

Paper & Paperboard Interlaboratory Testing Program

Summary Report #284S - September 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:

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

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

Key for Web Summary Reports (Page 1 of 2)

WebCode	Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Paper Report published on the CTS web site. The WebCode for each analysis can be found in the Performance Analysis Report mailed to each participant. In addition, the WebCodes can be found on the data sheets.
Lab Mean	The average of the values obtained for each sample by the participant.
Grand Mean	The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.
Difference from Grand Mean	The difference of the LAB MEAN from the GRAND MEAN.
Between-Lab Standard Deviation	An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).
Comparative Performance Value	An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.
Inst Code	A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section), if instruments are tracked.
Data Flag	DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

DATA FLAG	STATISTICALLY INCLUDED/EXCLUDED	ACTION REQUIRED
*	INCLUDED	CAUTION - review testing procedure and monitor future results. Results fall outside 95% ellipse but within a 99% ellipse that is calculated but not drawn.
X	EXCLUDED	STOP - immediate review of data and/or testing procedure is required. Results fall outside the 99% ellipse. See specific notes following each table for more information on why the data is excluded.
M	EXCLUDED	PROCEED - lab was unable to report data for at least one sample.

Graph - For each laboratory, the LAB MEAN for the first sample (x-axis) is plotted against the LAB MEAN for the second sample (y-axis) with each point representing a laboratory. The horizontal and vertical cross-hairs are the GRAND MEANS for each sample. When 20 or more laboratories are in the statistics, an ellipse is also drawn so that 95% of the time a randomly selected laboratory will be included inside the ellipse. Plotted data flags are explained on the previous page.

Common Problems Highlighted in Footnotes

1. **Extreme data** - The laboratory's results for one or both samples are so inconsistent with those of the other participants that the lab mean(s) fall outside the plot. The participant is advised to immediately review his data and/or testing procedure.
2. **Systematic bias** - The laboratory's results are either consistently high or low for both samples when compared to the other participants (the plotted point falls near the top or bottom of the ellipse). This indicates that the participant is performing the test with a constant bias. Causes of systematic errors include improper calibration, the particular make/model of equipment or a modification to the testing procedure.
3. **Inconsistency in testing between samples/sample sets** - The laboratory's results indicate that there are differences in the way the two samples tested (the plotted point falls to the side of the ellipse). This type of error may be attributed to the analyst deviating from the procedure when testing one of the samples or a material interaction occurrence with the instrument or room conditions. The inconsistency is reflected in the CPVs for the two samples, such as a +1.5 CPV for sample A and a -2.2 CPV for sample B. CTS also will specify if the laboratory's data for one sample are high/low compared to the other participants. If this inconsistency is slight, the lab's plotted point will be an * that falls on the edge of the ellipse.
4. **Inconsistency in testing within a sample** - The laboratory's within-lab standard deviation for a specified sample is high when compared to the other participants, often causing the lab's plotted point to fall outside of the ellipse.

Labs flagged with an * are not typically included in the footnotes of a data table. These labs may locate their position in the control ellipse and use the definitions above to help identify the type of testing error. An * should serve as a caution flag, a "yellow light", to a lab. If this error is repeated in future rounds, a lab may need to stop and review its testing procedures. The initial data flag is not cause for alarm. Interlaboratory tests conducted at regular intervals permit a lab to recognize trends in testing.



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

Report #2845
 September 2016

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

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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 305

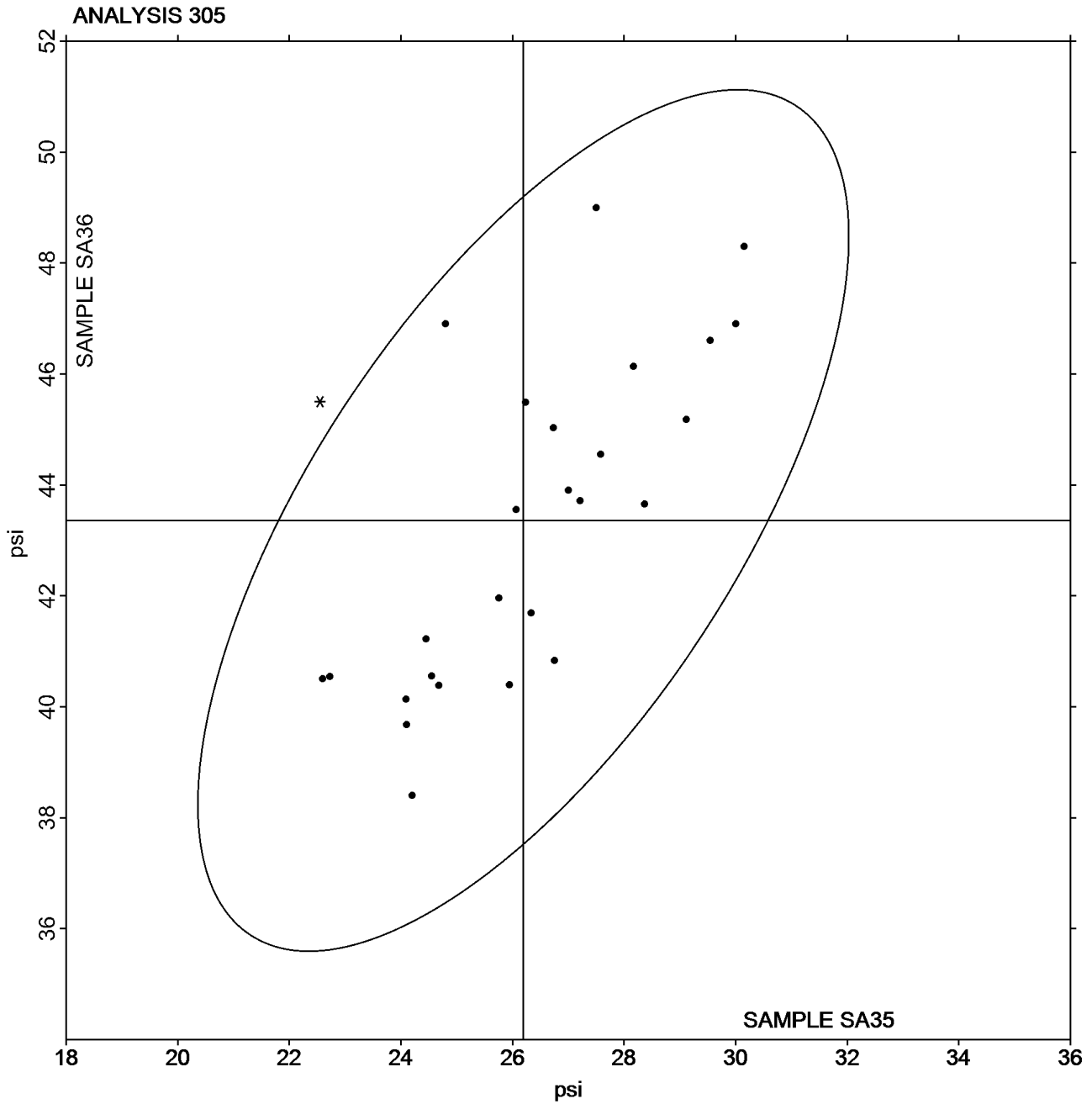
September 2016

Bursting Strength - Printing Papers

TAPPI Official Test Method T403

Grand Mean Sample SA35 = 26.194 psi

Grand Mean Sample SA36 = 43.359 psi





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 310

September 2016

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

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

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



Paper & Paperboard Interlaboratory Testing Program

Analysis 310

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

Report #284S

September 2016



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 310

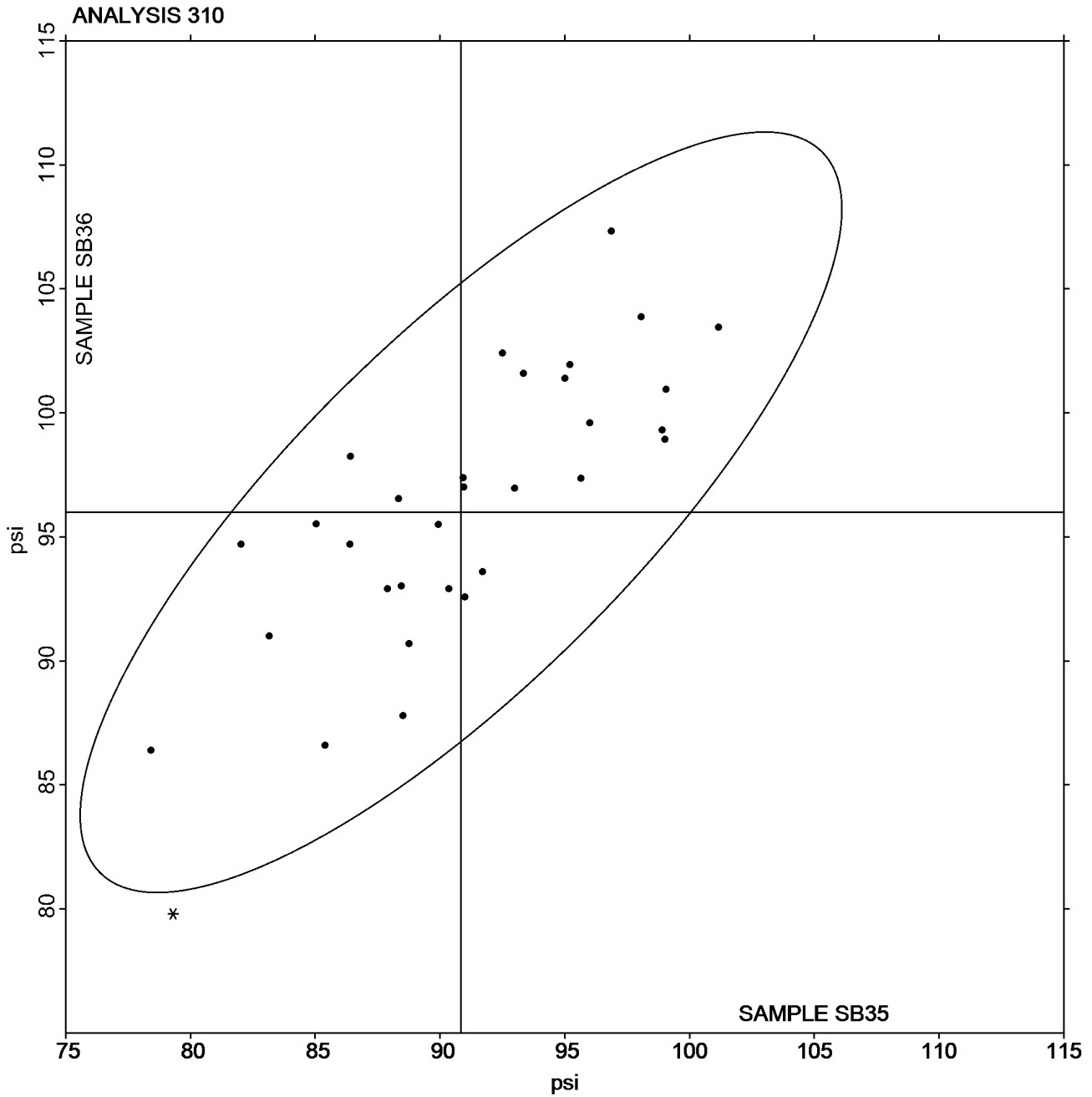
September 2016

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

Grand Mean Sample **SB35** = 90.838 psi

Grand Mean Sample **SB36** = 95.996 psi





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

Report #2845
September 2016

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

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

Comments on Assigned Data Flags for Test #311

6FMAD2 (X) - Extreme Data.



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 311

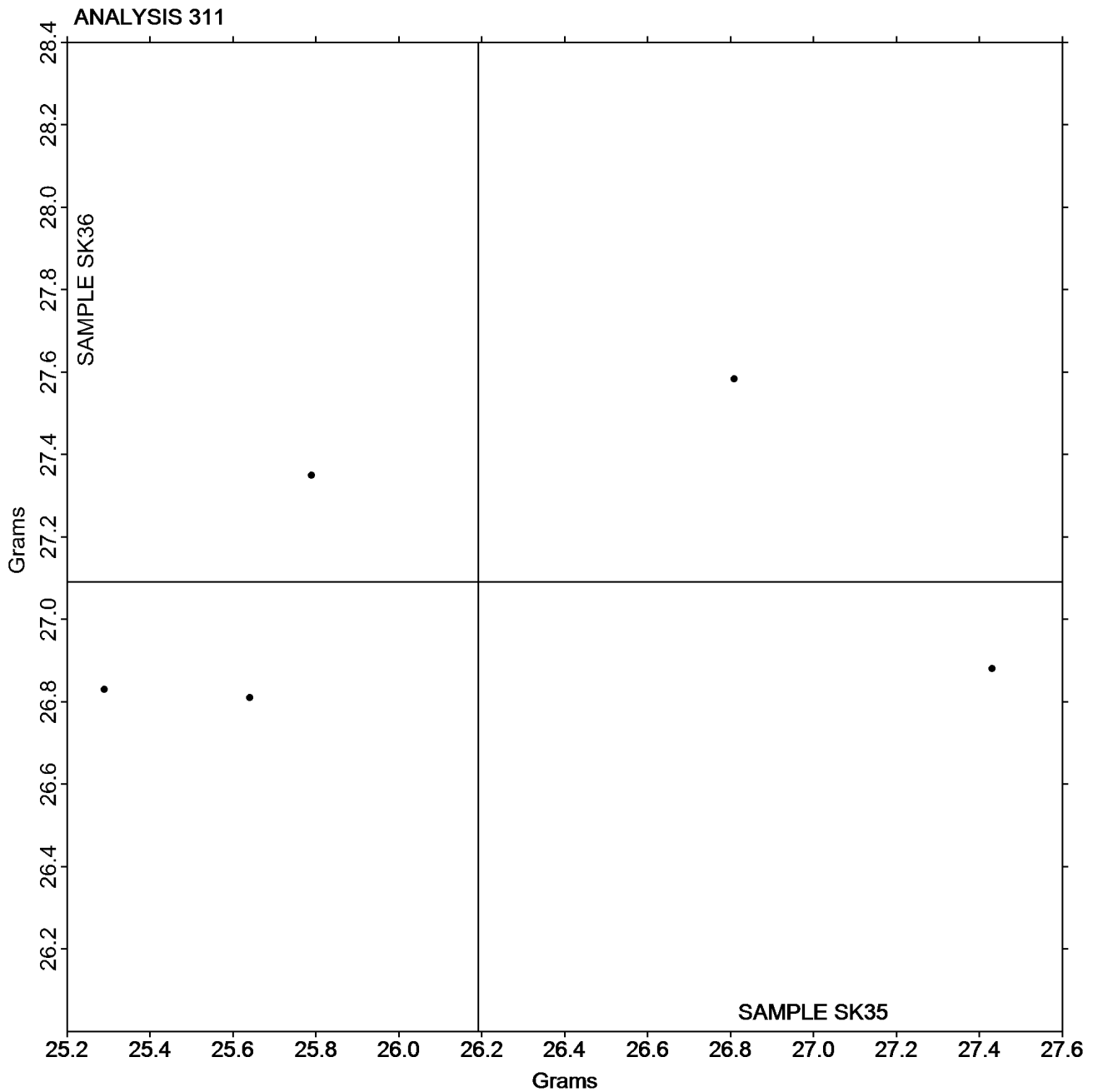
September 2016

Tearing Strength - Newsprint

TAPPI Official Test Method T414

Grand Mean Sample **SK35** = 26.192 Grams

Grand Mean Sample **SK36** = 27.091 Grams



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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 312

September 2016

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

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



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

Report #2845
 September 2016

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

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

Comments on Assigned Data Flags for Test #312

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

Analysis Notes:

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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 312

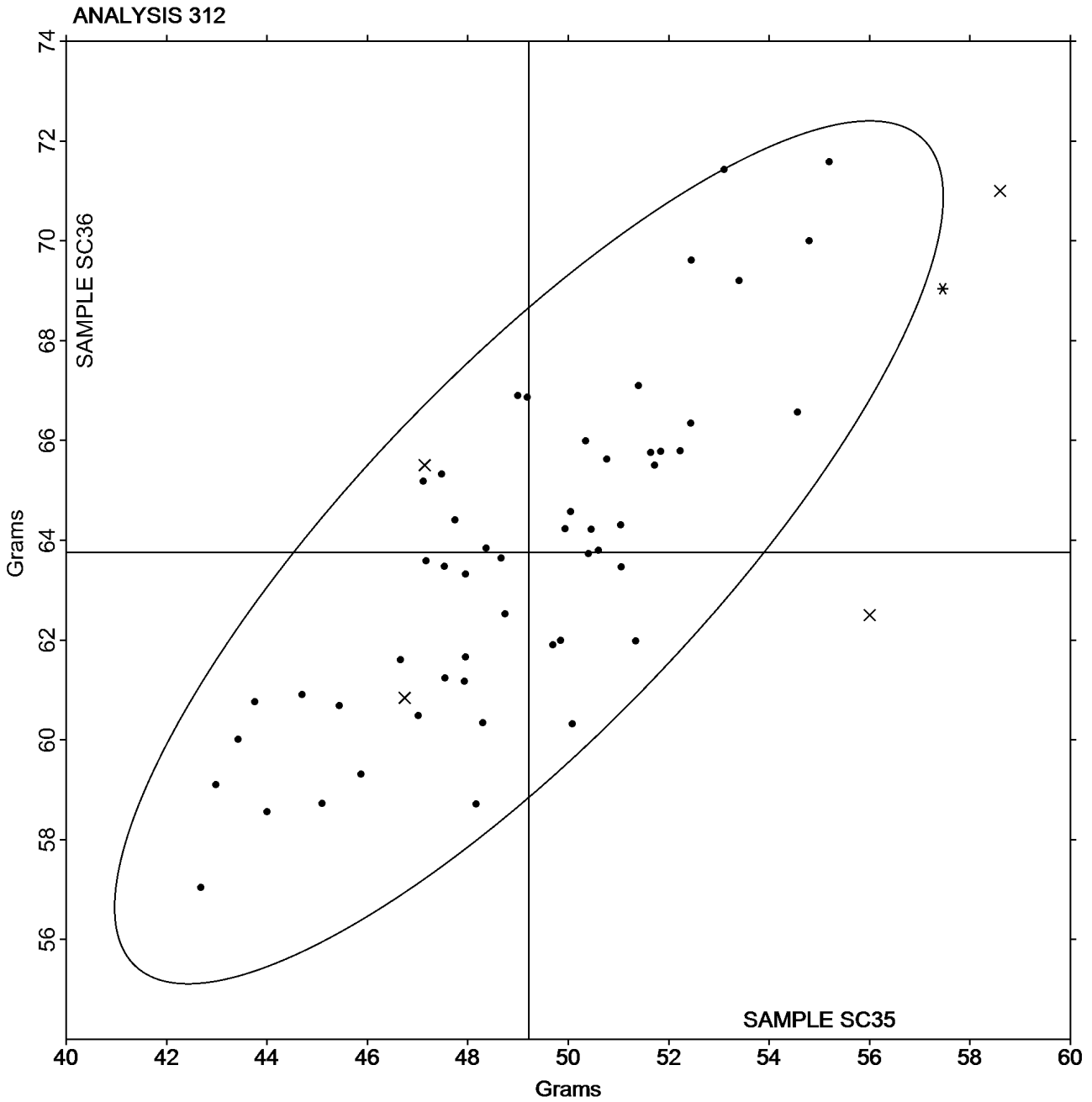
September 2016

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

Grand Mean Sample **SC35** = 49.216 Grams

Grand Mean Sample **SC36** = 63.757 Grams





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 314

September 2016

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

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



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

Report #2845
September 2016

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

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

Comments on Assigned Data Flags for Test #314

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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 314

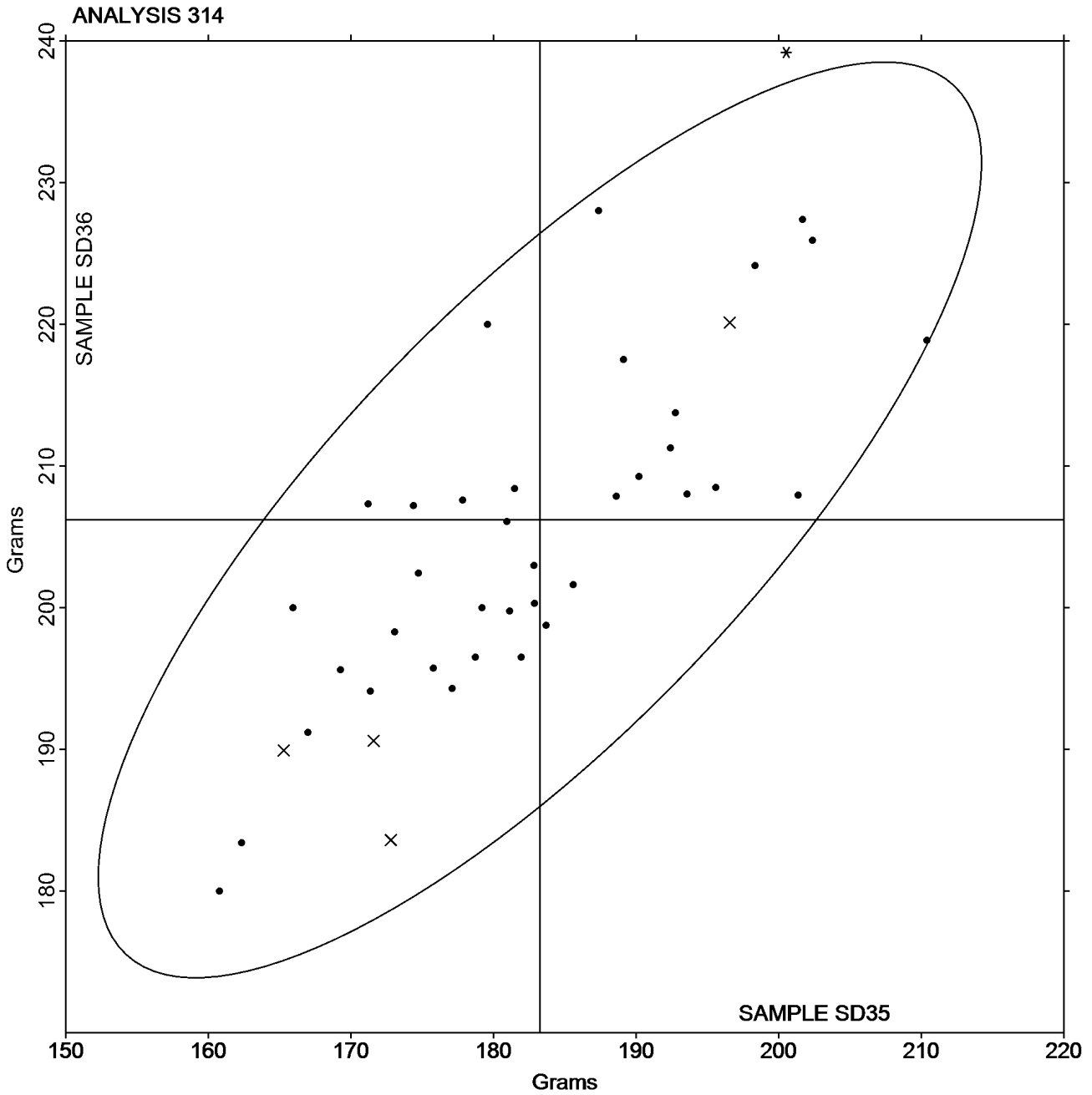
September 2016

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

Grand Mean Sample **SD35** = 183.25 Grams

Grand Mean Sample **SD36** = 206.19 Grams





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

Report #2845
 September 2016

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

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

Comments on Assigned Data Flags for Test #320

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

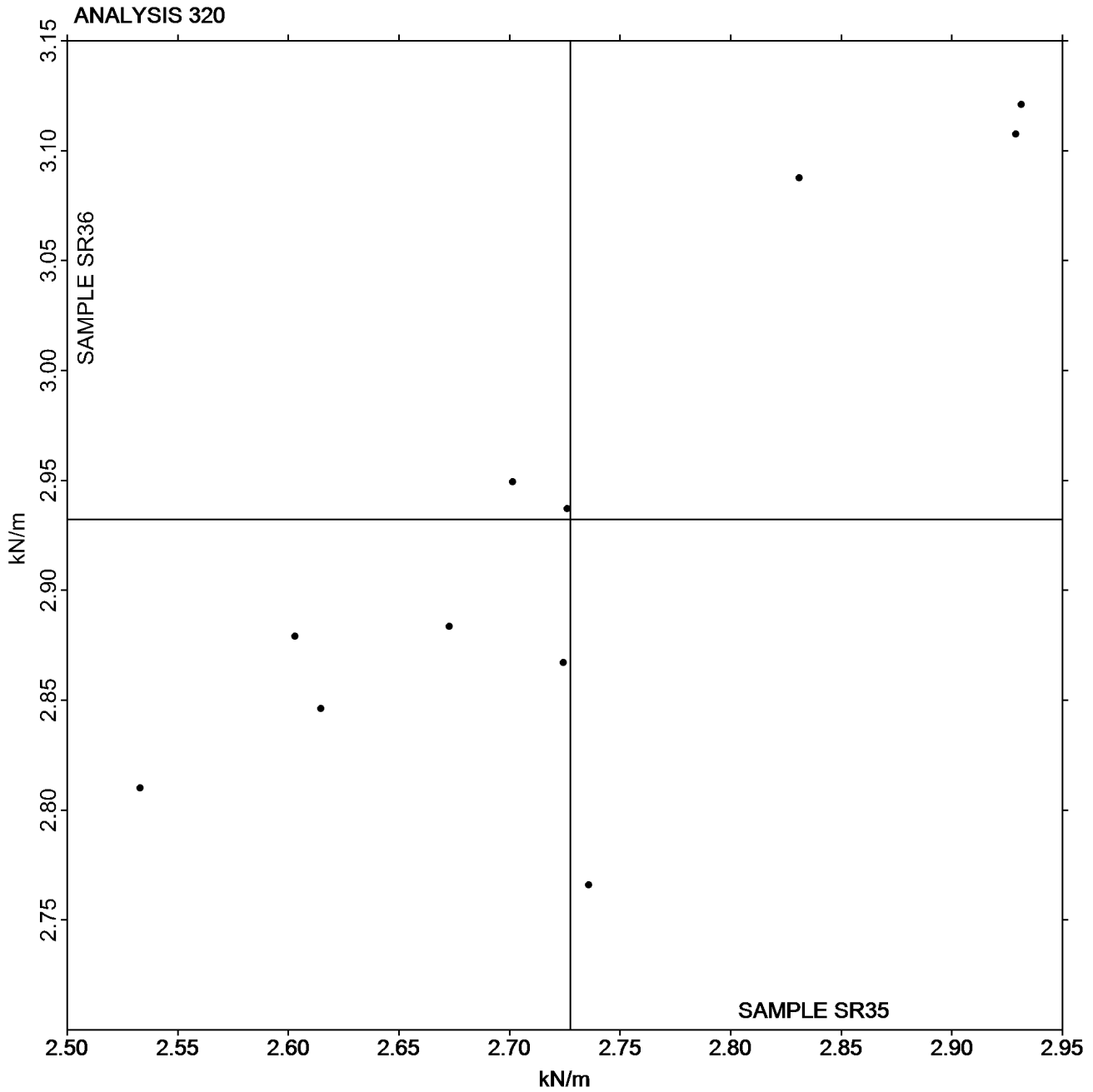


Paper & Paperboard Interlaboratory Testing Program
Analysis 320
Tensile Breaking Strength - Newsprint
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SR35** = 2.7275 kN/m

Grand Mean Sample **SR36** = 2.9322 kN/m



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



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

Report #2845
September 2016

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

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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 321

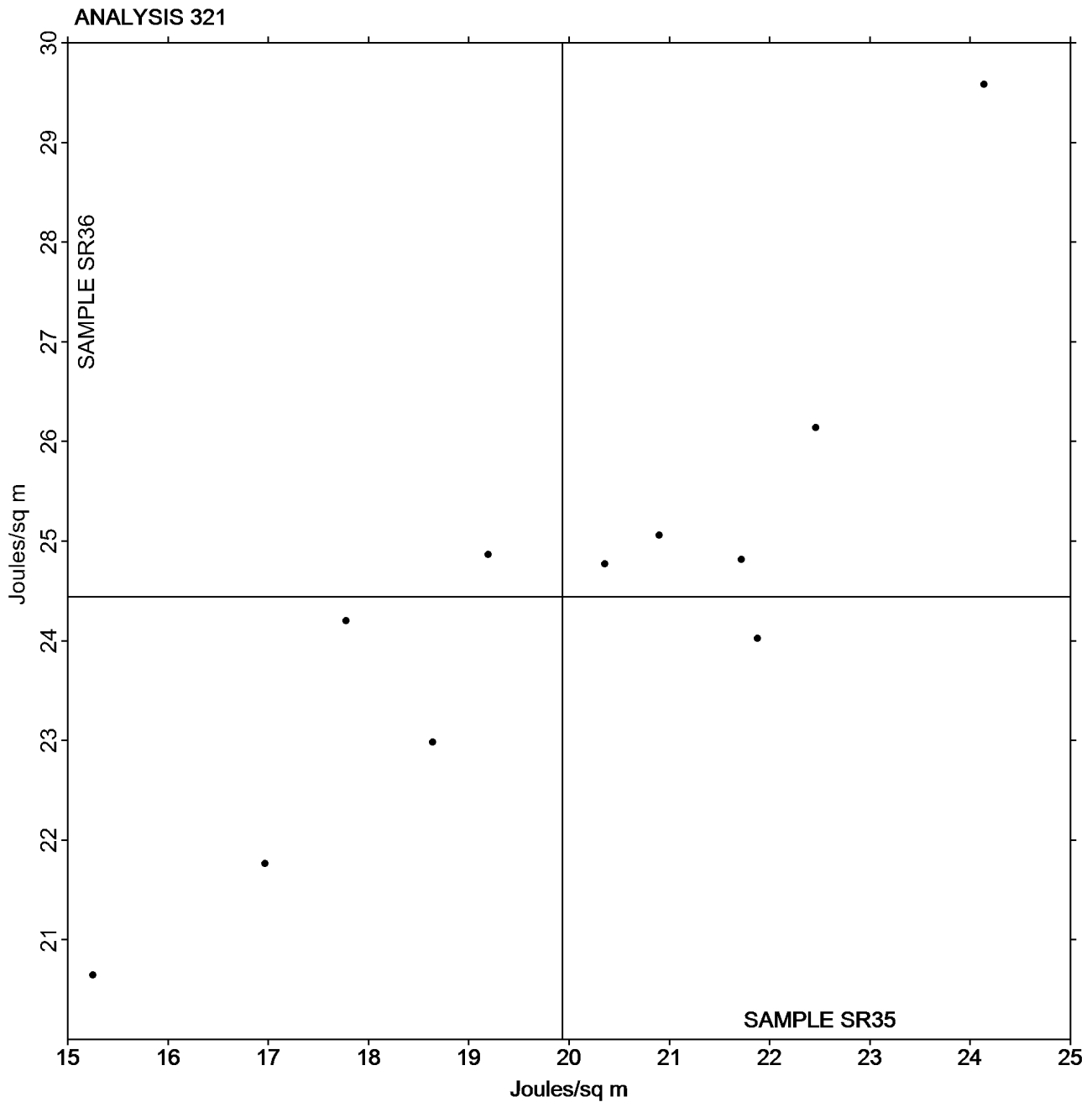
September 2016

Tensile Energy Absorption - Newsprint

TAPPI Official Test Method T494

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

Grand Mean Sample **SR36** = 24.439 Joules/sq m



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



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

Report #2845
September 2016

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

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

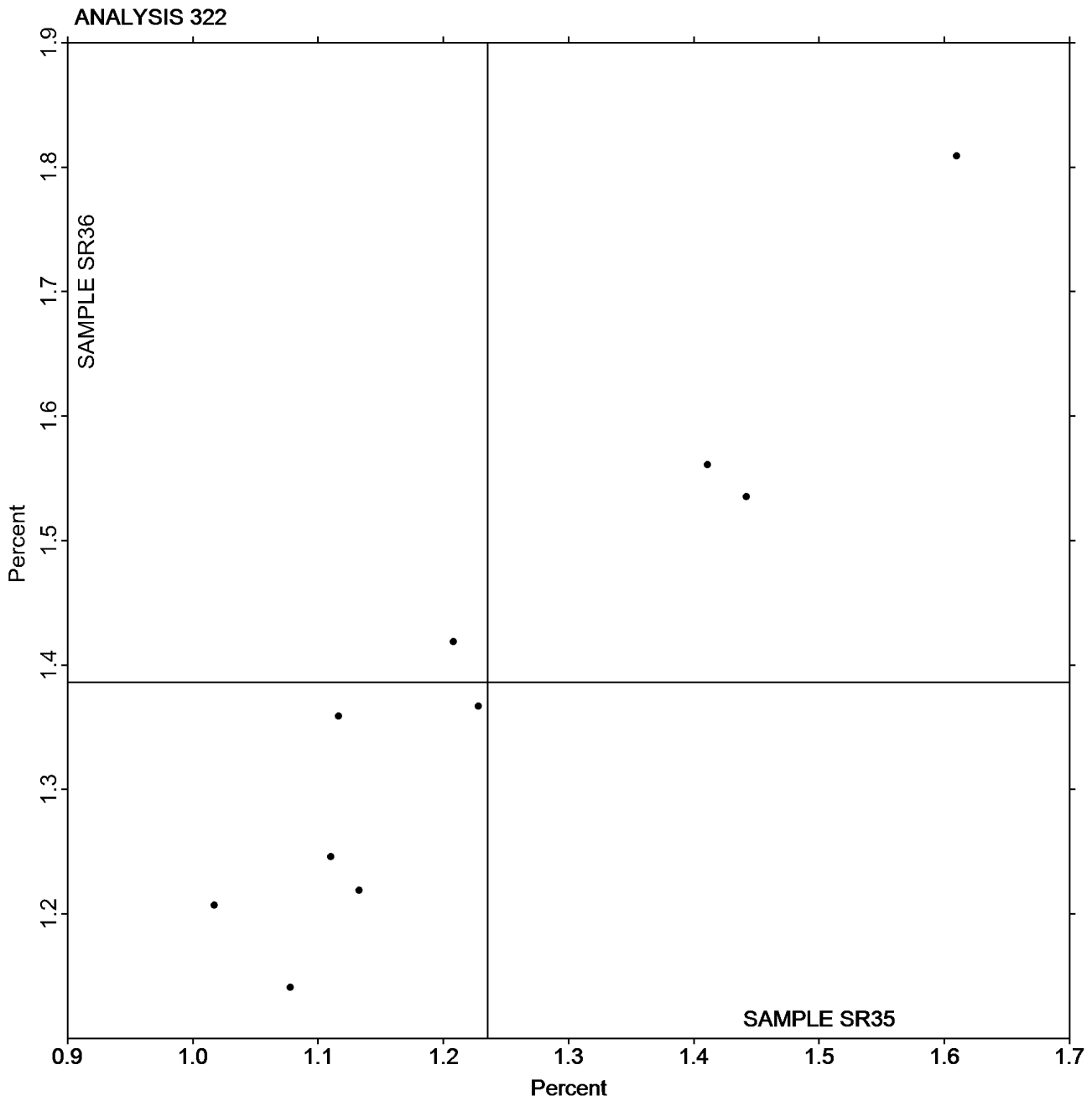


Paper & Paperboard Interlaboratory Testing Program
Analysis 322
Elongation to Break - Newsprint
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SR35** = 1.2353 Percent

Grand Mean Sample **SR36** = 1.3863 Percent



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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 325

September 2016

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

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



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

Report #2845
 September 2016

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

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

Comments on Assigned Data Flags for Test #325

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

Key to Instrument Codes Reported by Participants

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

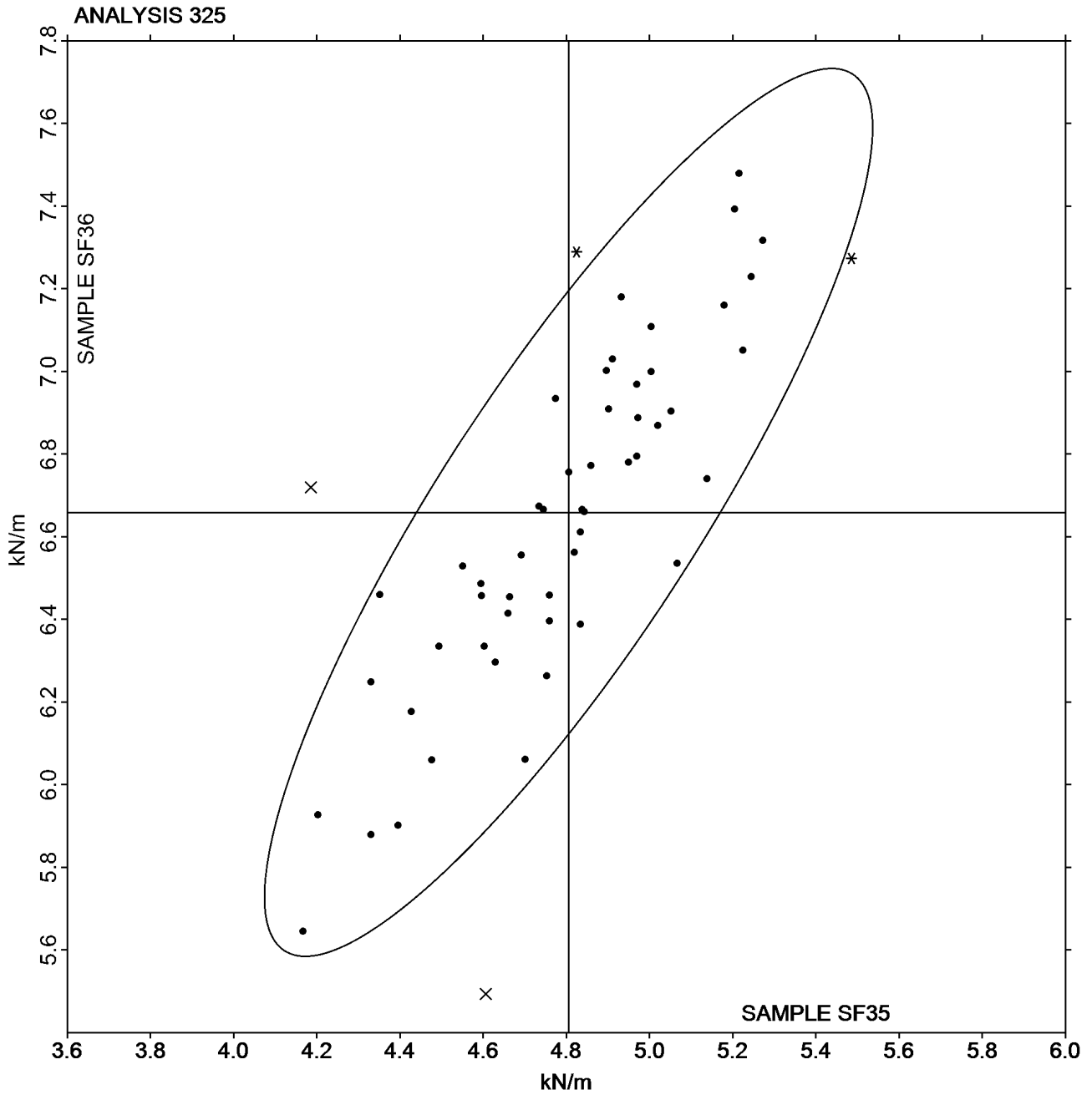


Paper & Paperboard Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SF35** = 4.8049 kN/m

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





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 327

September 2016

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

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



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

Report #2845
September 2016

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

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

Comments on Assigned Data Flags for Test #327

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

Key to Instrument Codes Reported by Participants

DL	EMIC DL500 Universal Testing Machines	ID	Instron 4201
IM	Instron 5500 Series	LA	L & W Tensile - Autoline 300
LH	L & W Alwetron TH1 (Horizontal) SE 060	LI	L & W Tensile Tester SE 062
LW	L & W Tensile Tester SE 064	LX	L & W (model not specified)
MR	MTS Alliance RT series	RE	Regmed
TA	Thwing-Albert	TB	Thwing-Albert EJA/1000
TF	Thwing-Albert EJA Vantage-1	TJ	Thwing-Albert QC II-XS
TO	Thwing-Albert QC-1000	TP	TMI Monitor/Tensile 100 (84-21-01)
XX	Instrument make/model not specified by lab		

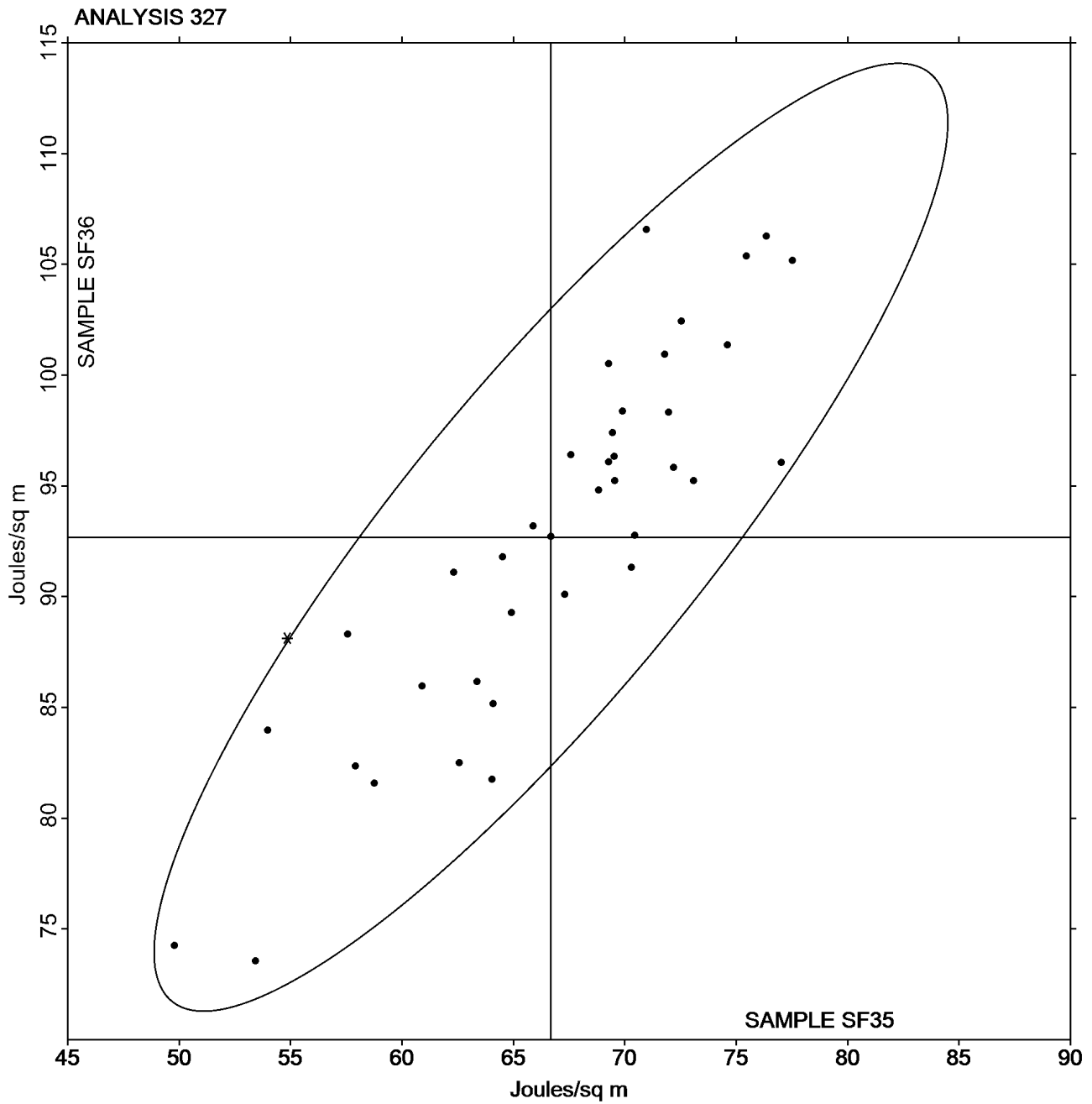


Paper & Paperboard Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers
TAPPI Official Test Method T494

Report #2845
September 2016

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

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





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 328

September 2016

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

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



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

Report #2845
 September 2016

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

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

Comments on Assigned Data Flags for Test #328

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

Key to Instrument Codes Reported by Participants

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

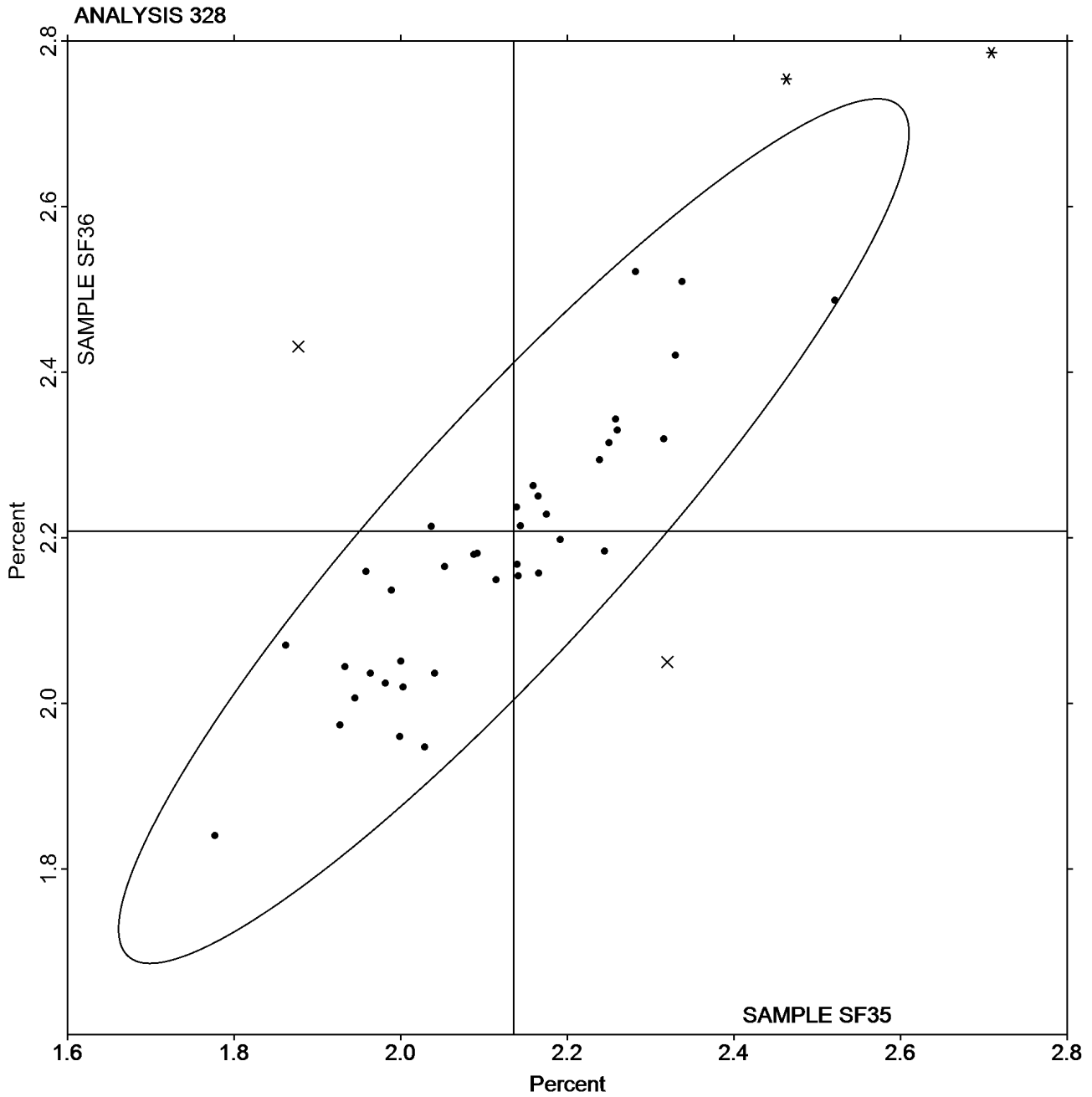


Paper & Paperboard Interlaboratory Testing Program
Analysis 328
Elongation to Break - Printing Papers
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SF35** = 2.1357 Percent

Grand Mean Sample **SF36** = 2.2081 Percent





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 330

September 2016

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

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



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

Report #2845
 September 2016

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

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

Comments on Assigned Data Flags for Test #330

RJAWJF (X) - Data for sample SE35 are high.

Key to Instrument Codes Reported by Participants

ID	Instron 4201	IF	Instron 3340 Series
IK	Instron 4400 Series	IM	Instron 5500 Series
IN	Instron 3360 Series	LA	L & W Autoline
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LI	Lloyds Instruments	LW	L & W Tensile Tester SE062
SA	Shimadzu Autograph AG 2000 A	TA	Thwing-Albert Tensile Tester
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
TK	Thwing-Albert Model 37-4	TO	Thwing-Albert QC-1000
TP	TMI Monitor/Tensile 100 (84-21-01)	TR	TMI Horizontal Tensile Tester
TX	Thwing-Albert (model not specified)	XX	Instrument make/model not specified by lab

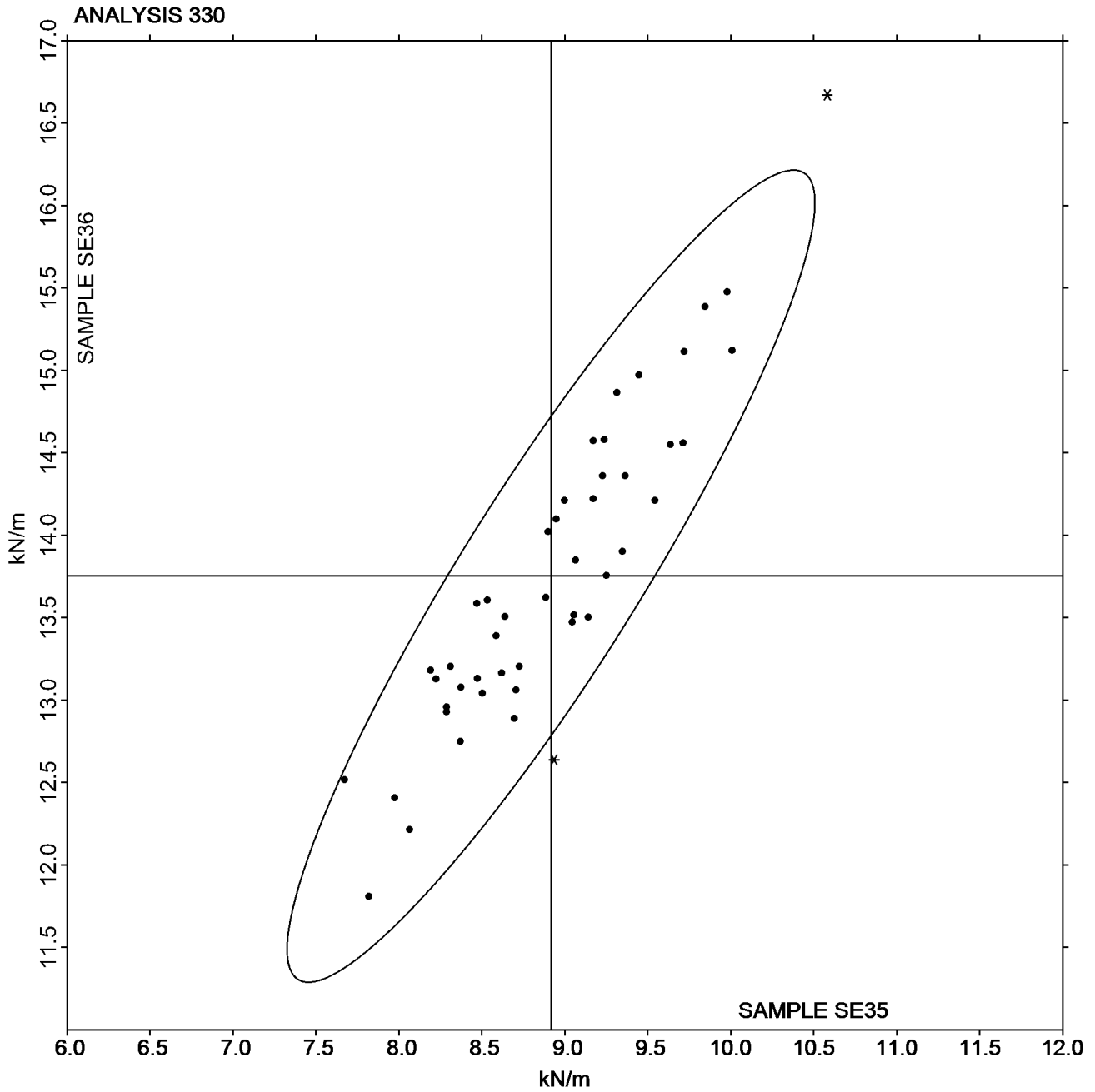


Paper & Paperboard Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers
TAPPI Official Test Method T494

Report #2845
September 2016

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

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





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 331

September 2016

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

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



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

Report #2845
 September 2016

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

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

Comments on Assigned Data Flags for Test #331

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

Key to Instrument Codes Reported by Participants

ID	Instron 4201	IF	Instron 3340 Series
IK	Instron 4400 Series	IM	Instron 5500 Series
IN	Instron 3360 Series	LA	L & W Autoline
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LW	L & W Tensile Tester SE062	SA	Shimadzu Autograph AG 2000 A
TA	Thwing-Albert Tensile Tester	TB	Thwing-Albert EJA/1000
TH	Thwing-Albert QC-3A	TK	Thwing-Albert Model 37-4
TO	Thwing-Albert QC-1000	TP	TMI Monitor/Tensile 100 (84-21-01)
TR	TMI Horizontal Tensile Tester	XX	Instrument make/model not specified by lab

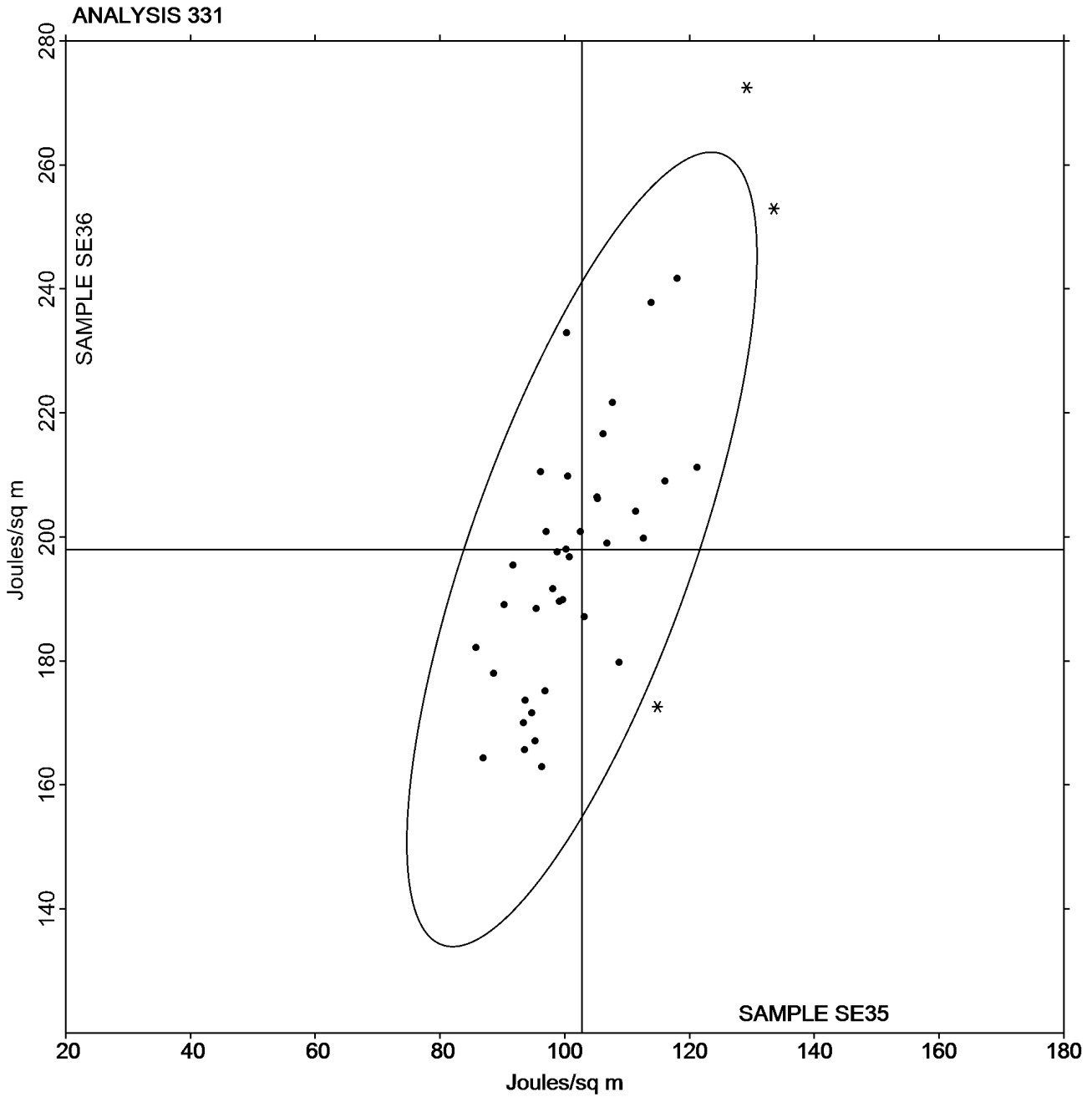


Paper & Paperboard Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers
TAPPI Official Test Method T494

Report #2845
September 2016

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

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





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 332

September 2016

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

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



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

Report #2845
 September 2016

WebCode	Data Flag	Sample SE35			Sample SE36			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
YFMLNH		1.340	-0.478	-2.11	1.790	-0.482	-1.75	XX
YQHYK9		1.716	-0.102	-0.45	2.076	-0.196	-0.71	LA
ZKX2RE	X	1.986	0.168	0.74	1.655	-0.617	-2.24	IN

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

Comments on Assigned Data Flags for Test #332

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

Analysis Notes:

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

Key to Instrument Codes Reported by Participants

ID	Instron 4201	IF	Instron 3340 Series
IK	Instron 4400 Series	IM	Instron 5500 Series
IN	Instron 3360 Series	LA	L & W Autoline 300
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LW	L & W Tensile Tester SE062	SA	Shimadzu Autograph AG 2000 A
TA	Thwing-Albert Tensile Tester	TB	Thwing-Albert EJA/1000
TH	Thwing-Albert QC-3A	TK	Thwing-Albert Model 37-4
TO	Thwing-Albert QC-1000	TP	TMI Monitor/Tensile 100 (84-21-01)
TR	TMI Horizontal Tensile Tester	XX	Instrument make/model not specified by lab

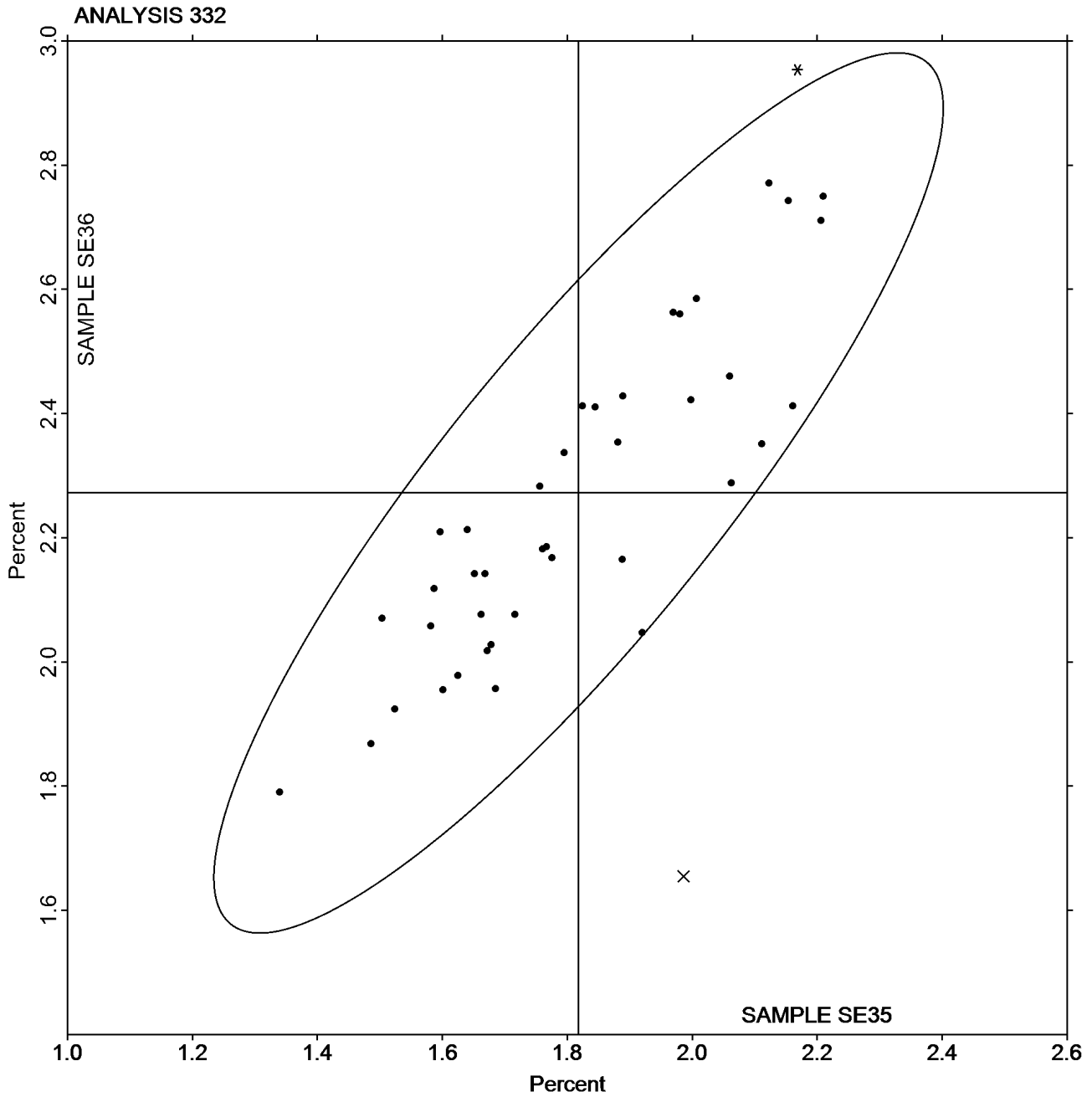


Paper & Paperboard Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers
TAPPI Official Test Method T494

Report #2845
September 2016

Grand Mean Sample **SE35** = 1.8179 Percent

Grand Mean Sample **SE36** = 2.2722 Percent





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 334

September 2016

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

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

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

Key to Instrument Codes Reported by Participants

MT MIT - Tinius Olsen

XX Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 334

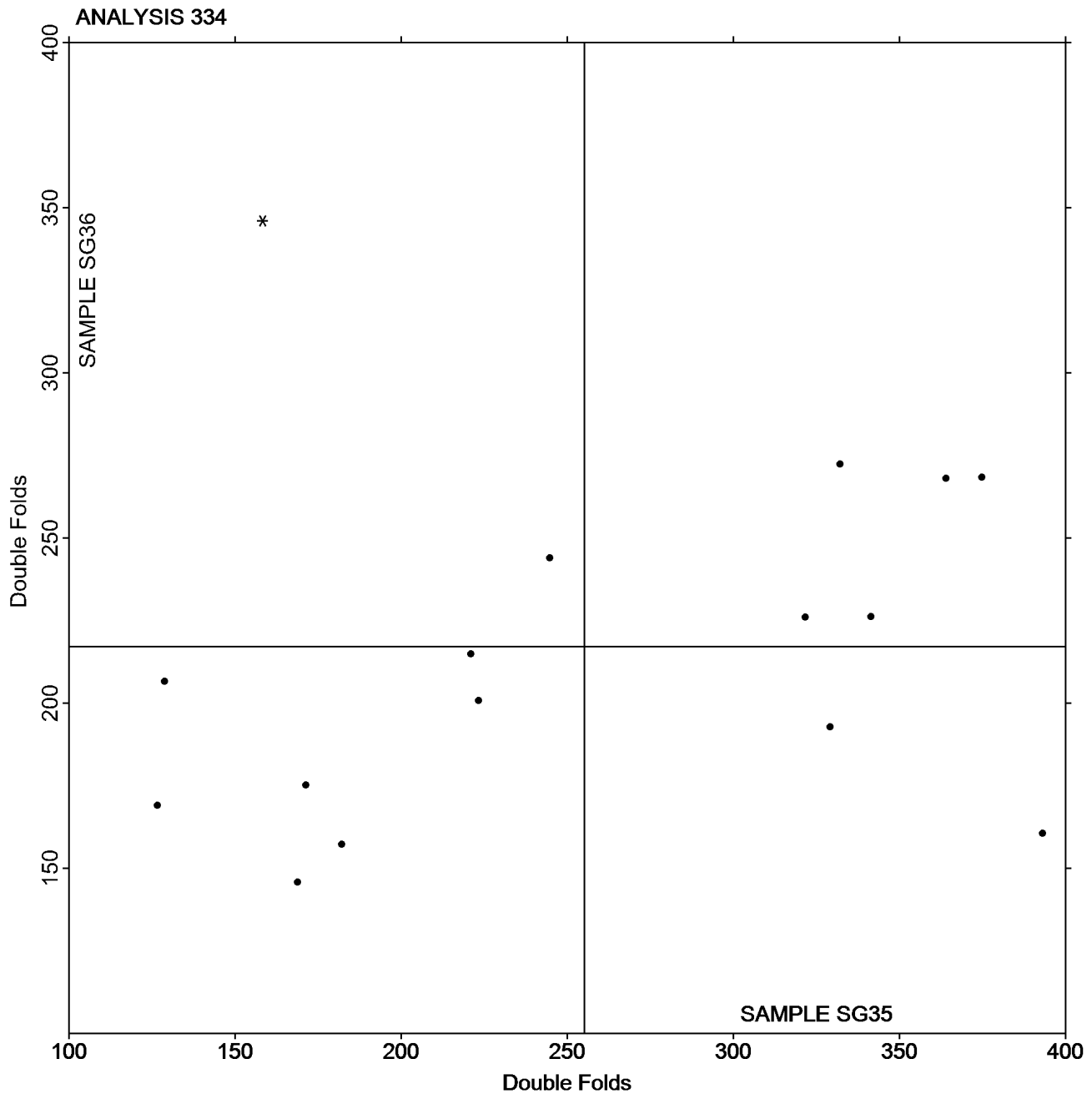
September 2016

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

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

Grand Mean Sample **SG36** = 217.09 Double Folds



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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 336

September 2016

Bending Resistance, Gurley Type

TAPPI Official Test Method T543

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

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

Comments on Assigned Data Flags for Test #336

63YREB (X) - Extreme Data.



Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 336

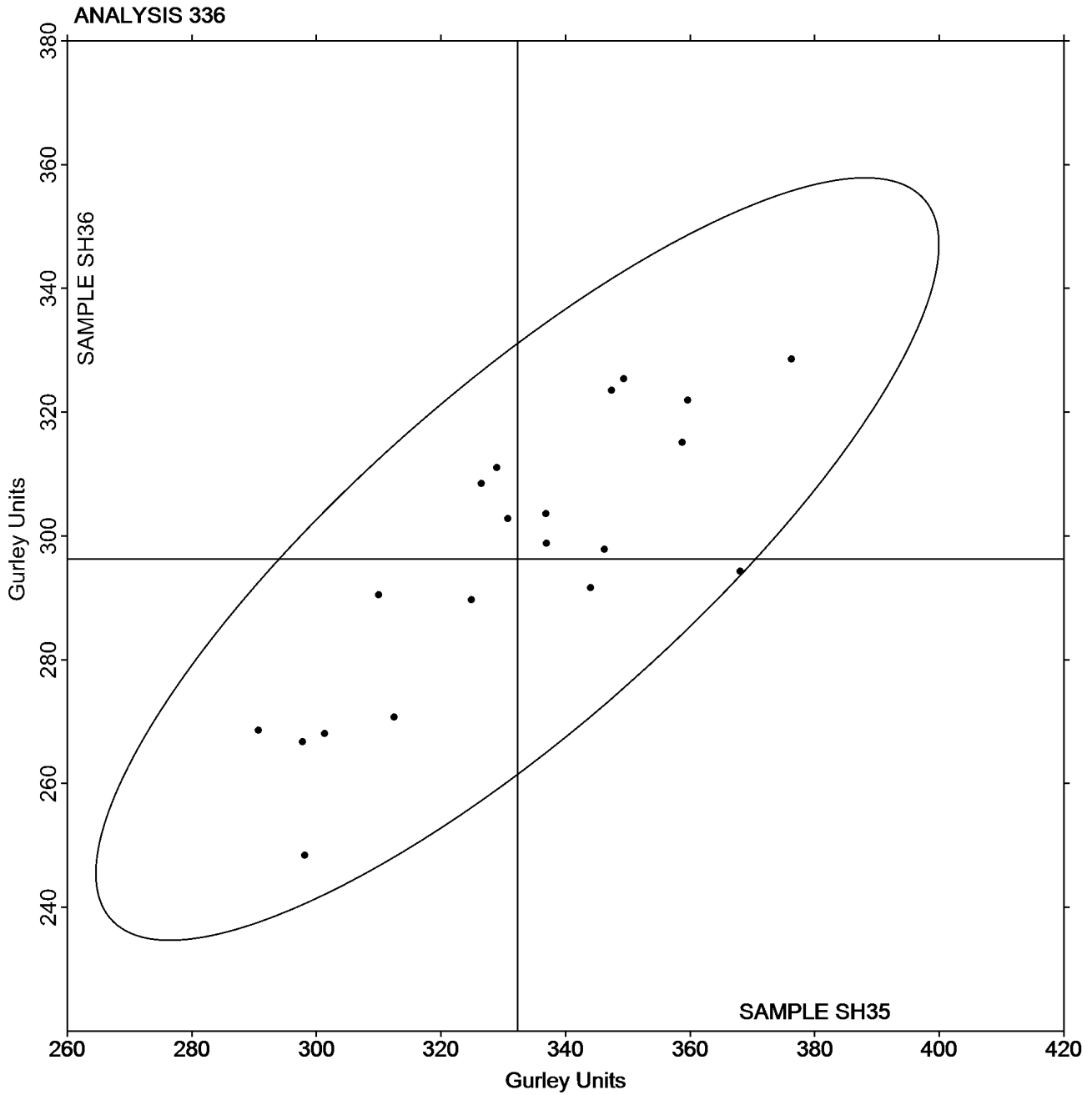
September 2016

Bending Resistance, Gurley Type

TAPPI Official Test Method T543

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

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





Paper & Paperboard Interlaboratory Testing Program

Report #2845

Analysis 338

September 2016

Bending Resistance, Taber Type - 0 to 10 Units

TAPPI Official Test Method T566

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

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

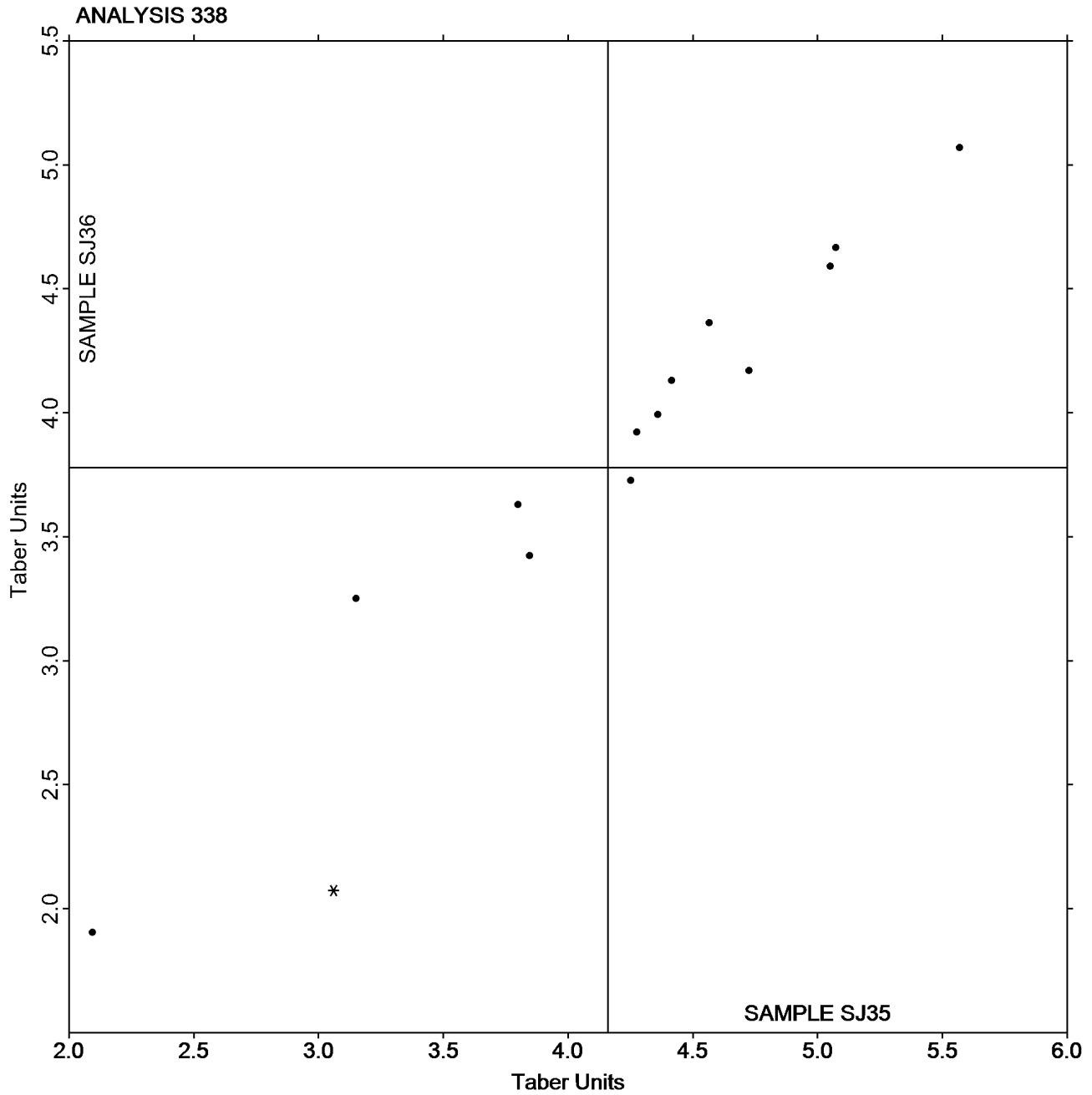


Paper & Paperboard Interlaboratory Testing Program
Analysis 338
Bending Resistance, Taber Type - 0 to 10 Units
TAPPI Official Test Method T566

Report #2845
September 2016

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

Grand Mean Sample **SJ36** = 3.7796 Taber Units



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



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

Report #2845
September 2016

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

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

Comments on Assigned Data Flags for Test #339

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

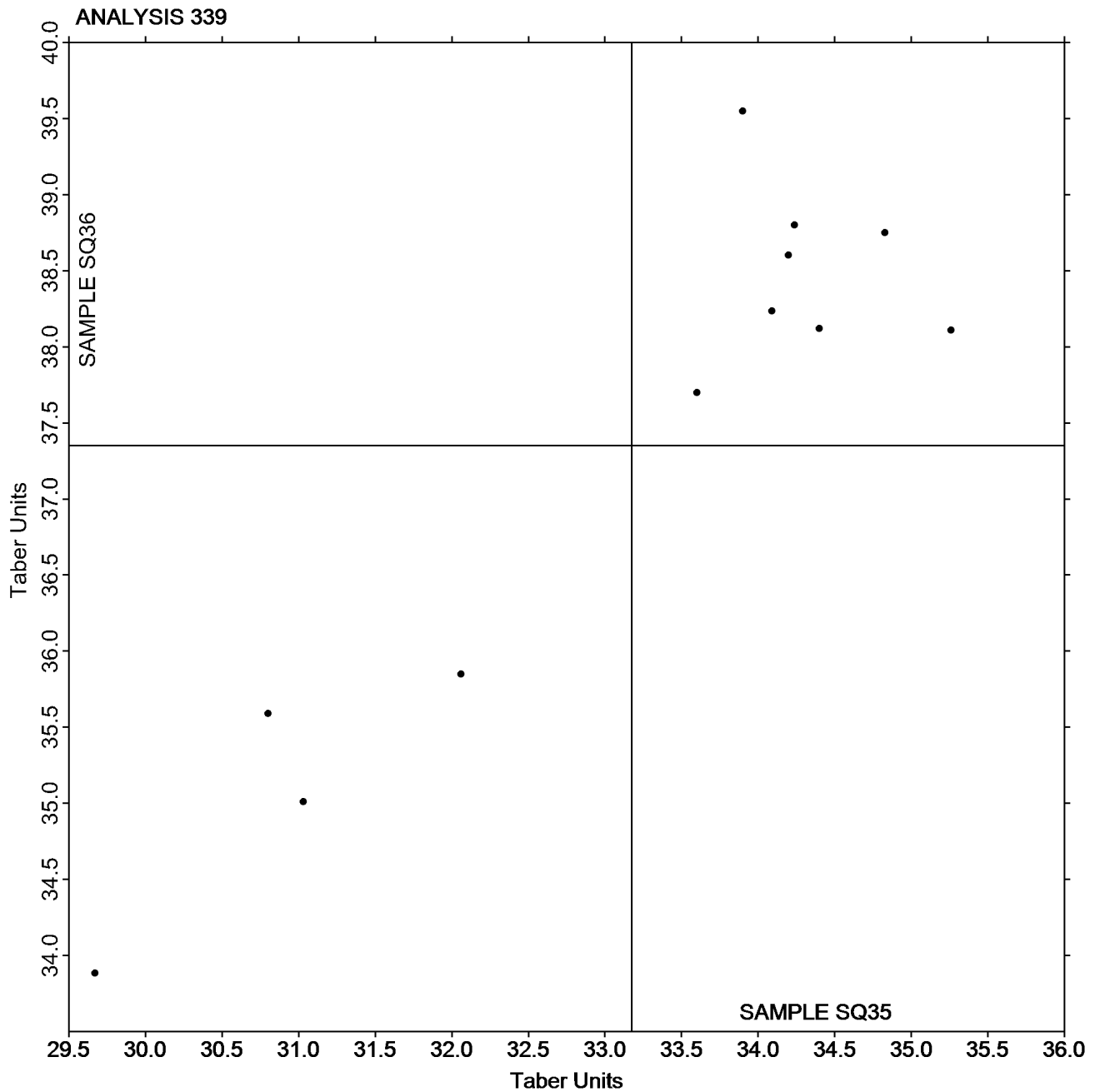


Paper & Paperboard Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units
TAPPI Official Test Method T489

Report #2845
September 2016

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

Grand Mean Sample **SQ36** = 37.350 Taber Units



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



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

Report #2845
September 2016

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

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

Comments on Assigned Data Flags for Test #340

T9ZKNA (X) - Extreme Data.

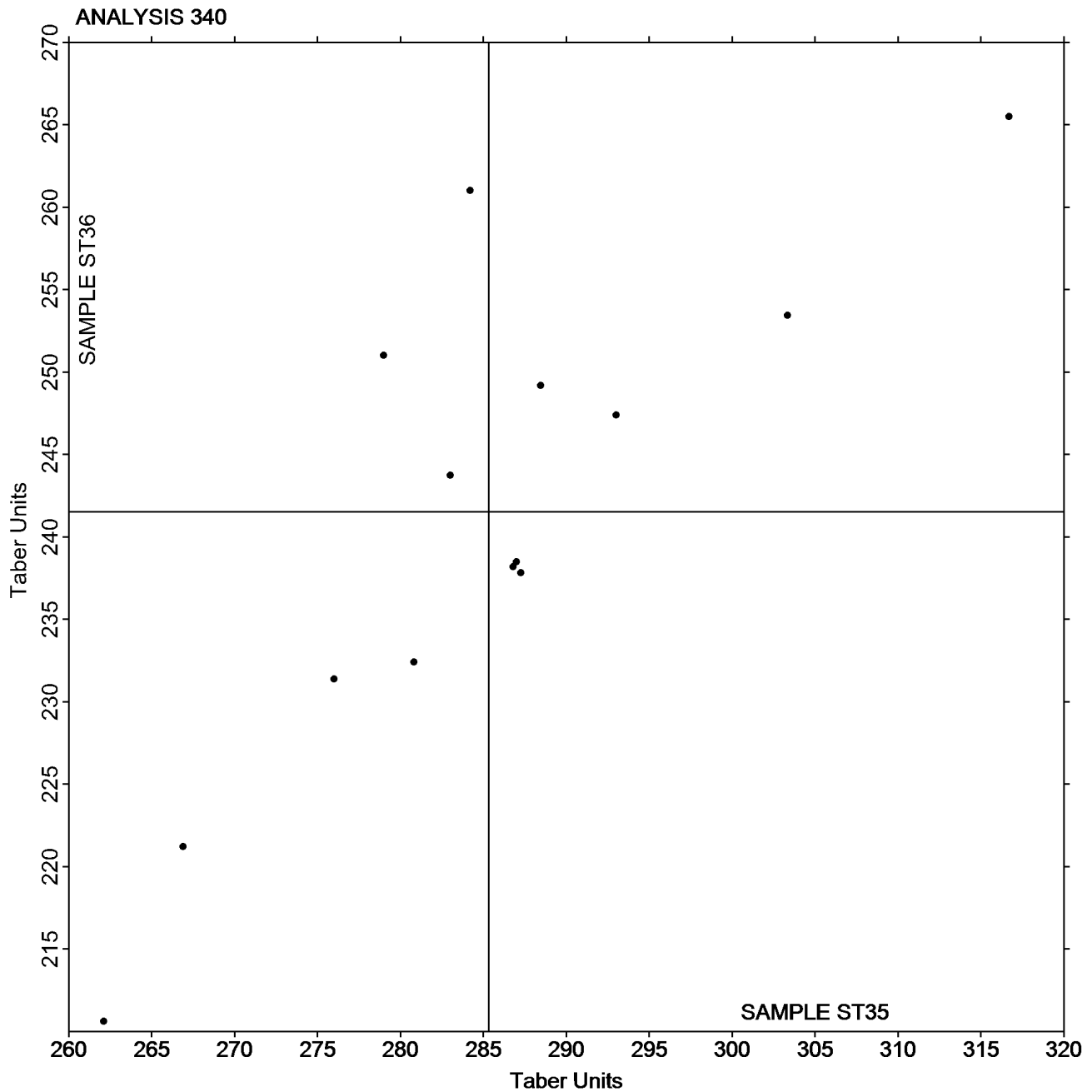


Paper & Paperboard Interlaboratory Testing Program
Analysis 340
Indenting Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
TAPPI Official Test Method T489

Report #2845
September 2016

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

Grand Mean Sample **ST36** = 241.53 Taber Units



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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

**Analysis 343
Z-Direction Tensile**

September 2016

TAPPI Official Test Method T541

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

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

Key to Instrument Codes Reported by Participants

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



Paper & Paperboard Interlaboratory Testing Program

Report #2845

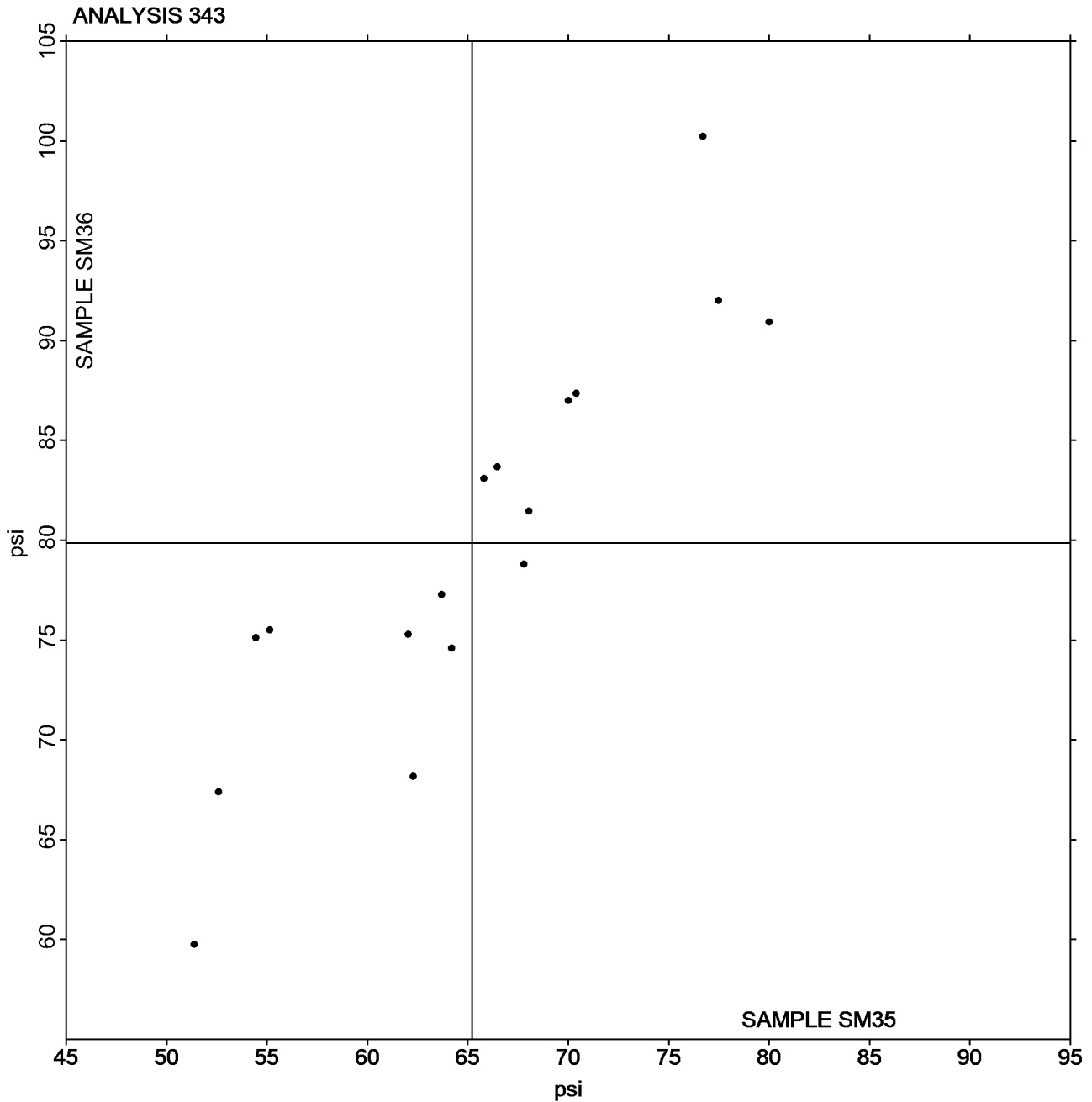
Analysis 343 Z-Direction Tensile

September 2016

TAPPI Official Test Method T541

Grand Mean Sample **SM35** = 65.207 psi

Grand Mean Sample **SM36** = 79.856 psi



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



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

Report #2845
September 2016

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

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

Comments on Assigned Data Flags for Test #345

ATVJ7T (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

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

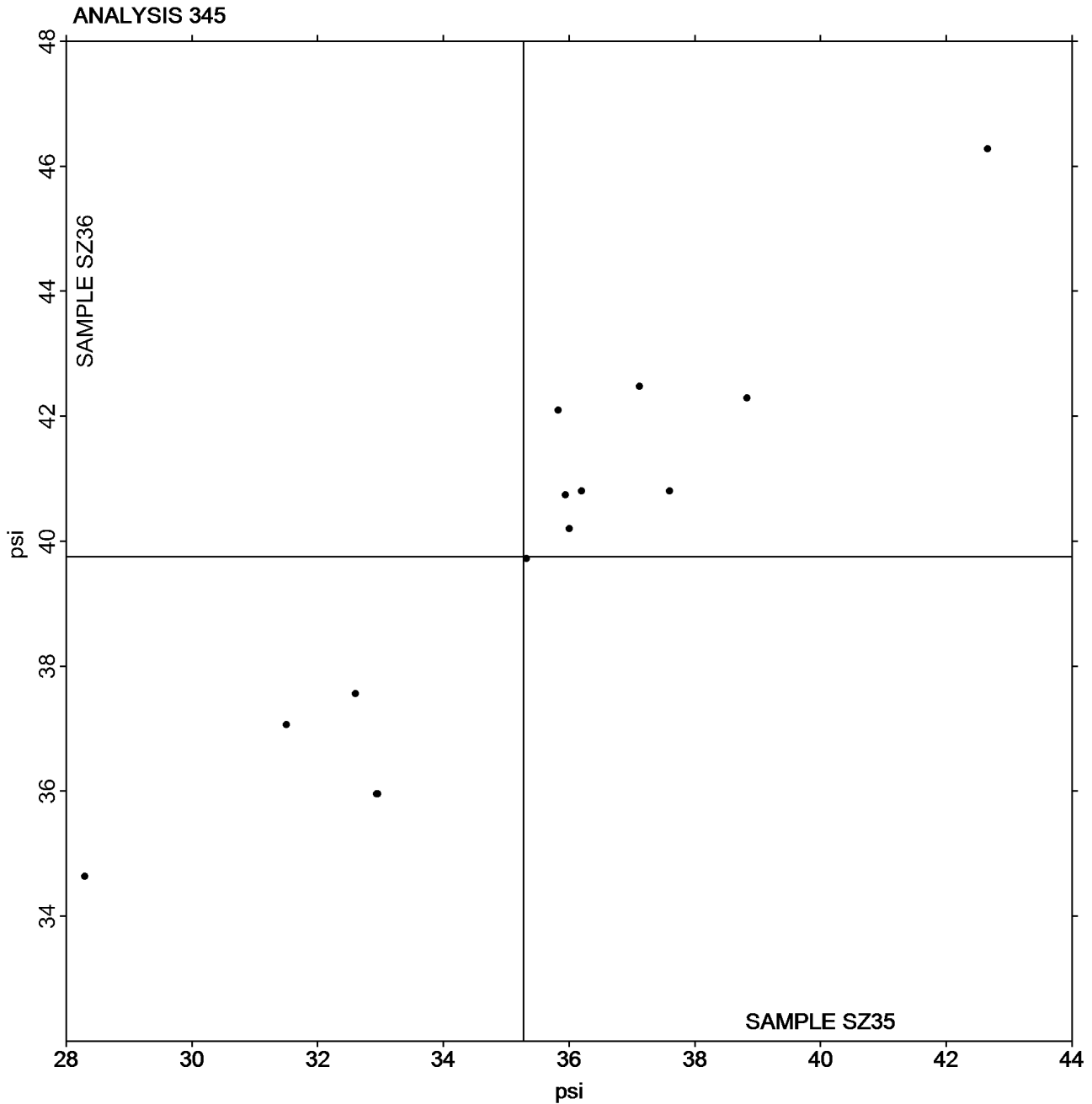


Paper & Paperboard Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard
TAPPI Official Test Method T541

Report #2845
September 2016

Grand Mean Sample **SZ35** = 35.271 psi

Grand Mean Sample **SZ36** = 39.756 psi



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



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

Report #2845
September 2016

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

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

Key to Instrument Codes Reported by Participants

HY	Huygen Digitized Scott Internal Bond Tester	HZ	Huygen Internal Bond Tester with AccuPress
KR	Kumagai Riki Kogyo Internal Bond Tester	XX	Instrument make/model not specified by lab

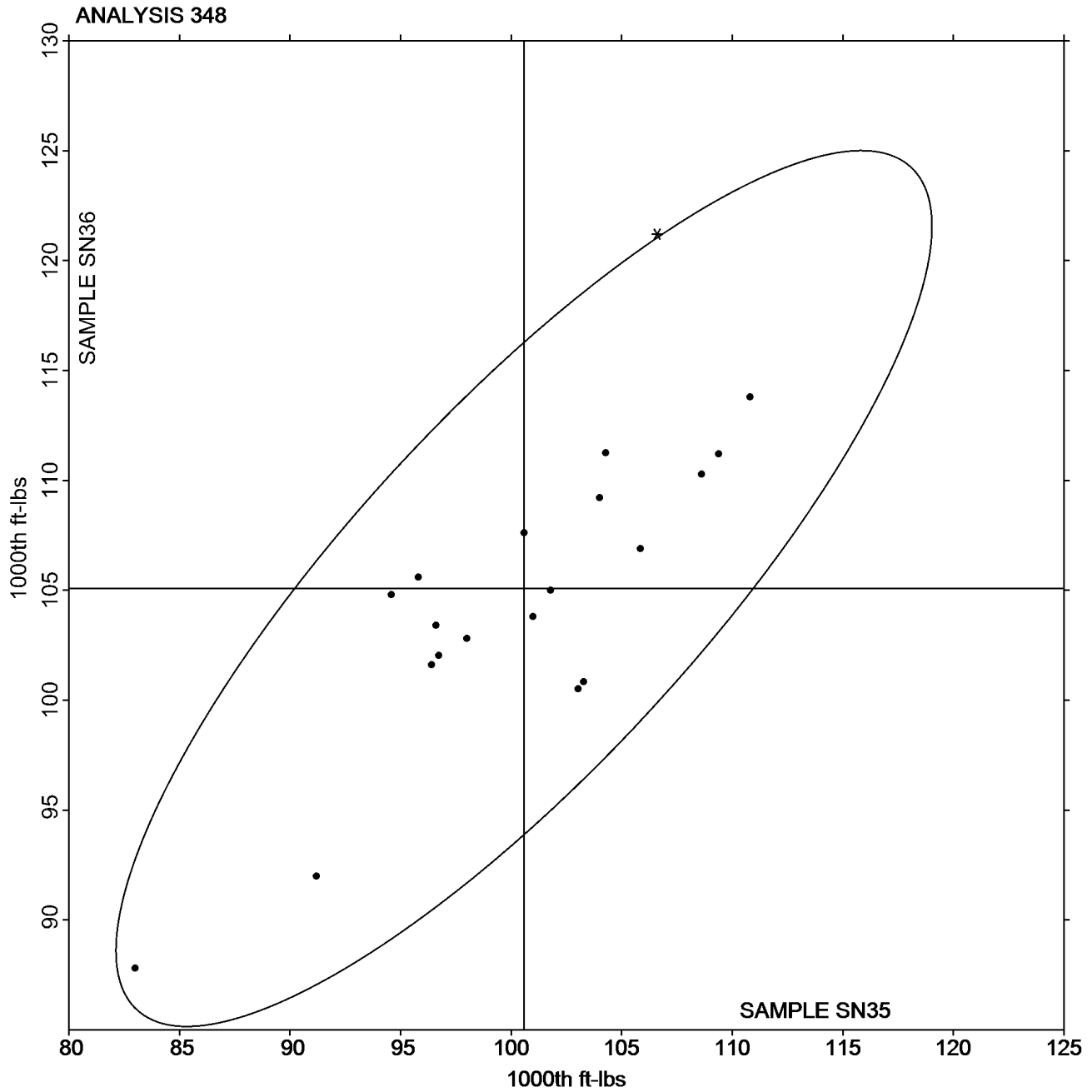


Paper & Paperboard Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics
TAPPI Provisional Test Method T569

Report #2845
September 2016

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

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





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

Report #2845
 September 2016

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

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

Comments on Assigned Data Flags for Test #349

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

Key to Instrument Codes Reported by Participants

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

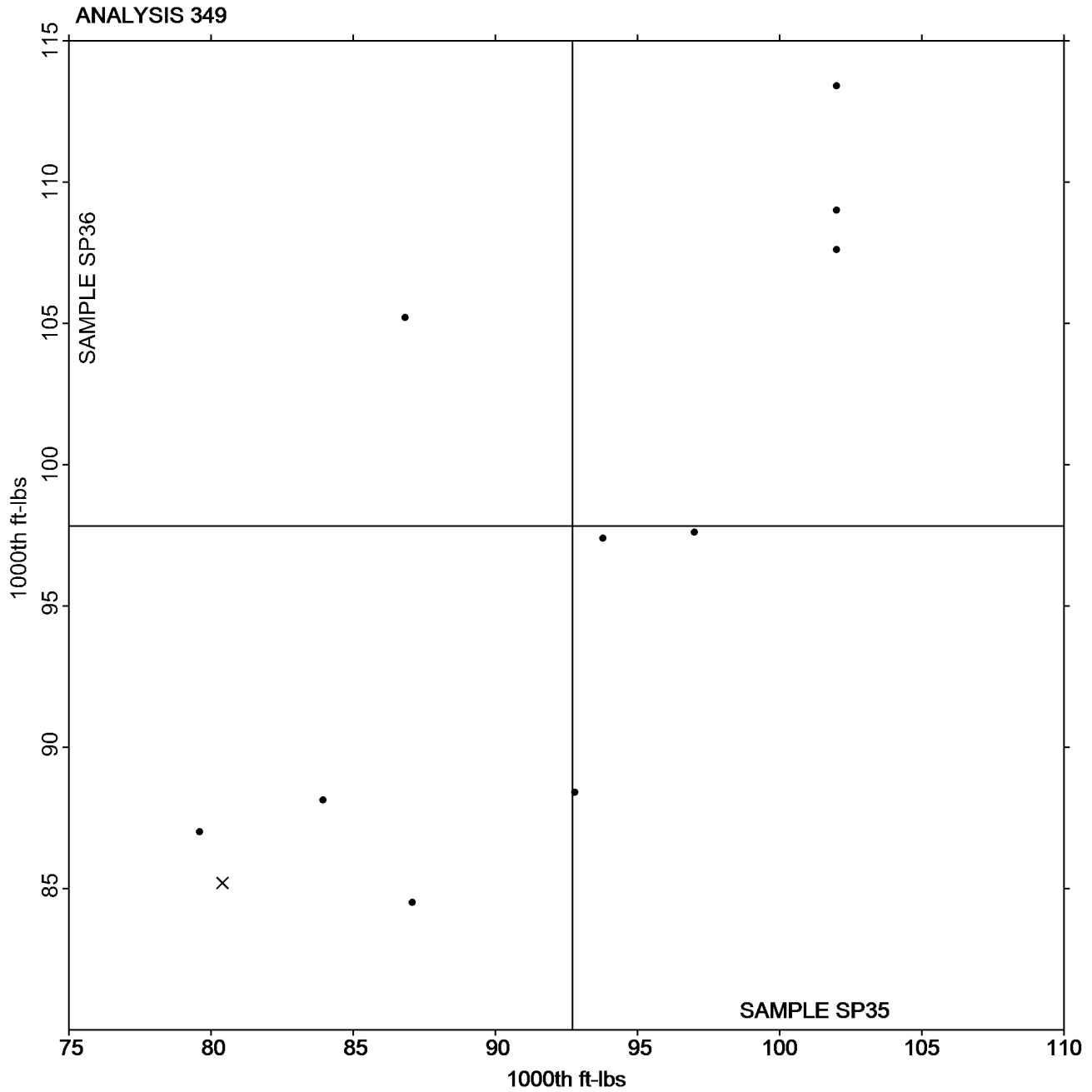


Paper & Paperboard Interlaboratory Testing Program
Analysis 349
Internal Bond Strength - Scott Bond Models
TAPPI Provisional Test Method T569

Report #2845
September 2016

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

Grand Mean Sample **SP36** = 97.823 1000th ft-lbs



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