

Paper & Paperboard Interlaboratory Testing Program

Summary Report #275S - March 2015

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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.

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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.

TAPPI-CTS Interlaboratory Testing Program
Analysis 305
Bursting Strength - Printing Papers

WebCode	Data Flag	Sample SA17			Sample SA18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3DY4HU		34.63	1.37	0.42	20.75	-0.36	-0.13
4JK9Y3		32.70	-0.55	-0.17	18.45	-2.66	-0.98
74FUR4		32.33	-0.92	-0.28	19.83	-1.28	-0.47
7N4DK2		35.23	1.97	0.60	21.41	0.30	0.11
93FV62		33.88	0.63	0.19	21.07	-0.03	-0.01
9LMAFZ		28.91	-4.35	-1.32	19.58	-1.53	-0.56
A8ND4T		32.79	-0.46	-0.14	21.55	0.44	0.16
B2CUCE		30.10	-3.15	-0.96	18.80	-2.31	-0.85
B9D2YU		30.63	-2.62	-0.79	20.61	-0.50	-0.18
DBD24J		31.39	-1.87	-0.57	20.03	-1.08	-0.40
DHBJPM		35.60	2.35	0.71	24.10	2.99	1.10
DZRW2Y		30.84	-2.41	-0.73	19.84	-1.27	-0.47
EYYG4M		39.60	6.35	1.92	23.60	2.49	0.92
HQUGGQ		30.52	-2.73	-0.83	20.88	-0.23	-0.08
K3VZP9		30.20	-3.05	-0.92	19.26	-1.85	-0.68
K6KAWN		32.16	-1.10	-0.33	19.25	-1.86	-0.69
KP74MA		38.80	5.55	1.68	24.10	2.99	1.10
LB6RPP		33.89	0.64	0.19	22.71	1.61	0.59
NBUUAB		36.01	2.76	0.83	21.57	0.46	0.17
NUVKPE		32.17	-1.08	-0.33	21.07	-0.04	-0.01
NYZFAE		27.17	-6.08	-1.84	15.60	-5.51	-2.03
RNQCC7		31.91	-1.35	-0.41	21.19	0.08	0.03
RW7T6F		34.83	1.58	0.48	23.54	2.43	0.89
TXUMJV	*	40.56	7.31	2.21	28.91	7.80	2.87
V2Q6FE		30.32	-2.93	-0.89	17.89	-3.22	-1.19
XB6N7N		38.10	4.85	1.47	25.95	4.84	1.78
Z8DMX7		32.60	-0.65	-0.20	18.40	-2.71	-1.00

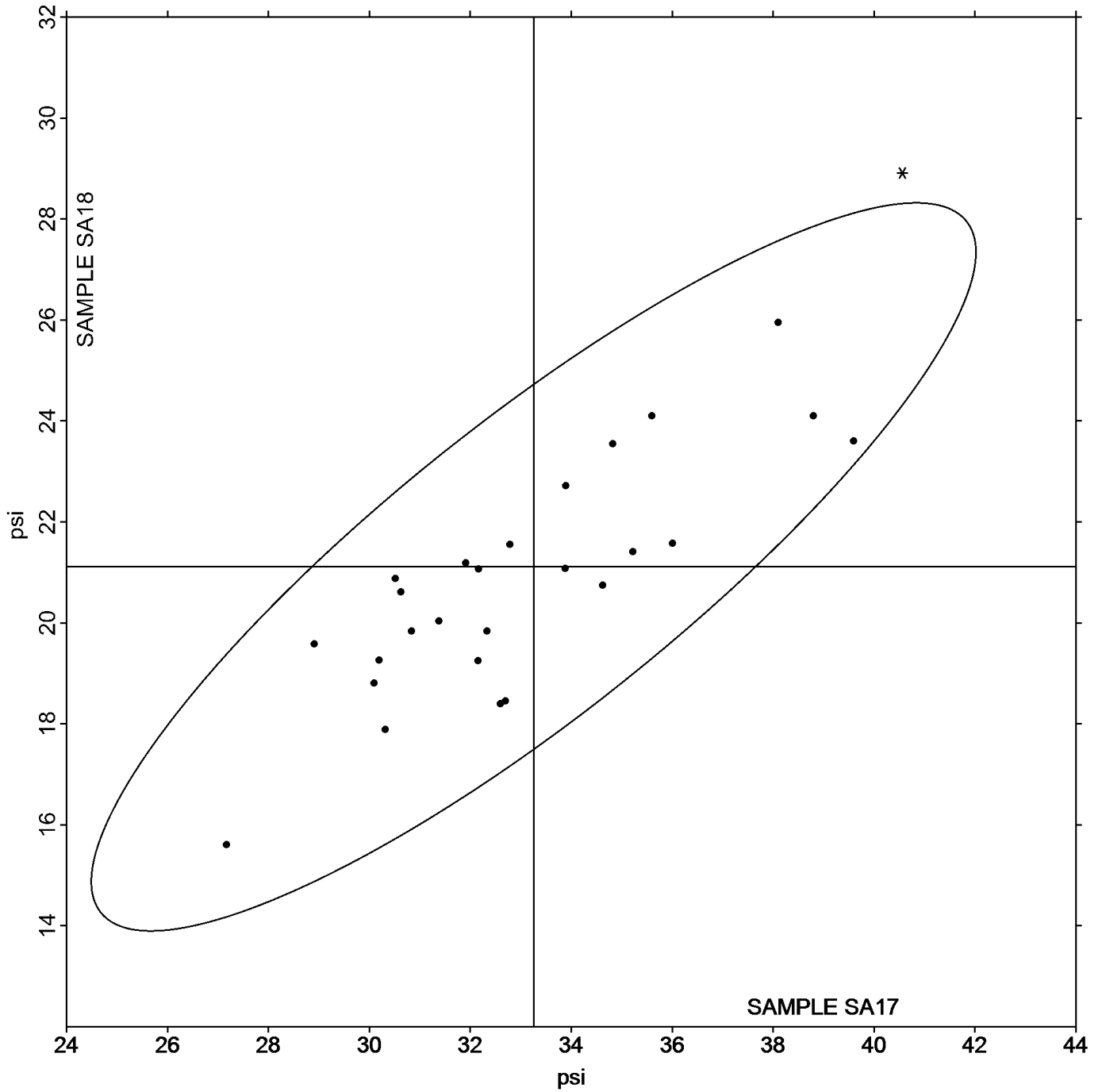
		Summary Statistics	
	Sample SA17		Sample SA18
Grand Means	33.254 psi		21.109 psi
SD Btwn Labs	3.302 psi		2.717 psi
Statistics based on 27 of 27 reporting participants			

TAPPI-CTS Interlaboratory Testing Program
Analysis 305
Bursting Strength - Printing Papers

Grand Mean Sample SA17 = 33.254 psi

Grand Mean Sample SA18 = 21.109 psi

ANALYSIS 305



TAPPI-CTS Interlaboratory Testing Program
Analysis 310
Bursting Strength - Packaging Papers

WebCode	Data Flag	Sample SB17			Sample SB18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3DY4HU		86.36	1.65	0.33	48.09	1.05	0.23
3TP72J		80.80	-3.91	-0.78	43.40	-3.64	-0.78
93FV62		78.25	-6.46	-1.29	43.54	-3.50	-0.75
AAA68J		85.70	0.99	0.20	48.97	1.93	0.42
ARB3CZ		81.16	-3.55	-0.71	44.21	-2.83	-0.61
D3Z3GZ		87.94	3.22	0.64	53.51	6.47	1.40
EJYJXH		81.24	-3.48	-0.69	45.08	-1.96	-0.42
FLPZVW		94.62	9.90	1.98	55.32	8.28	1.79
GLMT4P		78.30	-6.41	-1.28	43.39	-3.65	-0.79
GPE27A		77.76	-6.96	-1.39	41.67	-5.37	-1.16
GYP97J	X	95.33	10.62	2.12	64.88	17.84	3.85
HBFG4C		85.00	0.29	0.06	45.00	-2.04	-0.44
J4CWEM		80.19	-4.52	-0.90	42.30	-4.74	-1.02
JWD9Z4		86.50	1.79	0.36	50.40	3.36	0.73
LE7RPM		86.59	1.88	0.37	49.28	2.24	0.48
LNBZ88		95.55	10.84	2.16	56.70	9.66	2.08
MQVBJH		83.56	-1.16	-0.23	41.81	-5.22	-1.13
NAKM94		80.29	-4.42	-0.88	43.57	-3.47	-0.75
NEDPC3		85.85	1.14	0.23	48.33	1.29	0.28
NUVKPE		92.88	8.17	1.63	54.48	7.44	1.60
Q876ZH		85.20	0.49	0.10	52.67	5.63	1.21
V7232F		87.40	2.69	0.54	46.60	-0.44	-0.09
WGCV72		88.90	4.19	0.84	49.80	2.76	0.60
XH7WU4		82.76	-1.95	-0.39	42.77	-4.27	-0.92
XT7LB6		78.58	-6.13	-1.22	43.01	-4.03	-0.87
ZBF826		80.95	-3.76	-0.75	41.10	-5.94	-1.28
ZX7UK6		90.20	5.49	1.10	48.00	0.96	0.21

Sample SB17		Summary Statistics	Sample SB18	
Grand Means	84.712 psi			47.038 psi
SD Btwn Labs	5.011 psi			4.637 psi
Statistics based on 26 of 27 reporting participants				

Comments on assigned Data Flags for Test #310

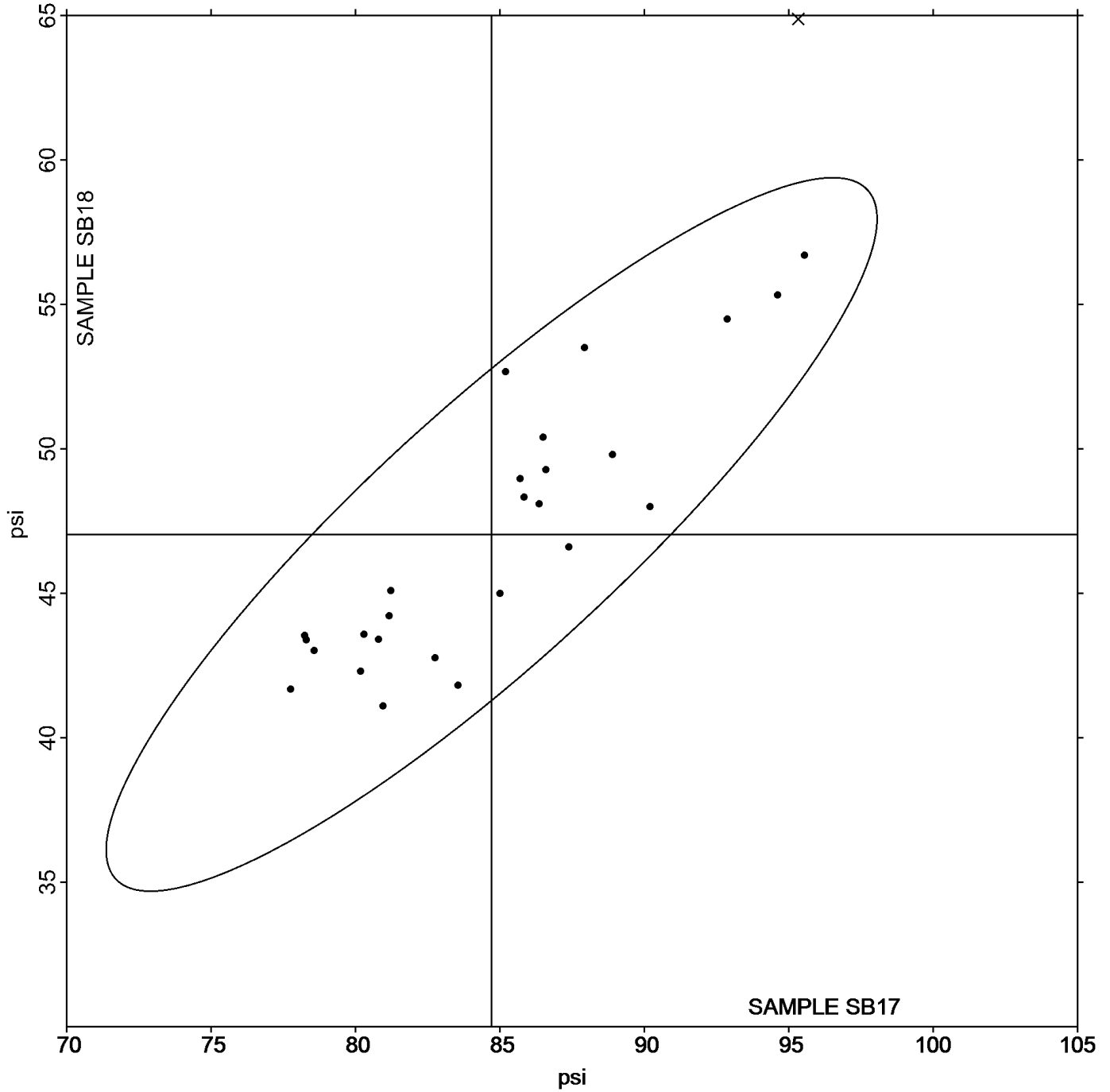
GYP97J (X) - Inconsistent in testing between samples, data for Sample SB18 are high.

TAPPI-CTS Interlaboratory Testing Program
Analysis 310
Bursting Strength - Packaging Papers

Grand Mean Sample **SB17** = 84.712 psi

Grand Mean Sample **SB18** = 47.038 psi

ANALYSIS 310



TAPPI-CTS Interlaboratory Testing Program
 Analysis 311
 Tearing Strength - Newsprint

WebCode	Data Flag	Sample SK17			Sample SK18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
34PRA4	X	36.65	10.30	12.58	37.18	11.05	13.90
3DY4HU		26.46	0.12	0.14	26.19	0.06	0.07
A7QA4Q		25.89	-0.45	-0.55	25.23	-0.90	-1.13
A8ND4T		24.80	-1.54	-1.89	25.10	-1.03	-1.30
J98KGM		26.41	0.07	0.08	26.28	0.15	0.19
PHCF3E		26.98	0.64	0.78	26.39	0.26	0.33
RW7T6F		26.54	0.20	0.24	26.24	0.11	0.14
XGV3YP		27.33	0.99	1.20	27.48	1.35	1.70

Sample SK17		Summary Statistics	Sample SK18	
Grand Means	26.345 Grams		26.130 Grams	
SD Btwn Labs	0.819 Grams		0.795 Grams	
Statistics based on 7 of 8 reporting participants				

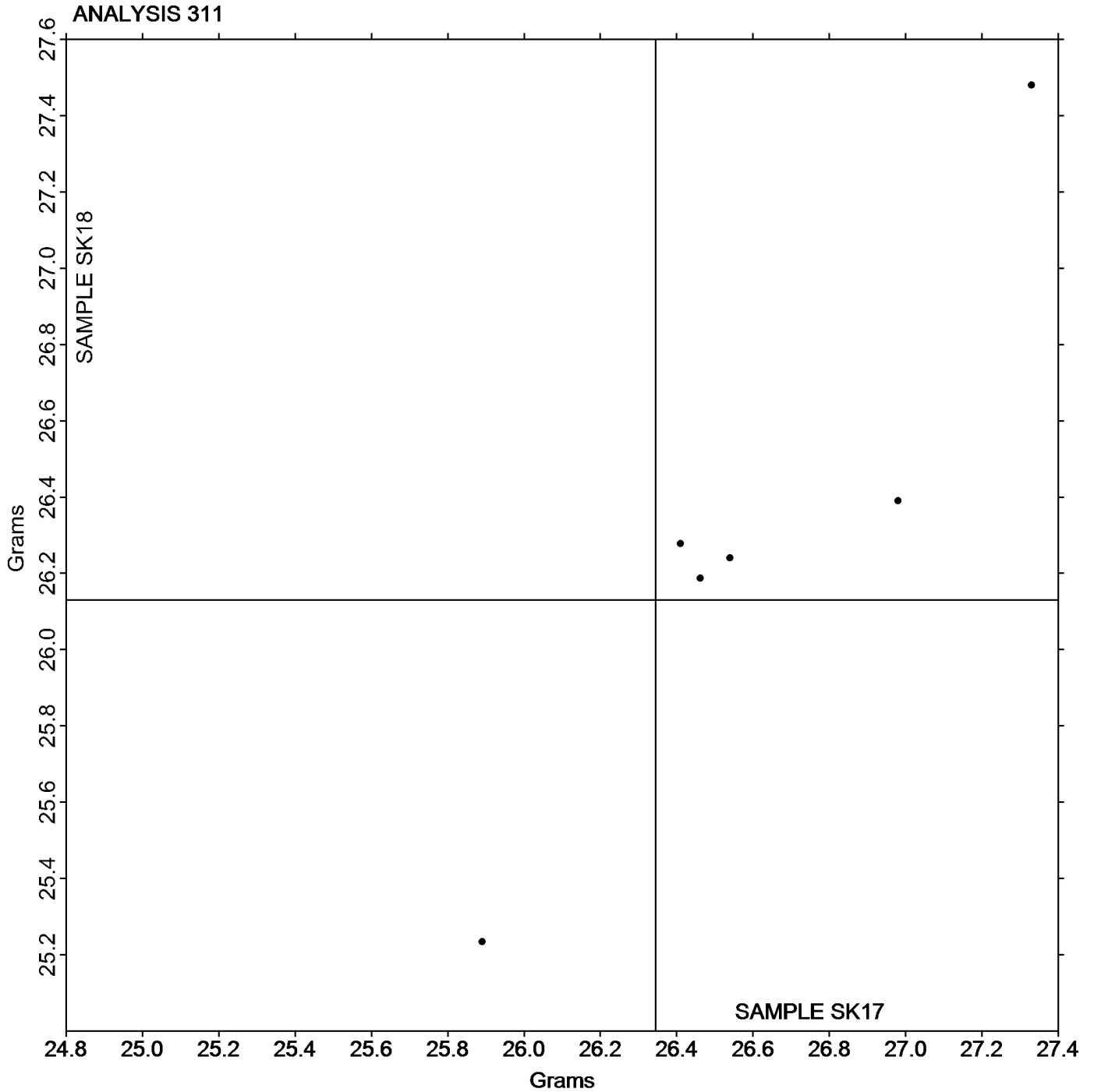
Comments on assigned Data Flags for Test #311

34PRA4 (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program
Analysis 311
Tearing Strength - Newsprint

Grand Mean Sample **SK17** = 26.345 Grams

Grand Mean Sample **SK18** = 26.130 Grams



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

TAPPI-CTS Interlaboratory Testing Program

Analysis 312

Tearing Strength - Printing Papers

WebCode	Data Flag	Sample SC17			Sample SC18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3DY4HU		47.82	-1.53	-0.37	65.79	0.18	0.04
3TP72J		44.64	-4.71	-1.13	59.51	-6.11	-1.35
6DAP8M		47.91	-1.45	-0.35	65.51	-0.11	-0.02
6WY3JQ		42.04	-7.31	-1.76	57.34	-8.28	-1.83
74FUR4		48.99	-0.36	-0.09	67.77	2.15	0.48
7N4DK2		51.81	2.46	0.59	69.32	3.70	0.82
7PVHYE		48.00	-1.35	-0.33	66.74	1.12	0.25
7TWFN2		42.56	-6.79	-1.63	58.30	-7.32	-1.62
7WEM4N		49.91	0.56	0.13	67.35	1.73	0.38
93FV62		49.41	0.05	0.01	63.98	-1.64	-0.36
9LMAFZ		43.29	-6.06	-1.46	59.32	-6.30	-1.39
A87ALV		50.60	1.25	0.30	66.80	1.18	0.26
ACYBPV		47.47	-1.88	-0.45	61.93	-3.69	-0.82
ARB3CZ		48.45	-0.91	-0.22	62.62	-2.99	-0.66
B9AQ3B		49.58	0.23	0.05	66.68	1.06	0.24
B9D2YU	*	57.76	8.41	2.02	70.17	4.55	1.01
BRPZXW		51.55	2.20	0.53	70.91	5.29	1.17
CXTY9L		43.94	-5.41	-1.30	58.96	-6.66	-1.47
DBD24J		50.81	1.46	0.35	68.72	3.10	0.69
DHBJPM		49.75	0.40	0.10	65.94	0.32	0.07
DNGF9M		48.38	-0.97	-0.23	65.64	0.02	0.01
DZRW2Y		49.84	0.49	0.12	65.28	-0.34	-0.07
E6FYDN		51.23	1.88	0.45	68.30	2.68	0.59
EJYJXH		47.72	-1.63	-0.39	63.68	-1.94	-0.43
EYYG4M		49.39	0.04	0.01	66.98	1.36	0.30
GPE27A		54.02	4.67	1.12	72.83	7.21	1.60
HBFG4C		44.27	-5.08	-1.22	60.74	-4.88	-1.08
HMUDEV		45.00	-4.35	-1.05	60.40	-5.22	-1.15
HQUGGQ		52.32	2.97	0.71	69.44	3.82	0.85
HTWETJ		39.64	-9.71	-2.34	58.00	-7.62	-1.69
HVMKBU		50.22	0.87	0.21	65.50	-0.12	-0.03
K3VZP9		50.85	1.50	0.36	68.20	2.58	0.57
K6KAWN		50.31	0.95	0.23	66.87	1.25	0.28
KRVB7L		59.20	9.85	2.37	74.24	8.62	1.91
LE7RPM		47.46	-1.89	-0.46	63.83	-1.79	-0.40
MP44KF		55.02	5.67	1.36	74.78	9.16	2.03
MQVBJH		49.85	0.50	0.12	64.42	-1.20	-0.27
NAKM94		50.41	1.06	0.26	69.28	3.66	0.81
NBUUAB		49.20	-0.15	-0.04	67.00	1.38	0.31
NUVKPE		52.70	3.35	0.80	70.20	4.58	1.01
NYZFAE		55.00	5.65	1.36	66.60	0.98	0.22
P3Z2KG		51.60	2.25	0.54	69.00	3.38	0.75
RNQCC7		51.46	2.10	0.51	69.07	3.45	0.76

TAPPI-CTS Interlaboratory Testing Program
Analysis 312
Tearing Strength - Printing Papers

WebCode	Data Flag	Sample SC17			Sample SC18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
U8XAT8		46.00	-3.35	-0.81	62.20	-3.42	-0.76
V2Q6FE		53.32	3.97	0.95	72.61	6.99	1.55
VU9LCE		45.81	-3.54	-0.85	63.98	-1.64	-0.36
W7W79V	*	46.80	-2.55	-0.61	56.90	-8.72	-1.93
WJNKF6	X	76.60	27.25	6.55	90.80	25.18	5.58
WRYUX7	X	49.08	-0.27	-0.07	56.42	-9.20	-2.04
XB6N7N		43.56	-5.79	-1.39	57.40	-8.22	-1.82
XH7WU4		51.50	2.14	0.52	68.88	3.27	0.72
XNQZGD	*	58.58	9.23	2.22	69.59	3.97	0.88
XT7LB6		46.00	-3.35	-0.81	59.84	-5.78	-1.28
YD8YK4		45.98	-3.37	-0.81	62.92	-2.70	-0.60
ZX7UK6		56.80	7.45	1.79	69.40	3.78	0.84

Sample SC17		Summary Statistics	Sample SC18	
Grand Means	49.353 Grams		65.616 Grams	
SD Btwn Labs	4.159 Grams		4.517 Grams	
Statistics based on 53 of 55 reporting participants				

Comments on assigned Data Flags for Test #312

WJNKF6 (X) - Extreme data.

WRYUX7 (X) - Inconsistent in testing between samples.

TAPPI-CTS Interlaboratory Testing Program

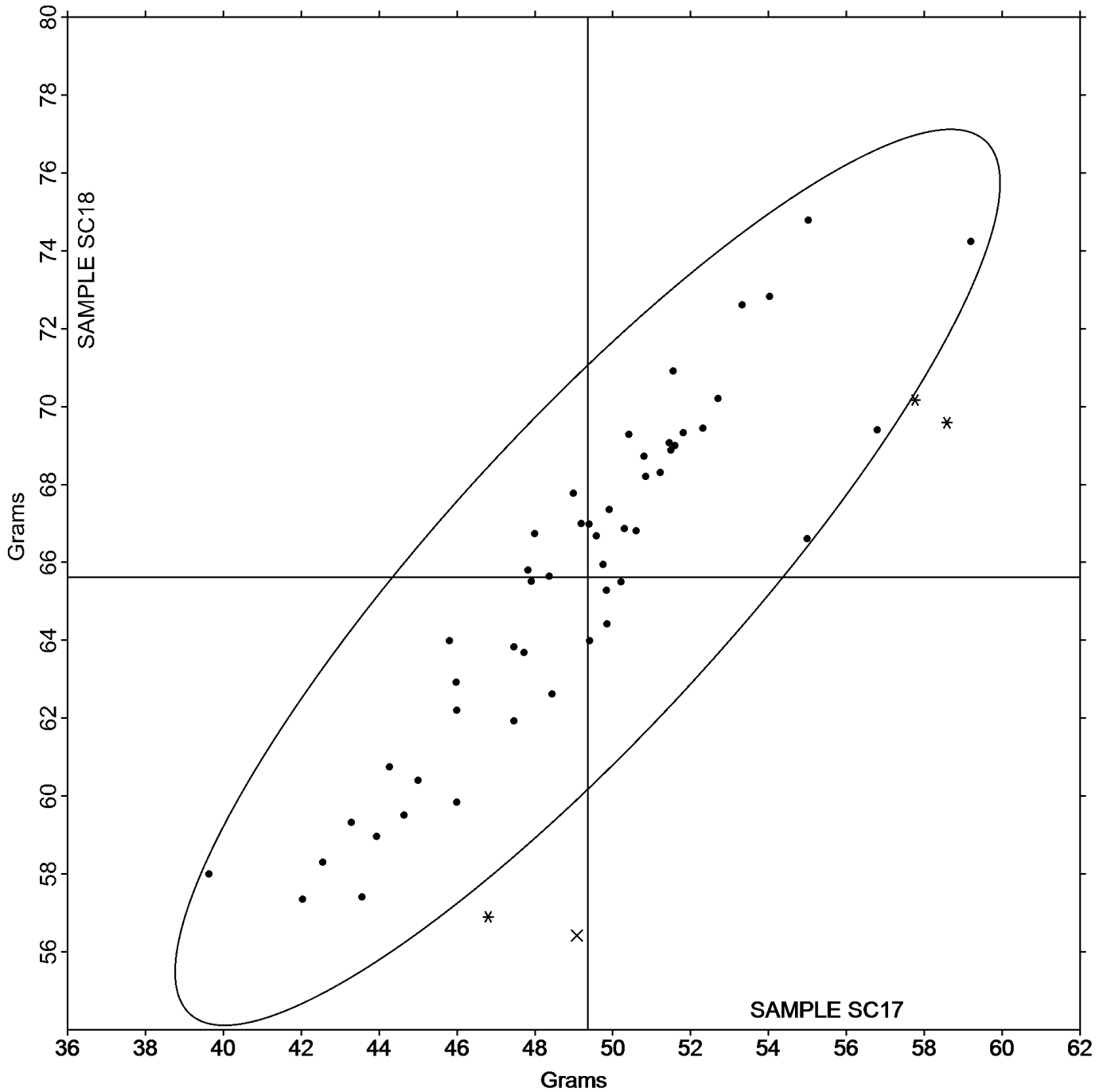
Analysis 312

Tearing Strength - Printing Papers

Grand Mean Sample **SC17** = 49.353 Grams

Grand Mean Sample **SC18** = 65.616 Grams

ANALYSIS 312



TAPPI-CTS Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

WebCode	Data Flag	Sample SD17			Sample SD18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2BUDFL		131.4	-13.0	-1.34	143.3	-16.8	-1.34
3DY4HU		146.5	2.0	0.21	166.9	6.8	0.54
4JK9Y3		134.4	-10.1	-1.04	146.4	-13.7	-1.09
4KVBLZ		146.4	1.9	0.20	155.5	-4.6	-0.37
4NQC GN		133.0	-11.4	-1.18	146.2	-13.9	-1.10
4TMVHL		129.0	-15.4	-1.59	139.2	-20.9	-1.66
6JX8LX	*	146.1	1.6	0.17	147.1	-13.0	-1.04
6JXAB3	X	138.0	-6.5	-0.67	150.7	-9.4	-0.75
A7QA4Q		140.4	-4.0	-0.42	158.1	-2.0	-0.16
B2CUCE		134.8	-9.7	-1.00	148.4	-11.7	-0.93
BHXK9T		134.6	-9.9	-1.02	146.7	-13.4	-1.07
BPYP84		156.8	12.3	1.27	176.8	16.7	1.33
CLGUXJ		143.3	-1.2	-0.12	158.1	-2.0	-0.16
D3Z3GZ	*	142.4	-2.1	-0.22	171.8	11.7	0.93
DQ7LRY		137.4	-7.0	-0.72	153.3	-6.8	-0.54
EYYG4M		144.8	0.4	0.04	161.2	1.1	0.09
FCZABQ		142.1	-2.4	-0.25	152.4	-7.7	-0.62
G8JBAG		146.9	2.5	0.25	162.2	2.1	0.17
GBJLBV		138.2	-6.3	-0.65	153.7	-6.4	-0.51
GLMT4P		140.8	-3.7	-0.38	151.2	-8.9	-0.71
GXTQ4H		148.6	4.1	0.42	167.0	6.9	0.55
GYP97J		164.5	20.1	2.07	181.6	21.5	1.71
HKNTQV		136.0	-8.5	-0.87	149.6	-10.5	-0.84
J4CWEM		143.2	-1.3	-0.13	161.2	1.1	0.09
JWD9Z4		127.2	-17.3	-1.78	133.2	-26.9	-2.14
KLM9KH		150.0	5.5	0.57	172.0	11.9	0.95
L92W7M		148.8	4.3	0.44	166.5	6.4	0.51
LNBZ88		139.2	-5.3	-0.54	149.6	-10.5	-0.84
N3626Q		147.9	3.4	0.35	171.7	11.6	0.92
NEDPC3		159.9	15.5	1.59	181.1	21.0	1.67
NUDN7R		156.5	12.1	1.25	174.0	13.9	1.11
P2QUHN		159.0	14.5	1.49	172.0	11.9	0.94
PWTHDC		153.3	8.8	0.91	165.1	5.0	0.40
Q876ZH		137.1	-7.4	-0.76	152.2	-7.9	-0.63
RLPZYE		153.6	9.1	0.94	173.5	13.4	1.07
TXUMJV		135.2	-9.3	-0.96	153.6	-6.5	-0.52
V7232F	X	138.0	-6.5	-0.67	158.7	-1.4	-0.11
VNKVBD		148.9	4.5	0.46	162.8	2.7	0.22
YQEWHC	X	131.8	-12.7	-1.31	137.7	-22.4	-1.79
YQVBNZ		168.3	23.8	2.46	186.0	25.9	2.07
Z8DMX7		137.6	-6.9	-0.71	161.1	1.0	0.08
ZBF826		150.2	5.7	0.59	171.8	11.7	0.93
ZX7UK6	X	151.2	6.7	0.69	172.4	12.3	0.98

TAPPI-CTS Interlaboratory Testing Program
Analysis 314
Tearing Strength - Packaging Papers

	Sample SD17	Summary Statistics	Sample SD18
Grand Means	144.47 Grams		160.10 Grams
SD Btwn Labs	9.70 Grams		12.54 Grams
Statistics based on 39 of 43 reporting participants			

Comments on assigned Data Flags for Test #314

6JXAB3 (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).

V7232F (X) - Data appear to be off by a factor of 2; data converted by CTS (x0.5).

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

ZX7UK6 (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).

TAPPI-CTS Interlaboratory Testing Program

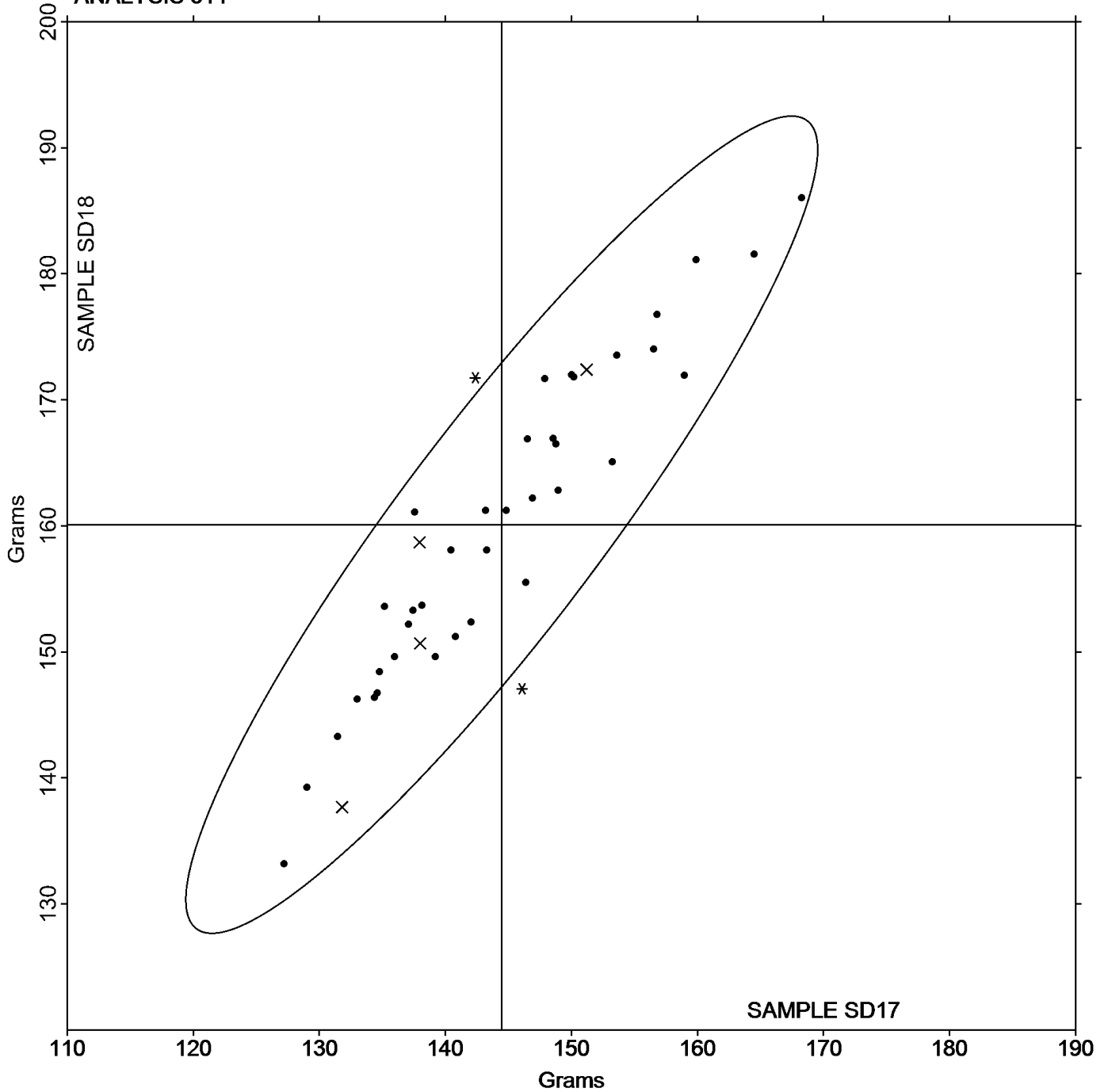
Analysis 314

Tearing Strength - Packaging Papers

Grand Mean Sample **SD17** = 144.47 Grams

Grand Mean Sample **SD18** = 160.10 Grams

ANALYSIS 314



TAPPI-CTS Interlaboratory Testing Program
Analysis 320
Tensile Breaking Strength - Newsprint

WebCode	Data Flag	Sample SR17			Sample SR18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
34PRA4		2.633	0.034	0.22	2.571	0.002	0.01
93FV62		2.435	-0.164	-1.05	2.453	-0.116	-0.63
A7QA4Q		2.637	0.038	0.24	2.803	0.234	1.26
A8ND4T		2.533	-0.066	-0.43	2.417	-0.153	-0.82
J98KGM		2.442	-0.157	-1.01	2.493	-0.077	-0.41
LB6RPP		2.496	-0.103	-0.66	2.494	-0.076	-0.41
N96NQY		2.446	-0.153	-0.98	2.365	-0.204	-1.10
NBUUAB		2.569	-0.030	-0.19	2.399	-0.171	-0.92
PHCF3E		2.580	-0.019	-0.12	2.542	-0.027	-0.15
QUKPY4		2.979	0.380	2.43	3.007	0.438	2.36
RW7T6F		2.701	0.102	0.66	2.652	0.083	0.45
WGCV72		2.737	0.138	0.89	2.636	0.066	0.36

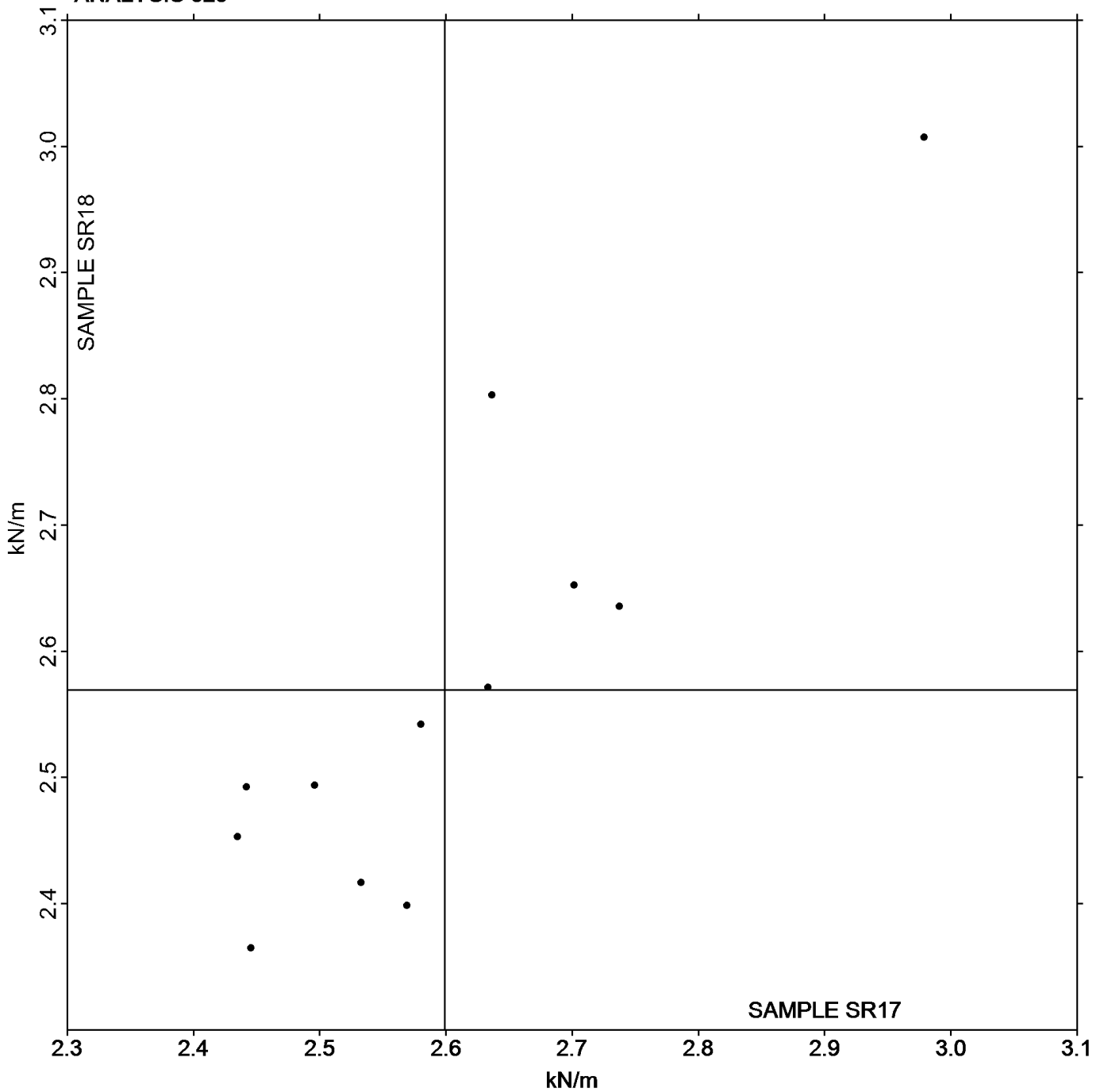
		Summary Statistics			
		Sample SR17		Sample SR18	
Grand Means		2.5990 kN/m		2.5693 kN/m	
SD Btwn Labs		0.1561 kN/m		0.1852 kN/m	
Statistics based on 12 of 12 reporting participants					

TAPPI-CTS Interlaboratory Testing Program
Analysis 320
Tensile Breaking Strength - Newsprint

Grand Mean Sample **SR17** = 2.5990 kN/m

Grand Mean Sample **SR18** = 2.5693 kN/m

ANALYSIS 320



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 321
Tensile Energy Absorption - Newsprint

WebCode	Data Flag	Sample SR17			Sample SR18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
34PRA4		19.00	-1.01	-0.40	14.99	-1.64	-0.66
93FV62		17.49	-2.53	-1.00	14.85	-1.77	-0.71
A7QA4Q		19.45	-0.56	-0.22	19.12	2.49	1.00
A8ND4T		21.94	1.92	0.76	18.12	1.50	0.60
J98KGM		17.76	-2.26	-0.89	14.48	-2.14	-0.86
LB6RPP		18.77	-1.24	-0.49	15.46	-1.17	-0.47
N96NQY		23.01	3.00	1.19	17.03	0.41	0.16
NBUUAB		18.96	-1.06	-0.42	14.52	-2.10	-0.85
PHCF3E		21.24	1.23	0.49	18.50	1.87	0.75
QUKPY4		24.27	4.25	1.68	21.06	4.43	1.78
RW7T6F		22.37	2.36	0.93	18.72	2.09	0.84
WGCV72		15.91	-4.10	-1.62	12.66	-3.96	-1.59

		Summary Statistics	
	Sample SR17		Sample SR18
Grand Means	20.014 Joules/sq m		16.626 Joules/sq m
SD Btwn Labs	2.525 Joules/sq m		2.488 Joules/sq m
Statistics based on 12 of 12 reporting participants			

TAPPI-CTS Interlaboratory Testing Program

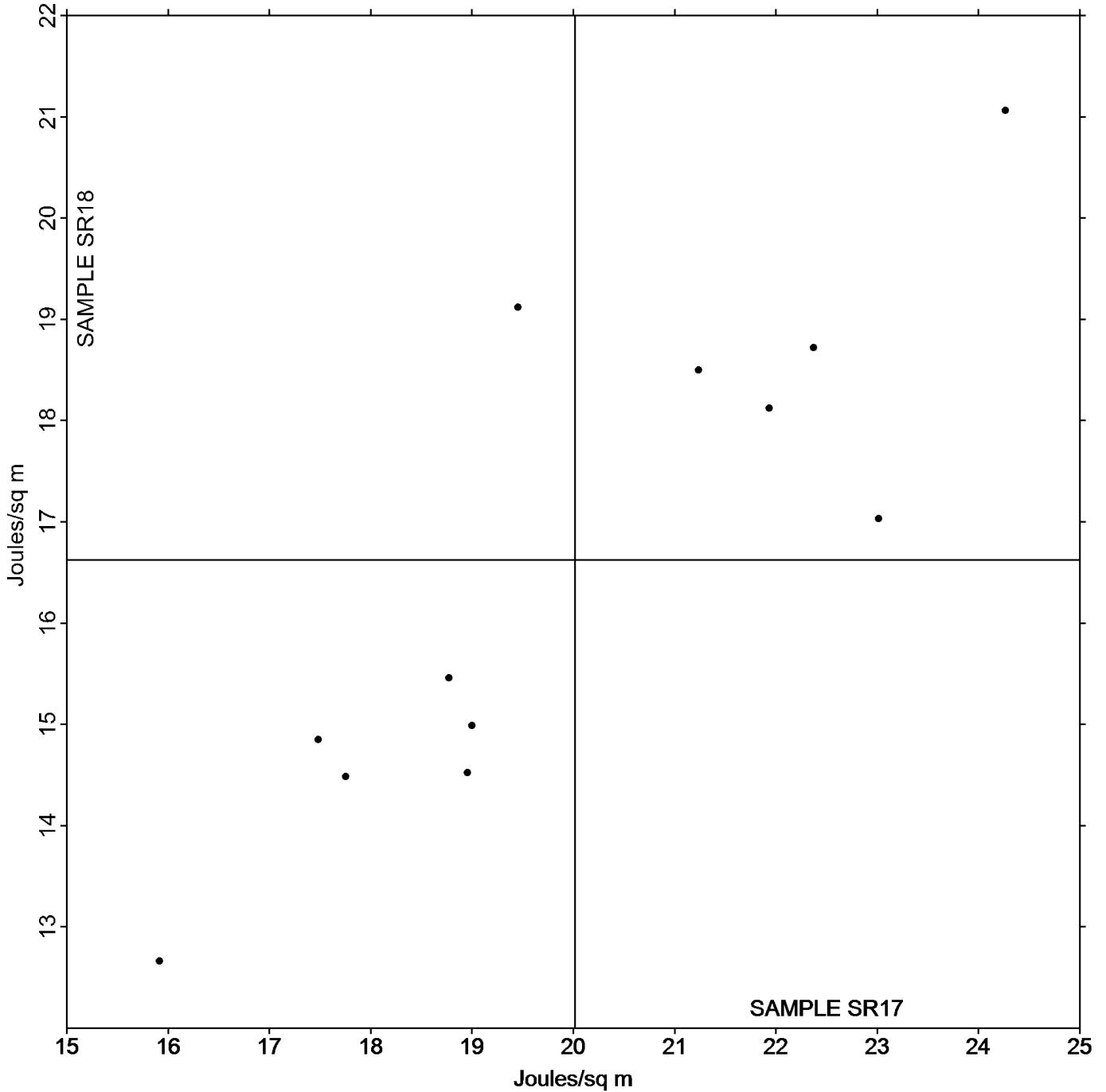
Analysis 321

Tensile Energy Absorption - Newsprint

Grand Mean Sample **SR17** = 20.014 Joules/sq m

Grand Mean Sample **SR18** = 16.626 Joules/sq m

ANALYSIS 321



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

TAPPI-CTS Interlaboratory Testing Program
 Analysis 322
 Elongation to Break - Newsprint

WebCode	Data Flag	Sample SR17			Sample SR18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
34PRA4		1.204	-0.159	-0.69	1.002	-0.164	-0.93
93FV62		1.185	-0.178	-0.77	1.022	-0.144	-0.82
A7QA4Q		1.231	-0.132	-0.57	1.155	-0.011	-0.06
A8ND4T		1.644	0.280	1.21	1.471	0.305	1.73
LB6RPP		1.251	-0.113	-0.48	1.064	-0.102	-0.58
N96NQY		1.798	0.435	1.87	1.281	0.115	0.65
NBUUAB		1.419	0.056	0.24	1.231	0.065	0.37
PHCF3E		1.326	-0.038	-0.16	1.196	0.030	0.17
QUKPY4		1.297	-0.066	-0.29	1.127	-0.039	-0.22
RW7T6F		1.616	0.253	1.09	1.402	0.236	1.34
WGCV72		1.027	-0.336	-1.45	0.875	-0.291	-1.65

		Summary Statistics	
	Sample SR17		Sample SR18
Grand Means	1.3634 Percent		1.1659 Percent
SD Btwn Labs	0.2325 Percent		0.1765 Percent
Statistics based on 11 of 11 reporting participants			

TAPPI-CTS Interlaboratory Testing Program

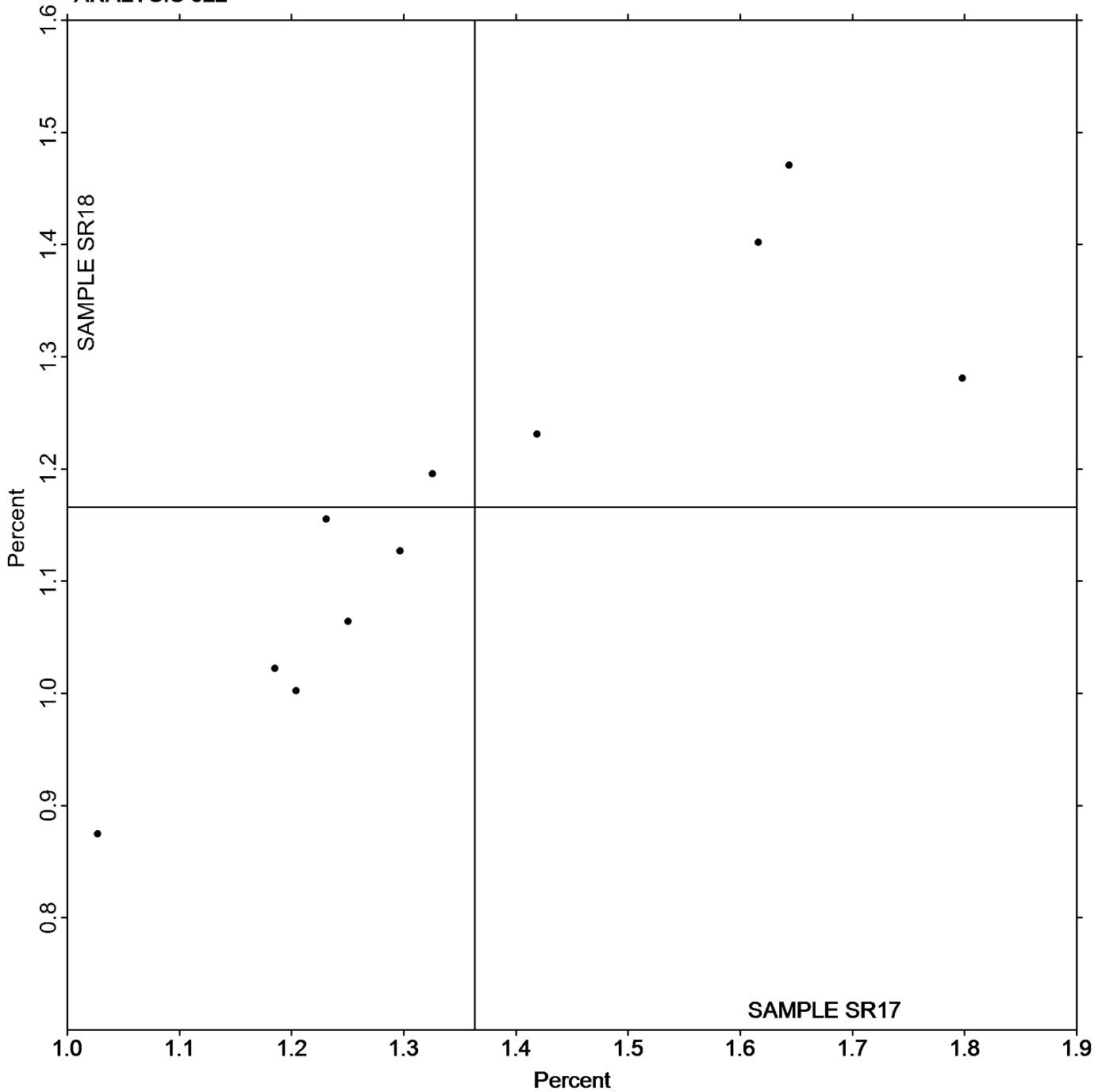
Analysis 322

Elongation to Break - Newsprint

Grand Mean Sample **SR17** = 1.3634 Percent

Grand Mean Sample **SR18** = 1.1659 Percent

ANALYSIS 322



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers

WebCode	Data Flag	Sample SF17			Sample SF18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DY4HU		4.857	0.039	0.12	4.086	0.019	0.07	LH
3YDTU4		5.325	0.507	1.58	4.518	0.451	1.57	TJ
6GAXDH		4.714	-0.104	-0.33	4.079	0.011	0.04	TP
6WY3JQ		5.450	0.632	1.97	4.566	0.498	1.74	LH
74FUR4		4.761	-0.058	-0.18	4.005	-0.062	-0.22	IM
7N4DK2		4.848	0.030	0.09	4.059	-0.009	-0.03	LH
7PVHYE		4.851	0.032	0.10	4.128	0.060	0.21	TI
7TWFN2		4.887	0.069	0.21	4.180	0.113	0.39	LF
7WEM4N		4.856	0.037	0.12	4.038	-0.029	-0.10	LX
93FV62		4.546	-0.273	-0.85	3.811	-0.256	-0.89	LH
9LMAFZ		5.351	0.533	1.66	4.600	0.533	1.86	LX
9QZNME		5.505	0.687	2.15	4.656	0.589	2.05	XX
ACYBPV		4.753	-0.066	-0.20	3.877	-0.190	-0.66	XX
ARB3CZ		4.732	-0.087	-0.27	3.931	-0.137	-0.48	XX
B9AQ3B		4.902	0.084	0.26	4.088	0.020	0.07	MR
B9D2YU		4.550	-0.269	-0.84	3.925	-0.142	-0.50	LA
BRPZXW		4.321	-0.498	-1.55	3.496	-0.571	-1.99	IM
CXTY9L		5.512	0.694	2.17	4.655	0.588	2.05	TB
DBD24J		4.609	-0.210	-0.65	3.947	-0.120	-0.42	LI
DHBJPM		4.962	0.144	0.45	4.193	0.126	0.44	LH
DNGF9M		4.747	-0.072	-0.22	4.124	0.057	0.20	LE
DZRW2Y		4.515	-0.304	-0.95	3.829	-0.238	-0.83	TB
E6FYDN	*	4.029	-0.789	-2.47	3.330	-0.737	-2.57	TP
GLMT4P		4.830	0.011	0.04	4.067	0.000	0.00	IM
GPE27A		4.654	-0.165	-0.51	4.131	0.064	0.22	LI
HBFG4C		4.992	0.174	0.54	4.189	0.122	0.43	TP
HEC7M6		4.851	0.032	0.10	4.005	-0.062	-0.22	IN
HQUGGQ	X	4.235	-0.584	-1.82	3.197	-0.870	-3.03	ID
HTWETJ	X	3.458	-1.361	-4.25	4.682	0.615	2.14	TJ
J33QEE		4.696	-0.123	-0.38	3.919	-0.148	-0.52	LH
K3VZP9		4.487	-0.332	-1.04	3.723	-0.344	-1.20	TO
K6KAWN		4.973	0.155	0.48	4.349	0.282	0.98	LH
MP44KF		4.892	0.074	0.23	4.117	0.050	0.17	LH
MQVBJH		4.879	0.061	0.19	4.076	0.009	0.03	LH
NAKM94		4.654	-0.165	-0.51	3.921	-0.146	-0.51	LI
NUVKPE		4.577	-0.242	-0.75	4.007	-0.060	-0.21	DL
P3Z2KG		4.812	-0.007	-0.02	3.877	-0.190	-0.66	TC
QUKMAY		5.001	0.183	0.57	4.266	0.198	0.69	LX
RNQCC7		4.682	-0.137	-0.43	4.011	-0.056	-0.20	LH
T4YH3V	X	5.826	1.008	3.15	4.716	0.649	2.26	LA
U8XAT8		4.930	0.112	0.35	4.089	0.021	0.07	TO
V2Q6FE		4.434	-0.384	-1.20	3.591	-0.476	-1.66	LH
VBD496		4.714	-0.104	-0.33	3.969	-0.099	-0.34	TB

TAPPI-CTS Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers

WebCode	Data Flag	Sample SF17			Sample SF18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
VU9LCE		4.854	0.035	0.11	4.062	-0.005	-0.02	LI
W7W79V		4.655	-0.164	-0.51	4.008	-0.060	-0.21	TB
WRYUX7		4.478	-0.340	-1.06	3.975	-0.092	-0.32	TF
XB6N7N		5.117	0.299	0.93	4.193	0.125	0.44	TO
XNQZGD		4.214	-0.604	-1.89	3.564	-0.504	-1.76	SP
XT7LB6		5.035	0.217	0.68	4.310	0.242	0.85	TA
YD8YK4		5.474	0.656	2.05	4.623	0.556	1.94	LA

Sample SF17		Summary Statistics	Sample SF18	
Grand Means	4.8186 kN/m		4.0672 kN/m	
SD Btwn Labs	0.3201 kN/m		0.2868 kN/m	
Statistics based on 47 of 50 reporting participants				

Comments on assigned Data Flags for Test #325

HQUGGQ (X) - Inconsistent in testing between samples, data for Sample SF18 are low.

HTWETJ (X) - Inconsistent in testing between samples, data for Sample SF17 are low.

T4YH3V (X) - Inconsistent in testing between samples, data for Sample SF17 are high.

Instrument Code List

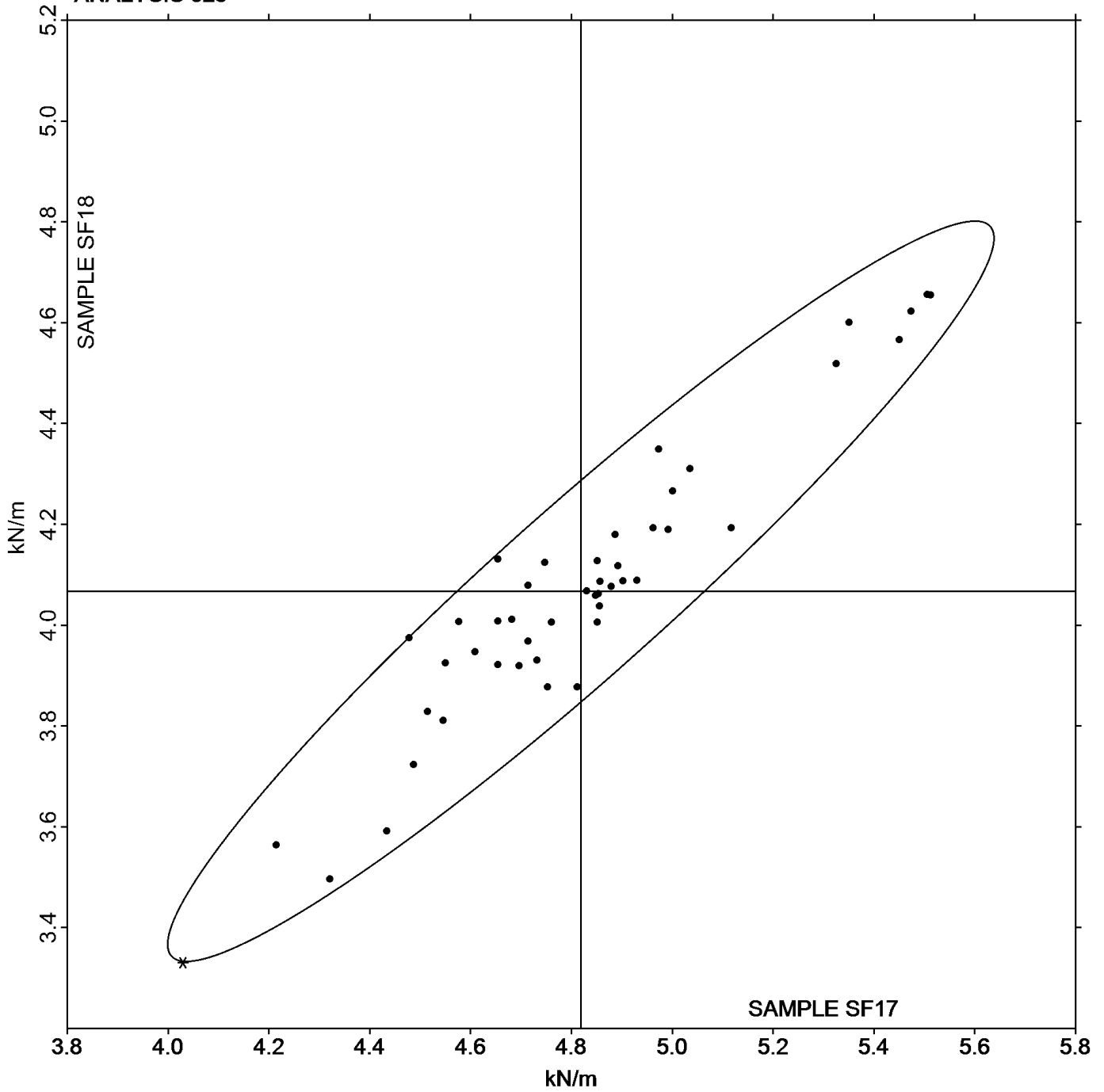
- | | |
|---|--|
| (DL) - EMIC DL500 Universal Testing Machines | (ID) - Instron 4201/4202 |
| (IM) - Instron 5500 Series | (IN) - Instron 3340 series |
| (LA) - L & W Tensile - Autoline 300 | (LE) - L & W Tensile Tester 066 |
| (LF) - L & W Tensile/Fracture Toughness Tester SE 064 | (LH) - L & W Alwetron TH1 (Horizontal) SE 060/065F |
| (LI) - L & W Tensile Tester SE 062 | (LX) - L & W (model not specified) |
| (MR) - MTS Alliance RT series | (SP) - Schopper Type Tensile Tester (TMI) |
| (TA) - Testometric AX | (TB) - Thwing-Albert EJA/1000 |
| (TC) - Thwing-Albert Electro-Hydraulic, Model 30LT | (TF) - Thwing-Albert EJA Vantage-1 |
| (TI) - Thwing-Albert QC II | (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 | |

TAPPI-CTS Interlaboratory Testing Program
Analysis 325
Tensile Breaking Strength - Printing Papers

Grand Mean Sample **SF17** = 4.8186 kN/m

Grand Mean Sample **SF18** = 4.0672 kN/m

ANALYSIS 325



TAPPI-CTS Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers

WebCode	Data Flag	Sample SF17			Sample SF18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DY4HU		65.78	-1.14	-0.16	31.00	-0.85	-0.22	LH
3YDTU4		80.50	13.57	1.90	37.10	5.24	1.37	TJ
6WY3JQ		70.68	3.75	0.52	31.50	-0.36	-0.09	LH
74FUR4		78.33	11.41	1.59	36.94	5.08	1.33	IM
7N4DK2		68.58	1.65	0.23	33.34	1.48	0.39	LH
7PVHYE		70.20	3.27	0.46	33.13	1.27	0.33	TI
7TWFN2		55.09	-11.84	-1.65	26.63	-5.22	-1.37	LW
7WEM4N		62.55	-4.38	-0.61	28.40	-3.46	-0.91	LX
93FV62		63.77	-3.16	-0.44	28.58	-3.28	-0.86	LH
9LMAFZ		65.22	-1.71	-0.24	28.72	-3.14	-0.82	LX
ARB3CZ		69.32	2.39	0.33	32.30	0.44	0.12	XX
B9AQ3B		65.34	-1.59	-0.22	30.43	-1.43	-0.38	MR
B9D2YU		52.74	-14.19	-1.98	27.73	-4.13	-1.08	LA
BRPZXW		61.43	-5.50	-0.77	28.21	-3.65	-0.96	IM
CXTY9L		72.87	5.94	0.83	34.40	2.54	0.67	TB
DBD24J		65.23	-1.70	-0.24	32.25	0.39	0.10	LI
DHBJPM		65.70	-1.23	-0.17	30.71	-1.15	-0.30	LH
DZRW2Y		68.63	1.70	0.24	32.96	1.10	0.29	TB
E6FYDN	X	33.86	-33.07	-4.62	20.66	-11.19	-2.94	TP
GLMT4P		69.48	2.55	0.36	31.80	-0.06	-0.02	IM
GPE27A		65.00	-1.93	-0.27	34.53	2.67	0.70	LI
HBFG4C	*	47.96	-18.97	-2.65	22.14	-9.72	-2.55	TP
HQUGGQ	X	62.26	-4.67	-0.65	21.14	-10.72	-2.81	ID
J33QEE		67.67	0.74	0.10	32.54	0.69	0.18	LH
K6KAWN	*	68.92	1.99	0.28	37.38	5.52	1.45	LH
MP44KF		59.19	-7.74	-1.08	28.30	-3.56	-0.93	LH
MQVBJH		69.14	2.21	0.31	34.61	2.75	0.72	LH
NAKM94		64.22	-2.70	-0.38	29.89	-1.96	-0.52	LI
NUVKPE		73.14	6.21	0.87	36.38	4.52	1.19	DL
QUKMAY		73.44	6.51	0.91	37.59	5.73	1.50	LX
RNQCC7		59.69	-7.23	-1.01	28.88	-2.98	-0.78	LH
U8XAT8		60.51	-6.42	-0.90	27.91	-3.95	-1.04	TO
V2Q6FE		68.40	1.47	0.21	30.80	-1.05	-0.28	LH
VBD496		67.52	0.59	0.08	30.39	-1.47	-0.39	TB
VU9LCE		67.80	0.87	0.12	30.19	-1.67	-0.44	LI
XB6N7N		82.16	15.23	2.13	39.26	7.40	1.94	TO
YD8YK4		76.31	9.38	1.31	38.14	6.28	1.65	LA

TAPPI-CTS Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers

	Summary Statistics	
	Sample SF17	Sample SF18
Grand Means	66.929 Joules/sq m	31.858 Joules/sq m
SD Btwn Labs	7.158 Joules/sq m	3.812 Joules/sq m
Statistics based on 35 of 37 reporting participants		

Comments on assigned Data Flags for Test #327

E6FYDN (X) - Data for both samples are low.

HQUGGQ (X) - Data for Sample SF18 are low.

Analysis Notes:

3YDTU4 - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

VBD496 - Data appear to be reported as kg-m/sq m, not J/sq m as indicated on datasheet. Units corrected by CTS.

Instrument Code List

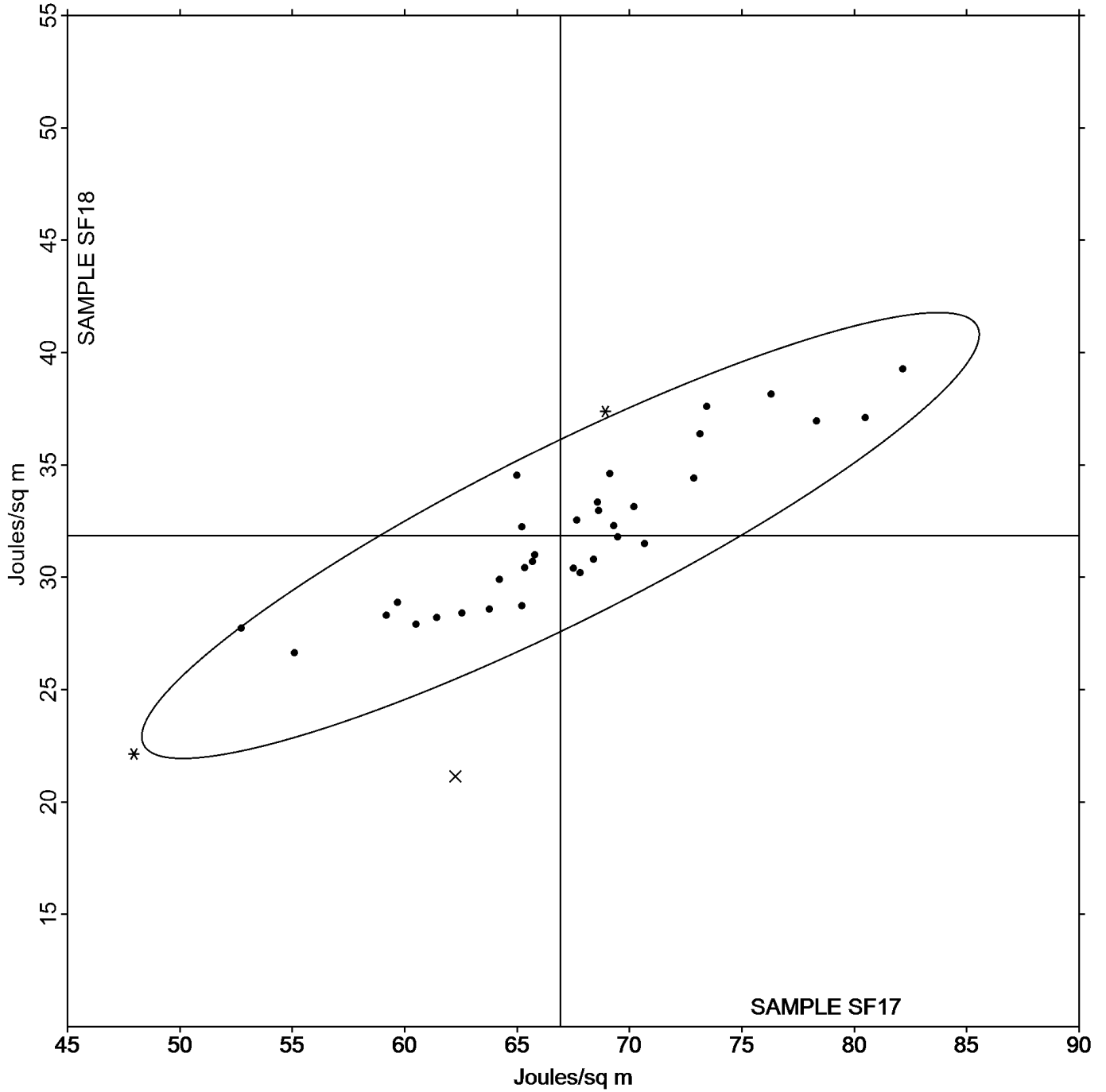
- | | |
|---|---|
| (DL) - EMIC DL500 Universal Testing Machines
(IM) - Instron 5500 Series
(LH) - L & W Alwetron TH1 (Horizontal) SE 060
(LW) - L & W Tensile Tester SE 064
(MR) - MTS Alliance RT series
(TI) - Thwing-Albert QC II
(TO) - Thwing-Albert QC-1000
(XX) - Instrument make/model not specified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

TAPPI-CTS Interlaboratory Testing Program
Analysis 327
Tensile Energy Absorption - Printing Papers

Grand Mean Sample **SF17** = 66.929 Joules/sq m

Grand Mean Sample **SF18** = 31.858 Joules/sq m

ANALYSIS 327



TAPPI-CTS Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

WebCode	Data Flag	Sample SF17			Sample SF18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DY4HU		2.017	-0.069	-0.33	1.201	-0.059	-0.42	LH
3YDTU4		2.401	0.315	1.50	1.378	0.118	0.83	TJ
6WY3JQ		1.935	-0.151	-0.72	1.118	-0.142	-1.00	LH
74FUR4		2.465	0.379	1.81	1.477	0.217	1.53	IM
7N4DK2		2.087	0.001	0.00	1.281	0.021	0.15	LH
7PVHYE		2.210	0.124	0.59	1.336	0.076	0.54	TI
7TWFN2		1.742	-0.344	-1.64	1.075	-0.185	-1.31	LX
7WEM4N		1.897	-0.189	-0.90	1.110	-0.150	-1.06	LX
93FV62		2.068	-0.018	-0.09	1.169	-0.091	-0.64	LH
9LMAFZ		1.823	-0.263	-1.26	1.054	-0.206	-1.45	LX
ARB3CZ		2.191	0.105	0.50	1.334	0.074	0.52	XX
B9AQ3B		2.040	-0.046	-0.22	1.235	-0.025	-0.18	MR
B9D2YU		2.049	-0.037	-0.18	1.308	0.048	0.34	LA
BRPZXW		2.314	0.228	1.09	1.475	0.215	1.52	XX
CXTY9L		1.974	-0.112	-0.54	1.189	-0.071	-0.50	TB
DBD24J		2.104	0.018	0.08	1.277	0.017	0.12	LI
DHBJPM		1.966	-0.120	-0.57	1.167	-0.093	-0.66	LH
DZRW2Y		2.292	0.206	0.98	1.383	0.123	0.87	TB
E6FYDN	X	3.684	1.598	7.63	1.806	0.546	3.85	TP
GLMT4P		2.136	0.050	0.24	1.246	-0.014	-0.10	IM
GPE27A		2.072	-0.014	-0.07	1.296	0.036	0.25	LI
HBFG4C		2.020	-0.066	-0.32	1.205	-0.055	-0.39	TP
HEC7M6		2.275	0.189	0.90	1.362	0.102	0.72	IN
HQUGGQ	X	2.182	0.096	0.46	1.082	-0.178	-1.26	ID
HTWETJ		1.611	-0.475	-2.27	1.003	-0.257	-1.81	LH
J33QEE		2.154	0.068	0.32	1.306	0.046	0.33	LH
K3VZP9		2.421	0.335	1.60	1.551	0.291	2.05	TO
K6KAWN		2.034	-0.052	-0.25	1.322	0.062	0.44	LH
MP44KF		1.738	-0.348	-1.66	1.044	-0.216	-1.52	LH
MQVBJH		2.096	0.010	0.05	1.317	0.057	0.40	LH
NAKM94		2.042	-0.044	-0.21	1.202	-0.058	-0.41	LI
NUVKPE		2.588	0.502	2.40	1.616	0.356	2.51	DL
QUKMAY		2.070	-0.016	-0.08	1.256	-0.004	-0.03	LX
RNQCC7		1.801	-0.285	-1.36	1.051	-0.209	-1.47	LH
U8XAT8		1.823	-0.263	-1.26	1.068	-0.192	-1.35	TG
V2Q6FE		2.274	0.188	0.90	1.313	0.053	0.37	LH
VBD496		2.179	0.093	0.44	1.249	-0.011	-0.08	TB
VU9LCE		2.129	0.043	0.20	1.206	-0.054	-0.38	LI
W7W79V		2.170	0.084	0.40	1.310	0.050	0.35	TF
WRYUX7		2.240	0.154	0.73	1.450	0.190	1.34	TF
XB6N7N	X	2.731	0.645	3.08	1.849	0.589	4.16	TO
YD8YK4		1.916	-0.170	-0.81	1.196	-0.064	-0.45	LA

TAPPI-CTS Interlaboratory Testing Program
Analysis 328
Elongation to Break - Printing Papers

Sample SF17		Summary Statistics	Sample SF18	
Grand Means	2.0863 Percent		1.2599 Percent	
SD Btwn Labs	0.2093 Percent		0.1417 Percent	
Statistics based on 39 of 42 reporting participants				

Comments on assigned Data Flags for Test #328

E6FYDN (X) - Extreme data.

HQUGGQ (X) - Inconsistent in testing between samples.

XB6N7N (X) - Data for both samples are high.

Instrument Code List

(DL) - EMIC DL500 Universal Testing Machines

(IM) - Instron 5500

(LA) - L & W Tensile - Autoline 300

(LI) - L & W Tensile Tester SE 062

(MR) - MTS Alliance RT series

(TF) - Thwing-Albert EJA Vantage-1

(TI) - Thwing-Albert QC II

(TO) - Thwing-Albert QC-1000

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

(ID) - Instron 4201

(IN) - Instron 3340 Series

(LH) - L & W Alwetron TH1 (Horizontal) SE 060

(LX) - L & W (model not specified)

(TB) - Thwing-Albert EJA/1000

(TG) - Thwing-Albert QC

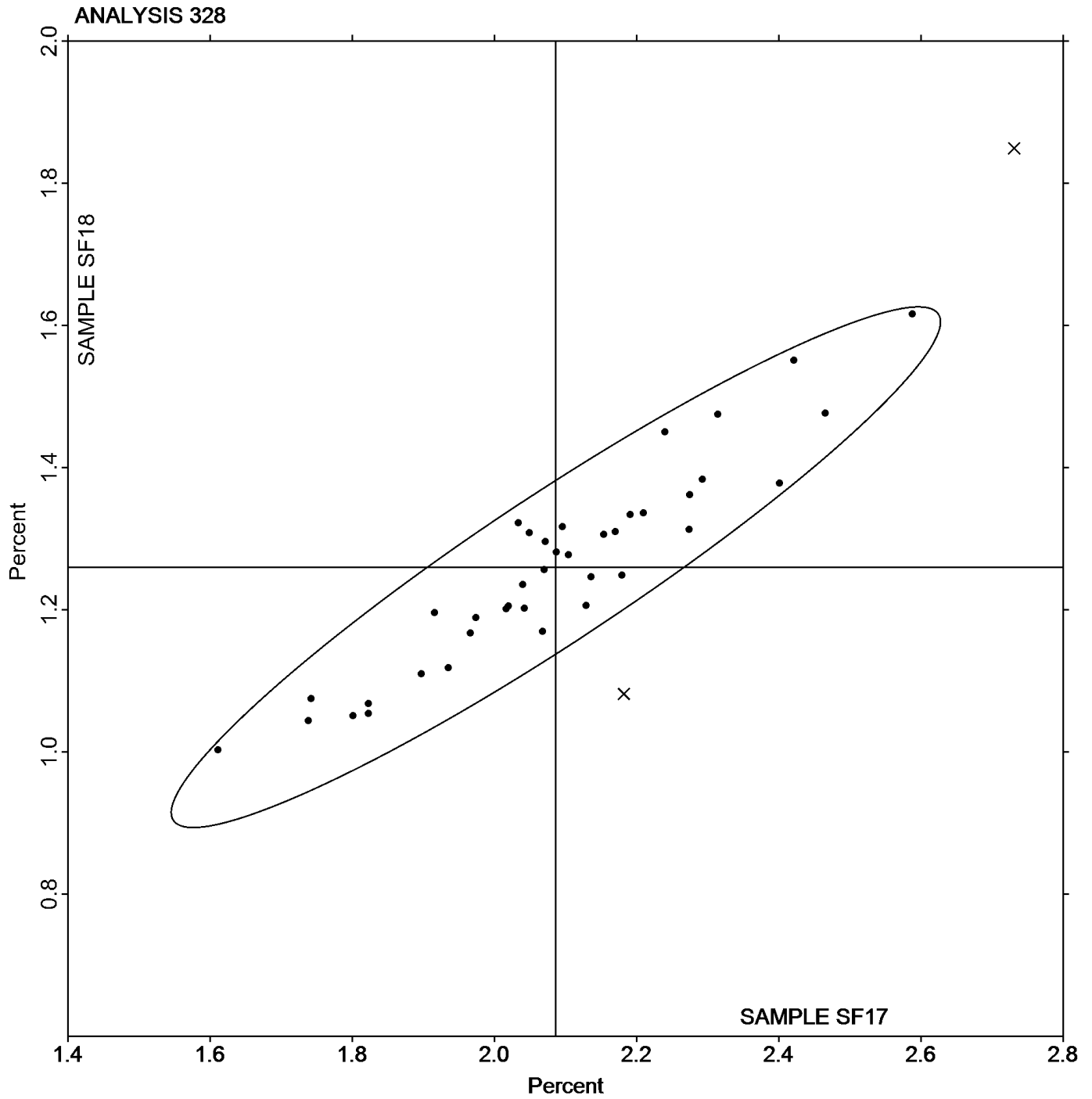
(TJ) - Thwing-Albert QC II-XS

(TP) - TMI Monitor/Tensile 100 (84-21-01)

TAPPI-CTS Interlaboratory Testing Program
Analysis 328
Elongation to Break - Printing Papers

Grand Mean Sample **SF17** = 2.0863 Percent

Grand Mean Sample **SF18** = 1.2599 Percent



TAPPI-CTS Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers

WebCode	Data Flag	Sample SE17			Sample SE18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2BUDFL		10.014	0.147	0.19	11.45	-0.01	-0.01	IN
3DY4HU		9.691	-0.176	-0.23	11.29	-0.16	-0.18	LH
4BKYKW		9.915	0.048	0.06	11.56	0.11	0.12	TH
4JK9Y3	*	10.035	0.168	0.22	12.47	1.02	1.12	TK
4KVBLZ		9.954	0.087	0.12	11.59	0.14	0.15	LH
4NQCGN		11.369	1.502	2.00	13.00	1.55	1.70	LA
7WZDW9		11.650	1.783	2.37	13.33	1.88	2.07	LA
AAA68J		9.434	-0.433	-0.58	11.08	-0.37	-0.41	XX
AE8N9H		10.735	0.868	1.15	13.00	1.55	1.70	TA
B2CUCE		10.720	0.853	1.13	12.40	0.95	1.04	TH
BPYP84		9.163	-0.704	-0.94	10.51	-0.94	-1.04	XX
BW4BDL		10.967	1.100	1.46	12.65	1.20	1.32	TX
CLGUXJ		10.366	0.499	0.66	11.98	0.52	0.58	TO
D3Z3GZ		9.959	0.092	0.12	11.20	-0.26	-0.28	LH
DGGZLZ		9.278	-0.589	-0.78	10.71	-0.74	-0.82	IM
DQ7LRY		10.288	0.420	0.56	12.01	0.56	0.62	TO
EYYG4M		9.486	-0.381	-0.51	10.75	-0.70	-0.77	TB
F9Y7LN		8.860	-1.008	-1.34	10.39	-1.07	-1.17	LA
FCZABQ		11.062	1.195	1.59	12.78	1.33	1.46	TP
G8JBAG		9.359	-0.508	-0.68	10.38	-1.07	-1.18	IF
GBJLBV		9.334	-0.533	-0.71	10.93	-0.52	-0.58	SA
GXTQ4H		9.158	-0.709	-0.94	10.91	-0.55	-0.60	ID
HBFG4C		10.268	0.400	0.53	11.63	0.18	0.20	TO
HKNTQV		10.424	0.557	0.74	11.89	0.44	0.48	LW
HVMKBU		9.509	-0.358	-0.48	11.06	-0.40	-0.43	XX
JWD9Z4		9.898	0.031	0.04	11.80	0.35	0.38	IK
KLM9KH		8.440	-1.427	-1.90	10.04	-1.42	-1.56	SP
LE7RPM		9.877	0.010	0.01	11.72	0.26	0.29	IF
LNBZ88		10.360	0.493	0.66	12.30	0.85	0.93	TP
N3626Q		8.783	-1.084	-1.44	10.47	-0.98	-1.08	TK
NEDPC3		11.299	1.432	1.90	12.54	1.09	1.20	LA
NUDN7R		8.674	-1.193	-1.59	9.91	-1.54	-1.70	LW
NXB82X		9.539	-0.328	-0.44	11.43	-0.02	-0.03	TB
P2QUHN		9.804	-0.063	-0.08	11.21	-0.24	-0.27	IM
PWTHDC		10.898	1.031	1.37	12.69	1.24	1.36	LA
Q876ZH		9.649	-0.218	-0.29	11.29	-0.17	-0.18	IK
RB7KWC		9.321	-0.547	-0.73	10.59	-0.86	-0.95	LW
RLPZYE		8.756	-1.111	-1.48	10.42	-1.03	-1.14	TK
TXUMJV	*	10.756	0.889	1.18	13.35	1.89	2.08	TH
UWDREF		9.754	-0.113	-0.15	11.40	-0.05	-0.06	LE
V294P6		9.451	-0.416	-0.55	10.27	-1.19	-1.31	XX
VNKVBD		9.619	-0.248	-0.33	11.16	-0.29	-0.32	TB
XH7WU4		9.108	-0.759	-1.01	10.67	-0.78	-0.86	LE

TAPPI-CTS Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers

WebCode	Data Flag	Sample SE17			Sample SE18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
YQVBNZ		9.446	-0.421	-0.56	10.98	-0.48	-0.52	TP
Z8DMX7		9.653	-0.214	-0.28	11.11	-0.34	-0.38	TO
ZX7UK6		9.805	-0.062	-0.08	10.56	-0.90	-0.99	IF

Summary Statistics			
	Sample SE17		Sample SE18
Grand Means	9.8672 kN/m		11.453 kN/m
SD Btwn Labs	0.7519 kN/m		0.910 kN/m
Statistics based on 46 of 46 reporting participants			

Analysis Notes:

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

V294P6 - Data appear to be reported as lb/inch, not kN/m as indicated on datasheet. Units corrected by CTS.

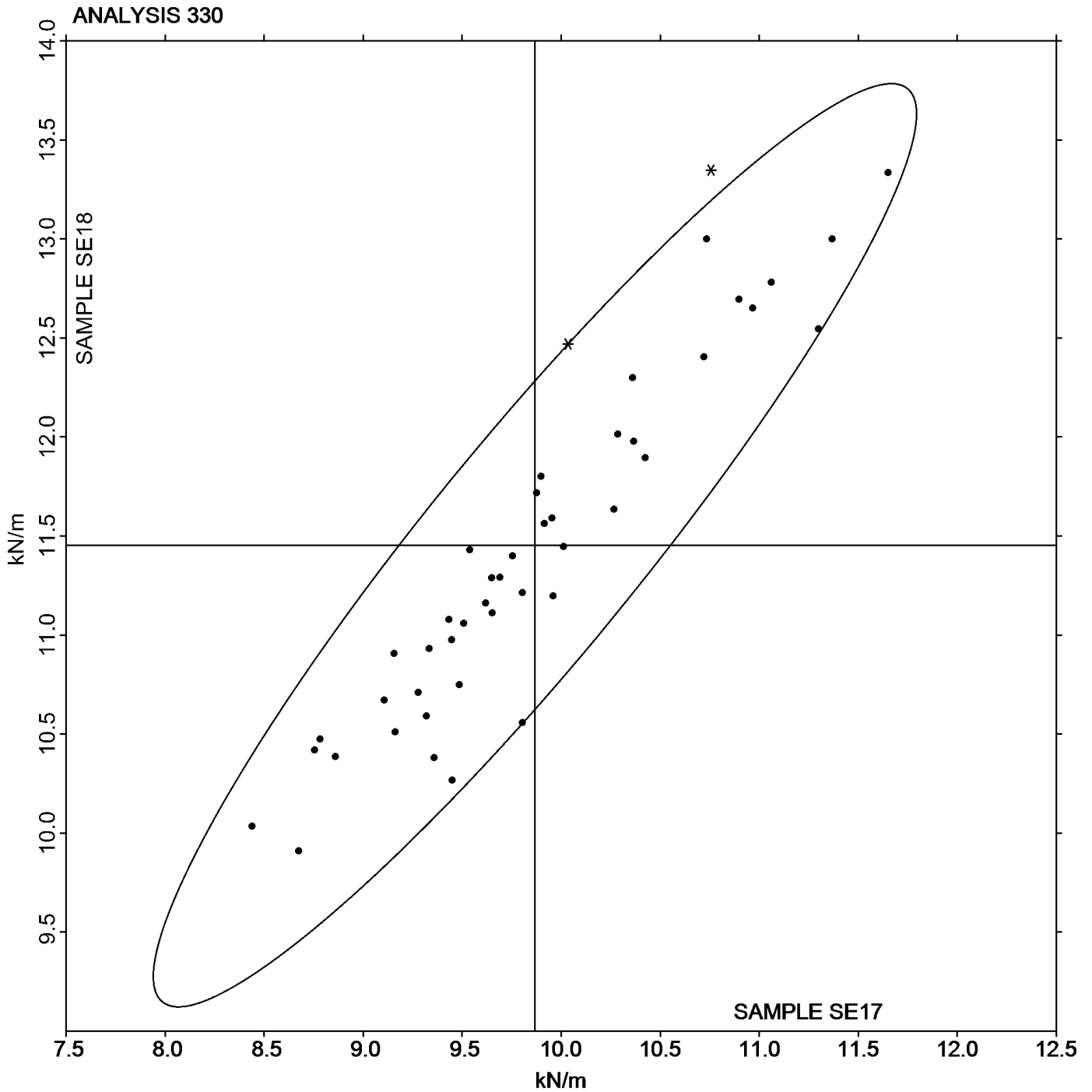
Instrument Code List

- | | |
|---|---|
| (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 |
| (SP) - Schopper Type Tensile Tester (TMI) | (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) | (TX) - Thwing-Albert (model not specified) |
| (XX) - Instrument make/model not specified by lab | |

TAPPI-CTS Interlaboratory Testing Program
Analysis 330
Tensile Breaking Strength - Packaging Papers

Grand Mean Sample **SE17** = 9.8672 kN/m

Grand Mean Sample **SE18** = 11.453 kN/m



TAPPI-CTS Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers

WebCode	Data Flag	Sample SE17			Sample SE18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2BUDFL		129.9	15.1	1.14	221.4	7.8	0.30	IN
3DY4HU		107.5	-7.4	-0.56	200.6	-12.9	-0.50	LH
4BKYKW		113.1	-1.8	-0.14	213.7	0.2	0.01	TH
4KVBLZ		100.1	-14.8	-1.12	190.5	-23.1	-0.89	LH
4NQCGN		123.4	8.6	0.65	223.3	9.8	0.38	LA
7WZDW9		111.1	-3.7	-0.28	203.2	-10.3	-0.40	LA
AAA68J		121.7	6.8	0.52	238.8	25.3	0.97	XX
B2CUCE		131.5	16.7	1.26	244.3	30.8	1.18	TH
BPYP84		105.3	-9.5	-0.72	192.9	-20.6	-0.79	XX
BW4BDL		142.5	27.6	2.09	270.2	56.7	2.18	XX
CLGUXJ		142.5	27.6	2.09	259.2	45.6	1.76	TO
D3Z3GZ		104.5	-10.4	-0.79	174.0	-39.5	-1.52	LH
DGGZLZ		109.3	-5.6	-0.42	196.8	-16.7	-0.64	IM
DQ7LRY		122.1	7.2	0.55	235.8	22.2	0.86	TO
F9Y7LN		113.0	-1.9	-0.14	215.4	1.8	0.07	LA
FCZABQ	*	71.9	-42.9	-3.26	132.8	-80.7	-3.11	TP
GBJLBV		107.6	-7.2	-0.55	193.9	-19.6	-0.75	SA
HBFG4C		120.7	5.8	0.44	225.3	11.8	0.46	TO
HKNTQV		98.5	-16.4	-1.25	198.0	-15.5	-0.60	LW
HVMKBU		113.6	-1.3	-0.10	206.6	-6.9	-0.27	XX
JWD9Z4		105.7	-9.2	-0.70	212.8	-0.7	-0.03	XX
LE7RPM		121.5	6.6	0.50	227.4	13.9	0.54	IF
LNBZ88		120.5	5.6	0.43	218.9	5.4	0.21	TP
N3626Q		107.2	-7.7	-0.59	205.9	-7.7	-0.29	TK
NEDPC3		118.5	3.6	0.27	225.9	12.4	0.48	LA
NUDN7R		100.2	-14.7	-1.12	178.4	-35.1	-1.35	LW
NXB82X		110.2	-4.7	-0.36	213.9	0.4	0.02	TB
P2QUHN		116.4	1.5	0.12	211.1	-2.4	-0.09	IM
PWTHDC		113.9	-0.9	-0.07	218.1	4.6	0.18	LA
Q876ZH		128.8	14.0	1.06	223.9	10.4	0.40	IK
TXUMJV	*	125.7	10.8	0.82	265.1	51.6	1.99	TH
UWDREF		114.6	-0.3	-0.02	215.9	2.4	0.09	LE
VNKVBD		106.5	-8.4	-0.64	193.4	-20.1	-0.77	TB
Z8DMX7		126.2	11.4	0.86	220.5	7.0	0.27	TO
ZX7UK6		115.1	0.3	0.02	205.3	-8.2	-0.32	IN

Sample SE17**Summary Statistics****Sample SE18**

Grand Means 114.88 Joules/sq m
SD Btwn Labs 13.18 Joules/sq m

213.51 Joules/sq m
25.96 Joules/sq m

Statistics based on 35 of 35 reporting participants

TAPPI-CTS Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers

Instrument Code List

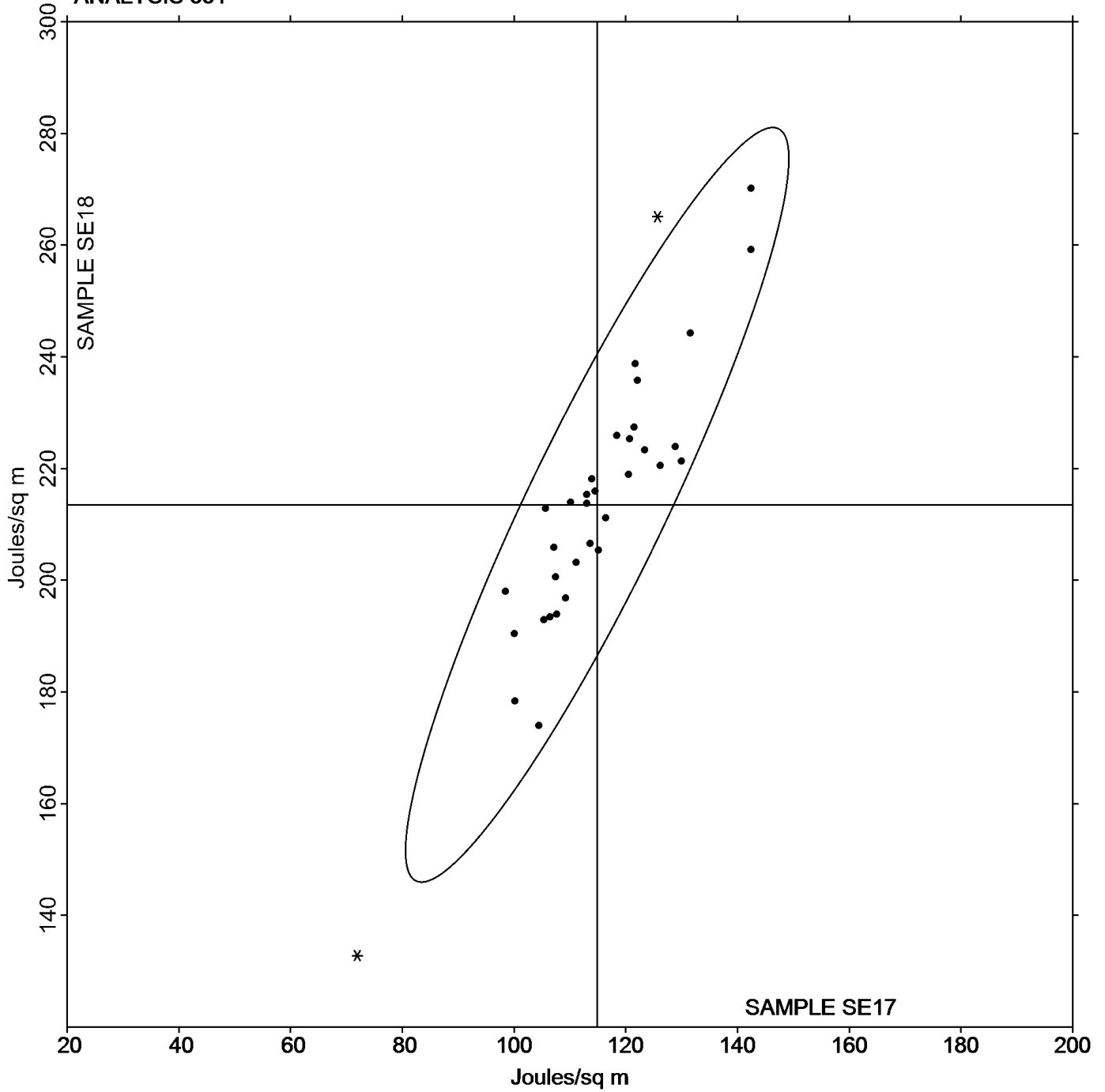
(IF) - Instron 3340 Series	(IK) - Instron 4400 Series
(IM) - Instron 5500 Series	(IN) - Instron 3360 Series
(LA) - L & W Autoline	(LE) - L & W Tensile Tester 066
(LH) - L & W Alwetron TH1 (Horizontal) SE 060	(LW) - L & W Tensile Tester SE062
(SA) - Shimadzu Autograph AG 2000 A	(TB) - Thwing-Albert EJA/1000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

TAPPI-CTS Interlaboratory Testing Program
Analysis 331
Tensile Energy Absorption - Packaging Papers

Grand Mean Sample **SE17** = 114.88 Joules/sq m

Grand Mean Sample **SE18** = 213.51 Joules/sq m

ANALYSIS 331



TAPPI-CTS Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers

WebCode	Data Flag	Sample SE17			Sample SE18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2BUDFL	X	2.190	0.353	1.76	2.890	0.117	0.42	IN
3DY4HU		1.684	-0.153	-0.76	2.569	-0.204	-0.74	LH
4BKYKW		1.982	0.145	0.72	2.936	0.163	0.59	TH
4KVBLZ		1.540	-0.297	-1.48	2.430	-0.343	-1.24	LH
4NQCGN		1.621	-0.216	-1.07	2.457	-0.316	-1.14	LA
7WZDW9		1.504	-0.333	-1.65	2.238	-0.535	-1.93	XX
AAA68J		2.036	0.199	0.99	3.227	0.454	1.64	XX
B2CUCE		2.044	0.207	1.03	2.992	0.219	0.79	TH
BPYP84		1.747	-0.090	-0.45	2.688	-0.085	-0.31	XX
BW4BDL		2.111	0.274	1.37	3.245	0.472	1.70	XX
CLGUXJ		2.192	0.355	1.77	3.277	0.504	1.82	TO
D3Z3GZ		1.639	-0.198	-0.98	2.324	-0.449	-1.62	LH
DGGZLZ		2.152	0.315	1.57	3.003	0.230	0.83	IM
DQ7LRY		1.867	0.030	0.15	2.897	0.124	0.45	TO
EYYG4M		1.790	-0.047	-0.23	2.595	-0.178	-0.64	TB
F9Y7LN		1.631	-0.206	-1.02	2.561	-0.212	-0.77	LA
FCZABQ	X	0.151	-1.686	-8.39	0.285	-2.489	-8.98	TP
GBJLBV		1.828	-0.009	-0.04	2.803	0.030	0.11	SA
GXTQ4H		1.756	-0.081	-0.40	2.724	-0.049	-0.18	ID
HBFG4C		1.846	0.009	0.05	2.872	0.099	0.36	TO
HKNTQV		1.546	-0.291	-1.45	2.519	-0.254	-0.92	LW
HVMKBU		1.941	0.104	0.52	2.844	0.071	0.25	XX
JWD9Z4		1.652	-0.185	-0.92	2.357	-0.416	-1.50	XX
LE7RPM		2.026	0.189	0.94	2.991	0.218	0.79	IF
LNBZ88		2.220	0.383	1.91	3.200	0.427	1.54	TP
N3626Q		1.872	0.036	0.18	2.890	0.117	0.42	TK
NEDPC3		1.678	-0.159	-0.79	2.526	-0.247	-0.89	LA
NUDN7R		1.764	-0.073	-0.36	2.655	-0.118	-0.43	LW
NXB82X		1.920	0.083	0.41	2.871	0.098	0.35	TB
P2QUHN		1.831	-0.006	-0.03	2.795	0.022	0.08	IM
PWTHDC		1.564	-0.273	-1.36	2.447	-0.326	-1.18	LA
Q876ZH		2.164	0.328	1.63	3.038	0.265	0.95	IK
RB7KWC		1.769	-0.068	-0.34	2.705	-0.068	-0.25	LW
TXUMJV		2.027	0.190	0.95	3.165	0.392	1.41	TH
UWDREF		1.783	-0.054	-0.27	2.752	-0.021	-0.08	LE
VNKVBD		1.682	-0.155	-0.77	2.609	-0.164	-0.59	TB
Z8DMX7	X	2.804	0.967	4.81	3.784	1.011	3.65	TO
ZX7UK6		1.872	0.035	0.17	2.866	0.093	0.33	IN

TAPPI-CTS Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers

Sample SE17		Summary Statistics	Sample SE18	
Grand Means	1.8366 Percent		2.7734 Percent	
SD Btwn Labs	0.2010 Percent		0.2772 Percent	
Statistics based on 35 of 38 reporting participants				

Comments on assigned Data Flags for Test #332

2BUDFL (X) - Inconsistent in testing between samples and within the determinations for both samples.

FCZABQ (X) - Extreme data.

Z8DMX7 (X) - Data for both samples are high. Inconsistent within the determinations for Sample SE18.

Instrument Code List

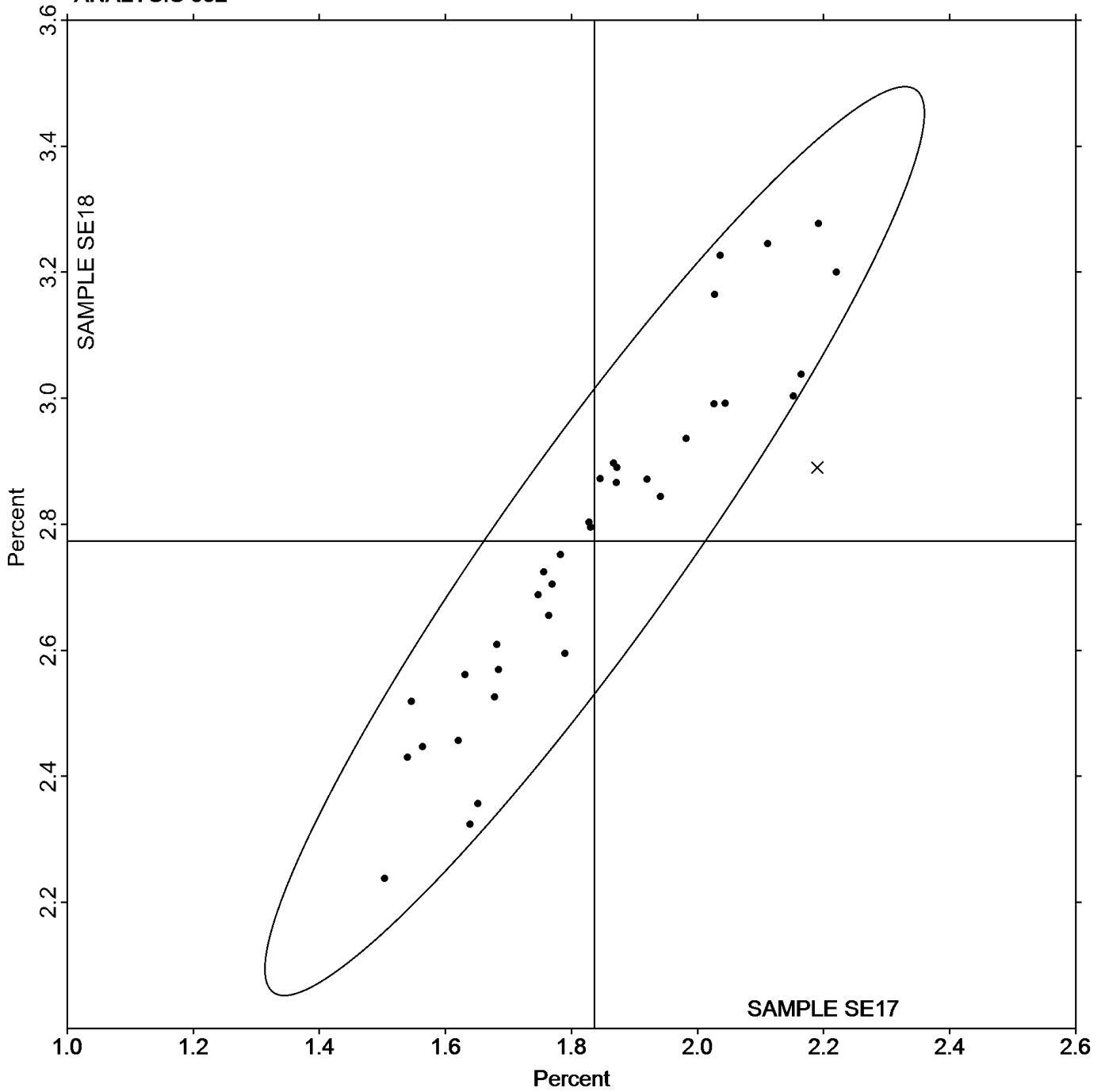
(ID) - Instron 4201	(IF) - Instron 3340 Series
(IK) - Instron 4400 Series	(IM) - Instron 5500 Series
(IN) - Instron 3360 Series	(LA) - L & W Autoline 300
(LE) - L & W Tensile Tester 066	(LH) - L & W Alwetron TH1 (Horizontal) SE 060
(LW) - L & W Tensile Tester SE062	(SA) - Shimadzu Autograph AG 2000 A
(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)	(XX) - Instrument make/model not specified by lab

TAPPI-CTS Interlaboratory Testing Program
Analysis 332
Elongation to Break - Packaging Papers

Grand Mean Sample **SE17** = 1.8366 Percent

Grand Mean Sample **SE18** = 2.7734 Percent

ANALYSIS 332



TAPPI-CTS Interlaboratory Testing Program
Analysis 334
Folding Endurance (MIT) - Double Folds

WebCode	Data Flag	Sample SG17			Sample SG18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4JK9Y3		133.90	38.39	1.61	45.70	-10.79	-0.88	MT
74FUR4		109.80	14.29	0.60	63.50	7.01	0.57	MT
8C67XG		119.50	23.99	1.00	74.10	17.61	1.44	MT
BRPZXW		111.30	15.79	0.66	61.80	5.31	0.44	MT
DNGF9M		95.40	-0.11	0.00	73.10	16.61	1.36	MT
EYYG4M		60.80	-34.71	-1.45	45.90	-10.59	-0.87	MT
HQUGGQ		103.30	7.79	0.33	56.60	0.11	0.01	MT
HTWETJ		97.20	1.69	0.07	40.20	-16.29	-1.34	MT
HVMKBU		86.40	-9.11	-0.38	60.70	4.21	0.35	MT
KP74MA		118.40	22.89	0.96	61.60	5.11	0.42	MT
PWTHDC		80.60	-14.91	-0.62	53.70	-2.79	-0.23	XX
RB7KWC		64.20	-31.31	-1.31	49.60	-6.89	-0.56	MT
VU9LCE		130.60	35.09	1.47	80.70	24.21	1.99	MT
WRYUX7		66.60	-28.91	-1.21	48.10	-8.39	-0.69	MT
YQVBNZ		68.20	-27.31	-1.14	41.20	-15.29	-1.25	MT
Z6QRDY		82.00	-13.51	-0.57	47.30	-9.19	-0.75	XX

		Summary Statistics			
		Sample SG17		Sample SG18	
Grand Means		95.513	Double Folds	56.488	Double Folds
SD Btwn Labs		23.911	Double Folds	12.196	Double Folds
Statistics based on 16 of 16 reporting participants					

Instrument Code List

(MT) - MIT - Tinius Olsen

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

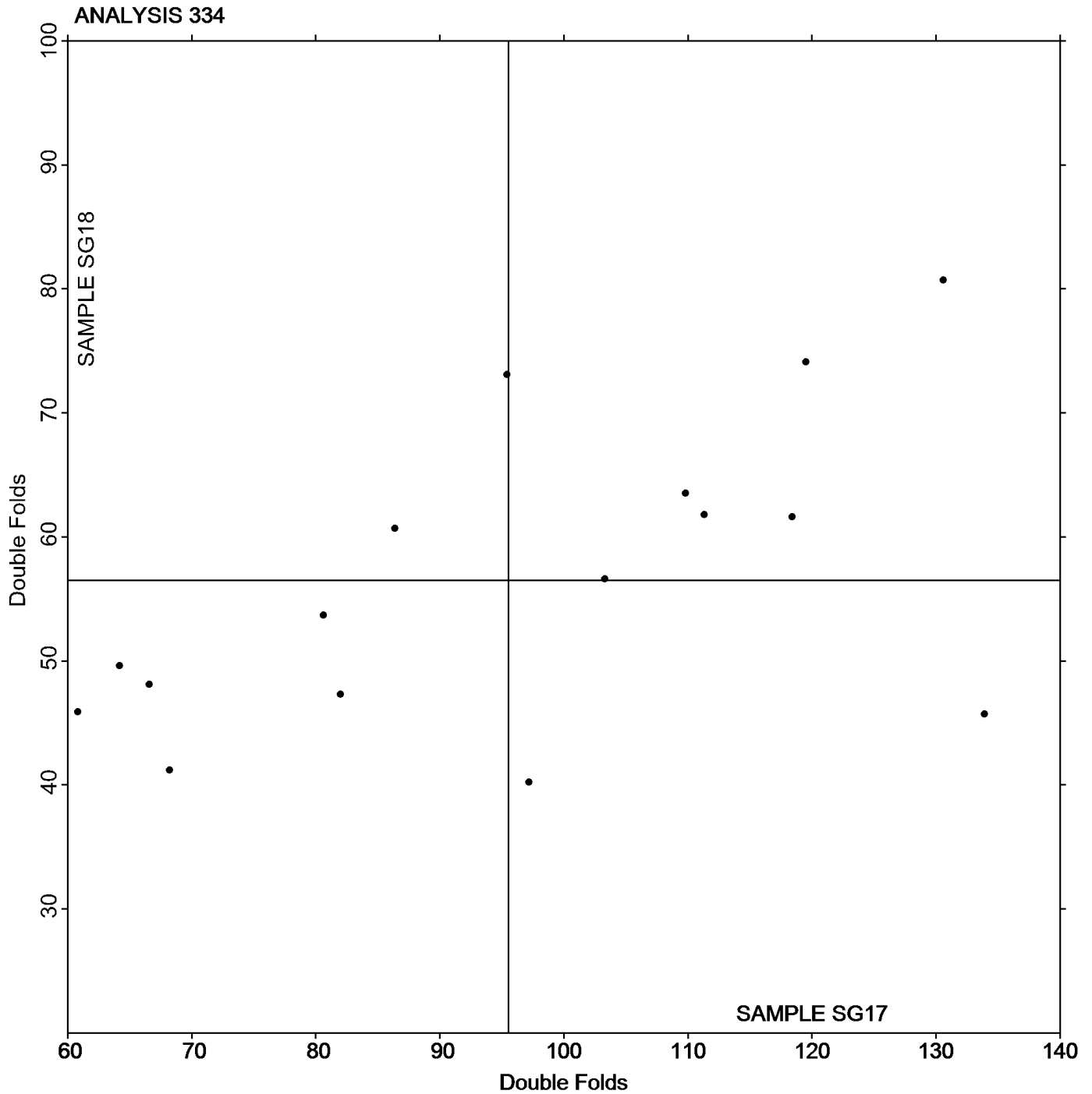
TAPPI-CTS Interlaboratory Testing Program

Analysis 334

Folding Endurance (MIT) - Double Folds

Grand Mean Sample **SG17** = 95.513 Double Folds

Grand Mean Sample **SG18** = 56.488 Double Folds



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

TAPPI-CTS Interlaboratory Testing Program

Analysis 336

Bending Resistance, Gurley Type

WebCode	Data Flag	Sample SH17			Sample SH18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
6DAP8M		202.7	6.4	0.47	272.9	23.9	1.56
6WY3JQ		211.1	14.9	1.09	262.2	13.1	0.86
74FUR4		187.8	-8.4	-0.62	253.1	4.0	0.26
7N4DK2		203.4	7.1	0.52	274.4	25.4	1.66
7PVHYE		183.9	-12.4	-0.91	241.9	-7.2	-0.47
B9AQ3B		178.0	-18.2	-1.34	233.8	-15.3	-1.00
B9D2YU		198.7	2.4	0.18	248.5	-0.6	-0.04
EYYG4M		214.7	18.4	1.36	263.2	14.2	0.93
HMUDEV		186.0	-10.3	-0.76	238.5	-10.5	-0.69
HTWETJ		192.0	-4.2	-0.31	248.5	-0.5	-0.04
HVMKBU		196.7	0.4	0.03	249.7	0.7	0.05
KRVB7L	X	104.1	-92.2	-6.78	125.8	-123.3	-8.06
LE7RPM		215.3	19.1	1.40	257.5	8.5	0.55
P3Z2KG		182.8	-13.5	-0.99	239.4	-9.6	-0.63
V2Q6FE		179.2	-17.1	-1.26	218.0	-31.0	-2.03
VBD496		188.5	-7.8	-0.57	229.5	-19.5	-1.27
XB6N7N		176.3	-20.0	-1.47	229.1	-19.9	-1.30
XGV3YP		207.1	10.9	0.80	252.5	3.4	0.22
Z8DMX7		207.4	11.2	0.82	253.3	4.3	0.28
ZBF826		217.3	21.1	1.55	265.7	16.7	1.09

Sample SH17		Summary Statistics	Sample SH18	
Grand Means	196.26 Gurley Units		249.04 Gurley Units	
SD Btw Labs	13.59 Gurley Units		15.30 Gurley Units	
Statistics based on 19 of 20 reporting participants				

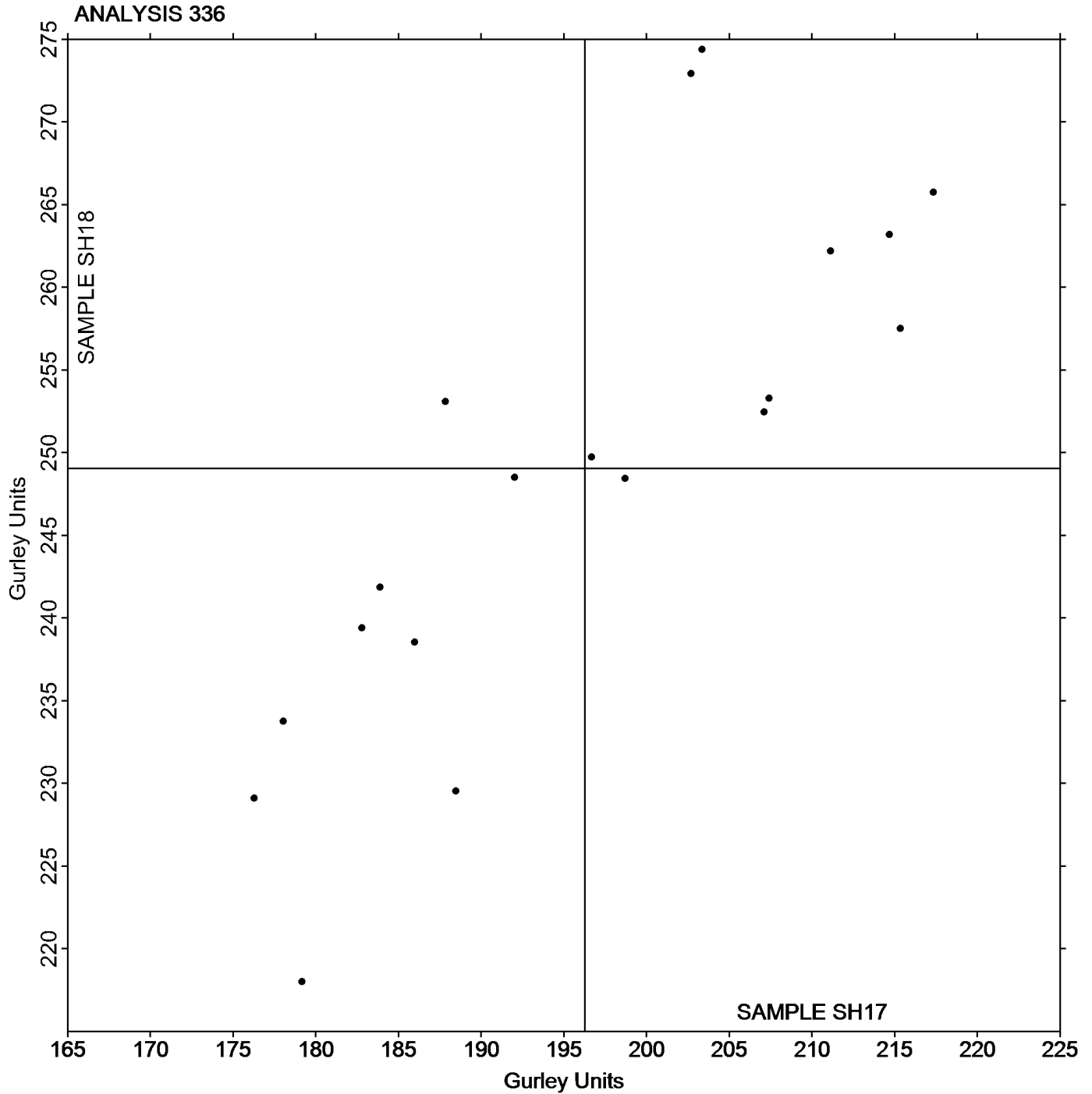
Comments on assigned Data Flags for Test #336

KRVB7L (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program
Analysis 336
Bending Resistance, Gurley Type

Grand Mean Sample **SH17** = 196.26 Gurley Units

Grand Mean Sample **SH18** = 249.04 Gurley Units



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 338
Bending Resistance, Taber Type - 0 to 10 Units

WebCode	Data Flag	Sample SJ17			Sample SJ18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3YDTU4	X	3.650	1.809	8.60	2.590	-0.018	-0.07
6GAXDH		2.037	0.196	0.93	2.656	0.048	0.19
74FUR4		1.666	-0.175	-0.83	2.560	-0.048	-0.19
7N4DK2		2.239	0.398	1.89	3.033	0.425	1.66
8C67XG		1.870	0.030	0.14	2.636	0.028	0.11
9QZNME		1.908	0.067	0.32	2.862	0.254	0.99
A87ALV		1.852	0.011	0.05	2.622	0.014	0.06
B9AQ3B		1.339	-0.502	-2.39	1.932	-0.676	-2.64
DZRW2Y		1.949	0.108	0.52	2.656	0.048	0.19
HKNTQV		1.600	-0.241	-1.14	2.240	-0.368	-1.44
HQUGGQ		1.943	0.102	0.49	2.845	0.237	0.93
LE7RPM		1.748	-0.093	-0.44	2.615	0.007	0.03
QUKMAY		1.953	0.112	0.53	2.702	0.094	0.37
VBD496		1.842	0.001	0.00	2.625	0.017	0.07
YD8YK4		1.704	-0.137	-0.65	2.605	-0.003	-0.01
ZX7UK6		1.960	0.119	0.57	2.530	-0.078	-0.30

Summary Statistics	
Sample SJ17	Sample SJ18
Grand Means	1.8406 Taber Units
SD Btwn Labs	0.2103 Taber Units
	2.6079 Taber Units
	0.2559 Taber Units
Statistics based on 15 of 16 reporting participants	

Comments on assigned Data Flags for Test #338

3YDTU4 (X) - Extreme data.

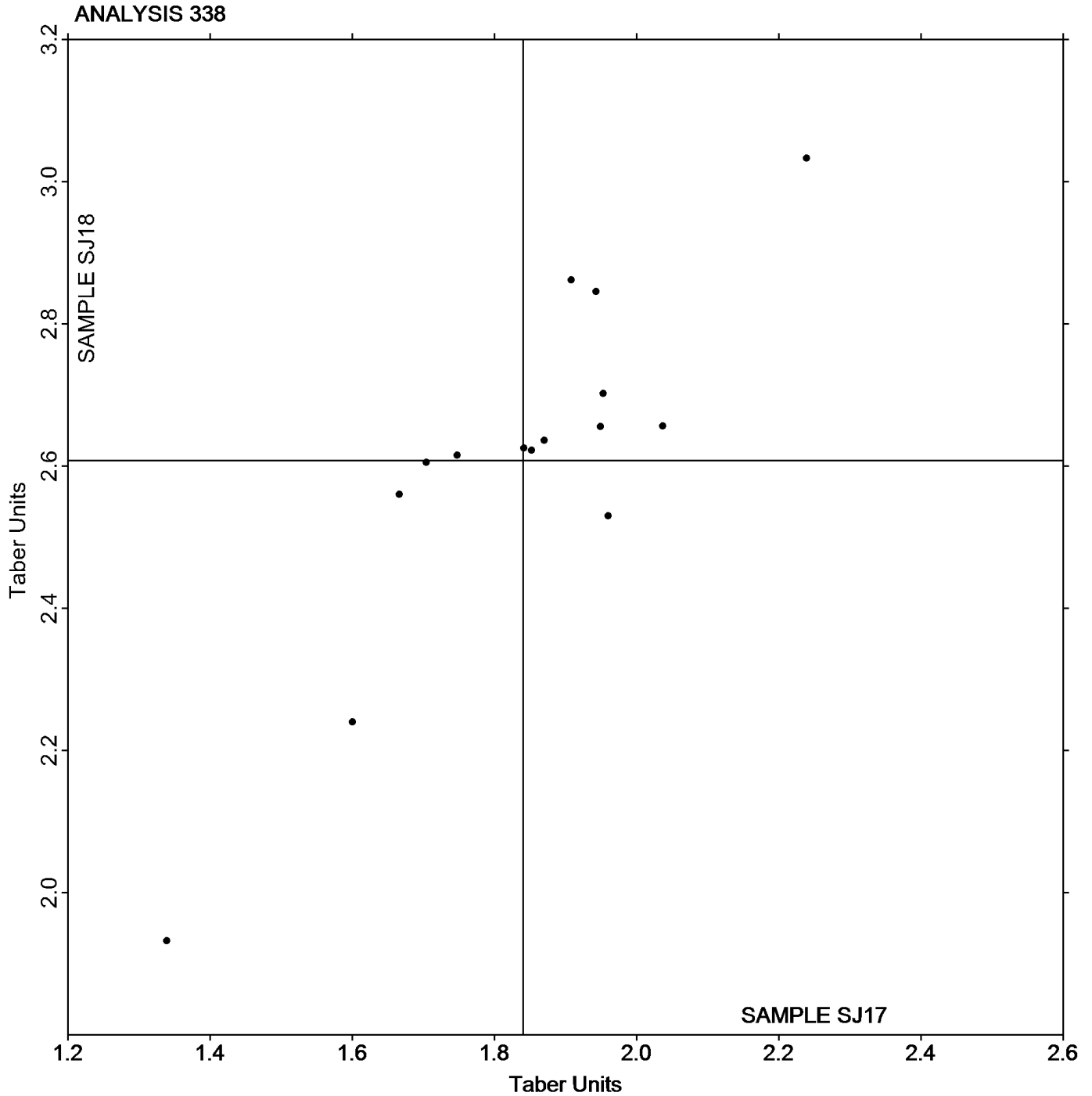
Analysis Notes:

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

TAPPI-CTS Interlaboratory Testing Program
Analysis 338
Bending Resistance, Taber Type - 0 to 10 Units

Grand Mean Sample **SJ17** = 1.8406 Taber Units

Grand Mean Sample **SJ18** = 2.6079 Taber Units



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units

WebCode	Data Flag	Sample SQ17			Sample SQ18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
74FUR4		65.00	1.12	0.32	47.84	0.12	0.04
A8ND4T		67.06	3.18	0.91	52.97	5.25	1.95
F9Y7LN		60.12	-3.76	-1.08	45.64	-2.08	-0.77
GLMT4P		69.60	5.72	1.64	51.20	3.48	1.29
HKNTQV		58.35	-5.53	-1.59	44.95	-2.77	-1.03
NUVKPE		59.70	-4.18	-1.20	43.10	-4.62	-1.72
NXB82X		64.21	0.33	0.10	47.88	0.16	0.06
PWTHDC		68.02	4.14	1.19	49.26	1.54	0.57
RB7KWC		64.89	1.01	0.29	47.49	-0.23	-0.09
U8XAT8		62.70	-1.18	-0.34	47.55	-0.17	-0.06
UWDREF		65.35	1.47	0.42	48.85	1.13	0.42
ZBF826		61.54	-2.34	-0.67	45.95	-1.77	-0.66

		Summary Statistics	
	Sample SQ17		Sample SQ18
Grand Means	63.878 Taber Units		47.723 Taber Units
SD Btwn Labs	3.485 Taber Units		2.695 Taber Units
Statistics based on 12 of 12 reporting participants			

Analysis Notes:

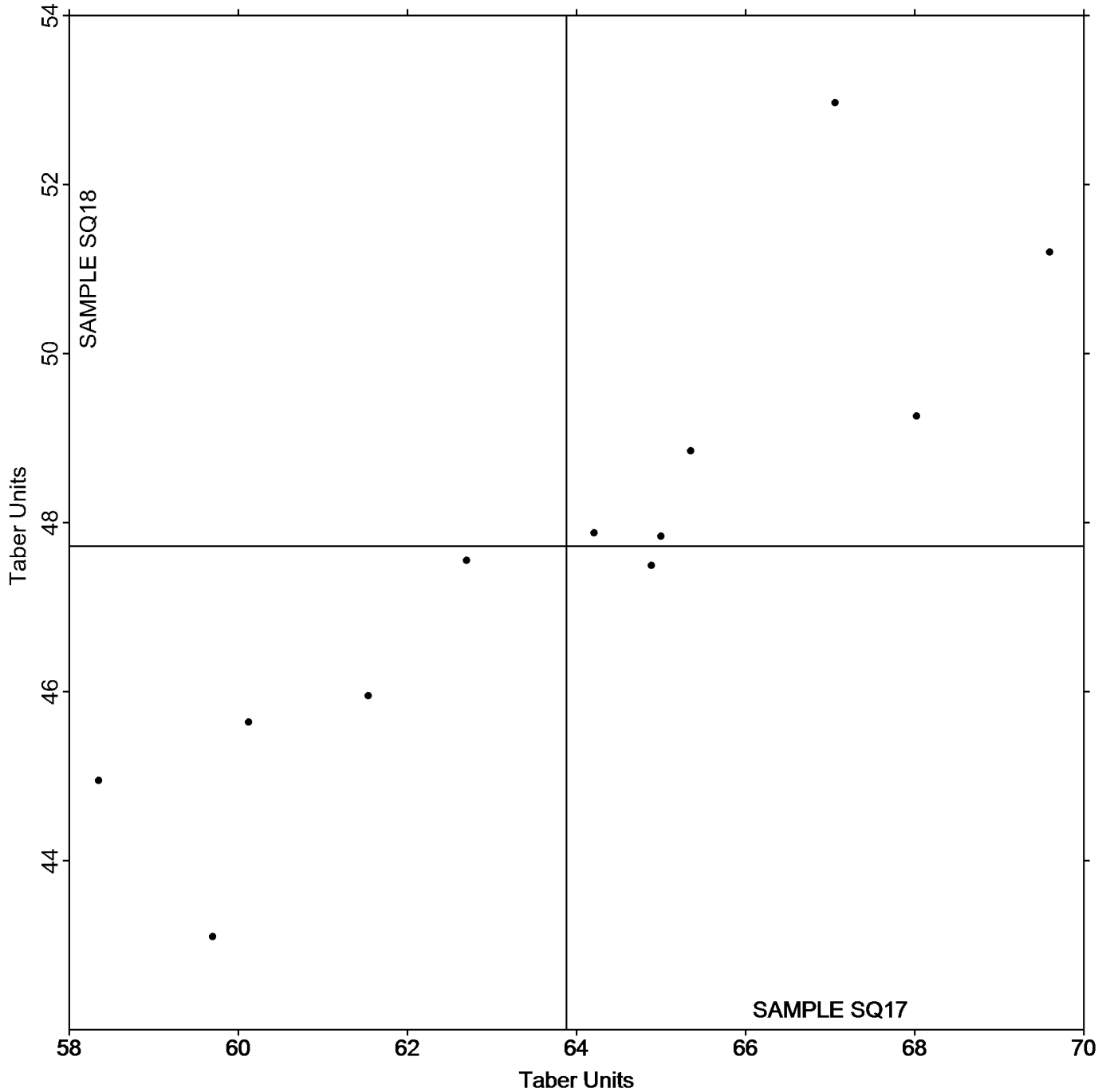
NXB82X - Data appear to be reported as g-cm, not mN-m as indicated on datasheet. Units corrected by CTS.

TAPPI-CTS Interlaboratory Testing Program
Analysis 339
Bending Resistance, Taber Type - 10 to 100 Taber Units

Grand Mean Sample **SQ17** = 63.878 Taber Units

Grand Mean Sample **SQ18** = 47.723 Taber Units

ANALYSIS 339



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

TAPPI-CTS Interlaboratory Testing Program
 Analysis 340

Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard

WebCode	Data Flag	Sample ST17			Sample ST18		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
4BKYKW		243.4	-3.2	-0.27	295.3	7.0	0.45
6JXAB3		271.1	24.5	2.09	299.4	11.1	0.71
A7QA4Q		246.2	-0.4	-0.03	289.4	1.1	0.07
AE8N9H		243.4	-3.2	-0.27	248.0	-40.3	-2.57
CEZEC2	X	114.5	-132.1	-11.28	121.8	-166.6	-10.63
G8JBAG		253.0	6.4	0.55	305.6	17.3	1.10
GBJLBV		235.6	-11.0	-0.94	279.7	-8.6	-0.55
GXTQ4H		256.0	9.4	0.80	297.5	9.2	0.59
HFB9CA	X	328.4	81.8	6.99	286.6	-1.7	-0.11
HKNTQV		232.8	-13.8	-1.18	277.8	-10.6	-0.67
HVMKBU		238.9	-7.7	-0.65	278.7	-9.7	-0.62
LNBZ88		238.6	-8.0	-0.68	281.1	-7.2	-0.46
NY2BU6		260.9	14.3	1.22	300.6	12.3	0.78
V7232F		232.2	-14.4	-1.23	290.0	1.7	0.11
YQEWHC		253.5	6.9	0.59	305.2	16.8	1.07

Summary Statistics		
	Sample ST17	Sample ST18
Grand Means	246.59 Taber Units	288.32 Taber Units
SD Btwn Labs	11.71 Taber Units	15.67 Taber Units
Statistics based on 13 of 15 reporting participants		

Comments on assigned Data Flags for Test #340

CEZEC2 (X) - Extreme data.

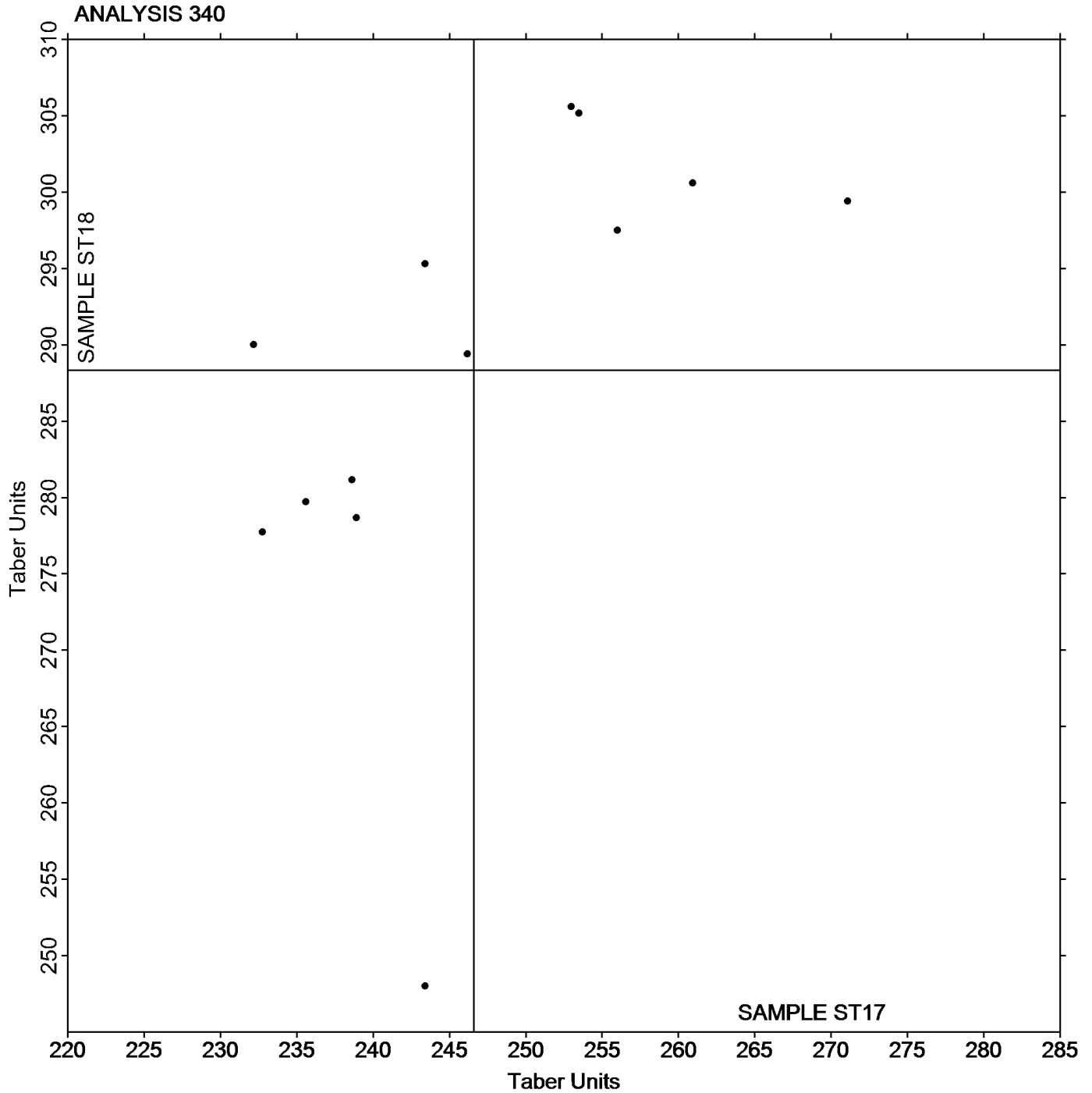
HFB9CA (X) - Extreme data for Sample ST17.

TAPPI-CTS Interlaboratory Testing Program Analysis 340

Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard

Grand Mean Sample **ST17** = 246.59 Taber Units

Grand Mean Sample **ST18** = 288.32 Taber Units



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 343
Z-Direction Tensile

WebCode	Data Flag	Sample SM17			Sample SM18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4BKYKW		57.20	-0.92	-0.12	72.78	-4.27	-0.43	LW
74FUR4		53.29	-4.83	-0.63	67.21	-9.84	-0.98	TZ
7K3JF6		64.72	6.60	0.86	85.00	7.95	0.80	DT
A8ND4T		51.47	-6.65	-0.86	68.55	-8.50	-0.85	TZ
AAA68J		50.36	-7.76	-1.01	72.84	-4.21	-0.42	DT
CEZEC2		64.64	6.52	0.85	89.96	12.91	1.29	CA
DBD24J		42.99	-15.13	-1.96	63.73	-13.32	-1.33	LW
EDUMCW		65.20	7.08	0.92	78.20	1.15	0.12	DT
HQUGGQ		43.02	-15.10	-1.96	65.48	-11.57	-1.16	CD
L92W7M		63.88	5.76	0.75	84.04	6.99	0.70	TA
LE7RPM		66.98	8.86	1.15	85.84	8.79	0.88	TL
LNBZ88	*	55.75	-2.37	-0.31	57.49	-19.56	-1.96	XX
NXB82X		66.60	8.48	1.10	91.41	14.36	1.44	TA
PWTHDC		63.56	5.44	0.71	85.10	8.05	0.81	LW
RB7KWC		58.80	0.68	0.09	83.84	6.79	0.68	CD
UWDREF		60.92	2.80	0.36	82.02	4.97	0.50	TA
WJNKF6		58.72	0.60	0.08	76.34	-0.71	-0.07	XX

Summary Statistics		
	Sample SM17	Sample SM18
Grand Means	58.124 psi	77.049 psi
SD Btwn Labs	7.702 psi	9.995 psi
Statistics based on 17 of 17 reporting participants		

Instrument Code List

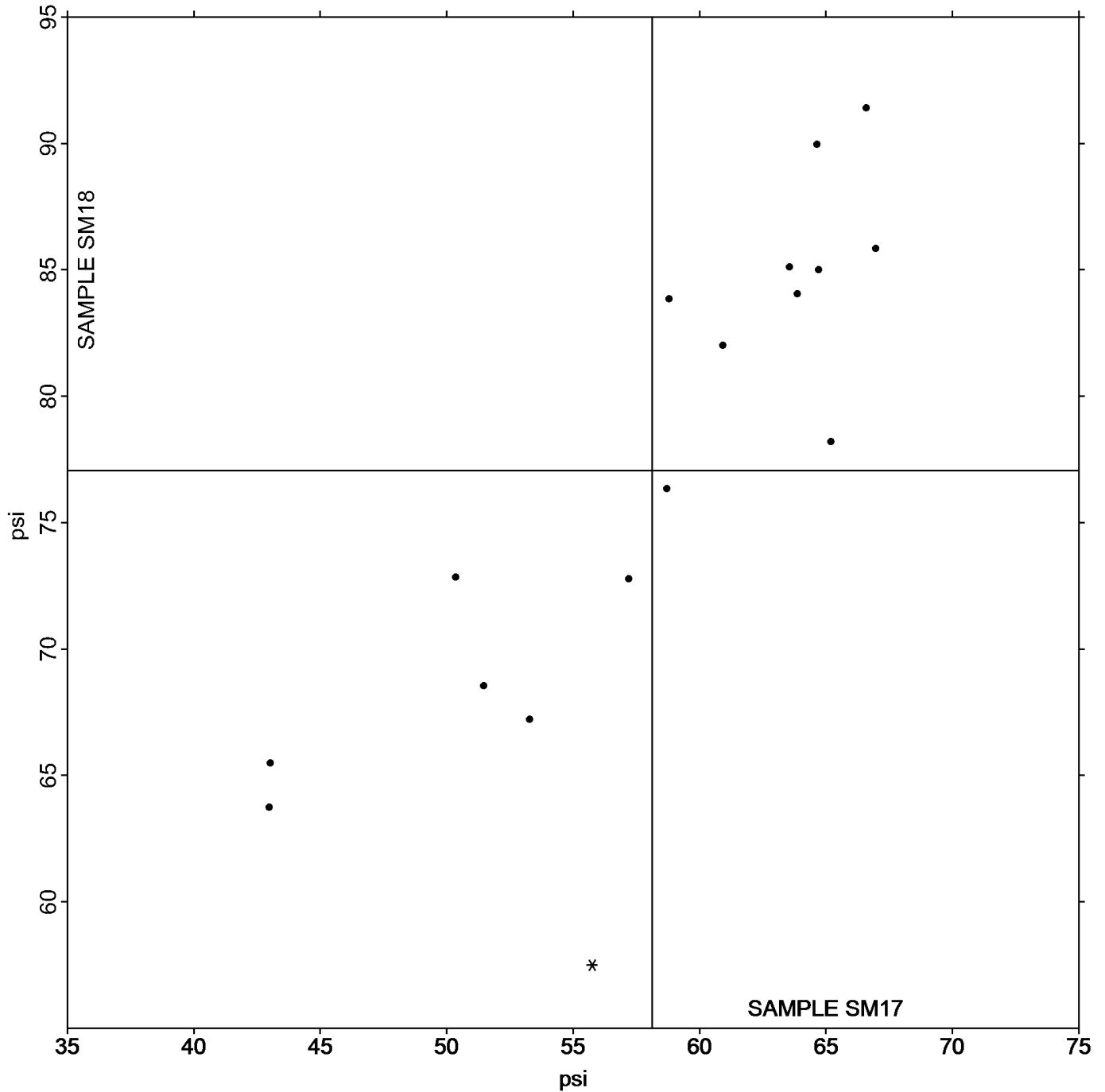
- | | |
|-------------------------------------|---|
| (CA) - CSI CS-163 | (CD) - CSI CS-163D |
| (DT) - Dek-Tron DCS-163A ZDT Tester | (LW) - L & W ZD Tensile Tester |
| (TA) - Thwing-Albert Tensile Tester | (TL) - TMI Lab Master |
| (TZ) - TMI Monitor/ZDT Tester | (XX) - Instrument make/model not specified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

TAPPI-CTS Interlaboratory Testing Program
Analysis 343
Z-Direction Tensile

Grand Mean Sample **SM17** = 58.124 psi

Grand Mean Sample **SM18** = 77.049 psi

ANALYSIS 343



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard

WebCode	Data Flag	Sample SZ17			Sample SZ18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4NQCGN		39.52	0.26	0.10	37.00	1.49	0.53	XX
4TMVHL		37.42	-1.85	-0.71	34.94	-0.57	-0.20	TL
6JXAB3		41.44	2.17	0.84	40.02	4.51	1.62	TL
A7QA4Q		38.40	-0.87	-0.33	34.80	-0.71	-0.25	CA
F6ZTXY		41.14	1.87	0.72	30.68	-4.83	-1.73	LW
FLPZVW		40.86	1.59	0.62	35.32	-0.19	-0.07	LW
HFB9CA		40.40	1.13	0.44	35.80	0.29	0.11	TZ
HVMKBU		38.72	-0.55	-0.21	33.40	-2.11	-0.76	CA
J3LPFJ		40.14	0.87	0.34	34.64	-0.87	-0.31	XX
LB6RPP		38.98	-0.29	-0.11	31.72	-3.79	-1.36	CA
NY2BU6		33.38	-5.89	-2.27	34.10	-1.41	-0.51	TL
Q876ZH		41.99	2.73	1.05	40.00	4.49	1.61	PG
U767DE		42.92	3.65	1.41	39.78	4.27	1.53	TL
V294P6		34.22	-5.05	-1.95	33.06	-2.45	-0.88	TL
V7232F		40.40	1.13	0.44	37.40	1.89	0.68	CA
ZFCVPC		38.32	-0.95	-0.37	35.46	-0.05	-0.02	LW

		Summary Statistics			
		Sample SZ17		Sample SZ18	
Grand Means		39.266 psi		35.507 psi	
SD Btwn Labs		2.589 psi		2.785 psi	
Statistics based on 16 of 16 reporting participants					

Instrument Code List

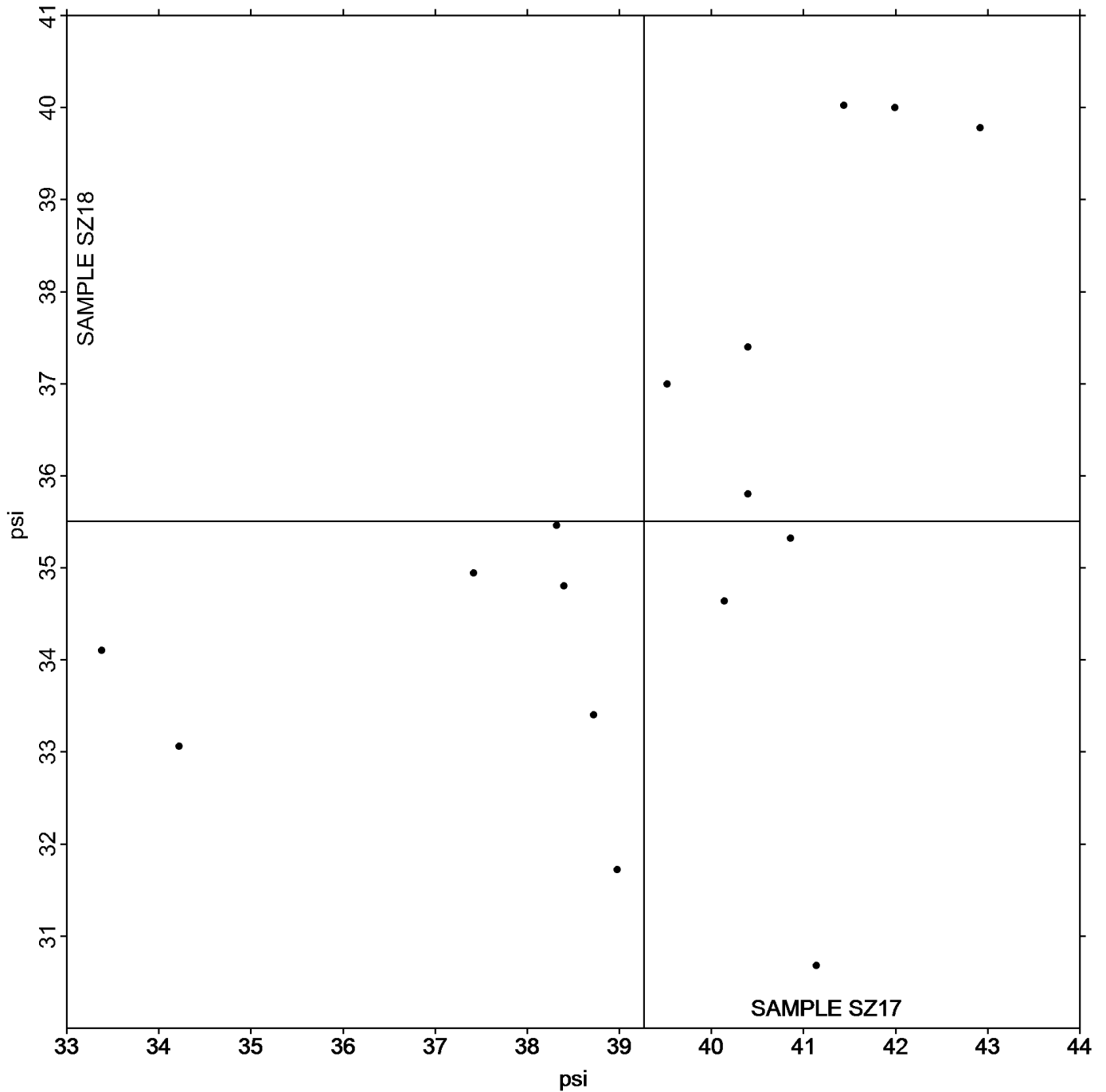
- | | |
|--------------------------------------|---|
| (CA) - CSI CS-163 | (LW) - L & W ZD Tensile Tester |
| (PG) - Perkins Model A Mullen Tester | (TL) - TMI Lab Master |
| (TZ) - TMI Monitor/ZDT Tester | (XX) - Instrument make/model not specified by lab |

TAPPI-CTS Interlaboratory Testing Program
Analysis 345
Z-Direction Tensile, Recycled Paperboard

Grand Mean Sample **SZ17** = 39.266 psi

Grand Mean Sample **SZ18** = 35.507 psi

ANALYSIS 345



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

TAPPI-CTS Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics

WebCode	Data Flag	Sample SN17			Sample SN18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4BKYKW		72.40	-3.61	-0.62	87.80	-10.41	-1.44	HZ
6WY3JQ		78.64	2.63	0.45	95.04	-3.17	-0.44	HZ
74FUR4		81.60	5.59	0.97	101.80	3.59	0.50	HY
7N4DK2		75.12	-0.89	-0.15	93.56	-4.65	-0.64	KR
7WEM4N		72.18	-3.83	-0.66	99.80	1.59	0.22	HY
A8ND4T		67.00	-9.01	-1.56	89.60	-8.61	-1.19	HY
CLGUXJ		76.80	0.79	0.14	93.40	-4.81	-0.66	HZ
DQ7LRY		73.40	-2.61	-0.45	95.60	-2.61	-0.36	HY
HQUGGQ		73.20	-2.81	-0.49	98.40	0.19	0.03	HY
HTWETJ		68.40	-7.61	-1.32	97.00	-1.21	-0.17	HY
HVMKBU		79.00	2.99	0.52	104.80	6.59	0.91	HZ
K3VZP9		71.40	-4.61	-0.80	94.20	-4.01	-0.55	HY
L92W7M		83.20	7.19	1.24	112.80	14.59	2.02	HY
NGZJVP		69.80	-6.21	-1.07	88.20	-10.01	-1.38	XX
NXB82X		79.60	3.59	0.62	100.20	1.99	0.27	HZ
PWTHDC		85.60	9.59	1.66	109.60	11.39	1.57	XX
RB7KWC		71.60	-4.41	-0.76	94.80	-3.41	-0.47	HY
UWDREF		88.60	12.59	2.18	112.80	14.59	2.02	HY
VBD496		74.08	-1.93	-0.33	96.24	-1.97	-0.27	HY
XB6N7N		78.60	2.59	0.45	98.60	0.39	0.05	HY

		Summary Statistics			
		Sample SN17		Sample SN18	
Grand Means		76.011	1000th ft-lbs	98.212	1000th ft-lbs
SD Btw Labs		5.780	1000th ft-lbs	7.240	1000th ft-lbs
Statistics based on 20 of 20 reporting participants					

Instrument Code List

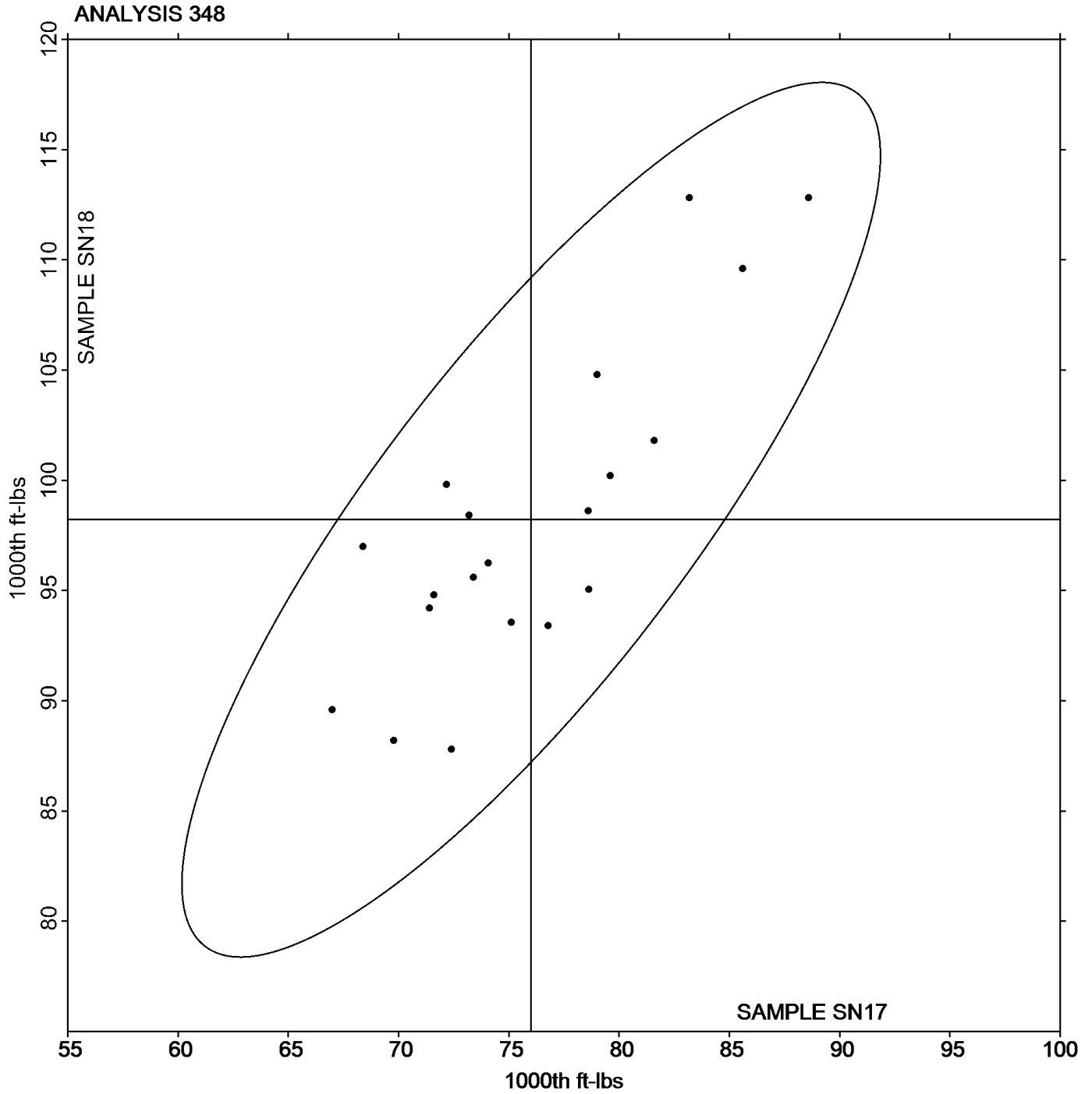
(HY) - Huygen Digitized Scott Internal Bond Tester
 (KR) - Kumagai Riki Kogyo Internal Bond Tester

(HZ) - Huygen Internal Bond Tester with AccuPress
 (XX) - Instrument make/model not specified by lab

TAPPI-CTS Interlaboratory Testing Program
Analysis 348
Internal Bond Strength - Modified Scott Mechanics

Grand Mean Sample **SN17** = 76.011 1000th ft-lbs

Grand Mean Sample **SN18** = 98.212 1000th ft-lbs



TAPPI-CTS Interlaboratory Testing Program
Analysis 349
Internal Bond Strength - Scott Bond Models

WebCode	Data Flag	Sample SP17			Sample SP18			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DY4HU		64.32	0.07	0.01	84.37	-0.59	-0.06	TM
93FV62		64.43	0.19	0.03	85.18	0.22	0.02	XX
FLPZVW	X	101.60	37.36	6.39	82.00	-2.95	-0.29	XX
G6U6PJ		73.20	8.96	1.53	91.20	6.25	0.60	SC
HKNTQV		67.42	3.18	0.54	100.04	15.09	1.46	SC
LNBZ88		51.20	-13.04	-2.23	62.43	-22.52	-2.18	TM
NUVKPE		61.40	-2.84	-0.49	78.99	-5.96	-0.58	TM
PAJCP6		64.80	0.56	0.10	85.59	0.63	0.06	TM
Q876ZH		65.60	1.36	0.23	91.60	6.65	0.64	TM
V294P6		65.80	1.56	0.27	85.20	0.25	0.02	XX

Sample SP17		Summary Statistics	Sample SP18	
Grand Means	64.241 1000th ft-lbs		84.955 1000th ft-lbs	
SD Btwn Labs	5.843 1000th ft-lbs		10.335 1000th ft-lbs	
Statistics based on 9 of 10 reporting participants				

Comments on assigned Data Flags for Test #349

FLPZVW (X) - Extreme data for Sample SP17.

Instrument Code List

(SC) - Scott Internal Bond Tester (Manual)

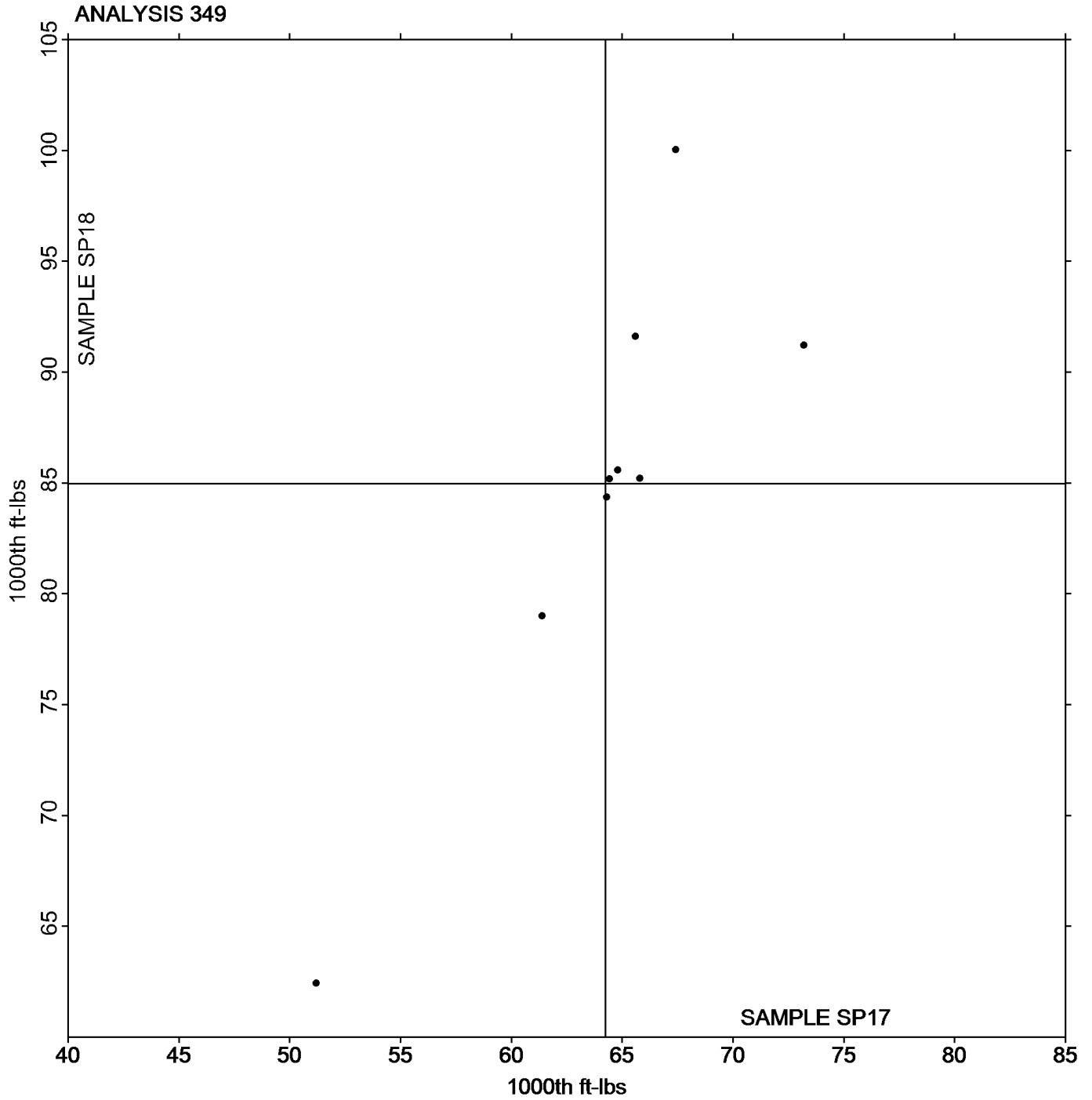
(TM) - TMI Monitor/Internal Bond Tester

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

TAPPI-CTS Interlaboratory Testing Program
Analysis 349
Internal Bond Strength - Scott Bond Models

Grand Mean Sample **SP17** = 64.241 1000th ft-lbs

Grand Mean Sample **SP18** = 84.955 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.