2.23	-0.99
K7QYMY		45.00	2.06	0.76	28.50	2.64	1.18
KUEJN7		38.47	-4.47	-1.65	22.09	-3.77	-1.68
MGEUL3		41.32	-1.62	-0.60	27.04	1.18	0.53
NJKFBM		43.07	0.13	0.05	25.43	-0.43	-0.19
NVWPTL		44.42	1.47	0.54	27.73	1.87	0.83
P7PRAK		42.53	-0.42	-0.15	25.95	0.09	0.04
PEANJ2		40.30	-2.65	-0.97	23.36	-2.50	-1.11
QQWB32		46.58	3.63	1.34	29.29	3.43	1.53
RTGJQT		45.45	2.51	0.92	28.24	2.38	1.06
TAJJC2		41.00	-1.94	-0.71	25.91	0.06	0.02
UCK76W		42.08	-0.87	-0.32	27.53	1.67	0.75
VAVYKZ		44.30	1.36	0.50	26.50	0.64	0.29

	Sample SA45	Summary Statistics	Sample SA46
Grand Means	42.944 psi		25.857 psi
SD Btwn Labs	2.717 psi		2.243 psi
Statistics based on 25 of 25 reporting participants			



Paper & Paperboard Interlaboratory Testing Program

Report #2895

Analysis 305

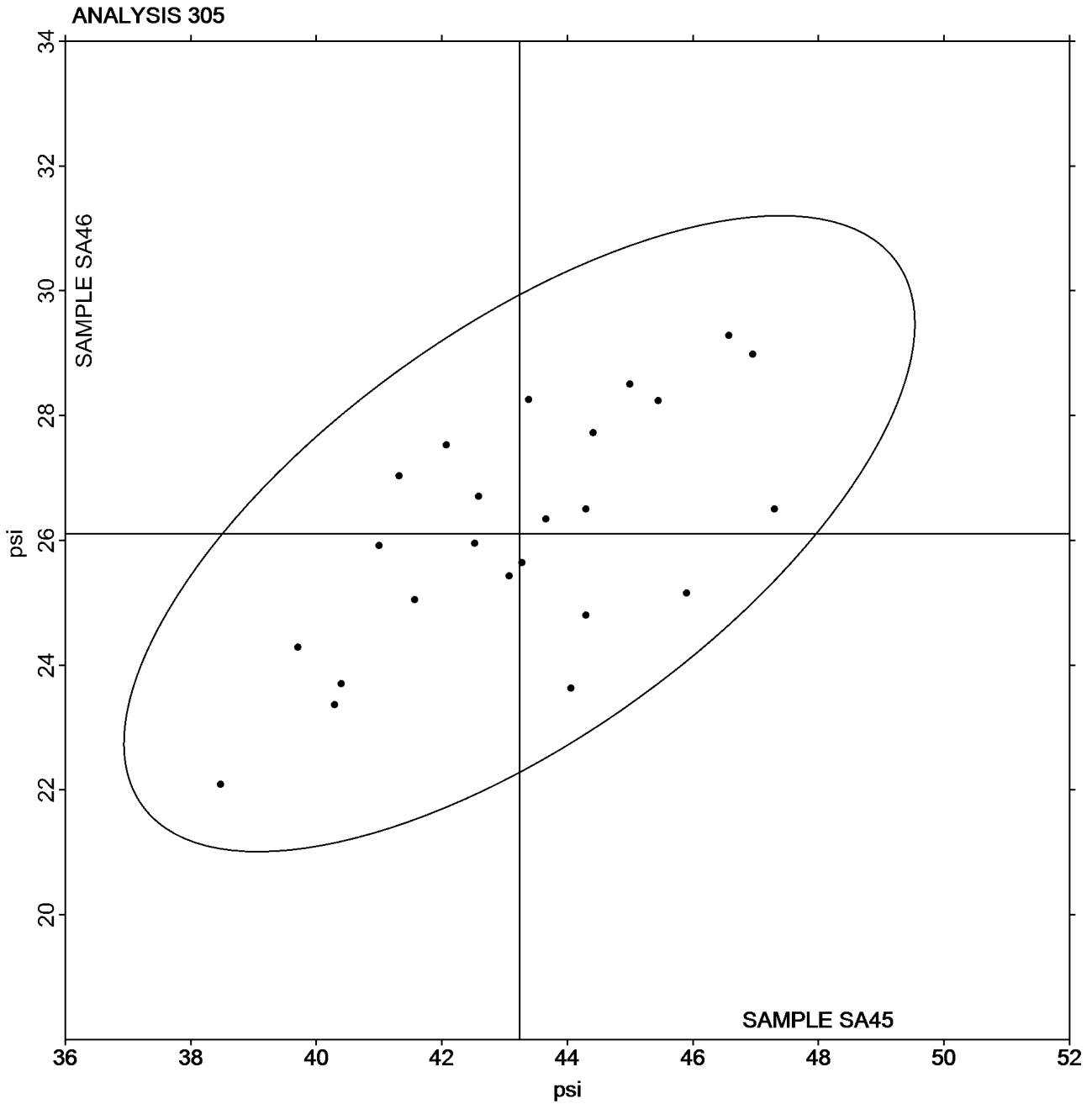
July 2017

Bursting Strength - Printing Papers

TAPPI Official Test Method T403

Grand Mean Sample SA45 = 42.944 psi

Grand Mean Sample SA46 = 25.857 psi





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

Report #2895
 July 2017

WebCode	Data Flag	Sample SB45			Sample SB46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
6PTB32		88.81	-1.45	-0.38	79.15	-8.78	-1.79
7JZVQY		90.79	0.53	0.14	90.07	2.14	0.44
8AAMNM	X	107.67	17.40	4.57	105.21	17.28	3.52
8FXERA		86.65	-3.61	-0.95	83.45	-4.48	-0.91
9GL6EZ		95.70	5.44	1.43	94.40	6.47	1.32
9HK7MD		89.82	-0.44	-0.12	87.98	0.05	0.01
9K636C		89.43	-0.83	-0.22	92.54	4.61	0.94
AURCC7		89.56	-0.70	-0.18	86.40	-1.53	-0.31
CE66RG		83.73	-6.53	-1.71	81.92	-6.01	-1.22
DG8BZV		90.79	0.53	0.14	89.20	1.27	0.26
DKVMYZ		93.72	3.46	0.91	90.28	2.35	0.48
EUXHGW		97.25	6.99	1.84	95.38	7.45	1.52
FJATBV		91.55	1.29	0.34	91.53	3.60	0.73
GZRBG2		95.83	5.57	1.46	95.90	7.97	1.62
HNVL2R		88.26	-2.00	-0.53	84.43	-3.50	-0.71
KK9LWW		93.26	3.00	0.79	94.46	6.53	1.33
L6MTKU		89.85	-0.41	-0.11	82.70	-5.23	-1.06
LWGRMP		88.05	-2.21	-0.58	83.55	-4.38	-0.89
NBNMUG		88.43	-1.84	-0.48	86.57	-1.36	-0.28
NVWPTL		93.92	3.66	0.96	89.28	1.35	0.27
PBLGQR		94.30	4.04	1.06	88.40	0.47	0.10
R73ZBJ		93.60	3.34	0.88	94.90	6.97	1.42
REVBFL		84.30	-5.96	-1.57	77.70	-10.23	-2.08
RXANKW		93.81	3.55	0.93	91.03	3.10	0.63
UCK76W		85.73	-4.53	-1.19	84.25	-3.68	-0.75
WFRHT9		84.98	-5.28	-1.39	83.30	-4.63	-0.94
XE22GU		85.52	-4.74	-1.24	89.68	1.76	0.36
XWVEPC		86.16	-4.10	-1.08	86.26	-1.67	-0.34
YJM9D9		93.50	3.24	0.85	87.30	-0.63	-0.13

	Sample SB45	Summary Statistics	Sample SB46
Grand Means	90.261 psi		87.929 psi
SD Btwn Labs	3.807 psi		4.914 psi
Statistics based on 28 of 29 reporting participants			

Comments on Assigned Data Flags for Test #310

8AAMNM (X) - Data for both samples are high.

Analysis Notes:

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



Paper & Paperboard Interlaboratory Testing Program

Report #2895

Analysis 310

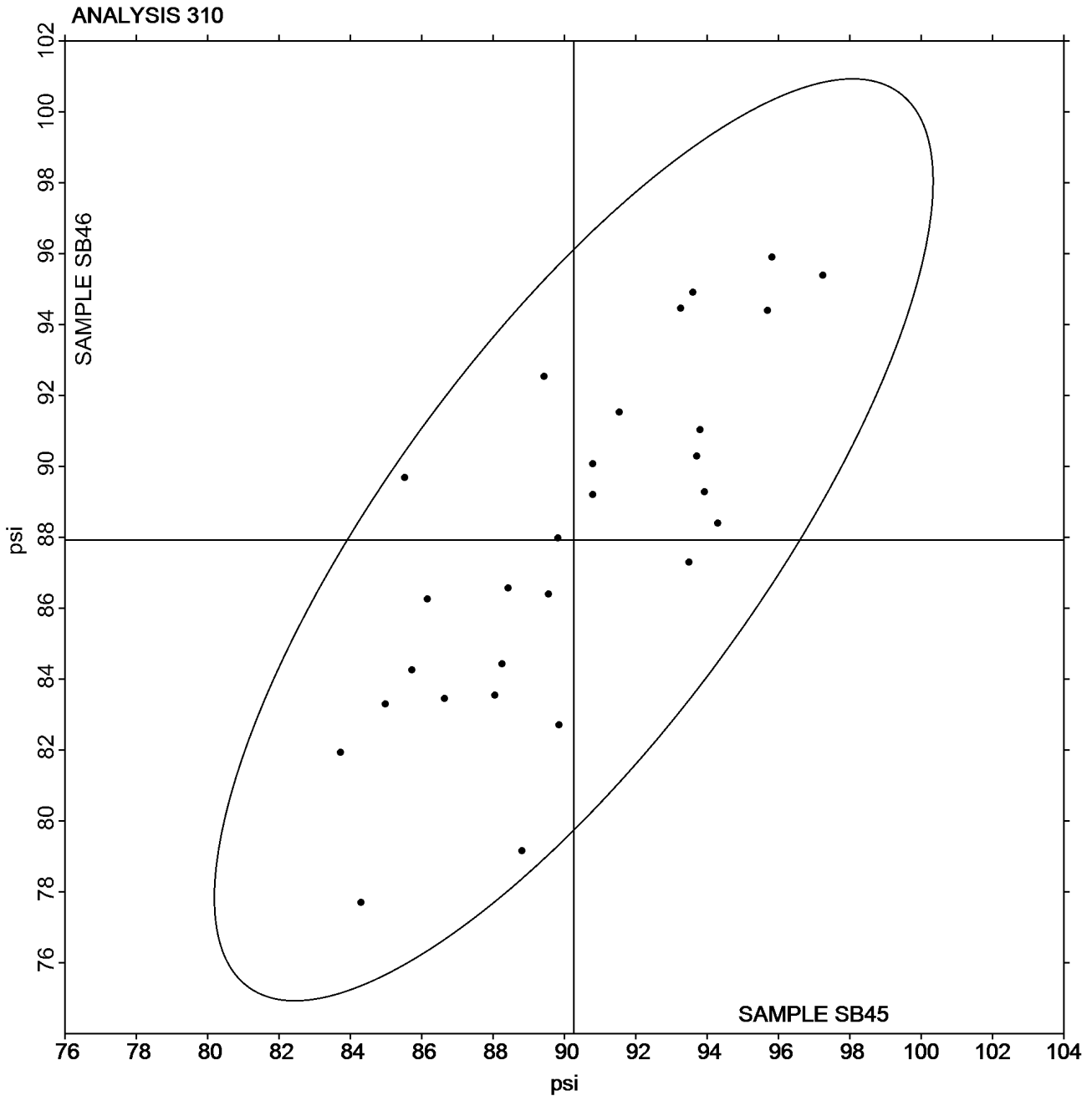
July 2017

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

Grand Mean Sample **SB45** = 90.261 psi

Grand Mean Sample **SB46** = 87.929 psi





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

Report #289S
July 2017

WebCode	Data Flag	Sample SK45			Sample SK46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
8MH9BM		26.04	-2.70	-0.84	19.95	-1.73	-0.69
BBYVLG		33.55	4.81	1.50	25.20	3.52	1.40
DMHAK2		27.31	-1.43	-0.45	20.81	-0.87	-0.35
NKVE7W		26.78	-1.96	-0.61	20.13	-1.55	-0.62
NVWPTL		27.10	-1.64	-0.51	19.65	-2.03	-0.81
RTGJQT		27.18	-1.56	-0.49	20.61	-1.07	-0.43
XC9GTU		33.22	4.48	1.40	25.42	3.74	1.49

		Summary Statistics			
		Sample SK45		Sample SK46	
Grand Means		28.741 Grams		21.681 Grams	
SD Btwn Labs		3.202 Grams		2.510 Grams	
Statistics based on 7 of 7 reporting participants					



Paper & Paperboard Interlaboratory Testing Program

Report #289S

Analysis 311

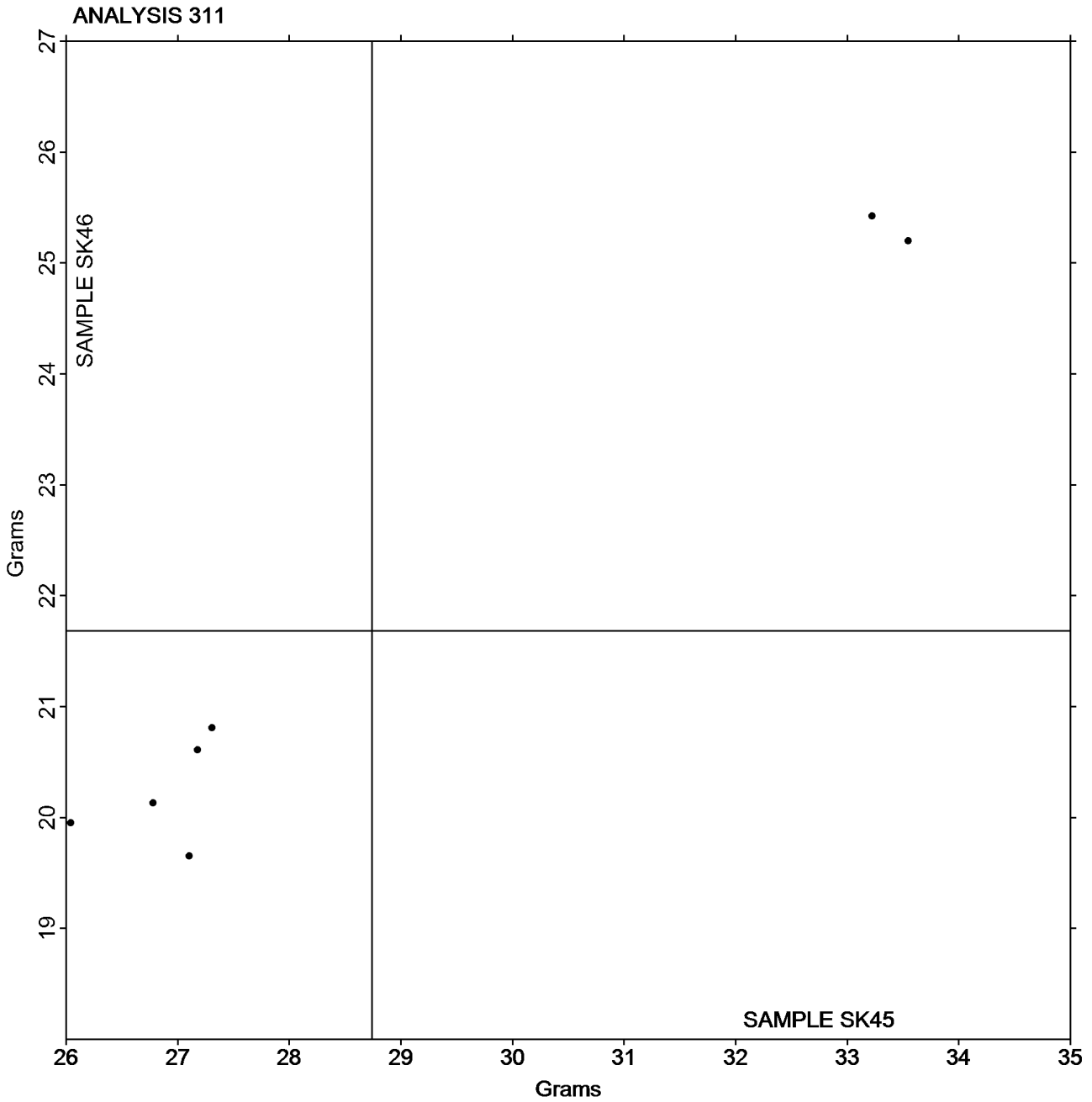
July 2017

Tearing Strength - Newsprint

TAPPI Official Test Method T414

Grand Mean Sample **SK45** = 28.741 Grams

Grand Mean Sample **SK46** = 21.681 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 #289S

Analysis 312

July 2017

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SC45			Sample SC46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3PZWLC		65.20	1.45	0.32	62.77	-1.99	-0.49
3UUZ4H		59.44	-4.31	-0.95	59.84	-4.92	-1.22
42QXT7		65.25	1.50	0.33	66.35	1.59	0.39
436EUQ		69.20	5.45	1.21	70.20	5.44	1.35
4F86CN		74.79	11.04	2.44	73.17	8.41	2.08
4TV8UG		66.77	3.02	0.67	67.57	2.81	0.70
6DG2JG		65.74	1.99	0.44	67.15	2.38	0.59
6PTB32		63.53	-0.22	-0.05	65.88	1.12	0.28
7RZ9TM		63.17	-0.58	-0.13	65.37	0.61	0.15
8FXERA		62.79	-0.96	-0.21	63.93	-0.83	-0.21
9HK7MD		60.45	-3.30	-0.73	62.99	-1.77	-0.44
9NP6VG	X	58.20	-5.55	-1.23	65.26	0.50	0.12
APYG8R		66.90	3.15	0.70	64.90	0.14	0.03
BF4ZT8		66.06	2.31	0.51	66.20	1.44	0.36
CE66RG		56.82	-6.93	-1.53	58.20	-6.56	-1.63
CX44EH		61.74	-2.01	-0.44	63.04	-1.72	-0.43
D7DWZX		70.48	6.73	1.49	73.02	8.26	2.05
DG8BZV		72.31	8.56	1.89	71.11	6.35	1.57
DU2KRA		66.60	2.85	0.63	67.61	2.85	0.71
FBE3C7		67.37	3.62	0.80	68.43	3.67	0.91
FJATBV		63.88	0.13	0.03	64.31	-0.45	-0.11
FU8VD4		63.64	-0.11	-0.02	63.64	-1.12	-0.28
GBE8KN		63.06	-0.69	-0.15	65.40	0.64	0.16
HNVL2R		63.07	-0.68	-0.15	65.85	1.09	0.27
HT8KGR		67.00	3.25	0.72	67.00	2.24	0.55
J2XATL		58.54	-5.21	-1.15	59.16	-5.60	-1.39
J3DP63		56.92	-6.83	-1.51	57.24	-7.52	-1.86
JLLR38		69.90	6.15	1.36	67.50	2.74	0.68
JTQL4U		60.94	-2.81	-0.62	62.34	-2.42	-0.60
K9CQNT		61.86	-1.89	-0.42	62.38	-2.38	-0.59
KK9LWW		61.27	-2.48	-0.55	59.82	-4.94	-1.22
KUEJN7		73.07	9.32	2.06	73.92	9.16	2.27
KXWJ78		62.46	-1.29	-0.29	62.20	-2.56	-0.63
L6MTKU		56.90	-6.85	-1.52	58.31	-6.45	-1.60
M4ET92		65.28	1.53	0.34	64.71	-0.05	-0.01
MGEUL3		60.32	-3.43	-0.76	62.38	-2.38	-0.59
NJKFBM		63.04	-0.71	-0.16	64.56	-0.20	-0.05
NVWPTL		62.96	-0.79	-0.18	64.22	-0.54	-0.13
P7PRAK		64.66	0.91	0.20	65.71	0.95	0.23
PEANJ2		66.54	2.79	0.62	70.12	5.36	1.33



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

Report #289S
 July 2017

WebCode	Data Flag	Sample SC45			Sample SC46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
QCA8DH		71.63	7.88	1.74	71.93	7.17	1.78
QQWB32		63.37	-0.38	-0.08	63.66	-1.10	-0.27
REVBFL	*	52.40	-11.35	-2.51	57.00	-7.76	-1.92
RHDB4F		56.08	-7.67	-1.70	58.20	-6.56	-1.63
T6NPGL		64.26	0.51	0.11	66.54	1.78	0.44
TAJJC2		61.32	-2.43	-0.54	63.35	-1.41	-0.35
TEDHQW	X	76.74	12.99	2.88	65.87	1.11	0.28
UCK76W		63.28	-0.47	-0.10	63.33	-1.43	-0.35
UVVX8Y	X	104.80	41.05	9.09	82.60	17.84	4.42
VAVYKZ		63.58	-0.17	-0.04	66.04	1.28	0.32
WBKUF8		60.94	-2.81	-0.62	62.10	-2.66	-0.66
WFRHT9		66.00	2.25	0.50	66.57	1.80	0.45
WQDM28	*	56.48	-7.27	-1.61	61.36	-3.40	-0.84
XEF2GU		65.12	1.37	0.30	66.65	1.89	0.47
YKMPUW		60.60	-3.15	-0.70	62.40	-2.36	-0.59

Sample SC45		Summary Statistics	Sample SC46	
Grand Means	63.749 Grams		64.763 Grams	
SD Btwn Labs	4.517 Grams		4.037 Grams	
Statistics based on 52 of 55 reporting participants				

Comments on Assigned Data Flags for Test #312

9NP6VG (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SC46.

UVVX8Y (X) - Extreme Data.

TEDHQW (X) - Data for sample SC45 are high.

Analysis Notes:

KK9LWW - Data appear to be reported as mN, not gf as indicated on datasheet. Units corrected by CTS.



Paper & Paperboard Interlaboratory Testing Program

Report #2895

Analysis 312

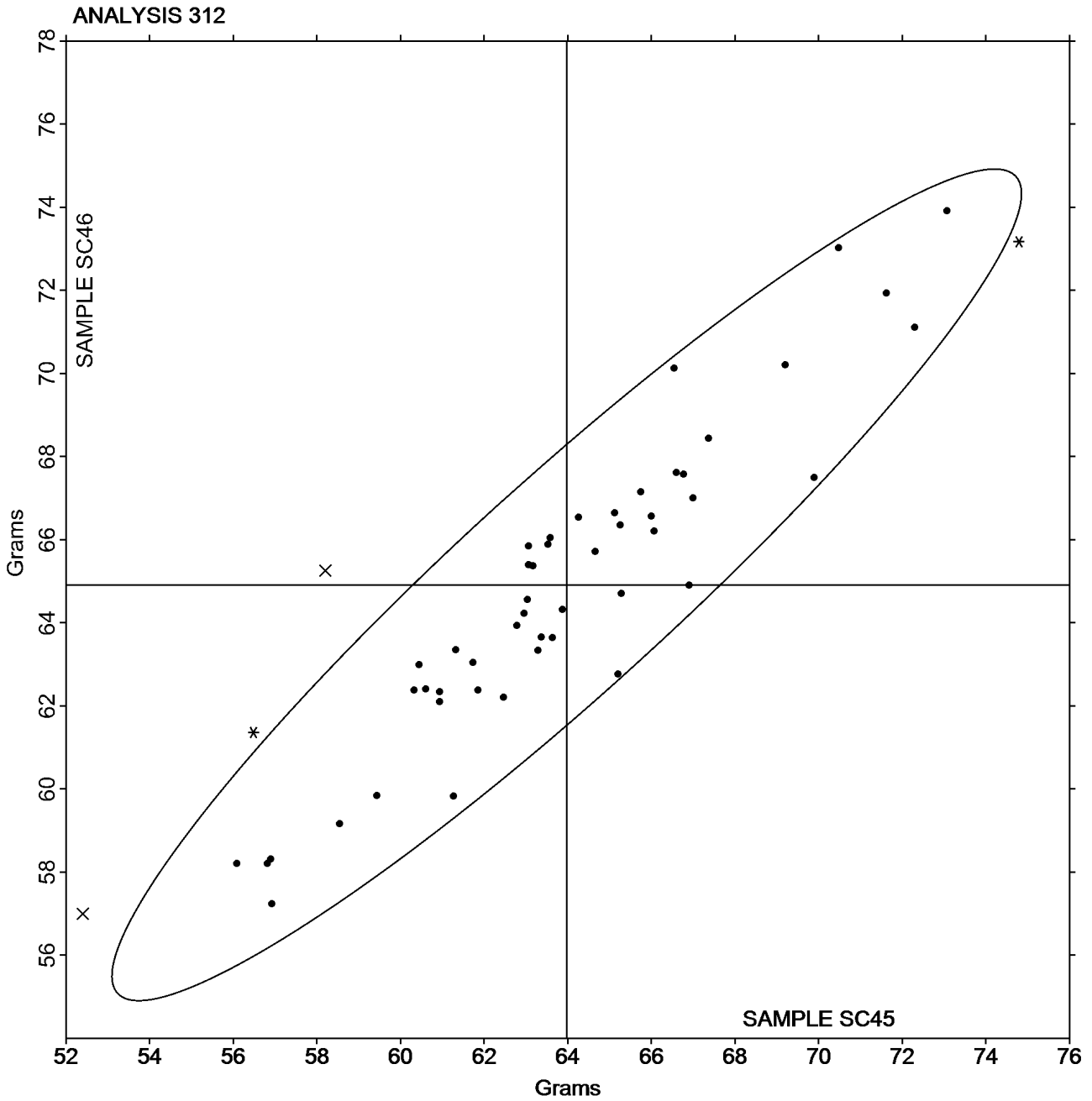
July 2017

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

Grand Mean Sample **SC45** = 63.749 Grams

Grand Mean Sample **SC46** = 64.763 Grams





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

Report #2895
 July 2017

WebCode	Data Flag	Sample SD45			Sample SD46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2L4XP2		187.0	5.3	0.27	176.1	-24.8	-1.24
36ULEM		177.9	-3.8	-0.19	193.9	-6.9	-0.35
6WUTD7		199.9	18.2	0.91	220.3	19.4	0.97
7F8PEH		201.0	19.3	0.97	227.4	26.5	1.32
7JZVQY		200.5	18.8	0.94	223.5	22.7	1.13
7U42P8		186.1	4.4	0.22	209.8	8.9	0.44
9K636C		176.8	-4.9	-0.25	204.8	3.9	0.20
9WGHW3		216.3	34.6	1.74	224.3	23.4	1.17
AURCC7		179.5	-2.2	-0.11	199.8	-1.1	-0.05
BKZMLV	*	132.4	-49.3	-2.48	152.3	-48.5	-2.42
CRFFJD		184.1	2.4	0.12	200.4	-0.5	-0.03
DKVMYZ		206.9	25.1	1.26	248.2	47.4	2.36
E79WFN		206.3	24.6	1.23	192.2	-8.7	-0.43
GZRBG2		151.3	-30.4	-1.53	173.5	-27.4	-1.36
KELR7Q		174.1	-7.6	-0.38	200.1	-0.7	-0.04
KMTQER		147.5	-34.2	-1.72	161.9	-39.0	-1.95
LWGRMP		186.8	5.1	0.26	220.4	19.5	0.97
NBNMUG		200.1	18.4	0.92	189.0	-11.8	-0.59
NKY2KP		187.6	5.9	0.30	219.2	18.4	0.92
NVWPTL		174.0	-7.7	-0.39	201.3	0.4	0.02
P8M36M		174.8	-6.9	-0.35	199.4	-1.5	-0.07
PBLGQR		201.6	19.9	1.00	192.8	-8.1	-0.40
PH78LZ		186.6	4.9	0.25	205.3	4.4	0.22
PW6LDG		189.2	7.5	0.38	204.4	3.5	0.18
QCA8DH		184.8	3.1	0.15	208.3	7.5	0.37
QXDRWW		181.2	-0.5	-0.03	200.9	0.1	0.00
R73ZBJ		195.2	13.5	0.68	188.8	-12.1	-0.60
REVBLE		170.8	-10.9	-0.55	192.8	-8.1	-0.40
RG3PBU		177.6	-4.1	-0.20	199.7	-1.1	-0.06
RXANKW		201.0	19.3	0.97	217.5	16.6	0.83
U3JFK		179.0	-2.7	-0.14	206.2	5.4	0.27
UACXVC	*	122.0	-59.7	-3.00	148.8	-52.0	-2.60
UWRHTC	X	242.0	60.3	3.03	270.7	69.8	3.48
VAVYKZ		176.6	-5.1	-0.25	199.0	-1.9	-0.09
VTKKUP		198.3	16.6	0.83	222.5	21.6	1.08
XWVEPC		159.8	-21.9	-1.10	201.2	0.3	0.02
YJMQD9		187.0	5.3	0.27	210.2	9.3	0.47
ZLNGU9		182.7	1.0	0.05	208.5	7.6	0.38
ZRCY9J		160.8	-20.9	-1.05	188.0	-12.9	-0.64



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

Report #289S
July 2017

	Sample SD45	Summary Statistics	Sample SD46
Grand Means	181.71 Grams		200.86 Grams
SD Btwn Labs	19.92 Grams		20.04 Grams
Statistics based on 38 of 39 reporting participants			

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

Analysis Notes:

7F8PEH - Data appear to be off by a factor of .25; data converted by CTS (x4).

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



Paper & Paperboard Interlaboratory Testing Program

Report #2895

Analysis 314

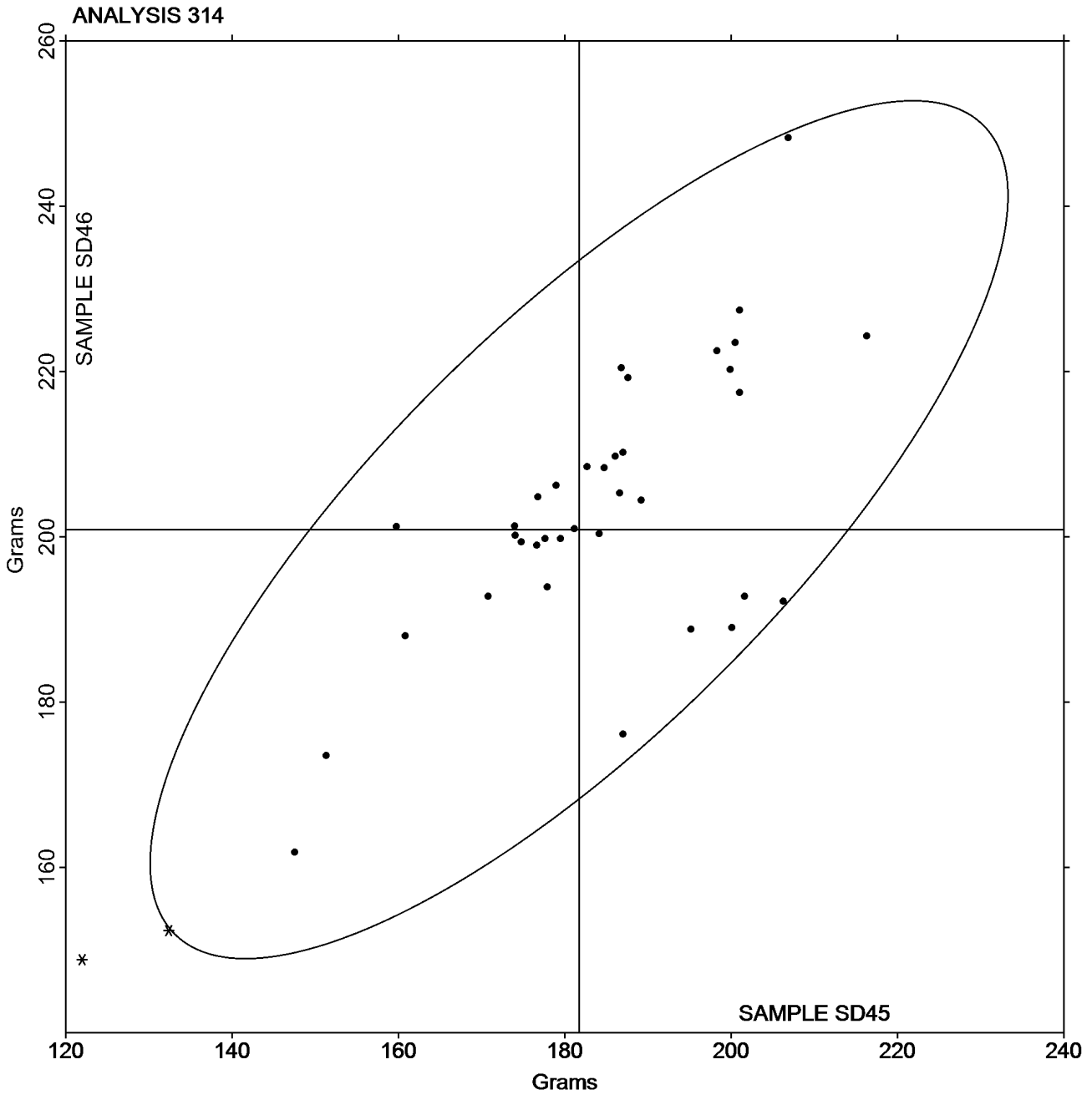
July 2017

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

Grand Mean Sample **SD45** = 181.71 Grams

Grand Mean Sample **SD46** = 200.86 Grams





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

Report #2895
July 2017

WebCode	Data Flag	Sample SR45			Sample SR46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
8H6M3F		2.969	-0.028	-0.16	2.089	-0.064	-0.55
8MH9BM		2.886	-0.111	-0.64	2.094	-0.059	-0.51
9GL6EZ		2.881	-0.116	-0.67	2.161	0.008	0.07
APYG8R		3.170	0.174	1.01	2.194	0.041	0.35
BBYVLG		3.135	0.138	0.80	2.348	0.195	1.67
DMHAK2		2.884	-0.113	-0.66	2.104	-0.049	-0.42
GNDF23		3.027	0.031	0.18	2.012	-0.141	-1.22
KCCRYX		3.391	0.394	2.30	2.402	0.249	2.14
NKVE7W		2.744	-0.253	-1.47	2.074	-0.079	-0.68
QCA8DH		2.836	-0.160	-0.93	2.078	-0.075	-0.65
RTGJQT		3.105	0.109	0.63	2.245	0.092	0.79
UCK76W		2.909	-0.088	-0.51	2.053	-0.100	-0.86
XC9GTU		3.018	0.021	0.12	2.135	-0.018	-0.15

		Summary Statistics	
	Sample SR45		Sample SR46
Grand Means	2.9965 kN/m		2.1529 kN/m
SD Btwn Labs	0.1719 kN/m		0.1163 kN/m
Statistics based on 13 of 13 reporting participants			



Paper & Paperboard Interlaboratory Testing Program

Report #289S

Analysis 320

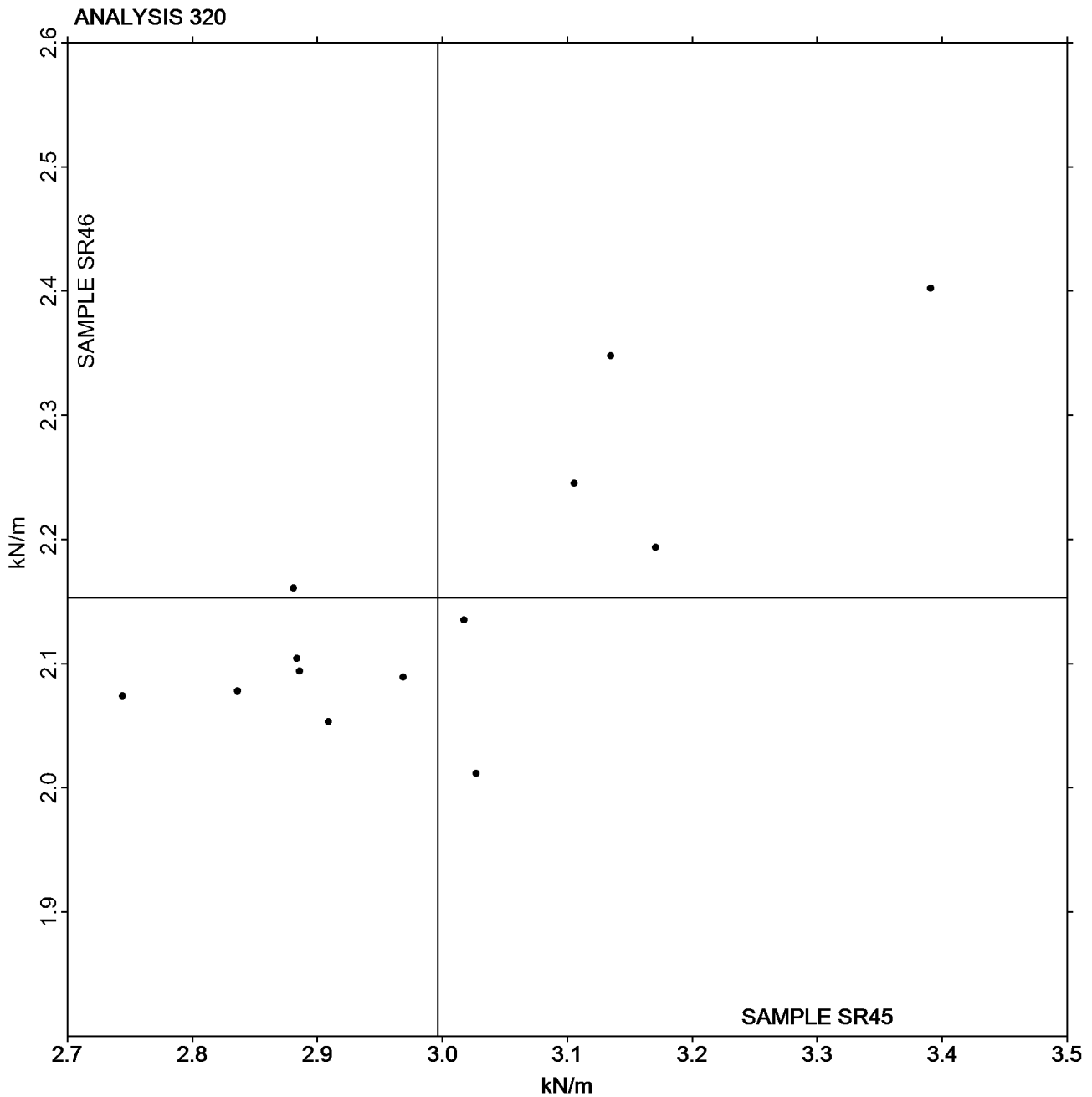
July 2017

Tensile Breaking Strength - Newsprint

TAPPI Official Test Method T494

Grand Mean Sample **SR45** = 2.9965 kN/m

Grand Mean Sample **SR46** = 2.1529 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 #289S
July 2017

WebCode	Data Flag	Sample SR45			Sample SR46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
8H6M3F		25.74	0.53	0.16	13.94	-0.76	-0.61
8MH9BM		26.34	1.13	0.33	16.70	2.00	1.61
9GL6EZ		24.12	-1.09	-0.32	15.35	0.65	0.53
APYG8R		27.29	2.08	0.61	14.23	-0.47	-0.38
BBYVLG		21.95	-3.26	-0.96	15.18	0.48	0.39
GNDF23		32.49	7.27	2.15	15.53	0.83	0.67
KCCRYX		29.26	4.05	1.20	15.87	1.17	0.94
NKVE7W		22.66	-2.55	-0.75	14.64	-0.06	-0.05
QCA8DH		24.30	-0.91	-0.27	14.70	0.00	0.00
RTGJQT		25.62	0.41	0.12	14.99	0.29	0.23
UCK76W		22.46	-2.75	-0.81	13.29	-1.41	-1.13
XC9GTU		20.31	-4.90	-1.45	11.97	-2.73	-2.19

		Summary Statistics			
		Sample SR45		Sample SR46	
Grand Means		25.213	Joules/sq m	14.699	Joules/sq m
SD Btwn Labs		3.385	Joules/sq m	1.245	Joules/sq m
Statistics based on 12 of 12 reporting participants					



Paper & Paperboard Interlaboratory Testing Program

Report #289S

Analysis 321

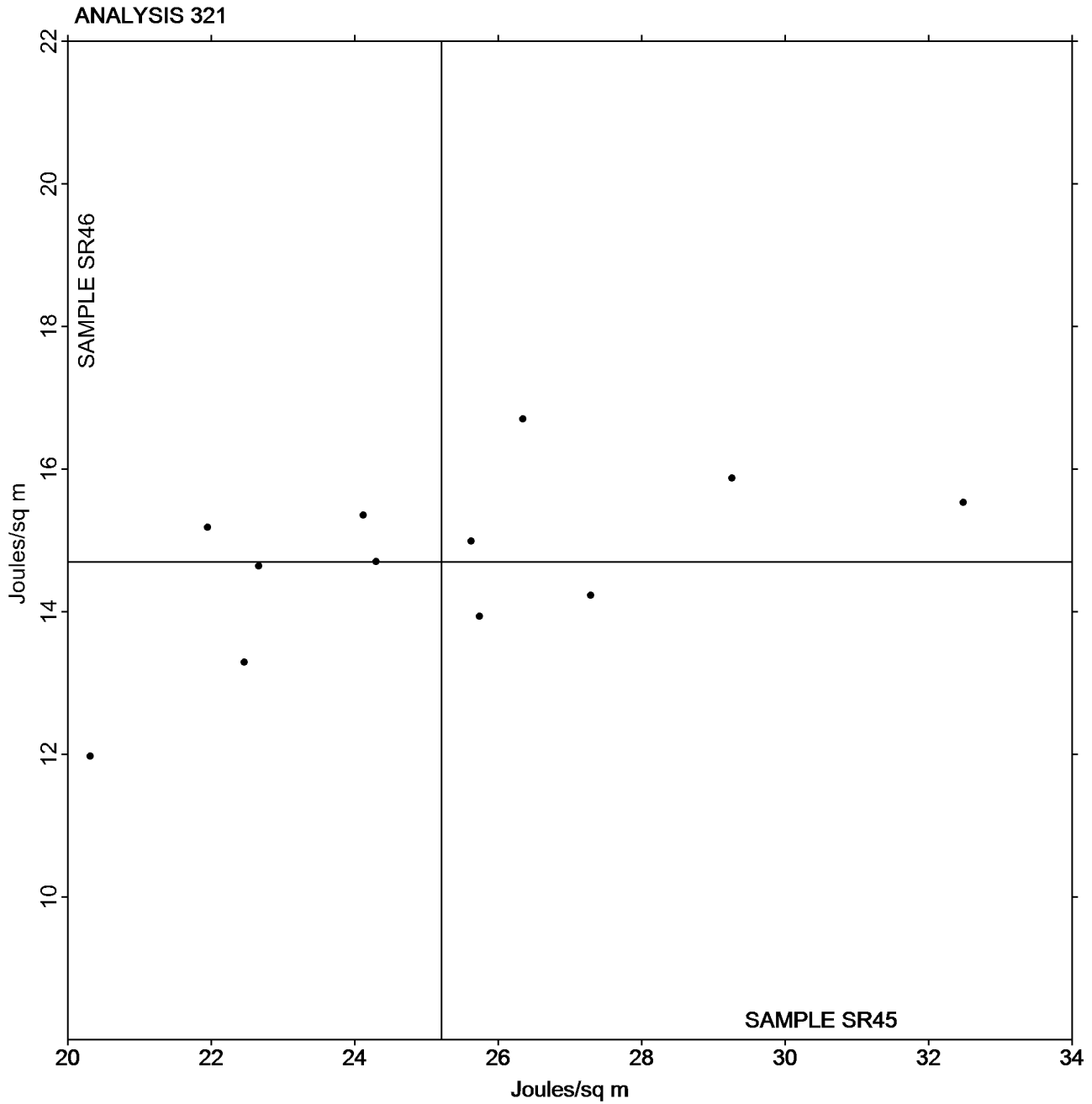
July 2017

Tensile Energy Absorption - Newsprint

TAPPI Official Test Method T494

Grand Mean Sample **SR45** = 25.213 Joules/sq m

Grand Mean Sample **SR46** = 14.699 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 #289S
July 2017

WebCode	Data Flag	Sample SR45			Sample SR46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
8H6M3F		1.423	0.001	0.01	1.136	-0.077	-0.50
8MH9BM		1.462	0.040	0.19	1.309	0.096	0.62
9GL6EZ		1.360	-0.062	-0.30	1.182	-0.031	-0.20
APYG8R		1.606	0.184	0.88	1.426	0.213	1.37
BBYVLG		1.189	-0.233	-1.11	1.106	-0.107	-0.69
GNDF23		1.898	0.476	2.27	1.463	0.250	1.61
KCCRYX		1.338	-0.084	-0.40	1.050	-0.163	-1.05
NKVE7W		1.349	-0.073	-0.35	1.174	-0.039	-0.25
QCA8DH		1.188	-0.234	-1.12	1.034	-0.179	-1.15
RTGJQT		1.578	0.156	0.74	1.382	0.169	1.09
UCK76W		1.253	-0.169	-0.81	1.079	-0.134	-0.86

		Summary Statistics			
		Sample SR45		Sample SR46	
Grand Means		1.4222	Percent	1.2128	Percent
SD Btwn Labs		0.2098	Percent	0.1556	Percent
Statistics based on 11 of 11 reporting participants					



Paper & Paperboard Interlaboratory Testing Program

Report #289S

Analysis 322

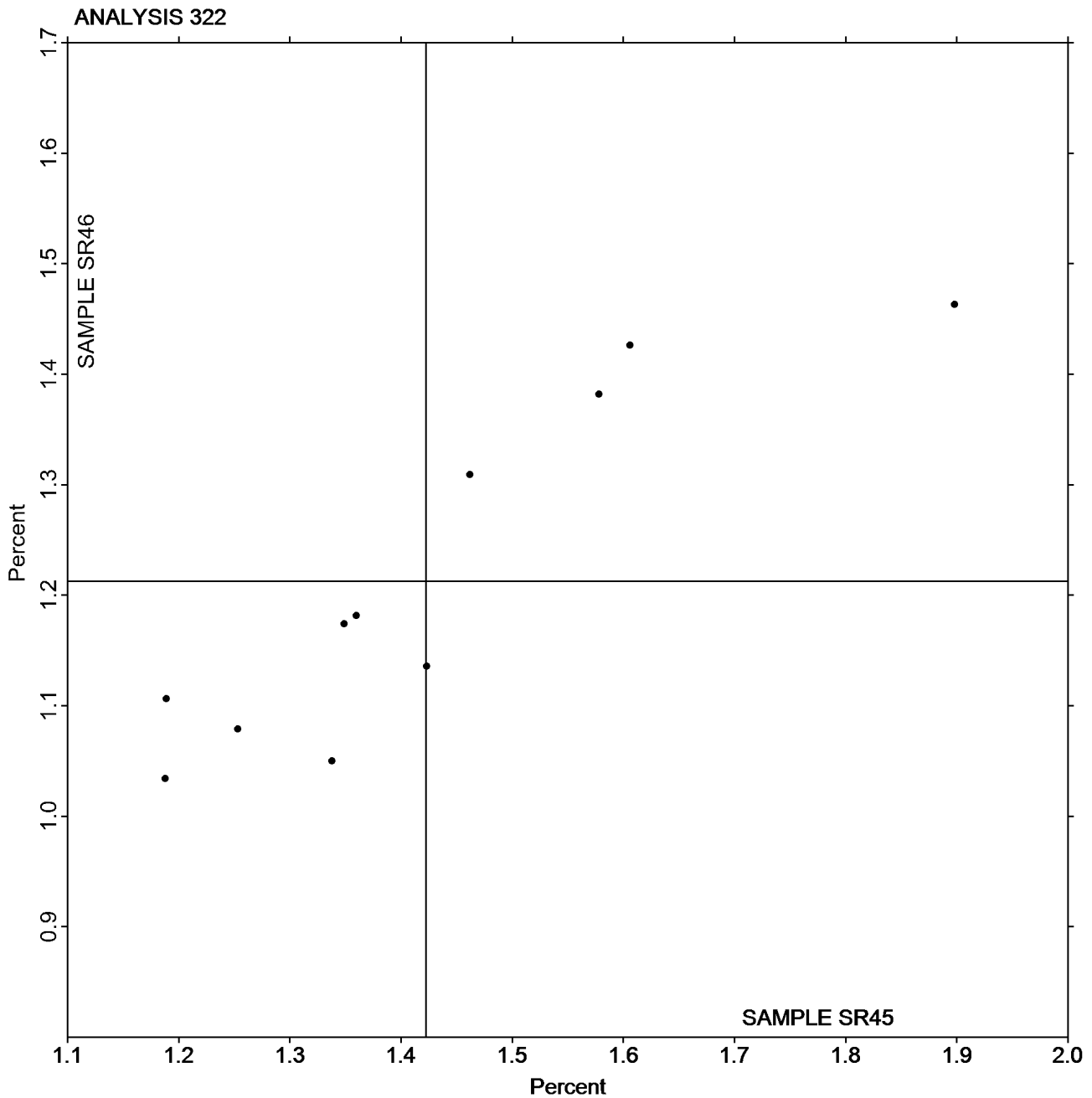
July 2017

Elongation to Break - Newsprint

TAPPI Official Test Method T494

Grand Mean Sample **SR45** = 1.4222 Percent

Grand Mean Sample **SR46** = 1.2128 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 #2895

Analysis 325

July 2017

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF45			Sample SF46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3UUZ4H		6.688	0.005	0.01	4.240	-0.042	-0.19	TO
42QXT7		7.314	0.631	1.86	4.540	0.259	1.15	LI
436EUQ		6.413	-0.270	-0.80	4.042	-0.240	-1.07	LH
4F86CN		6.828	0.145	0.43	4.441	0.160	0.71	LA
6DG2JG		6.185	-0.498	-1.47	4.091	-0.190	-0.85	LA
6PTB32		6.922	0.239	0.71	4.330	0.049	0.22	LI
6UPZJ9		7.182	0.499	1.47	4.682	0.401	1.79	TN
7RZ9TM		6.686	0.003	0.01	4.361	0.079	0.35	VM
8AAMNM		6.650	-0.033	-0.10	4.247	-0.034	-0.15	TB
9NP6VG		7.306	0.623	1.84	4.646	0.365	1.63	TJ
9YPH8B	X	5.452	-1.231	-3.64	4.014	-0.268	-1.19	TP
BF4ZT8		6.282	-0.401	-1.18	4.186	-0.095	-0.42	LX
CE66RG		6.612	-0.071	-0.21	4.335	0.053	0.24	TA
CX44EH		6.680	-0.003	-0.01	4.218	-0.063	-0.28	LE
DG8BZV		6.289	-0.394	-1.16	4.020	-0.261	-1.17	DL
DU2KRA		6.975	0.291	0.86	4.548	0.267	1.19	LX
FBE3C7		5.994	-0.689	-2.03	3.963	-0.318	-1.42	XX
FU8VD4	X	8.445	1.762	5.20	5.164	0.883	3.94	PP
GBE8KN		6.830	0.147	0.43	4.173	-0.108	-0.48	TO
H6GA92		6.804	0.120	0.36	4.402	0.121	0.54	XX
HB9E4R		7.126	0.443	1.31	4.437	0.156	0.69	LI
HNVL2R		6.641	-0.042	-0.12	4.361	0.080	0.36	LH
J3DP63		7.199	0.516	1.52	4.668	0.386	1.73	TJ
JLLR38		6.453	-0.230	-0.68	4.243	-0.038	-0.17	TC
JTQL4U	X	5.599	-1.084	-3.20	4.501	0.220	0.98	MR
K9CQNT		6.762	0.078	0.23	4.322	0.041	0.18	TO
KUEJN7	X	9.748	3.065	9.05	6.205	1.923	8.59	LH
KXWJ78		7.026	0.343	1.01	4.317	0.035	0.16	LF
L6MTKU		6.616	-0.067	-0.20	4.188	-0.094	-0.42	TF
M4ET92		6.924	0.241	0.71	4.269	-0.012	-0.06	LI
MGEUL3		6.767	0.084	0.25	4.442	0.160	0.71	LH
NJKFBM		6.524	-0.159	-0.47	4.181	-0.101	-0.45	TB
NVWPTL		6.812	0.129	0.38	4.334	0.053	0.23	LH
P7PRAK		7.145	0.462	1.36	4.580	0.299	1.33	LI
PEANJ2		6.048	-0.635	-1.88	3.812	-0.469	-2.09	ID
QQWB32		6.784	0.101	0.30	4.415	0.134	0.60	LH
RHDB4F		6.250	-0.433	-1.28	4.230	-0.052	-0.23	TF
TAJJC2		6.663	-0.020	-0.06	4.295	0.013	0.06	IM
TEDHQW	*	6.220	-0.463	-1.37	3.750	-0.531	-2.37	CB
UCK76W		6.430	-0.253	-0.75	4.198	-0.083	-0.37	LH



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

Report #2895
July 2017

WebCode	Data Flag	Sample SF45			Sample SF46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
WBKUF8		7.090	0.407	1.20	4.725	0.443	1.98	TB
WFRHT9		6.636	-0.047	-0.14	4.087	-0.194	-0.87	LI
WP3KDN		6.261	-0.422	-1.25	3.881	-0.401	-1.79	LA
WQDM28		6.365	-0.319	-0.94	4.180	-0.102	-0.45	TB
YJ6Z24		6.825	0.141	0.42	4.122	-0.159	-0.71	RE
YKMPUW		6.488	-0.195	-0.58	4.321	0.039	0.17	TO

	Sample SF45	Summary Statistics	Sample SF46
Grand Means	6.6832 kN/m		4.2815 kN/m
SD Btwn Labs	0.3387 kN/m		0.2240 kN/m
Statistics based on 42 of 46 reporting participants			

Comments on Assigned Data Flags for Test #325

- JTQL4U (X) - Data for sample SF45 are low.
- KUEJN7 (X) - Extreme Data.
- FU8VD4 (X) - Data for both samples are high. Inconsistent within the determinations of sample SF45.
- 9YPH8B (X) - Data for sample SF45 are low. Inconsistent within the determinations of sample SF45.

Analysis Notes:

- 7RZ9TM - Data appear to be reported as lb/inch, not kN/m as indicated on datasheet. Units corrected by CTS.
- TAJJC2 - Data appears to be transposed between samples. Data switched 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	TA Testometric AX
TB Thwing-Albert EJA/1000	TC Thwing-Albert Electro-Hydraulic, Model 30LT
TF Thwing-Albert EJA Vantage-1	TJ Thwing-Albert QC II-XS
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

Report #2895

Analysis 325

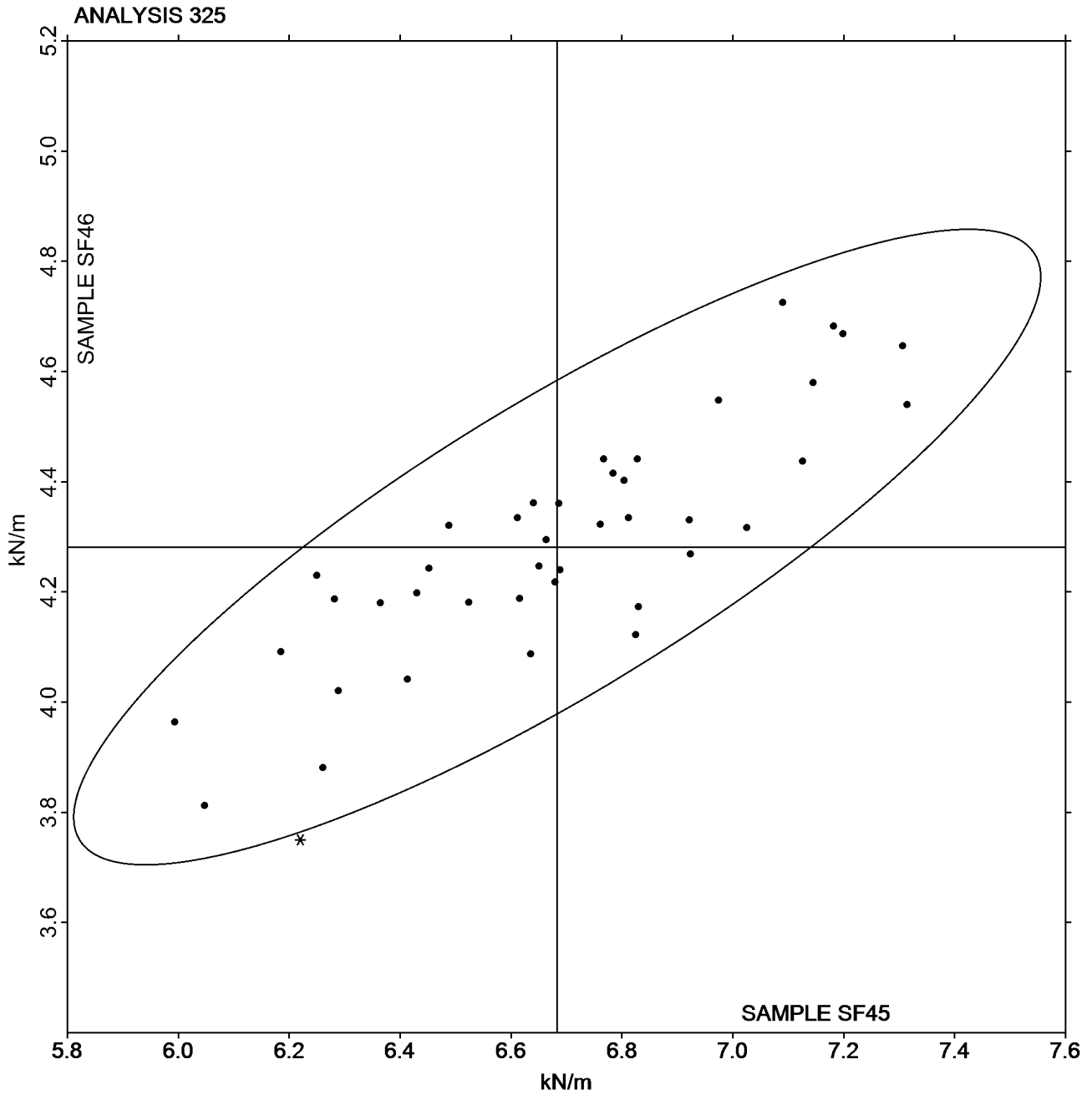
July 2017

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

Grand Mean Sample **SF45** = 6.6832 kN/m

Grand Mean Sample **SF46** = 4.2815 kN/m





Paper & Paperboard Interlaboratory Testing Program

Report #2895

Analysis 327

July 2017

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF45			Sample SF46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3UUZ4H		113.83	18.60	2.02	52.54	10.96	2.43	TO
42QXT7		106.94	11.70	1.27	45.38	3.80	0.84	LI
436EUQ		91.30	-3.93	-0.43	38.85	-2.73	-0.61	LH
4F86CN		101.49	6.25	0.68	50.28	8.70	1.93	LA
6DG2JG		72.17	-23.07	-2.51	32.82	-8.76	-1.94	LA
6PTB32		96.13	0.89	0.10	39.54	-2.04	-0.45	LI
6UPZJ9		97.97	2.74	0.30	43.29	1.72	0.38	LX
8AAMNM		98.92	3.69	0.40	41.58	0.00	0.00	TB
BF4ZT8		91.58	-3.66	-0.40	38.54	-3.04	-0.67	LX
DG8BZV		97.68	2.44	0.27	40.78	-0.80	-0.18	DL
DU2KRA		98.34	3.11	0.34	44.75	3.17	0.70	LX
FBE3C7		73.09	-22.15	-2.41	33.27	-8.30	-1.84	XX
FU8VD4		96.67	1.44	0.16	42.31	0.73	0.16	PP
HB9E4R		103.72	8.48	0.92	41.61	0.03	0.01	LI
HNVL2R		89.98	-5.25	-0.57	43.58	2.00	0.44	LH
J3DP63		112.49	17.26	1.88	48.47	6.89	1.53	TJ
JTQL4U		86.22	-9.02	-0.98	41.21	-0.37	-0.08	MR
K9CQNT		97.34	2.11	0.23	41.30	-0.28	-0.06	TO
KUEJN7	X	144.99	49.76	5.42	65.18	23.60	5.23	LH
KXWJ78		80.37	-14.86	-1.62	32.98	-8.60	-1.91	LW
L6MTKU		106.07	10.84	1.18	44.80	3.22	0.71	TF
M4ET92		92.78	-2.46	-0.27	42.05	0.48	0.11	LI
MGEUL3		95.50	0.26	0.03	46.27	4.69	1.04	LH
NJKFBM		100.10	4.87	0.53	43.31	1.73	0.38	TB
NVWPTL		94.26	-0.97	-0.11	39.21	-2.37	-0.53	LH
P7PRAK		102.43	7.19	0.78	42.83	1.25	0.28	LI
PEANJ2		95.99	0.75	0.08	38.56	-3.02	-0.67	ID
QQWB32		92.76	-2.48	-0.27	41.35	-0.23	-0.05	LH
TAJJC2		99.28	4.04	0.44	44.27	2.69	0.60	IM
UCK76W		87.04	-8.19	-0.89	40.80	-0.78	-0.17	LH
WBKUF8		100.36	5.13	0.56	45.47	3.90	0.86	TB
WFRHT9		90.61	-4.62	-0.50	36.68	-4.90	-1.09	LI
WP3KDN		99.04	3.81	0.41	40.57	-1.01	-0.22	XX
YJ6Z24		89.04	-6.20	-0.67	34.32	-7.26	-1.61	RE
YKMPUW		86.48	-8.75	-0.95	40.09	-1.49	-0.33	TO



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

Report #289S
July 2017

	Sample SF45	Summary Statistics	Sample SF46
Grand Means	95.233 Joules/sq m		41.579 Joules/sq m
SD Btwn Labs	9.185 Joules/sq m		4.511 Joules/sq m
Statistics based on 34 of 35 reporting participants			

Comments on Assigned Data Flags for Test #327

KUEJN7 (X) - Data for both samples are high.

Analysis Notes:

8AAMNM - 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

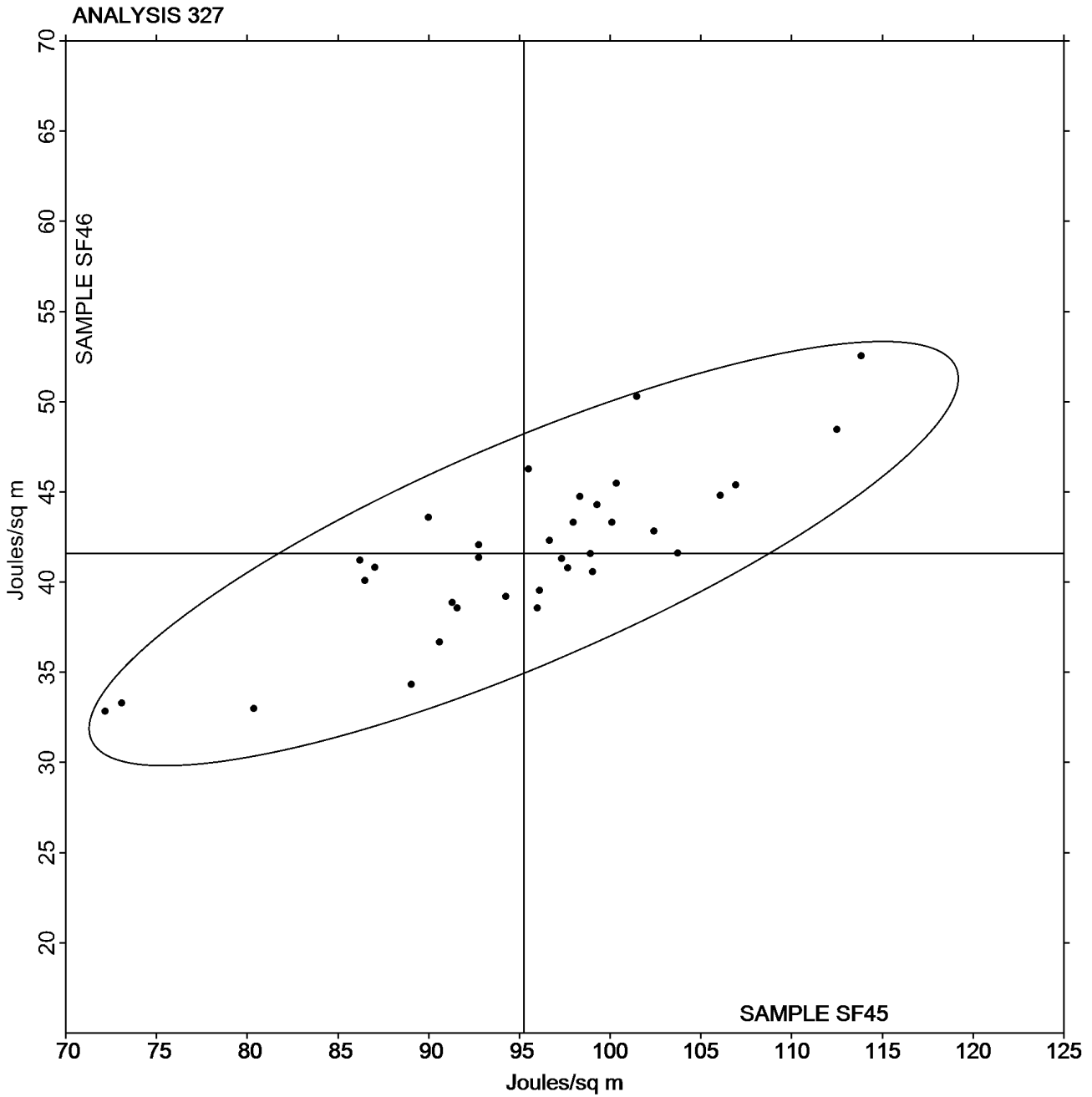


Paper & Paperboard Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers
TAPPI Official Test Method T494

Report #289S
July 2017

Grand Mean Sample **SF45** = 95.233 Joules/sq m

Grand Mean Sample **SF46** = 41.579 Joules/sq m





Paper & Paperboard Interlaboratory Testing Program

Report #2895

Analysis 328

July 2017

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF45			Sample SF46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3UUZ4H	X	2.956	0.799	4.15	2.203	0.720	5.29	TO
42QXT7		2.232	0.075	0.39	1.540	0.057	0.42	LI
436EUQ		2.171	0.014	0.07	1.472	-0.011	-0.08	LH
4F86CN		2.058	-0.099	-0.51	1.566	0.083	0.61	LA
6DG2JG		2.082	-0.075	-0.39	1.459	-0.024	-0.18	LA
6PTB32		2.115	-0.042	-0.22	1.415	-0.068	-0.50	LI
6UPZJ9	X	2.368	0.211	1.10	1.338	-0.145	-1.06	LX
7RZ9TM		1.780	-0.377	-1.96	1.230	-0.253	-1.86	VM
8AAMNM		2.279	0.122	0.63	1.515	0.032	0.24	TB
BF4ZT8		2.214	0.057	0.30	1.409	-0.074	-0.54	LX
DG8BZV		2.496	0.339	1.76	1.665	0.182	1.34	DL
DU2KRA		2.151	-0.006	-0.03	1.518	0.035	0.26	LX
FBE3C7		2.377	0.220	1.14	1.677	0.194	1.42	XX
FU8VD4	*	1.709	-0.448	-2.33	1.114	-0.369	-2.71	PP
HB9E4R		2.238	0.081	0.42	1.467	-0.016	-0.12	LI
HNVL2R		2.053	-0.104	-0.54	1.526	0.043	0.32	LH
J3DP63		2.424	0.267	1.39	1.651	0.168	1.23	TJ
JTQL4U		1.977	-0.180	-0.94	1.452	-0.031	-0.22	MR
K9CQNT		2.181	0.024	0.12	1.456	-0.027	-0.20	TO
KUEJN7		2.277	0.120	0.62	1.597	0.114	0.84	LH
KXWJ78		1.799	-0.358	-1.86	1.238	-0.245	-1.80	LX
L6MTKU		2.626	0.469	2.44	1.814	0.331	2.43	TF
M4ET92		2.087	-0.070	-0.36	1.544	0.061	0.45	LI
MGEUL3		2.154	-0.003	-0.02	1.588	0.105	0.77	LH
NJKFBM		2.346	0.189	0.98	1.587	0.104	0.76	TB
NVWPTL	X	3.717	1.560	8.11	2.458	0.975	7.16	LH
P7PRAK		2.032	-0.125	-0.65	1.351	-0.132	-0.97	LI
PEANJ2		2.393	0.236	1.23	1.536	0.053	0.39	ID
QQWB32		2.081	-0.076	-0.39	1.459	-0.024	-0.18	LH
TAJJC2		2.306	0.149	0.77	1.615	0.132	0.97	IM
UCK76W		2.056	-0.101	-0.52	1.483	0.000	0.00	LH
WBKUF8		2.174	0.017	0.09	1.497	0.014	0.10	TB
WFRHT9		2.072	-0.085	-0.44	1.382	-0.101	-0.74	LI
WP3KDN		2.093	-0.064	-0.33	1.384	-0.099	-0.73	XX
WQDM28		2.198	0.041	0.21	1.434	-0.049	-0.36	TF
YJ6Z24		2.108	-0.049	-0.25	1.392	-0.091	-0.67	RE
YKMPUW		1.999	-0.158	-0.82	1.388	-0.095	-0.70	TG



Paper & Paperboard Interlaboratory Testing Program
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		Summary Statistics	
		Sample SF45	Sample SF46
Grand Means		2.1570 Percent	1.4830 Percent
SD Btwn Labs		0.1925 Percent	0.1362 Percent
Statistics based on 34 of 37 reporting participants			

Comments on Assigned Data Flags for Test #328

- NVWPTL (X) - Extreme Data.
- 3UUZ4H (X) - Data for both samples are high. Inconsistent within the determinations of sample SF46.
- 6UPZJ9 (X) - Inconsistent in testing between samples.

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

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Analysis 328

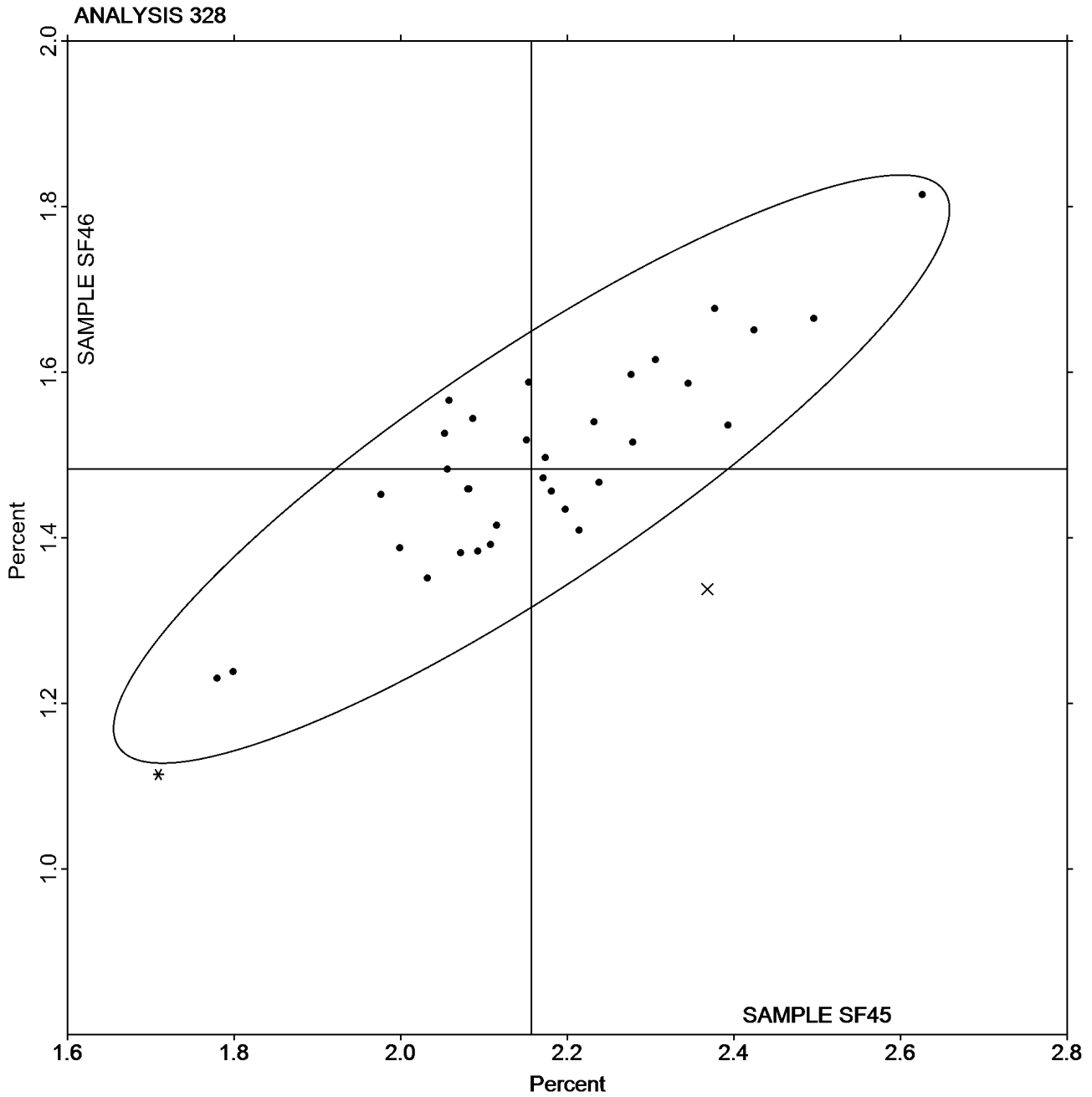
July 2017

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

Grand Mean Sample SF45 = 2.1570 Percent

Grand Mean Sample SF46 = 1.4830 Percent





Paper & Paperboard Interlaboratory Testing Program

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July 2017

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE45			Sample SE46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2AP3A2		8.856	0.010	0.01	10.311	0.507	0.57	XX
2L4XP2		8.579	-0.266	-0.36	8.695	-1.109	-1.24	IF
36ULEM		9.209	0.364	0.50	10.023	0.219	0.24	LE
3HLX8Z		8.384	-0.461	-0.63	8.907	-0.897	-1.00	TH
7U42P8		8.452	-0.394	-0.54	9.110	-0.694	-0.77	LE
8AAMNM		8.542	-0.303	-0.42	9.528	-0.275	-0.31	TB
9HK7MD		8.774	-0.071	-0.10	8.826	-0.977	-1.09	IF
9K636C		9.230	0.385	0.53	10.367	0.563	0.63	TH
9N8469		9.239	0.394	0.54	10.189	0.385	0.43	TX
9WGHW3		7.968	-0.877	-1.20	8.878	-0.926	-1.03	TR
AURCC7		9.271	0.426	0.58	10.429	0.625	0.70	LH
BNHJC7		8.930	0.085	0.12	10.196	0.392	0.44	TB
C3VDHP		9.264	0.419	0.57	10.613	0.809	0.90	TO
DKVMYZ		10.502	1.657	2.27	11.374	1.571	1.75	LA
E79WFN		9.099	0.254	0.35	9.878	0.074	0.08	ID
GZRBG2		9.190	0.345	0.47	10.340	0.536	0.60	TP
H4MGDJ		8.803	-0.042	-0.06	10.191	0.387	0.43	LI
KELR7Q		8.477	-0.368	-0.50	9.564	-0.240	-0.27	LW
KKPZ2K		9.643	0.798	1.09	10.089	0.285	0.32	LA
KMTQER		8.529	-0.316	-0.43	9.884	0.080	0.09	TK
L6MTKU		9.762	0.916	1.26	11.362	1.558	1.74	TO
NKY2KP		8.492	-0.353	-0.48	9.479	-0.325	-0.36	XX
NMHZUD		7.696	-1.149	-1.58	8.309	-1.495	-1.67	LA
NVWPTL		8.938	0.093	0.13	10.076	0.272	0.30	LH
P8M36M		9.685	0.840	1.15	10.667	0.863	0.96	TA
PBLGQR		10.147	1.301	1.78	10.722	0.918	1.02	IK
PMC9BV	*	7.020	-1.825	-2.50	7.129	-2.675	-2.98	ID
PW6LDG		9.507	0.662	0.91	10.588	0.784	0.87	LH
QKRCTW		8.900	0.055	0.08	9.827	0.023	0.03	LW
QXDRWW		8.477	-0.368	-0.50	9.247	-0.557	-0.62	LH
R73ZBJ		8.305	-0.541	-0.74	9.688	-0.116	-0.13	XX
REVBLE		9.196	0.351	0.48	10.521	0.717	0.80	IF
RXANKW		8.045	-0.800	-1.10	9.349	-0.455	-0.51	IK
T6NPGL		8.240	-0.605	-0.83	9.331	-0.473	-0.53	XX
TU8CVB	X	8.949	0.104	0.14	11.856	2.052	2.29	TH
U3JFK		9.033	0.187	0.26	9.902	0.098	0.11	TO
UTVRTT		9.275	0.430	0.59	9.458	-0.346	-0.39	LA
VAVYKZ		8.602	-0.243	-0.33	9.748	-0.056	-0.06	TB
VMGF6Q		6.987	-1.858	-2.55	7.800	-2.003	-2.23	IM
VTKKUP		7.648	-1.197	-1.64	8.572	-1.231	-1.37	IN



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

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WebCode	Data Flag	Sample SE45			Sample SE46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
WTH68G		8.786	-0.059	-0.08	10.051	0.247	0.28	IM
WUCXW8		9.607	0.762	1.05	10.651	0.847	0.94	XX
X6TXBG		8.618	-0.227	-0.31	9.548	-0.256	-0.29	IM
XEF2GU		8.493	-0.352	-0.48	9.517	-0.287	-0.32	LE
XWVEPC		8.319	-0.526	-0.72	8.831	-0.973	-1.09	ID
Y8E2JD		10.081	1.236	1.69	11.167	1.363	1.52	LA
ZLNGU9		9.304	0.459	0.63	10.621	0.818	0.91	TO
ZRCY9J		9.620	0.774	1.06	11.225	1.422	1.59	TH

Sample SE45		Summary Statistics	Sample SE46	
Grand Means	8.8452 kN/m		9.8038 kN/m	
SD Btwn Labs	0.7293 kN/m		0.8967 kN/m	
Statistics based on 47 of 48 reporting participants				

TU8CVB (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SE46.

Analysis Notes:

GZRBG2 - Data appear to be reported as kN/m, not kg/15mm as indicated on datasheet. Unit changed by CTS.

NMHZUD - Data appear to be off by a factor of 2. Corrected by CTS (x.5).

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

WUCXW8 - 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

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

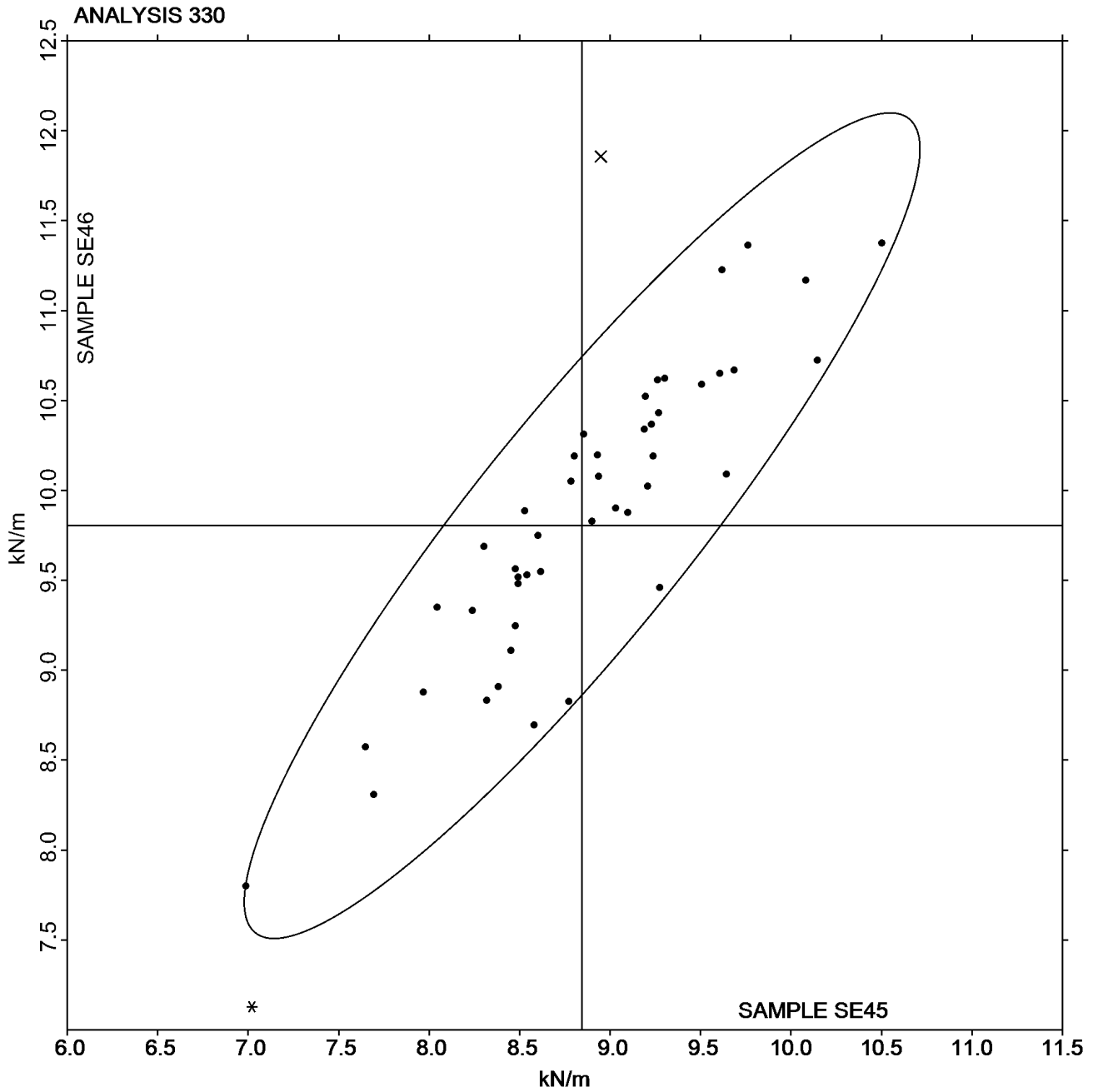


Paper & Paperboard Interlaboratory Testing Program
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Tensile Breaking Strength - Packaging Papers
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Grand Mean Sample **SE45** = 8.8452 kN/m

Grand Mean Sample **SE46** = 9.8038 kN/m





Paper & Paperboard Interlaboratory Testing Program

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Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE45			Sample SE46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2AP3A2		100.73	8.72	0.76	148.5	27.5	1.81	XX
36ULEM		83.68	-8.33	-0.73	115.2	-5.8	-0.38	LE
3HLX8Z		108.89	16.87	1.47	123.6	2.6	0.17	TH
7U42P8		85.65	-6.36	-0.55	110.4	-10.6	-0.70	LE
8AAMNM		86.15	-5.86	-0.51	115.3	-5.7	-0.38	XX
9HK7MD		84.98	-7.03	-0.61	93.4	-27.6	-1.81	IF
9K636C		108.20	16.19	1.41	147.5	26.5	1.74	TH
9N8469		108.59	16.58	1.44	141.2	20.2	1.33	XX
9WGHW3		83.35	-8.66	-0.75	111.6	-9.5	-0.62	TR
AURCC7		89.72	-2.29	-0.20	121.4	0.3	0.02	LH
BNHJC7		93.88	1.86	0.16	127.2	6.2	0.41	TB
C3VDHP		95.15	3.14	0.27	138.6	17.6	1.16	TO
DKVMYZ		101.11	9.10	0.79	119.5	-1.6	-0.10	LA
GZRBG2		90.00	-2.01	-0.18	127.5	6.5	0.42	TP
KELR7Q		77.26	-14.75	-1.28	110.4	-10.7	-0.70	LW
KKPZ2K		103.21	11.20	0.97	118.5	-2.5	-0.16	LA
KMTQER		87.32	-4.70	-0.41	116.4	-4.7	-0.31	TK
L6MTKU		90.19	-1.82	-0.16	131.6	10.6	0.70	TO
NKY2KP	X	83.51	-8.51	-0.74	25.8	-95.2	-6.26	XX
NMHZUD		94.48	2.47	0.21	118.8	-2.2	-0.15	LA
NVWPTL		90.59	-1.42	-0.12	118.3	-2.7	-0.18	LH
P8M36M		101.41	9.40	0.82	136.5	15.4	1.01	TA
PBLGQR	*	124.86	32.85	2.86	140.7	19.7	1.29	XX
PMC9BV	X	61.82	-30.19	-2.63	58.1	-62.9	-4.13	ID
QKRCTW		83.36	-8.65	-0.75	108.3	-12.7	-0.84	LW
QXDRWW		80.91	-11.10	-0.97	107.3	-13.7	-0.90	LH
R73ZBJ		80.41	-11.60	-1.01	121.9	0.8	0.05	XX
REVBLF		72.46	-19.55	-1.70	110.0	-11.1	-0.73	IN
RXANKW		112.01	20.00	1.74	149.9	28.9	1.90	IK
T6NPGL		90.22	-1.79	-0.16	124.9	3.9	0.25	XX
U3JFK		90.58	-1.43	-0.12	119.6	-1.4	-0.09	TO
UTVRTT	*	103.13	11.12	0.97	105.4	-15.6	-1.02	LA
VMGF6Q		68.21	-23.80	-2.07	84.5	-36.6	-2.40	IM
VTKKUP		91.77	-0.25	-0.02	123.8	2.8	0.18	IN
WTH68G		91.81	-0.20	-0.02	123.3	2.2	0.15	IM
X6TXBG		88.49	-3.52	-0.31	118.5	-2.5	-0.16	IM
XEF2GU		81.45	-10.56	-0.92	112.2	-8.8	-0.58	LE
XWVEPC		86.50	-5.51	-0.48	100.5	-20.6	-1.35	ID
Y8E2JD		85.62	-6.39	-0.56	108.1	-13.0	-0.85	LA
ZLNGU9		100.11	8.10	0.71	149.1	28.1	1.85	TO



Paper & Paperboard Interlaboratory Testing Program

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Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE45			Sample SE46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
ZRCY9J	X	731.52	639.51	55.65	1,066.3	945.2	62.13	TH

Sample SE45		Summary Statistics	Sample SE46	
Grand Means	92.012 Joules/sq m		121.04 Joules/sq m	
SD Btwn Labs	11.492 Joules/sq m		15.22 Joules/sq m	
Statistics based on 38 of 41 reporting participants				

NKY2KP (X) - Extreme Data for Sample SE46.

PMC9BV (X) - Data for sample SE46 are low.

ZRCY9J (X) - Extreme Data.

Analysis Notes:

8AAMNM - Data appear to be reported as kg-m/sq m, not J/sq m as indicated on datasheet. Units corrected by CTS.

9HK7MD - Data appears to be transposed between samples. Data Switched by CTS.

GZRBG2 - Data appear to be reported as J/sq m, not kg-m/sq m as indicated on datasheet. Units corrected by CTS.

U3JJFK - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq 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
XX	Instrument make/model not specified by lab		

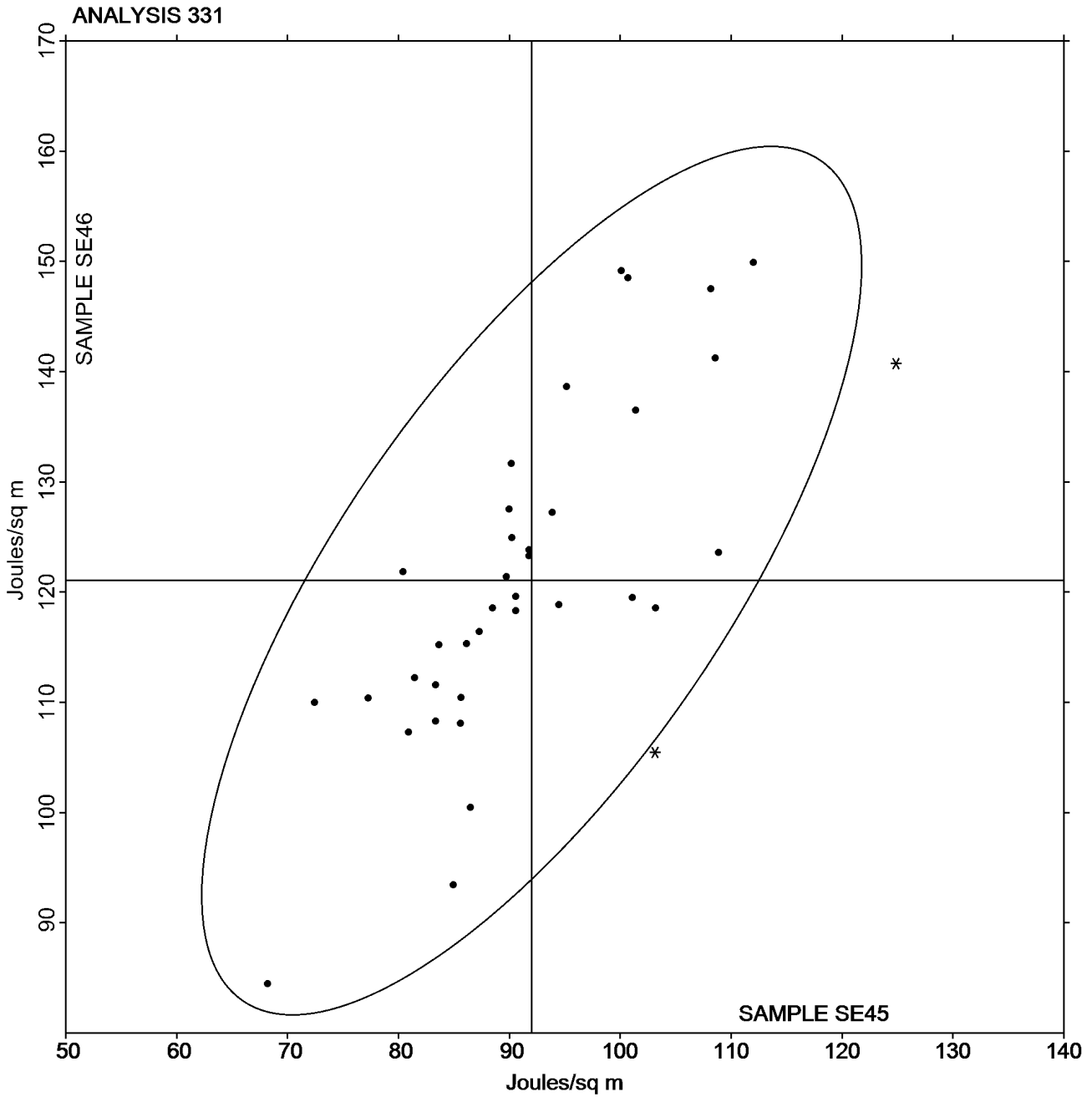


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Grand Mean Sample SE45 = 92.012 Joules/sq m

Grand Mean Sample SE46 = 121.04 Joules/sq m





Paper & Paperboard Interlaboratory Testing Program

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Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE45			Sample SE46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2AP3A2		1.776	0.129	0.56	2.139	0.300	1.09	XX
36ULEM		1.408	-0.239	-1.04	1.682	-0.157	-0.57	LE
3HLX8Z	*	2.201	0.554	2.42	2.248	0.409	1.48	TH
7U42P8		1.554	-0.093	-0.41	1.760	-0.079	-0.29	LE
8AAMNM		1.544	-0.103	-0.45	1.772	-0.067	-0.24	TB
9HK7MD	*	1.781	0.134	0.58	1.618	-0.221	-0.80	IF
9K636C		1.957	0.310	1.35	2.235	0.396	1.43	TH
9N8469		2.119	0.472	2.06	2.222	0.383	1.39	XX
9WGHW3		1.634	-0.013	-0.06	1.876	0.037	0.13	TR
AURCC7		1.496	-0.151	-0.66	1.706	-0.133	-0.48	LH
BNHJC7		1.645	-0.002	-0.01	1.882	0.043	0.15	TB
C3VDHP		1.750	0.103	0.45	2.090	0.251	0.91	TO
DKVMYZ		1.499	-0.148	-0.65	1.539	-0.300	-1.09	LA
E79WFN		1.664	0.017	0.07	1.843	0.004	0.01	ID
GZRBG2		2.087	0.440	1.92	2.407	0.568	2.06	TP
KELR7Q		1.424	-0.223	-0.97	1.688	-0.151	-0.55	LW
KKPZ2K		1.597	-0.050	-0.22	1.656	-0.183	-0.66	LA
KMTQER		1.633	-0.014	-0.06	1.810	-0.029	-0.11	TK
L6MTKU		1.542	-0.105	-0.46	1.819	-0.020	-0.07	TO
NKY2KP		1.507	-0.140	-0.61	1.769	-0.070	-0.26	XX
NMHZUD		1.168	-0.479	-2.09	1.227	-0.612	-2.22	XX
NVWPTL	X	2.678	1.031	4.50	3.028	1.189	4.31	LH
P8M36M		1.606	-0.041	-0.18	1.898	0.059	0.21	TA
PBLGQR		1.533	-0.114	-0.50	1.638	-0.201	-0.73	XX
PMC9BV		1.496	-0.151	-0.66	1.375	-0.464	-1.68	ID
QKRCTW		1.450	-0.197	-0.86	1.622	-0.217	-0.79	LW
QXDRWW		1.470	-0.177	-0.77	1.692	-0.147	-0.53	LH
R73ZBJ		1.560	-0.087	-0.38	1.922	0.083	0.30	XX
REVBLF		1.372	-0.275	-1.20	1.705	-0.134	-0.49	IN
RXANKW		2.149	0.502	2.19	2.380	0.541	1.96	IK
T6NPGL		1.741	0.094	0.41	2.007	0.168	0.61	XX
U3JJFK		1.527	-0.120	-0.52	1.756	-0.083	-0.30	TO
UTVRTT		1.442	-0.205	-0.90	1.378	-0.461	-1.67	LA
VAVYKZ		1.658	0.011	0.05	1.897	0.058	0.21	TB
VMGF6Q		1.575	-0.072	-0.31	1.672	-0.167	-0.61	IM
VTKKUP		2.060	0.413	1.80	2.330	0.491	1.78	IN
WTH68G		1.614	-0.033	-0.14	1.812	-0.027	-0.10	IM
X6TXBG		1.853	0.206	0.90	2.105	0.266	0.96	IM
XEF2GU		1.470	-0.177	-0.77	1.706	-0.133	-0.48	LE
XWVEPC		1.636	-0.011	-0.05	1.679	-0.160	-0.58	ID



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WebCode	Data Flag	Sample SE45			Sample SE46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
Y8E2JD		1.523	-0.124	-0.54	1.635	-0.204	-0.74	XX
ZLNGU9		1.811	0.164	0.72	2.217	0.378	1.37	TO
ZRCY9J	X	11.543	9.896	43.19	13.764	11.925	43.23	TH

Sample SE45		Summary Statistics	Sample SE46	
Grand Means	1.6471 Percent		1.8394 Percent	
SD Btwn Labs	0.2291 Percent		0.2758 Percent	
Statistics based on 41 of 43 reporting participants				

Comments on Assigned Data Flags for Test #332

- NVWPTL (X) - Data for both samples are high.
- ZRCY9J (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 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
XX	Instrument make/model not specified by lab		

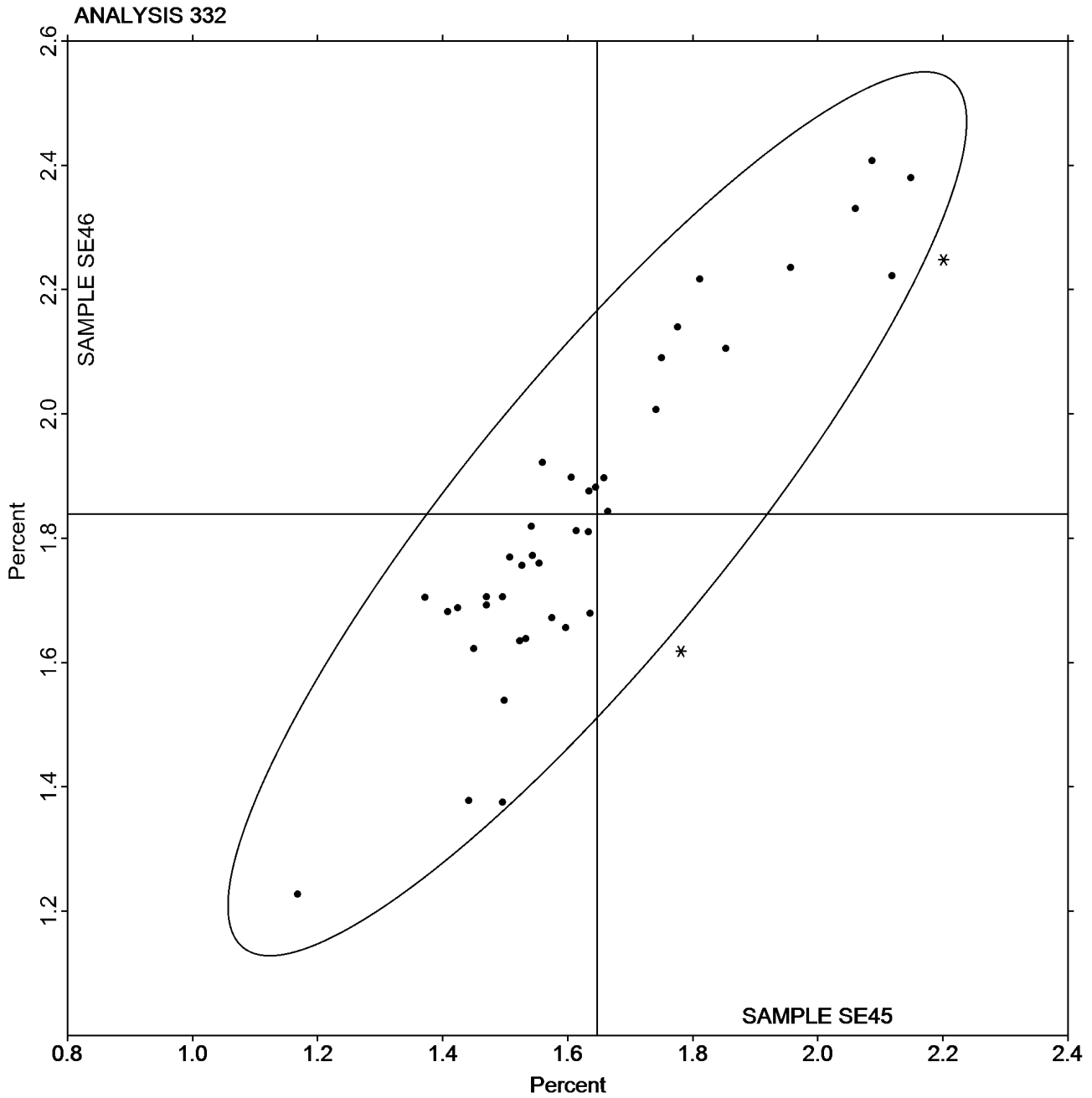


Paper & Paperboard Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers
TAPPI Official Test Method T494

Report #2895
July 2017

Grand Mean Sample **SE45** = 1.6471 Percent

Grand Mean Sample **SE46** = 1.8394 Percent





Paper & Paperboard Interlaboratory Testing Program

Report #289S

Analysis 334

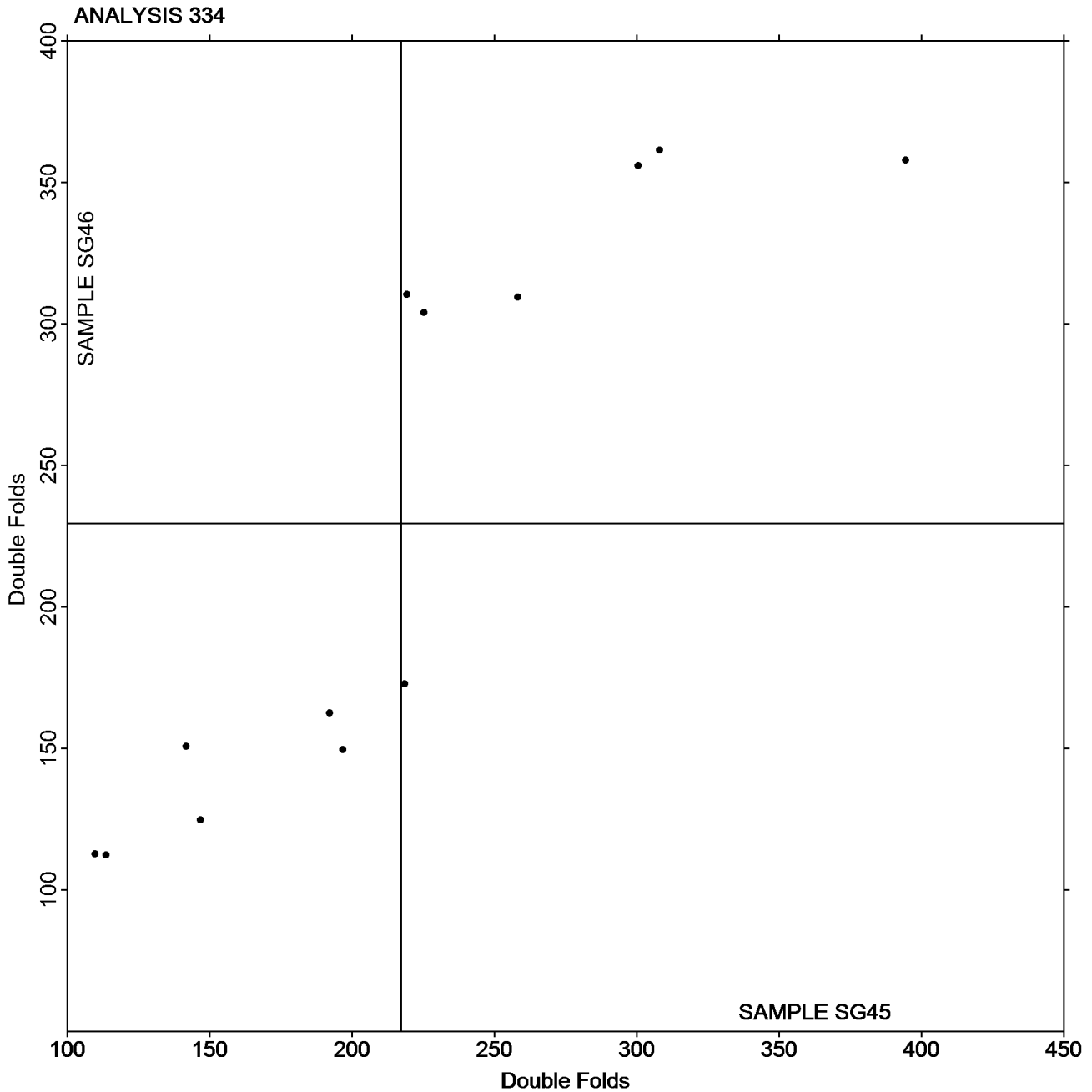
July 2017

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

Grand Mean Sample **SG45** = 217.29 Double Folds

Grand Mean Sample **SG46** = 229.52 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 #2895
July 2017

WebCode	Data Flag	Sample SH45			Sample SH46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3UUZ4H		272.7	-24.0	-1.01	212.7	-30.5	-1.45
6DG2JG		323.5	26.8	1.13	264.7	21.6	1.03
7RZ9TM		321.4	24.7	1.04	266.8	23.7	1.13
8AAMNM		247.3	-49.4	-2.08	207.1	-36.0	-1.72
8H6M3F		287.1	-9.6	-0.40	244.0	0.8	0.04
9HK7MD		287.5	-9.2	-0.39	239.8	-3.4	-0.16
BF4ZT8		270.8	-25.9	-1.09	213.1	-30.0	-1.43
D7DWZX	X	145.9	-150.8	-6.35	118.1	-125.0	-5.97
DMHAK2		280.9	-15.8	-0.67	240.9	-2.2	-0.11
GBE8KN		337.4	40.7	1.72	285.4	42.3	2.02
HT8KGR		290.4	-6.3	-0.26	231.4	-11.7	-0.56
JLLR38		330.4	33.7	1.42	262.4	19.3	0.92
JTQL4U		280.8	-15.9	-0.67	213.8	-29.3	-1.40
K9CQNT		273.8	-22.9	-0.96	234.6	-8.5	-0.41
KUEJN7	X	134.8	-162.0	-6.83	105.5	-137.7	-6.57
LWGRMP		316.5	19.8	0.83	240.5	-2.7	-0.13
NJKFBM		291.7	-5.0	-0.21	256.0	12.9	0.62
QQWB32		294.3	-2.4	-0.10	252.9	9.8	0.47
T6NPGL		304.9	8.2	0.35	253.8	10.7	0.51
TAJJC2		307.1	10.4	0.44	245.8	2.7	0.13
VAVYKZ		318.7	22.0	0.93	253.8	10.7	0.51

	Sample SH45	Summary Statistics	Sample SH46
Grand Means	296.71 Gurley Units		243.14 Gurley Units
SD Btwn Labs	23.72 Gurley Units		20.96 Gurley Units
Statistics based on 19 of 21 reporting participants			

KUEJN7 (X) - Extreme Data.

D7DWZX (X) - Extreme Data.

Analysis Notes:

HT8KGR - One determination removed from the Lab Mean of Sample SH45 per Grubb's Test at 1% risk (TAPPI 1205).



Paper & Paperboard Interlaboratory Testing Program

Report #289S

Analysis 336

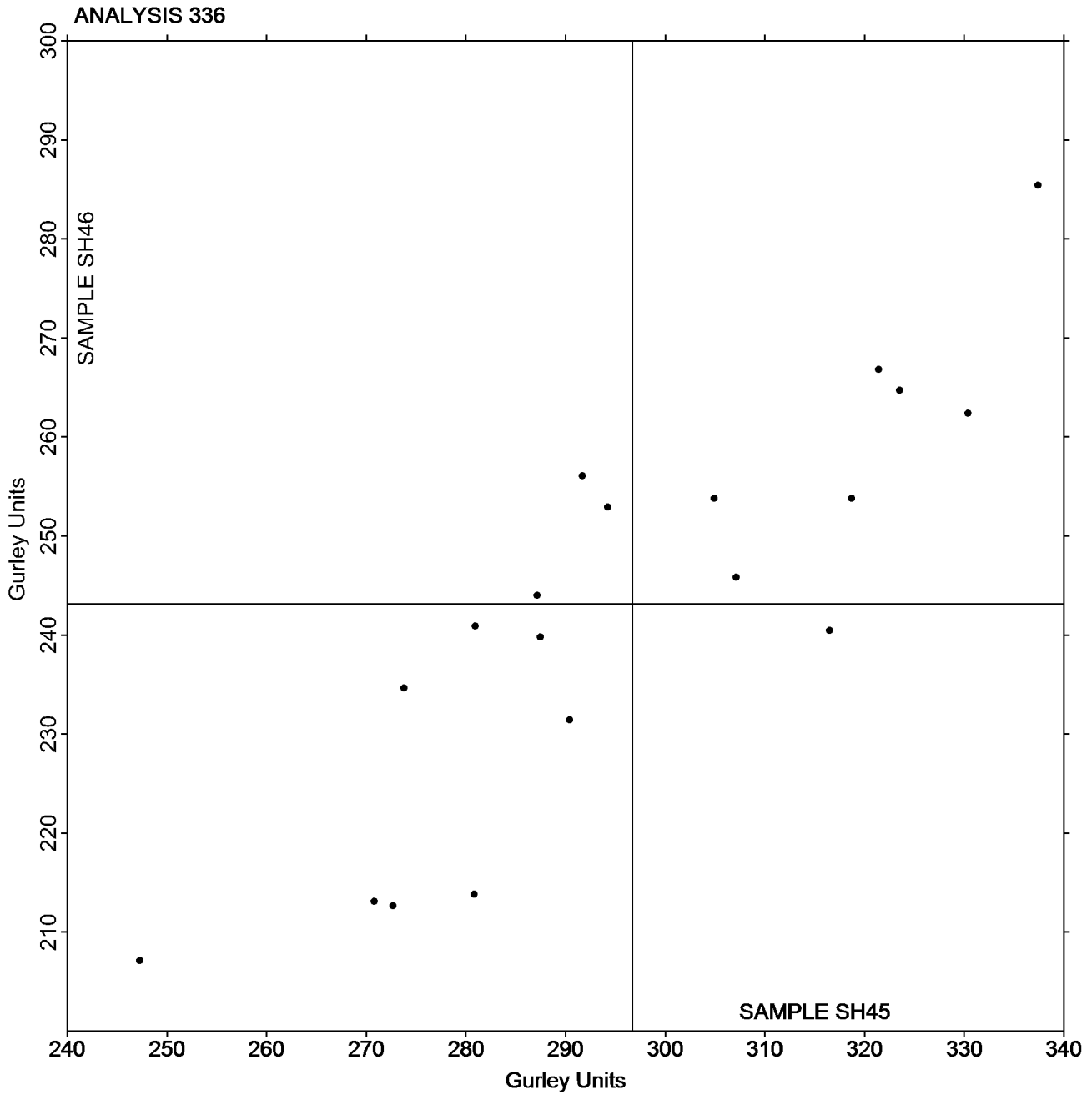
July 2017

Bending Resistance, Gurley Type

TAPPI Official Test Method T543

Grand Mean Sample **SH45** = 296.71 Gurley Units

Grand Mean Sample **SH46** = 243.14 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 #289S
July 2017

WebCode	Data Flag	Sample SJ45			Sample SJ46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2AP3A2		3.490	-0.635	-1.18	2.676	-0.741	-1.49
6UPZJ9		4.230	0.105	0.19	3.390	-0.027	-0.05
9HK7MD		3.819	-0.306	-0.57	3.224	-0.193	-0.39
9NP6VG		4.454	0.329	0.61	3.601	0.184	0.37
9YPH8B		3.624	-0.501	-0.93	3.155	-0.262	-0.53
DMHAK2		4.830	0.705	1.31	4.190	0.773	1.55
H6GA92		3.295	-0.830	-1.55	2.753	-0.664	-1.33
J3DP63		4.380	0.255	0.47	3.778	0.361	0.73
KELR7Q		3.400	-0.725	-1.35	2.870	-0.547	-1.10
NJKFBM		4.082	-0.044	-0.08	3.306	-0.111	-0.22
PEANJ2		4.466	0.341	0.63	3.504	0.087	0.18
QQWB32		4.095	-0.030	-0.06	3.425	0.008	0.02
REVBLF		5.010	0.885	1.65	4.430	1.013	2.04
TAJJC2		4.582	0.457	0.85	3.531	0.114	0.23

		Summary Statistics	
	Sample SJ45		Sample SJ46
Grand Means	4.1255 Taber Units		3.4166 Taber Units
SD Btwn Labs	0.5374 Taber Units		0.4975 Taber Units
Statistics based on 14 of 14 reporting participants			

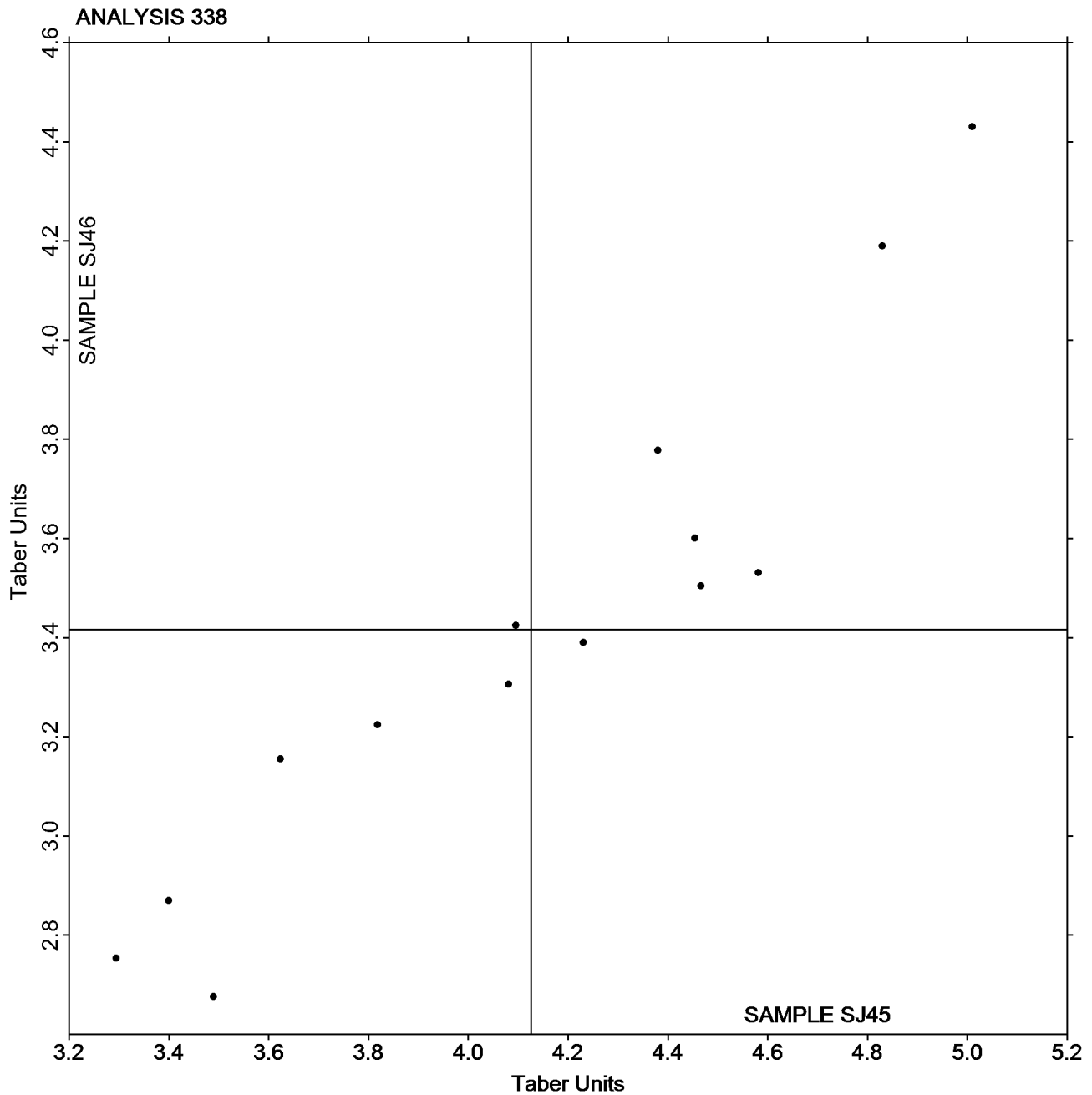


Paper & Paperboard Interlaboratory Testing Program
Analysis 338
Bending Resistance, Taber Type - 0 to 10 Units
TAPPI Official Test Method T566

Report #2895
July 2017

Grand Mean Sample **SJ45** = 4.1255 Taber Units

Grand Mean Sample **SJ46** = 3.4166 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 #289S
 July 2017

WebCode	Data Flag	Sample SQ45			Sample SQ46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
8AAMNM		21.24	-1.44	-0.53	34.28	-1.10	-0.40
8H6M3F		21.88	-0.80	-0.30	35.15	-0.23	-0.08
8MH9BM		21.07	-1.61	-0.59	32.79	-2.58	-0.93
BNHJC7		24.30	1.62	0.60	36.18	0.81	0.29
CRFFJD	X	241.40	218.72	80.96	374.60	339.23	122.81
DG8BZV		20.60	-2.08	-0.77	32.69	-2.68	-0.97
KELR7Q		22.95	0.27	0.10	35.35	-0.02	-0.01
LWGRMP		20.03	-2.65	-0.98	33.21	-2.16	-0.78
QKRCTW		23.02	0.34	0.13	36.37	1.00	0.36
TAJJC2		23.09	0.41	0.15	36.37	1.00	0.36
UTVRTT		29.87	7.19	2.66	42.60	7.23	2.62
YKMPUW		21.40	-1.28	-0.47	34.10	-1.27	-0.46

Sample SQ45		Summary Statistics	Sample SQ46	
Grand Means	22.676 Taber Units		35.371 Taber Units	
SD Btwn Labs	2.702 Taber Units		2.762 Taber Units	
Statistics based on 11 of 12 reporting participants				

CRFFJD (X) - Extreme Data.

Analysis Notes:

8MH9BM - Data appear to be reported as g-cm, not mN-m as indicated on datasheet. Units corrected by CTS.

BNHJC7 - Data appear to be transposed between samples. Switched by CTS.

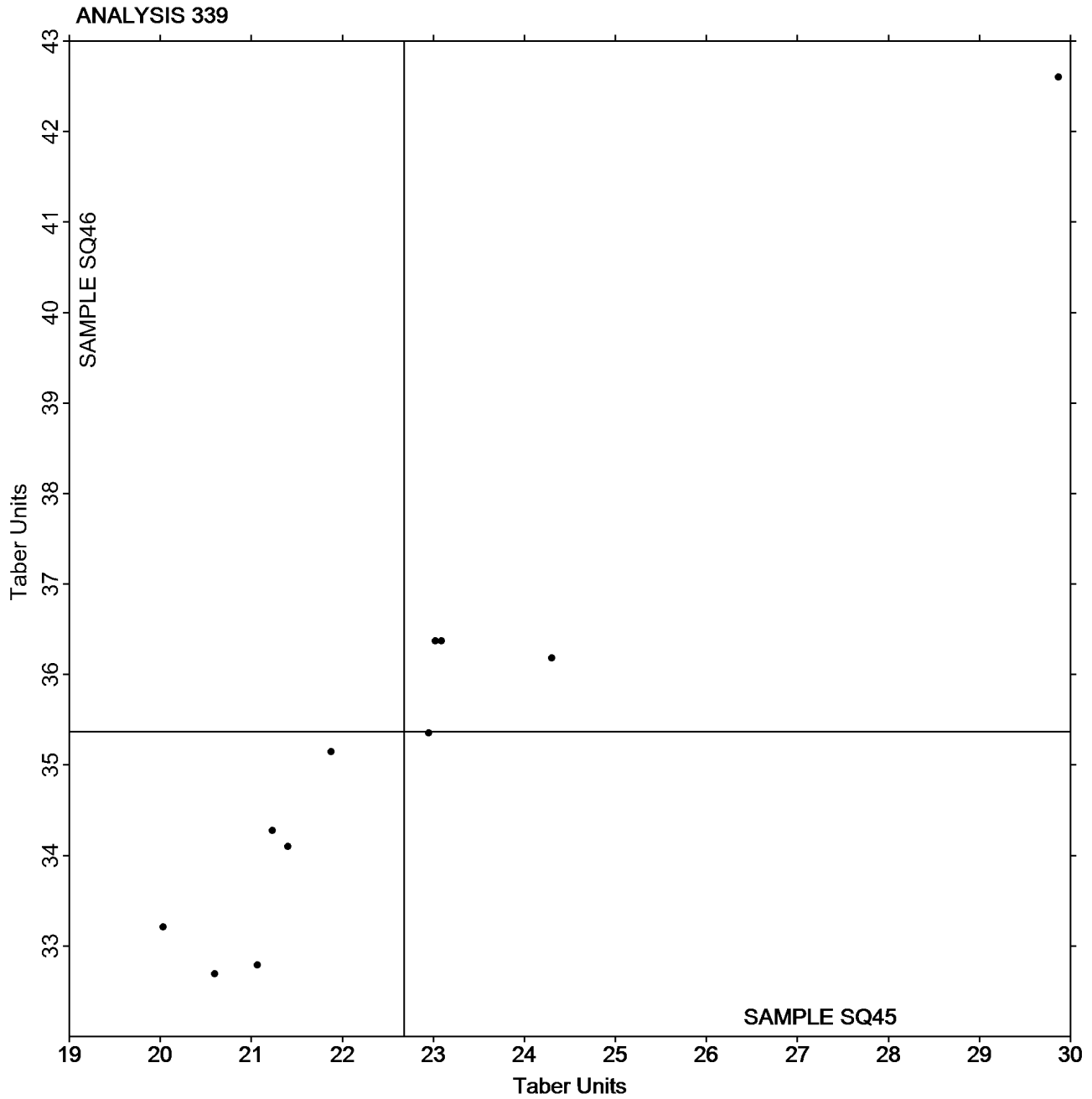


Paper & Paperboard Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units
TAPPI Official Test Method T489

Report #2895
July 2017

Grand Mean Sample **SQ45** = 22.676 Taber Units

Grand Mean Sample **SQ46** = 35.371 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
Indenting Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
TAPPI Official Test Method T489

Report #2895
July 2017

WebCode	Data Flag	Sample ST45			Sample ST46		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2L4XP2		291.4	9.5	0.93	298.4	3.6	0.27
3HLX8Z		282.0	0.1	0.01	306.3	11.5	0.87
3PZWLC		288.5	6.6	0.64	295.6	0.8	0.06
7F8PEH		295.6	13.7	1.33	309.3	14.5	1.09
8H6M3F		281.3	-0.5	-0.05	283.0	-11.8	-0.89
9WGHW3		258.0	-23.9	-2.32	266.6	-28.2	-2.13
GZRBG2		280.8	-1.1	-0.10	286.9	-7.9	-0.59
KELR7Q		267.0	-14.9	-1.44	281.3	-13.5	-1.02
NBNMUG		283.7	1.9	0.18	287.0	-7.8	-0.58
QKRCTW		293.1	11.3	1.09	312.8	18.1	1.36
RG3PBU		272.6	-9.3	-0.90	284.2	-10.6	-0.80
T6NPGL		274.2	-7.7	-0.74	283.3	-11.5	-0.87
TQQPJQ		281.1	-0.8	-0.07	307.3	12.5	0.94
TU8CVB		301.5	19.6	1.91	311.0	16.2	1.22
UWRHTC		280.1	-1.8	-0.17	292.8	-2.0	-0.15
WUCXW8		284.7	2.8	0.27	305.8	11.0	0.83
XJ7FYA		280.0	-1.9	-0.18	285.7	-9.1	-0.68
YJMQD9		277.9	-4.0	-0.38	308.9	14.1	1.06

	Sample ST45	Summary Statistics	Sample ST46
Grand Means	281.86 Taber Units		294.78 Taber Units
SD Btwn Labs	10.30 Taber Units		13.27 Taber Units
Statistics based on 18 of 18 reporting participants			

Analysis Notes:

RG3PBU - Data appear to be reported as g-cm, not mN-m as indicated on datasheet. Units corrected by CTS.

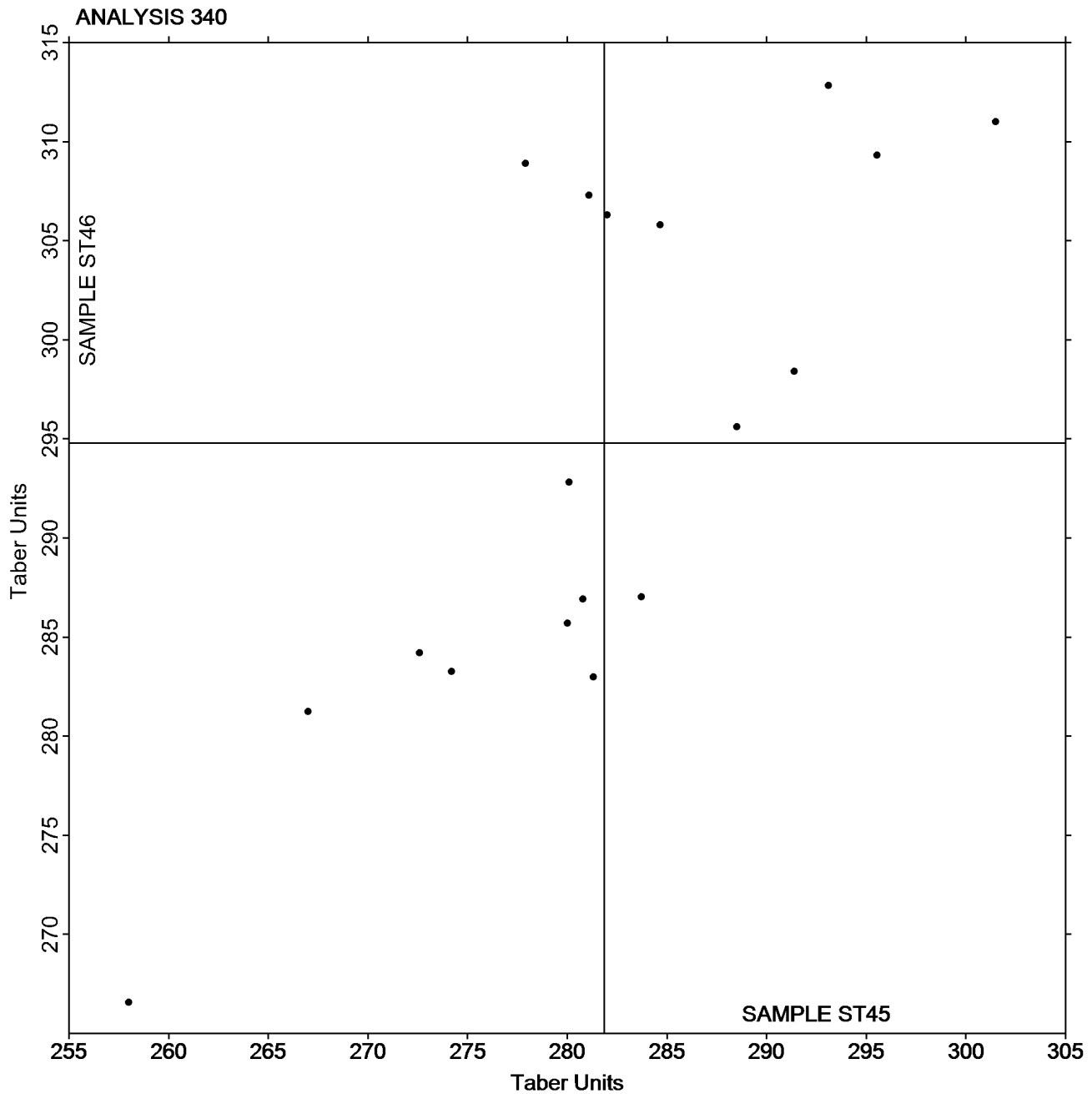


Paper & Paperboard Interlaboratory Testing Program
Analysis 340
Indenting Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
TAPPI Official Test Method T489

Report #2895
July 2017

Grand Mean Sample **ST45** = 281.86 Taber Units

Grand Mean Sample **ST46** = 294.78 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 #2895
July 2017

WebCode	Data Flag	Sample SM45			Sample SM46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2AP3A2		78.02	7.30	0.81	92.94	9.33	1.03	DT
38LKTL		79.38	8.66	0.96	93.82	10.21	1.13	XX
3HLX8Z		68.52	-2.20	-0.24	77.04	-6.57	-0.72	LW
42QXT7		57.40	-13.32	-1.47	70.72	-12.90	-1.42	LW
8MH9BM		56.63	-14.09	-1.56	66.99	-16.62	-1.83	TZ
9HK7MD		72.24	1.52	0.17	89.15	5.54	0.61	TL
BNHJC7		83.26	12.54	1.39	99.54	15.93	1.76	TA
BNXW24		71.32	0.60	0.07	92.52	8.91	0.98	CA
C3VDHP		69.80	-0.92	-0.10	78.80	-4.81	-0.53	TA
CRFFJD		70.54	-0.18	-0.02	80.64	-2.97	-0.33	TA
GZRBG2		74.41	3.68	0.41	83.08	-0.53	-0.06	LX
HFKDH7		65.14	-5.58	-0.62	82.08	-1.53	-0.17	XX
PEANJ2	*	49.82	-20.90	-2.31	72.20	-11.41	-1.26	CD
PH78LZ		80.00	9.28	1.03	88.66	5.05	0.56	TA
QCA8DH		70.60	-0.12	-0.01	79.60	-4.01	-0.44	XX
QKRCTW		80.92	10.20	1.13	90.56	6.95	0.77	LW
TAJJC2		67.89	-2.83	-0.31	76.19	-7.42	-0.82	TZ
UVVX8Y		77.08	6.36	0.70	90.50	6.89	0.76	LW

Sample SM45		Summary Statistics	Sample SM46	
Grand Means	70.720 psi		83.612 psi	
SD Btw Labs	9.043 psi		9.068 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		

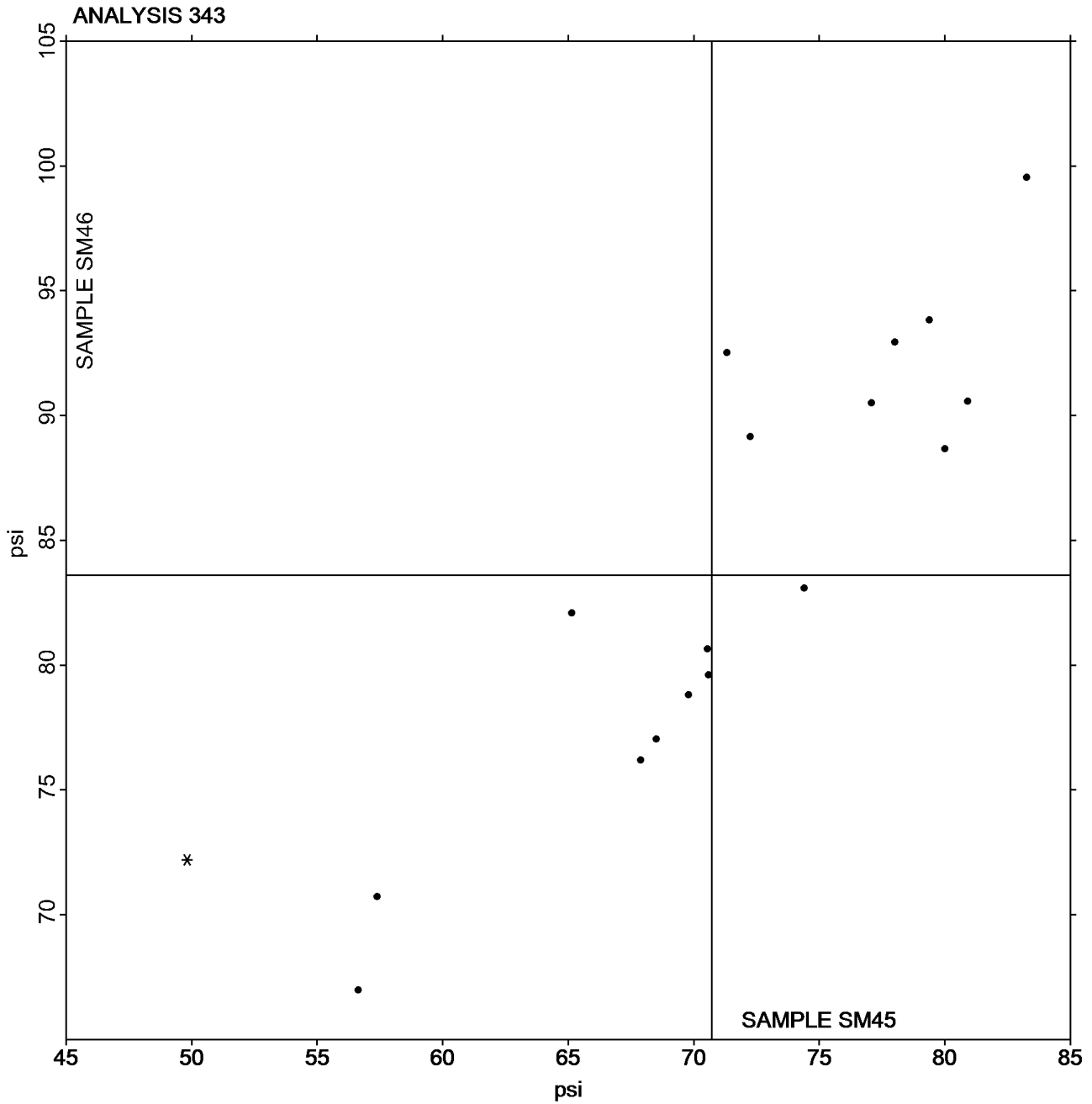


Paper & Paperboard Interlaboratory Testing Program
Analysis 343
Z-Direction Tensile
TAPPI Official Test Method T541

Report #289S
July 2017

Grand Mean Sample **SM45** = 70.720 psi

Grand Mean Sample **SM46** = 83.612 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 #2895
July 2017

WebCode	Data Flag	Sample SZ45			Sample SZ46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3PZWLC		37.00	2.10	0.75	37.20	2.17	0.85	CA
8H6M3F		31.64	-3.27	-1.17	30.84	-4.19	-1.64	CA
8XZUEV		38.60	3.70	1.32	37.00	1.97	0.77	CA
EUXHGW	*	31.20	-3.71	-1.33	34.28	-0.75	-0.29	LW
H4MGDJ		40.11	5.20	1.86	40.12	5.09	1.99	CH
JCF8HQ		33.16	-1.75	-0.62	33.60	-1.43	-0.56	LW
KKPZ2K		35.11	0.21	0.07	35.24	0.21	0.08	TA
LFAKFZ		36.48	1.58	0.56	35.92	0.89	0.35	CD
NBNMUG		34.42	-0.49	-0.17	34.16	-0.87	-0.34	TA
R9UVJL		30.44	-4.47	-1.60	30.42	-4.61	-1.80	LW
RG3PBU		35.76	0.86	0.31	35.16	0.13	0.05	CD
RXANKW		40.00	5.09	1.82	39.63	4.60	1.80	PG
T6NPGL		32.60	-2.31	-0.83	33.72	-1.31	-0.51	CA
TQQPJQ		35.20	0.30	0.11	35.60	0.57	0.22	TA
UWRHTC		33.60	-1.31	-0.47	34.84	-0.19	-0.07	TL
WUCXW8		34.97	0.07	0.02	34.75	-0.27	-0.11	TZ
XJ7FYA		35.00	0.10	0.03	36.00	0.97	0.38	CA
YJMQD9		33.00	-1.91	-0.68	32.00	-3.03	-1.18	CA

Sample SZ45		Summary Statistics	Sample SZ46	
Grand Means	34.905 psi		35.027 psi	
SD Btwn Labs	2.793 psi		2.555 psi	
Statistics based on 18 of 18 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	TZ	TMI Monitor/ZDT Tester

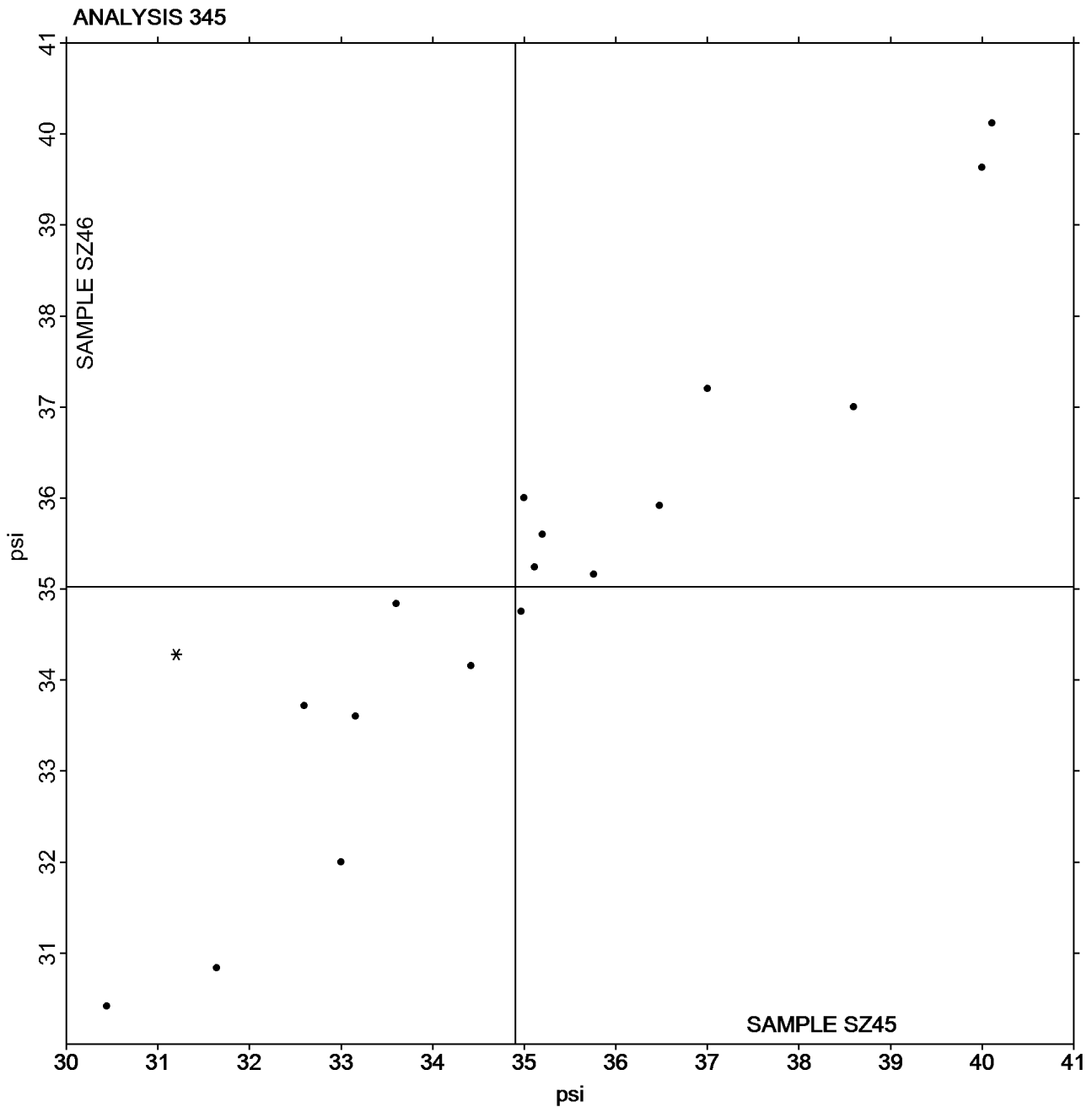


Paper & Paperboard Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard
TAPPI Official Test Method T541

Report #289S
July 2017

Grand Mean Sample **SZ45** = 34.905 psi

Grand Mean Sample **SZ46** = 35.027 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 #289S
July 2017

WebCode	Data Flag	Sample SN45			Sample SN46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3HLX8Z		151.6	2.7	0.28	101.8	-5.7	-1.26	HZ
3PZWLC		131.6	-17.3	-1.78	108.8	1.3	0.28	HY
3UUZ4H		138.2	-10.7	-1.10	107.0	-0.5	-0.11	HY
7RZ9TM		132.0	-16.9	-1.74	98.0	-9.5	-2.09	HY
8AAMNM		152.5	3.6	0.37	103.9	-3.6	-0.80	HY
8MH9BM		150.6	1.7	0.17	105.0	-2.5	-0.55	HY
BF4ZT8		151.8	2.9	0.30	110.2	2.7	0.59	HY
BNHJC7		158.0	9.1	0.93	104.2	-3.3	-0.73	HZ
CRFFJD		165.4	16.5	1.69	117.8	10.3	2.26	HY
GBE8KN		147.0	-1.9	-0.20	113.2	5.7	1.25	HY
NBNMUG		154.6	5.7	0.58	109.6	2.1	0.46	HZ
PEANJ2		160.6	11.7	1.20	106.2	-1.3	-0.29	HY
PH78LZ		156.0	7.1	0.73	111.8	4.3	0.94	HY
QKRCTW		159.0	10.1	1.04	106.8	-0.7	-0.16	HY
QQWB32		137.8	-11.1	-1.14	104.1	-3.4	-0.75	KR
T6NPGL		138.2	-10.7	-1.10	108.8	1.3	0.28	HZ
TAJJC2		153.8	4.9	0.50	104.0	-3.5	-0.77	HY
U3JFK		146.2	-2.7	-0.28	105.6	-1.9	-0.42	HY
YJ6Z24		154.2	5.3	0.54	113.0	5.4	1.20	HY
ZLNGU9		139.4	-9.5	-0.98	110.6	3.1	0.68	HZ

		Summary Statistics			
		Sample SN45		Sample SN46	
Grand Means		148.92	1000th ft-lbs	107.52	1000th ft-lbs
SD Btwn Labs		9.73	1000th ft-lbs	4.56	1000th ft-lbs
Statistics based on 20 of 20 reporting participants					

Key to Instrument Codes Reported by Participants

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

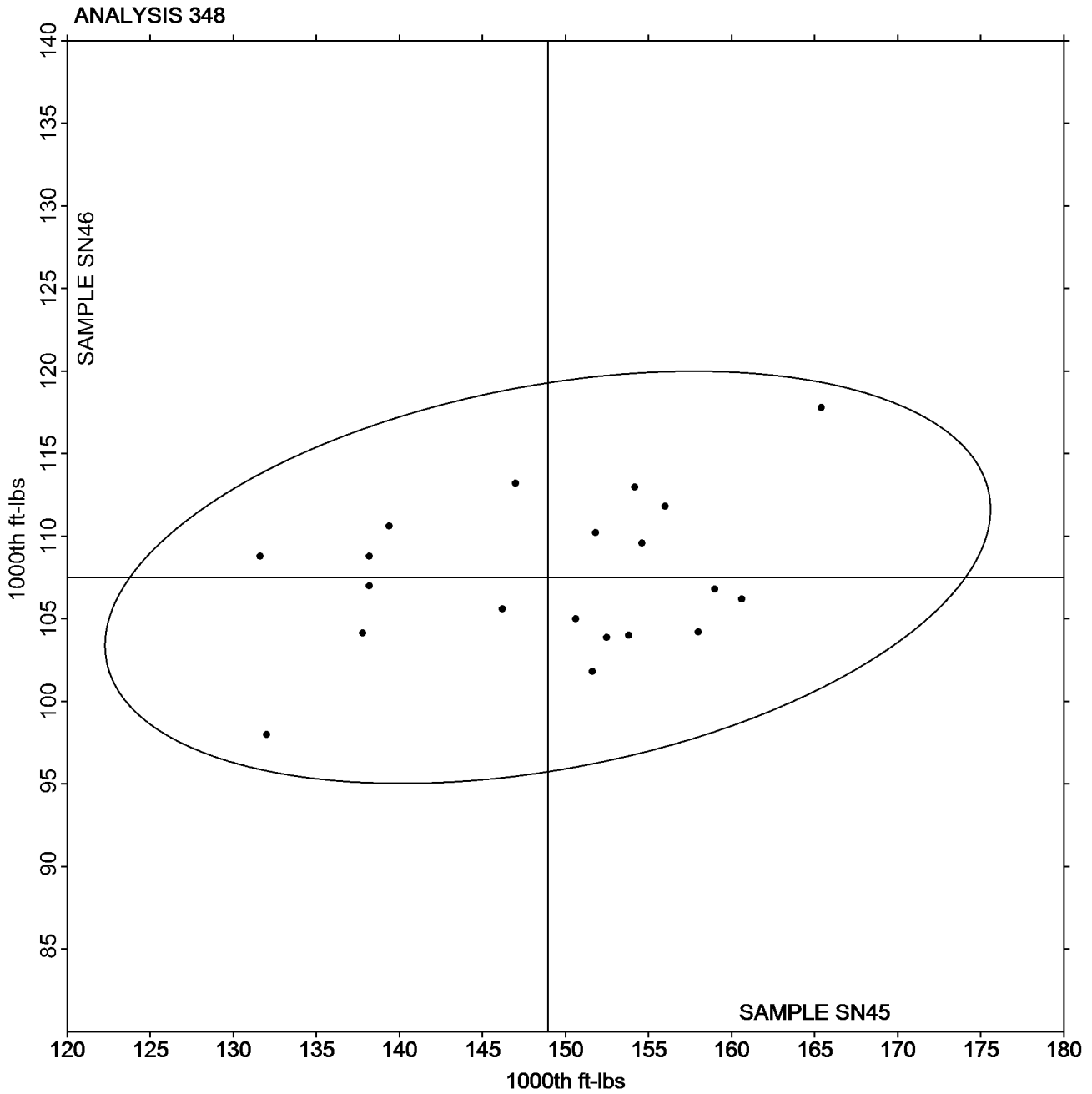


Paper & Paperboard Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics
TAPPI Provisional Test Method T569

Report #289S
July 2017

Grand Mean Sample **SN45** = 148.92 1000th ft-lbs

Grand Mean Sample **SN46** = 107.52 1000th ft-lbs





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

Report #289S
July 2017

WebCode	Data Flag	Sample SP45			Sample SP46			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
6WUTD7		169.8	29.2	1.23	108.40	8.49	0.86	XX
DRRGWY		152.2	11.6	0.49	108.60	8.69	0.88	XX
EUXHGW		130.0	-10.6	-0.45	104.20	4.29	0.44	XX
GZRBG2		101.9	-38.7	-1.63	76.61	-23.29	-2.36	TM
H4MGDJ		136.6	-4.0	-0.17	94.60	-5.31	-0.54	TM
J2XATL		164.4	23.8	1.00	107.00	7.09	0.72	SC
KELR7Q		173.8	33.2	1.39	109.94	10.03	1.02	XX
M4BDTE		120.4	-20.2	-0.85	100.00	0.09	0.01	SC
NVWPTL		132.0	-8.6	-0.36	95.78	-4.13	-0.42	TM
R73ZBJ	X	163.0	22.4	0.94	165.00	65.09	6.61	XX
RXANKW		152.6	12.0	0.50	101.80	1.89	0.19	TM
UCK76W		113.2	-27.5	-1.15	92.03	-7.88	-0.80	XX

		Summary Statistics			
		Sample SP45		Sample SP46	
Grand Means		140.63	1000th ft-lbs	99.905	1000th ft-lbs
SD Btwn Labs		23.79	1000th ft-lbs	9.852	1000th ft-lbs
Statistics based on 11 of 12 reporting participants					

Comments on Assigned Data Flags for Test #349

R73ZBJ (X) - Extreme Data for Sample SP46.

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 #289S

Analysis 349

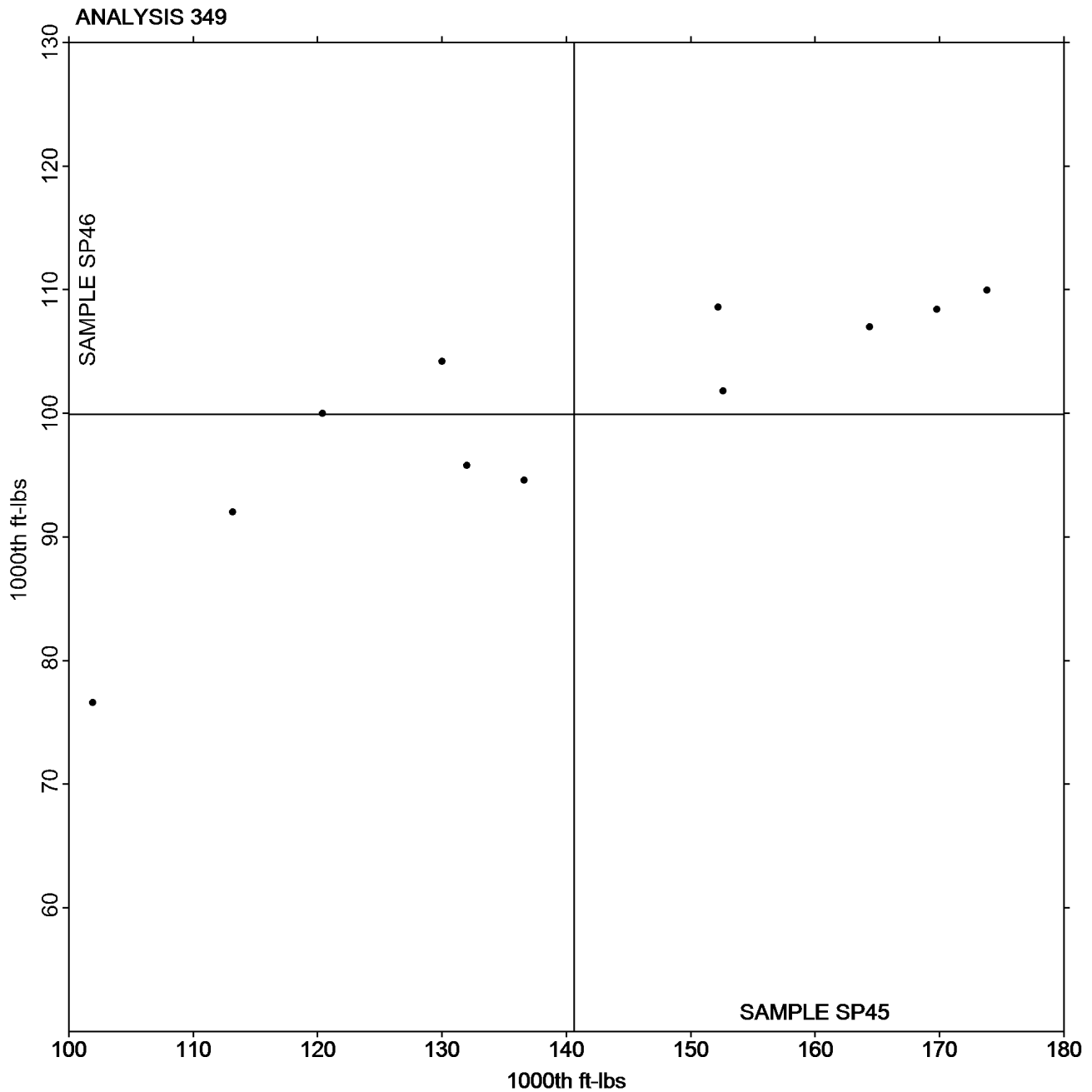
July 2017

Internal Bond Strength - Scott Bond Models

TAPPI Provisional Test Method T569

Grand Mean Sample **SP45** = 140.63 1000th ft-lbs

Grand Mean Sample **SP46** = 99.905 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.