Collaborative Testing Services, Inc.

Paper & Paperboard Interlaboratory Testing Program

Summary Report #276S - May 2015

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
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322	Elongation to Break - Newsprint
325	Tensile Breaking Strength - Printing Papers
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334	Folding Endurance (MIT) - Double Folds
336	Bending Resistance, Gurley Type
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The CTS Paper & Paperboard Interlaboratory Fiberboard Program

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

About CTS

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

If there are any questions on the report or testing program, please contact:

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Key for Web Summary Reports (Page 1 of 2)

WebCode Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Paper Report published on the CTS web site. The WebCode for each analysis can be found in the Performance Analysis Report mailed to each participant. In addition, the WebCodes can be found on the data sheets.

Lab Mean The average of the values obtained for each sample by the participant.

Grand Mean The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.

Difference from Grand Mean The difference of the LAB MEAN from the GRAND MEAN.

Between-Lab Standard Deviation An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).

Comparative Performance Value An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.

Inst Code A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section), if instruments are tracked.

Data Flag DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

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

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

Common Problems Highlighted in Footnotes

1. ***Extreme data*** - The laboratory's results for one or both samples are so inconsistent with those of the other participants that the lab mean(s) fall outside the plot. The participant is advised to immediately review his data and/or testing procedure.

2. ***Systematic bias*** - The laboratory's results are either consistently high or low for both samples when compared to the other participants (the plotted point falls near the top or bottom of the ellipse). This indicates that the participant is performing the test with a constant bias. Causes of systematic errors include improper calibration, the particular make/model of equipment or a modification to the testing procedure.

3. ***Inconsistency in testing between samples/sample sets*** - The laboratory's results indicate that there are differences in the way the two samples tested (the plotted point falls to the side of the ellipse). This type of error may be attributed to the analyst deviating from the procedure when testing one of the samples or a material interaction occurrence with the instrument or room conditions. The inconsistency is reflected in the CPVs for the two samples, such as a +1.5 CPV for sample A and a -2.2 CPV for sample B. CTS also will specify if the laboratory's data for one sample are high/low compared to the other participants. If this inconsistency is slight, the lab's plotted point will be an * that falls on the edge of the ellipse.

4. ***Inconsistency in testing within a sample*** - The laboratory's within-lab standard deviation for a specified sample is high when compared to the other participants, often causing the lab's plotted point to fall outside of the ellipse.

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

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

WebCode	Data Flag	Sample SA19 Lab Mean	Sample SA19 Diff from Grand Mean	Sample SA19 CPV	Sample SA20 Lab Mean	Sample SA20 Diff from Grand Mean	Sample SA20 CPV
27XDHR		33.68	-3.28	-0.99	24.12	-2.36	-0.94
2DJJZK		33.72	-3.24	-0.98	26.10	-0.37	-0.15
4Y9VY2		35.09	-1.87	-0.57	23.79	-2.69	-1.07
69DZNW		38.90	1.94	0.59	28.30	1.82	0.73
76BG2N		34.40	-2.56	-0.77	25.27	-1.21	-0.48
76MFWX		34.71	-2.25	-0.68	25.69	-0.78	-0.31
7FBABF		37.70	0.74	0.22	26.52	0.04	0.02
88VTDY		34.87	-2.09	-0.63	25.45	-1.03	-0.41
CN2LAN		35.42	-1.54	-0.47	25.75	-0.73	-0.29
CQQYPL		41.72	4.76	1.44	31.84	5.36	2.14
D936C2		40.69	3.73	1.13	28.22	1.74	0.70
E6ZLRE		38.41	1.45	0.44	27.04	0.56	0.22
F7R3GG		31.45	-5.51	-1.67	21.80	-4.68	-1.87
HVER3M	X	38.15	1.19	0.36	33.65	7.17	2.87
JFN3RC		38.10	1.14	0.35	28.40	1.92	0.77
JKXHYE		35.40	-1.56	-0.47	24.01	-2.47	-0.99
LE7RRA		34.21	-2.75	-0.83	25.50	-0.97	-0.39
M7644G	*	45.20	8.24	2.50	30.70	4.22	1.69
PZUNTJ		35.60	-1.36	-0.41	23.30	-3.18	-1.27
RV8QFD		37.62	0.66	0.20	28.28	1.81	0.72
U6RV3V		39.29	2.33	0.71	27.93	1.45	0.58
WVVR27		42.20	5.24	1.59	29.50	3.02	1.21
X2ECKC		33.07	-3.89	-1.18	23.46	-3.01	-1.20
Z29UK4		38.93	1.97	0.60	29.06	2.58	1.03
Z8CL7U		36.64	-0.32	-0.10	25.41	-1.07	-0.43

Summary Statistics

	Sample SA19	Sample SA20
Grand Means	36.959 psi	26.477 psi
SD Btwn Labs	3.297 psi	2.502 psi

Statistics based on 24 of 25 reporting participants

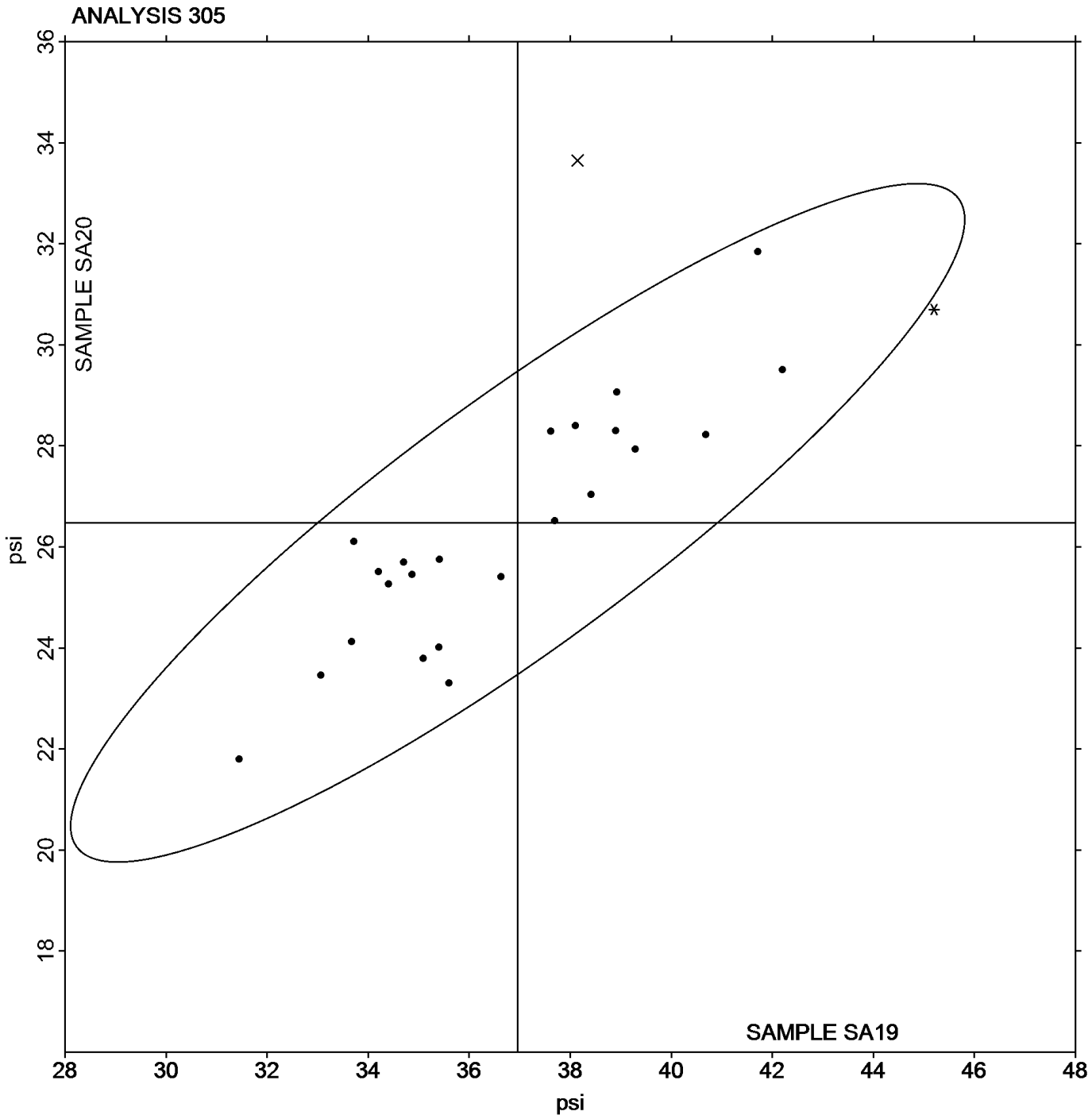
Comments on assigned Data Flags for Test #305

HVER3M (X) - Data for Sample SA20 are high. Inconsistent in testing within determinations for Sample SA19.

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

Grand Mean Sample **SA19** = 36.959 psi

Grand Mean Sample **SA20** = 26.477 psi



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

WebCode	Data Flag	Sample SB19 Lab Mean	Sample SB19 Diff from Grand Mean	Sample SB19 CPV	Sample SB20 Lab Mean	Sample SB20 Diff from Grand Mean	Sample SB20 CPV
3B6E3M	*	94.20	5.24	1.15	100.0	-8.9	-1.92
3YDQ62		87.84	-1.12	-0.25	113.5	4.6	0.98
4MDQLU		88.01	-0.95	-0.21	105.1	-3.8	-0.82
6APWU2		96.18	7.22	1.59	114.2	5.3	1.13
7BWLNX		85.30	-3.66	-0.80	110.0	1.1	0.24
7J8XQM		87.60	-1.36	-0.30	109.6	0.7	0.15
7MMC92		86.36	-2.60	-0.57	107.3	-1.6	-0.35
ACGJFC		89.50	0.54	0.12	103.1	-5.8	-1.25
CALM6N		78.95	-10.01	-2.20	100.2	-8.7	-1.87
DUHKWE		83.70	-5.26	-1.16	107.8	-1.1	-0.24
E6ZLRE		86.81	-2.15	-0.47	111.8	2.9	0.62
FB4VU2		94.57	5.61	1.23	109.6	0.7	0.16
GH4KYC		89.74	0.78	0.17	111.4	2.5	0.54
GJ9GWL		84.60	-4.36	-0.96	105.3	-3.7	-0.79
J9YUXK		87.80	-1.16	-0.25	107.7	-1.3	-0.27
KNW67N		95.85	6.89	1.51	119.1	10.2	2.19
L4JZX6		89.00	0.04	0.01	109.6	0.7	0.16
LTKX2N		83.80	-5.16	-1.13	112.5	3.5	0.76
MCAVGL		91.60	2.64	0.58	105.4	-3.5	-0.76
Q47ZZK		96.57	7.61	1.67	112.8	3.8	0.83
Q92RB3		94.90	5.94	1.31	114.7	5.8	1.25
RV8QFD		88.20	-0.76	-0.17	113.4	4.5	0.97
UEGB7D		90.36	1.40	0.31	108.1	-0.8	-0.17
VPB3C4		83.38	-5.58	-1.23	107.1	-1.8	-0.39
YHXFRP		89.14	0.18	0.04	103.5	-5.4	-1.15

Summary Statistics

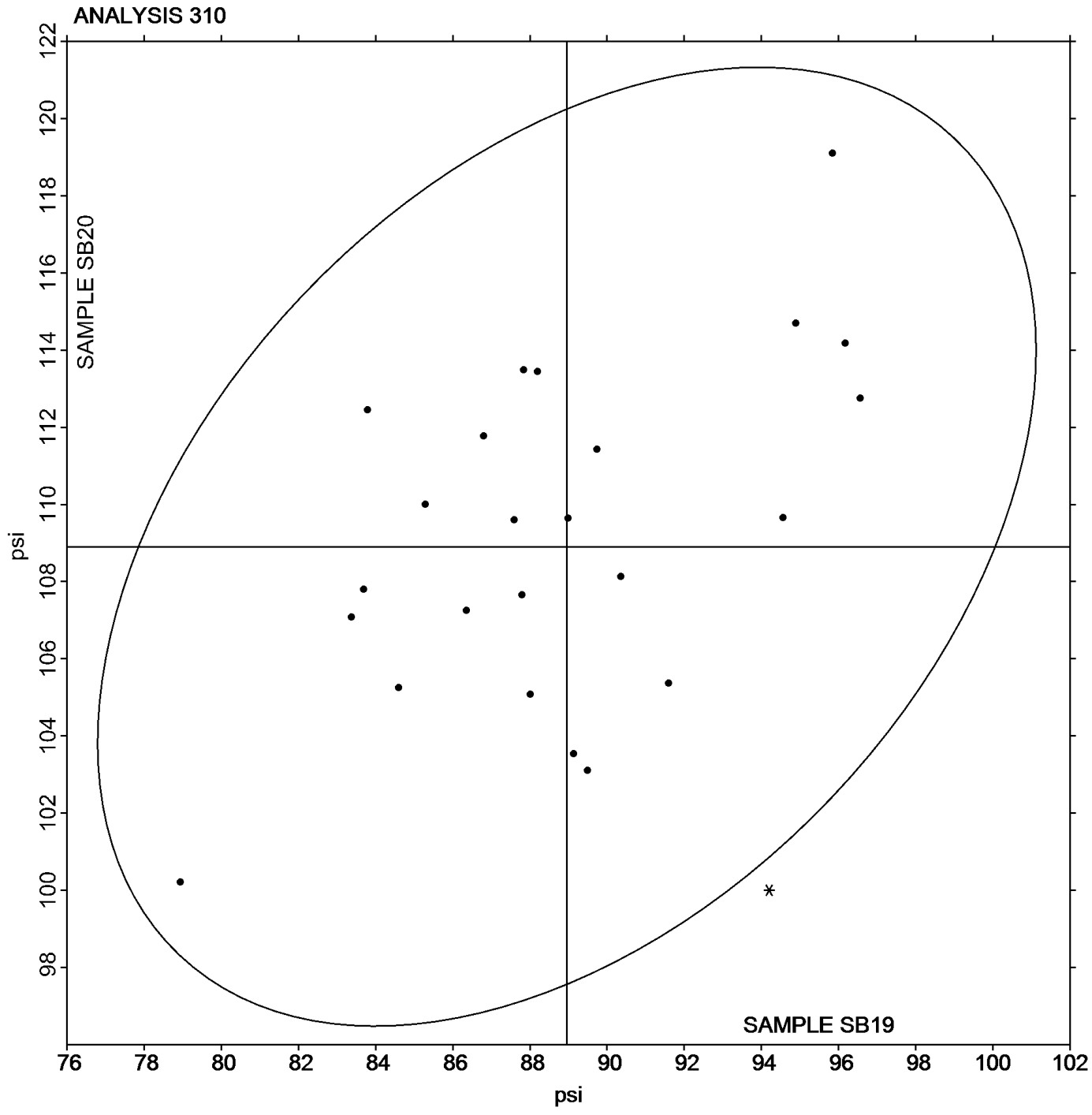
	Sample SB19	Sample SB20
Grand Means	88.957 psi	108.91 psi
SD Btwn Labs	4.551 psi	4.65 psi

Statistics based on 25 of 25 reporting participants

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

Grand Mean Sample **SB19** = 88.957 psi

Grand Mean Sample **SB20** = 108.91 psi



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

WebCode	Data Flag	Sample SK19 Lab Mean	Sample SK19 Diff from Grand Mean	Sample SK19 CPV	Sample SK20 Lab Mean	Sample SK20 Diff from Grand Mean	Sample SK20 CPV
93U4CH		26.54	-1.83	-0.66	26.38	-1.83	-0.66
E6ZLRE		25.49	-2.88	-1.04	25.36	-2.85	-1.02
KZ6WW3		26.72	-1.65	-0.60	26.24	-1.97	-0.71
KZT3EG		32.54	4.17	1.51	32.30	4.10	1.47
RXWWZA		31.98	3.61	1.31	31.90	3.69	1.33
U6RV3V		27.59	-0.78	-0.28	27.45	-0.76	-0.27
YBZQ8E		27.75	-0.62	-0.23	27.82	-0.39	-0.14

Summary Statistics

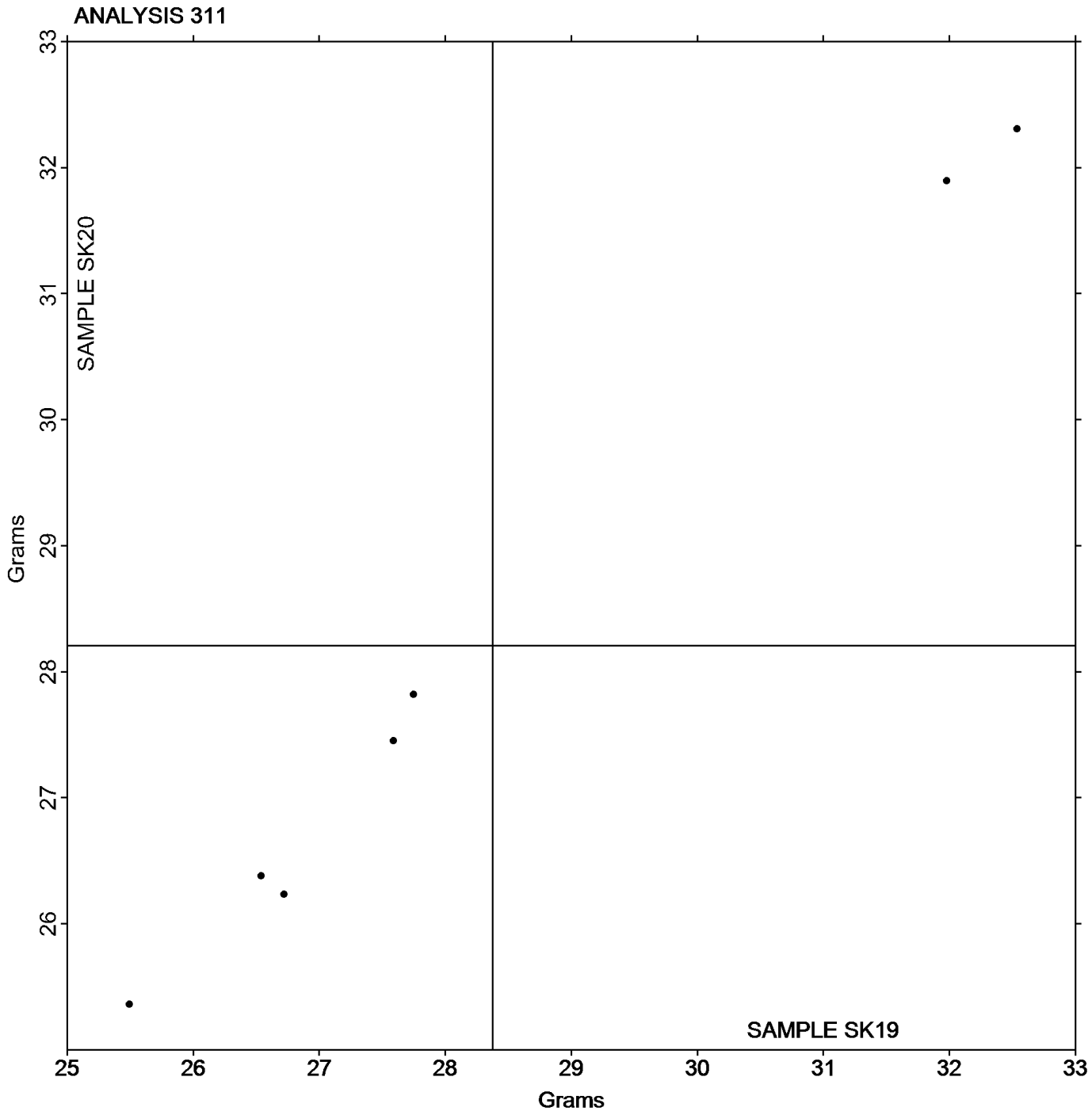
	Sample SK19	Sample SK20
Grand Means	28.373 Grams	28.207 Grams
SD Btwn Labs	2.761 Grams	2.783 Grams

Statistics based on 7 of 7 reporting participants

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

Grand Mean Sample **SK19** = 28.373 Grams

Grand Mean Sample **SK20** = 28.207 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 SC19 Lab Mean	Sample SC19 Diff from Grand Mean	Sample SC19 CPV	Sample SC20 Lab Mean	Sample SC20 Diff from Grand Mean	Sample SC20 CPV
27XDHR		69.90	3.96	0.95	52.37	3.25	1.04
2DJJZK		64.50	-1.44	-0.34	45.20	-3.92	-1.25
2FJVUY		59.42	-6.52	-1.56	43.04	-6.08	-1.94
2KCWWD		69.26	3.32	0.79	49.18	0.06	0.02
3B6E3M	X	31.30	-34.64	-8.27	22.40	-26.72	-8.52
3YDQ62		65.05	-0.89	-0.21	48.75	-0.37	-0.12
4CJ42T	X	131.88	65.94	15.75	100.58	51.46	16.42
4Y9VY2		73.34	7.40	1.77	51.48	2.36	0.75
678LWW		57.02	-8.92	-2.13	43.30	-5.82	-1.86
6H3NJY		67.50	1.56	0.37	52.70	3.58	1.14
6K8ENT		67.04	1.10	0.26	49.42	0.30	0.10
6PE34F		68.10	2.16	0.52	51.63	2.51	0.80
76BG2N		67.06	1.12	0.27	48.84	-0.28	-0.09
76MFWX		72.92	6.98	1.67	54.57	5.45	1.74
7J8XQM		65.24	-0.70	-0.17	47.81	-1.31	-0.42
7MMC92		67.98	2.04	0.49	50.39	1.28	0.41
7U8FF4		59.80	-6.14	-1.47	45.50	-3.62	-1.15
88VTDY		63.86	-2.08	-0.50	49.72	0.60	0.19
A7CNWC		59.48	-6.46	-1.54	46.74	-2.38	-0.76
CALM6N		63.92	-2.02	-0.48	46.88	-2.24	-0.71
CN2LAN		68.40	2.46	0.59	49.26	0.14	0.05
D936C2		67.80	1.86	0.44	46.90	-2.22	-0.71
DAJDNB	X	104.00	38.06	9.09	54.40	5.28	1.69
E6ZLRE		65.55	-0.39	-0.09	47.08	-2.04	-0.65
GJ9GWL		59.87	-6.07	-1.45	43.30	-5.82	-1.86
H8CN9V		70.76	4.82	1.15	51.74	2.62	0.84
HVER3M	*	72.30	6.36	1.52	49.80	0.68	0.22
HYGT3J		66.68	0.74	0.18	48.88	-0.24	-0.08
J9YUXK		61.35	-4.59	-1.10	45.00	-4.12	-1.31
JFN3RC		67.21	1.27	0.30	50.50	1.38	0.44
JKXHYE		72.48	6.54	1.56	56.37	7.25	2.31
JLCMXD		57.92	-8.02	-1.92	44.70	-4.42	-1.41
JRHGR9		71.15	5.21	1.24	55.11	5.99	1.91
L4JZX6		65.96	0.02	0.00	50.24	1.12	0.36
L9C326	X	62.43	-3.51	-0.84	57.88	8.76	2.80
LE7RRA		67.03	1.09	0.26	50.07	0.95	0.30
M7644G		63.28	-2.66	-0.64	45.26	-3.86	-1.23
MV7988		62.50	-3.44	-0.82	47.06	-2.06	-0.66
NTZYYB	X	91.20	25.26	6.03	86.40	37.28	11.89
RCKYH3		66.29	0.35	0.08	50.03	0.91	0.29
RFYWN4		69.70	3.76	0.90	51.60	2.48	0.79
RV8QFD		65.80	-0.14	-0.03	48.74	-0.38	-0.12
UEGB7D		65.87	-0.07	-0.02	48.78	-0.33	-0.11

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

WebCode	Data Flag	Sample SC19 Lab Mean	Sample SC19 Diff from Grand Mean	Sample SC19 CPV	Sample SC20 Lab Mean	Sample SC20 Diff from Grand Mean	Sample SC20 CPV
UN3THK	X	76.40	10.46	2.50	62.80	13.68	4.36
V284RT		64.97	-0.97	-0.23	51.24	2.12	0.68
VPB3C4		72.81	6.87	1.64	54.06	4.94	1.58
WYXFRT		67.85	1.91	0.46	50.21	1.09	0.35
X2ECKC		65.40	-0.54	-0.13	51.40	2.28	0.73
XW4CBR		58.02	-7.92	-1.89	45.39	-3.73	-1.19
YHXFRP		65.19	-0.75	-0.18	49.42	0.30	0.09
YVP8B9		66.66	0.72	0.17	50.28	1.16	0.37
Z29UK4		60.84	-5.10	-1.22	46.42	-2.70	-0.86
Z8CL7U		68.22	2.28	0.54	52.18	3.06	0.98

Summary Statistics

	Sample SC19	Sample SC20
Grand Means	65.941 Grams	49.118 Grams
SD Btwn Labs	4.187 Grams	3.135 Grams

Statistics based on 47 of 53 reporting participants

Comments on assigned Data Flags for Test #312

3B6E3M (X) - Extreme data.

4CJ42T (X) - Extreme data.

DAJDNB (X) - Extreme data for Sample SC19. Inconsistent in testing within the determinations for both samples.

L9C326 (X) - Data for Sample SC20 are high. Inconsistent in testing within the determinations for both samples.

NTZYYB (X) - Extreme data.

UN3THK (X) - Data for Sample SC20 are high. Inconsistent in testing within the determinations for both samples.

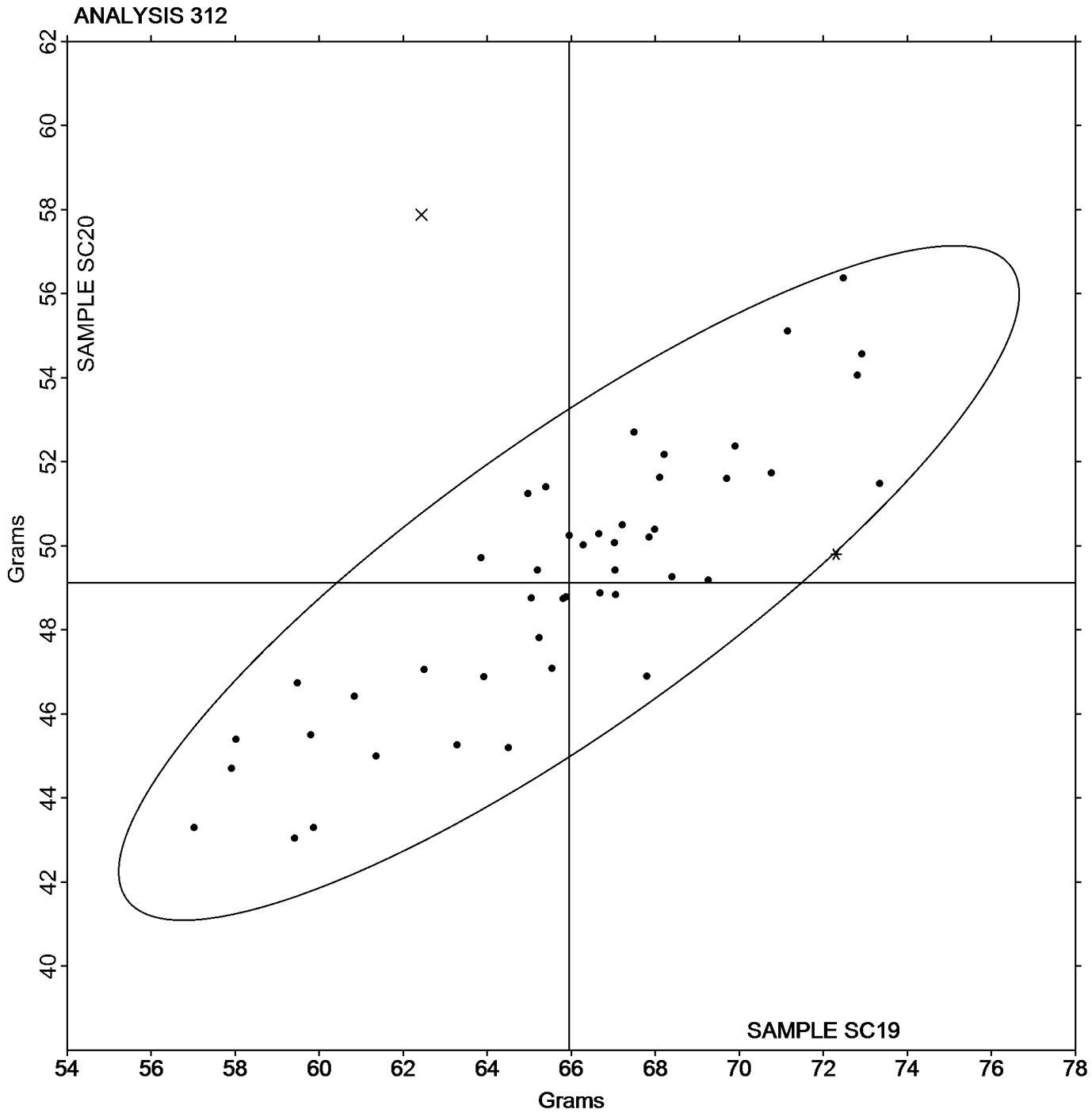
TAPPI-CTS Interlaboratory Testing Program

Analysis 312

Tearing Strength - Printing Papers

Grand Mean Sample **SC19** = 65.941 Grams

Grand Mean Sample **SC20** = 49.118 Grams



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

WebCode	Data Flag	Sample SD19 Lab Mean	Sample SD19 Diff from Grand Mean	Sample SD19 CPV	Sample SD20 Lab Mean	Sample SD20 Diff from Grand Mean	Sample SD20 CPV
3B6E3M	X	36.7	-124.1	-9.77	33.0	-112.8	-9.73
3RF2QJ	X	36.2	-124.6	-9.81	34.2	-111.6	-9.63
4FYXF6		175.9	15.1	1.19	157.3	11.4	0.99
4MDQLU		172.2	11.4	0.90	159.7	13.8	1.19
69DZNW		156.8	-4.0	-0.32	143.2	-2.6	-0.22
6JDTXM	X	192.0	31.2	2.46	158.8	13.0	1.12
6MT8E3	X	194.0	33.2	2.61	161.5	15.7	1.36
6XCN89		173.9	13.1	1.03	152.8	7.0	0.61
7BWLNX		138.8	-22.0	-1.73	128.8	-17.0	-1.47
ACGJFC		152.5	-8.3	-0.65	136.5	-9.3	-0.80
AQWUVM	*	122.7	-38.1	-3.00	110.0	-35.8	-3.09
BQEXCZ		170.8	10.0	0.78	154.5	8.7	0.75
CQQYPL		158.4	-2.4	-0.19	137.4	-8.4	-0.72
DUHKWE		157.2	-3.6	-0.28	145.2	-0.6	-0.05
E6ZLRE		156.2	-4.6	-0.36	143.7	-2.1	-0.18
EU2TG3		168.7	7.9	0.62	155.6	9.8	0.85
F7R3GG		178.4	17.6	1.39	161.2	15.4	1.33
FB4VU2		179.8	19.0	1.49	161.5	15.7	1.36
GH4KYC		170.1	9.3	0.73	150.1	4.3	0.37
H6LKFN		165.8	5.0	0.39	149.3	3.5	0.30
HPGVMW		154.4	-6.4	-0.50	140.0	-5.8	-0.50
HPXCHP		176.1	15.3	1.20	157.8	12.0	1.04
HQ6MC9	X	4.1	-156.7	-12.34	3.8	-142.0	-12.25
HWWL3W		165.2	4.4	0.34	149.0	3.2	0.27
KZ6WW3		153.2	-7.7	-0.60	139.1	-6.7	-0.58
L7QBXE		157.8	-3.1	-0.24	141.3	-4.5	-0.39
LGRGCM		154.7	-6.1	-0.48	137.7	-8.1	-0.70
LTKX2N		144.6	-16.2	-1.28	129.8	-16.0	-1.38
MCAVGL		168.2	7.4	0.58	151.1	5.2	0.45
MZZ9JG		147.4	-13.4	-1.06	138.8	-7.0	-0.60
P88LG4		156.6	-4.2	-0.33	142.9	-2.9	-0.25
PFJT2D		162.8	2.0	0.16	144.5	-1.3	-0.11
PQYRM9		159.8	-1.0	-0.08	145.8	0.0	0.00
PZUNTJ	*	154.2	-6.6	-0.52	148.6	2.8	0.24
Q47ZZK	*	184.6	23.8	1.87	172.8	27.0	2.33
QFYEBE		151.5	-9.3	-0.73	135.6	-10.2	-0.88
UWEM2U		157.6	-3.2	-0.25	144.4	-1.4	-0.12
XD8N63		159.6	-1.2	-0.09	145.6	-0.2	-0.02

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

Summary Statistics

	Sample SD19	Sample SD20
Grand Means	160.80 Grams	145.80 Grams
SD Btwn Labs	12.70 Grams	11.60 Grams

Statistics based on 33 of 38 reporting participants

Comments on assigned Data Flags for Test #314

3B6E3M (X) - Extreme data.

3RF2QJ (X) - Extreme data.

6JDTXM (X) - Inconsistent in testing between samples.

6MT8E3 (X) - Inconsistent in testing between samples.

HQ6MC9 (X) - Extreme data.

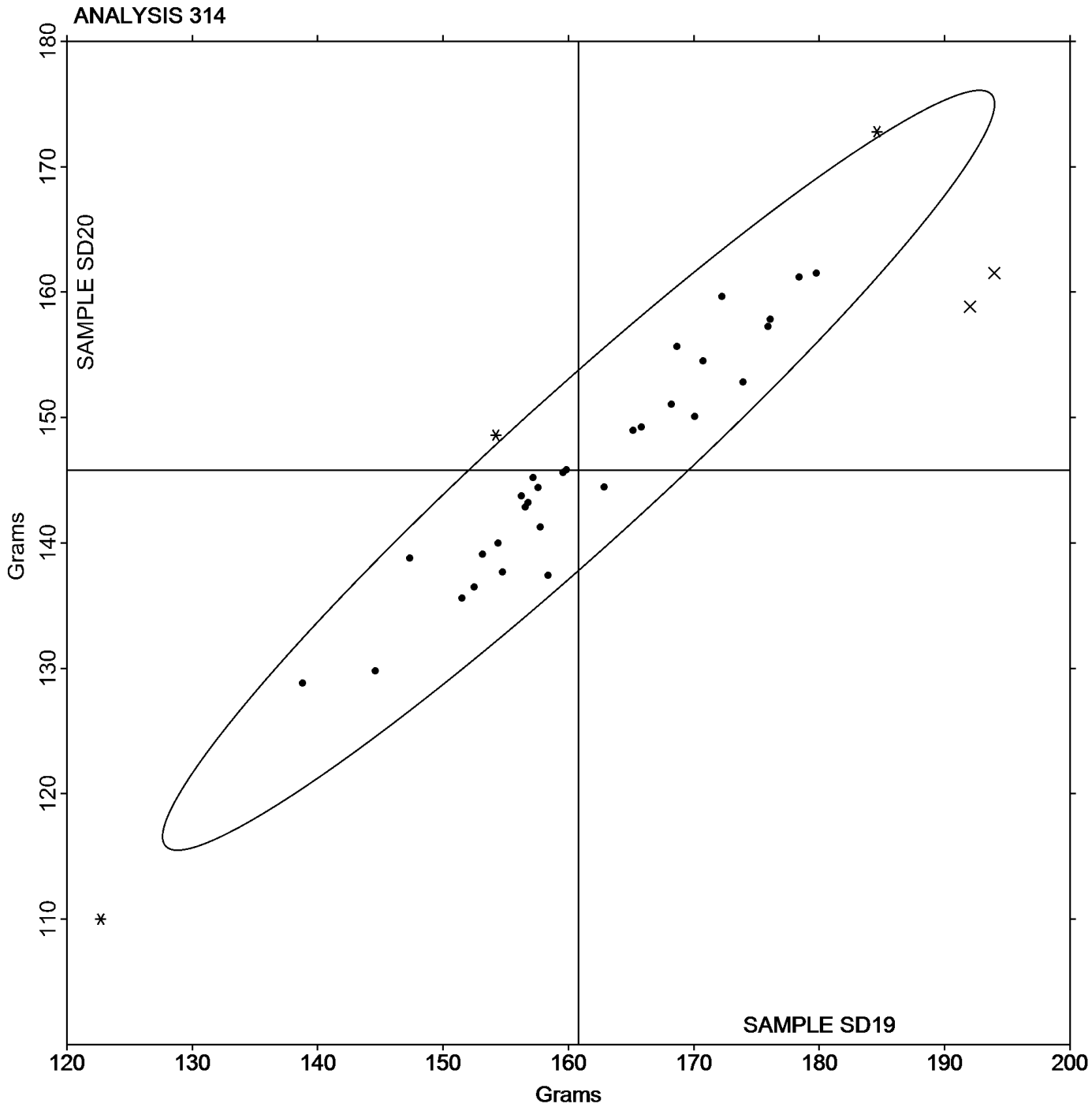
TAPPI-CTS Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

Grand Mean Sample **SD19** = 160.80 Grams

Grand Mean Sample **SD20** = 145.80 Grams



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

WebCode	Data Flag	Sample SR19 Lab Mean	Sample SR19 Diff from Grand Mean	Sample SR19 CPV	Sample SR20 Lab Mean	Sample SR20 Diff from Grand Mean	Sample SR20 CPV
7FBABF		2.436	-0.223	-1.55	2.481	-0.109	-0.62
93U4CH		2.577	-0.082	-0.57	2.574	-0.015	-0.09
D936C2		2.737	0.078	0.54	2.804	0.214	1.22
KZ6WW3		2.779	0.120	0.83	2.662	0.073	0.41
KZT3EG		2.570	-0.089	-0.61	2.530	-0.059	-0.34
P2J29G		2.552	-0.107	-0.74	2.407	-0.183	-1.04
Q92RB3	X	0.595	-2.064	-14.30	0.584	-2.006	-11.42
RV8QFD		2.627	-0.032	-0.22	2.407	-0.182	-1.04
RXWWZA		2.697	0.038	0.26	2.611	0.022	0.12
U6RV3V		2.734	0.075	0.52	2.663	0.074	0.42
XXZG4E		2.969	0.310	2.15	2.951	0.362	2.06
YBZQ8E		2.571	-0.088	-0.61	2.394	-0.195	-1.11

Summary Statistics

	Sample SR19	Sample SR20
Grand Means	2.6591 kN/m	2.5895 kN/m
SD Btwn Labs	0.1444 kN/m	0.1756 kN/m

Statistics based on 11 of 12 reporting participants

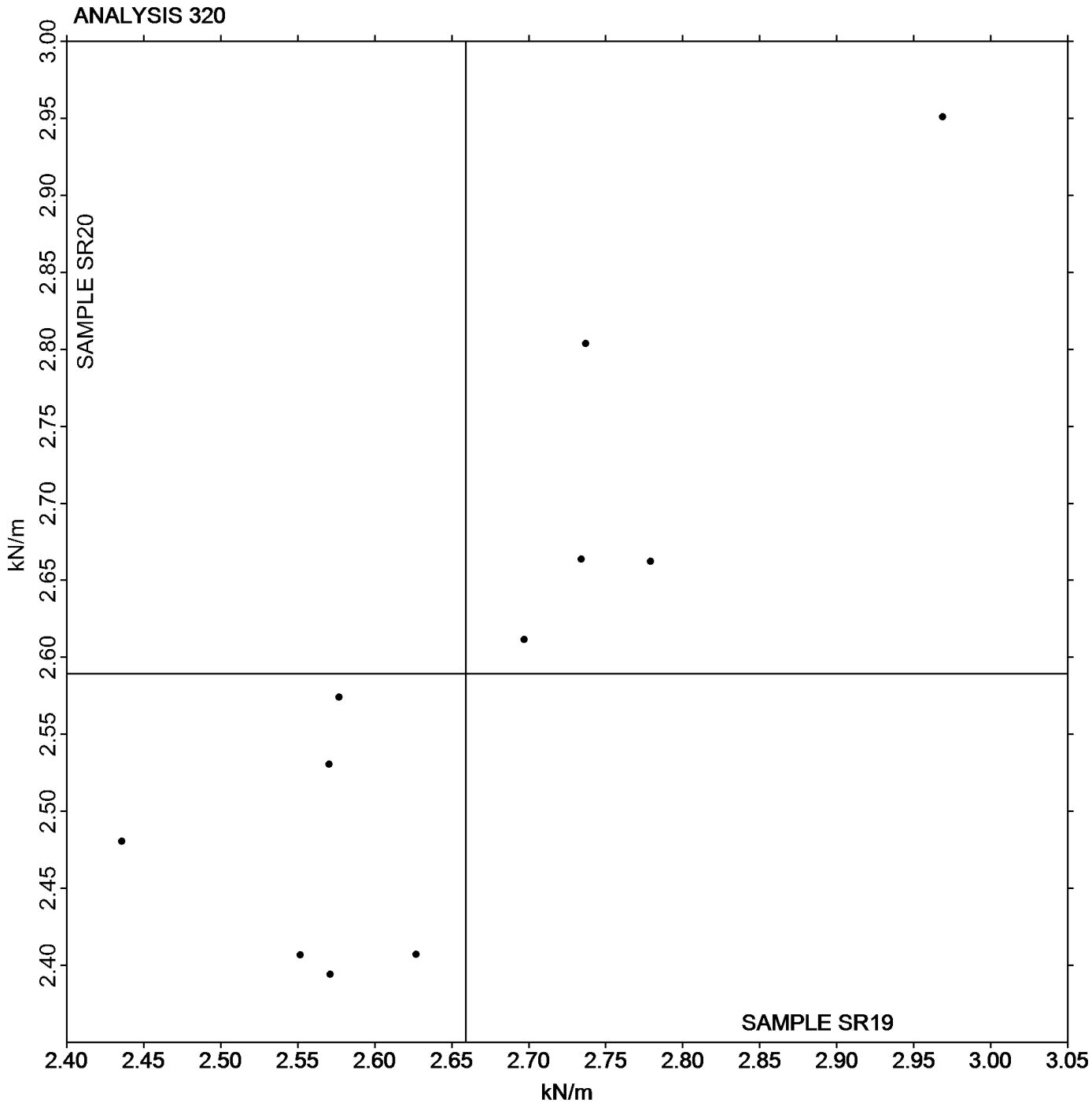
Comments on assigned Data Flags for Test #320

Q92RB3 (X) - Extreme data.

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

Grand Mean Sample **SR19** = 2.6591 kN/m

Grand Mean Sample **SR20** = 2.5895 kN/m



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 SR19 Lab Mean	Sample SR19 Diff from Grand Mean	Sample SR19 CPV	Sample SR20 Lab Mean	Sample SR20 Diff from Grand Mean	Sample SR20 CPV
7FBABF		14.10	-3.00	-1.36	18.47	-0.61	-0.26
93U4CH		17.84	0.73	0.33	20.38	1.30	0.56
D936C2		14.93	-2.18	-0.98	19.50	0.42	0.18
KZ6WW3		19.07	1.96	0.89	19.58	0.50	0.22
KZT3EG		14.40	-2.71	-1.23	16.09	-2.99	-1.29
P2J29G		19.86	2.76	1.25	20.02	0.94	0.41
Q92RB3		15.48	-1.63	-0.74	17.64	-1.44	-0.62
RV8QFD		18.03	0.93	0.42	17.06	-2.02	-0.87
RXWWZA		16.01	-1.09	-0.49	16.59	-2.49	-1.07
U6RV3V		18.19	1.09	0.49	20.19	1.11	0.48
XXZG4E		20.25	3.14	1.42	24.35	5.27	2.27

Summary Statistics

	Sample SR19	Sample SR20
Grand Means	17.105 Joules/sq m	19.078 Joules/sq m
SD Btwn Labs	2.209 Joules/sq m	2.317 Joules/sq m

Statistics based on 11 of 11 reporting participants

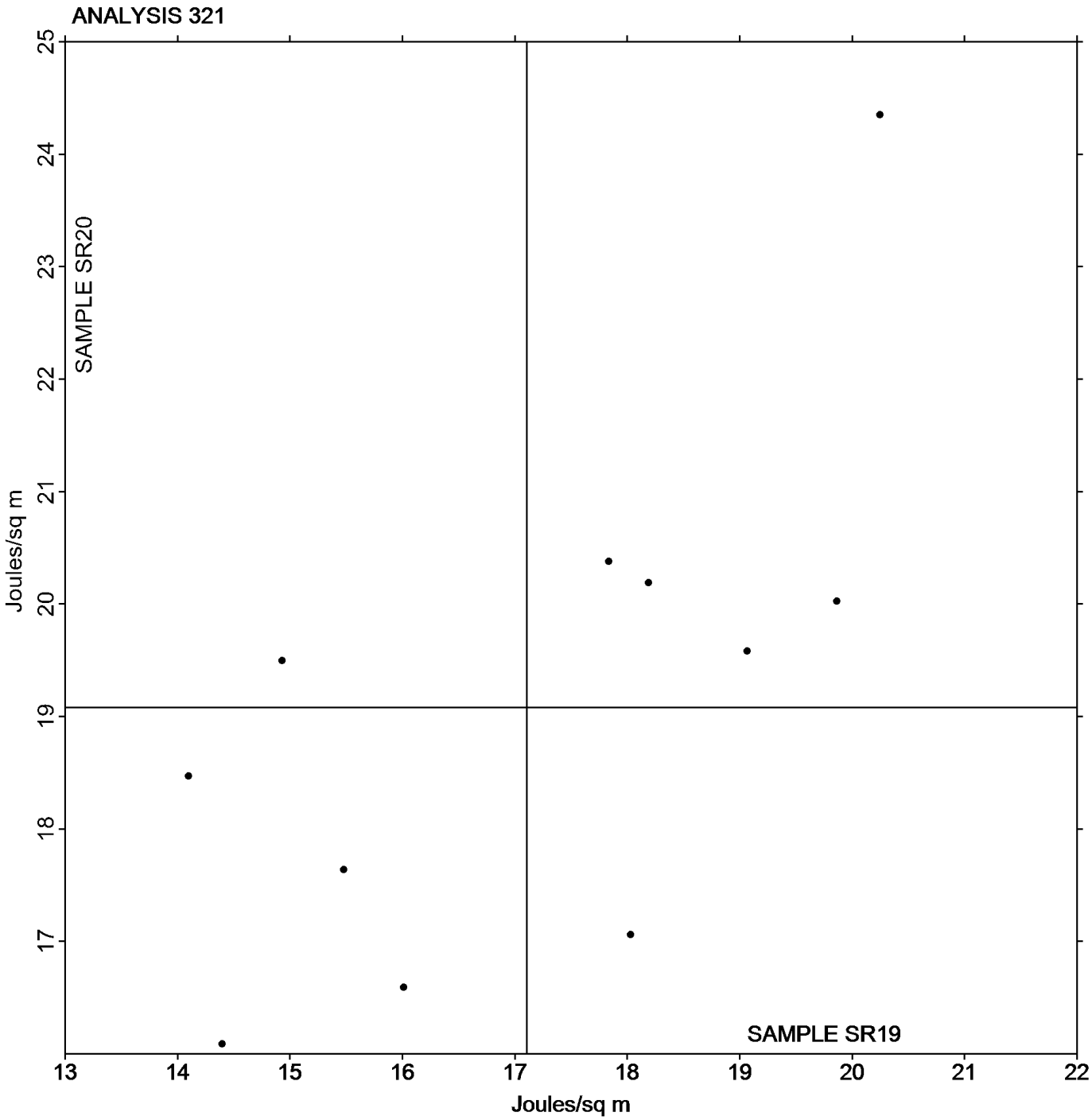
TAPPI-CTS Interlaboratory Testing Program

Analysis 321

Tensile Energy Absorption - Newsprint

Grand Mean Sample **SR19** = 17.105 Joules/sq m

Grand Mean Sample **SR20** = 19.078 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.

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

WebCode	Data Flag	Sample SR19 Lab Mean	Sample SR19 Diff from Grand Mean	Sample SR19 CPV	Sample SR20 Lab Mean	Sample SR20 Diff from Grand Mean	Sample SR20 CPV
7FBABF		1.000	-0.151	-1.21	1.248	-0.039	-0.28
93U4CH		1.151	0.000	0.00	1.293	0.006	0.05
D936C2		1.230	0.079	0.63	1.390	0.103	0.74
KZ6WW3		1.154	0.003	0.03	1.223	-0.064	-0.45
P2J29G		1.348	0.197	1.58	1.487	0.200	1.43
Q92RB3		1.060	-0.091	-0.73	1.205	-0.081	-0.58
RV8QFD		1.141	-0.010	-0.08	1.162	-0.125	-0.89
RXWWZA		1.015	-0.136	-1.09	1.074	-0.213	-1.52
U6RV3V		1.346	0.195	1.56	1.516	0.229	1.63
XXZG4E		1.063	-0.088	-0.70	1.269	-0.018	-0.13

Summary Statistics

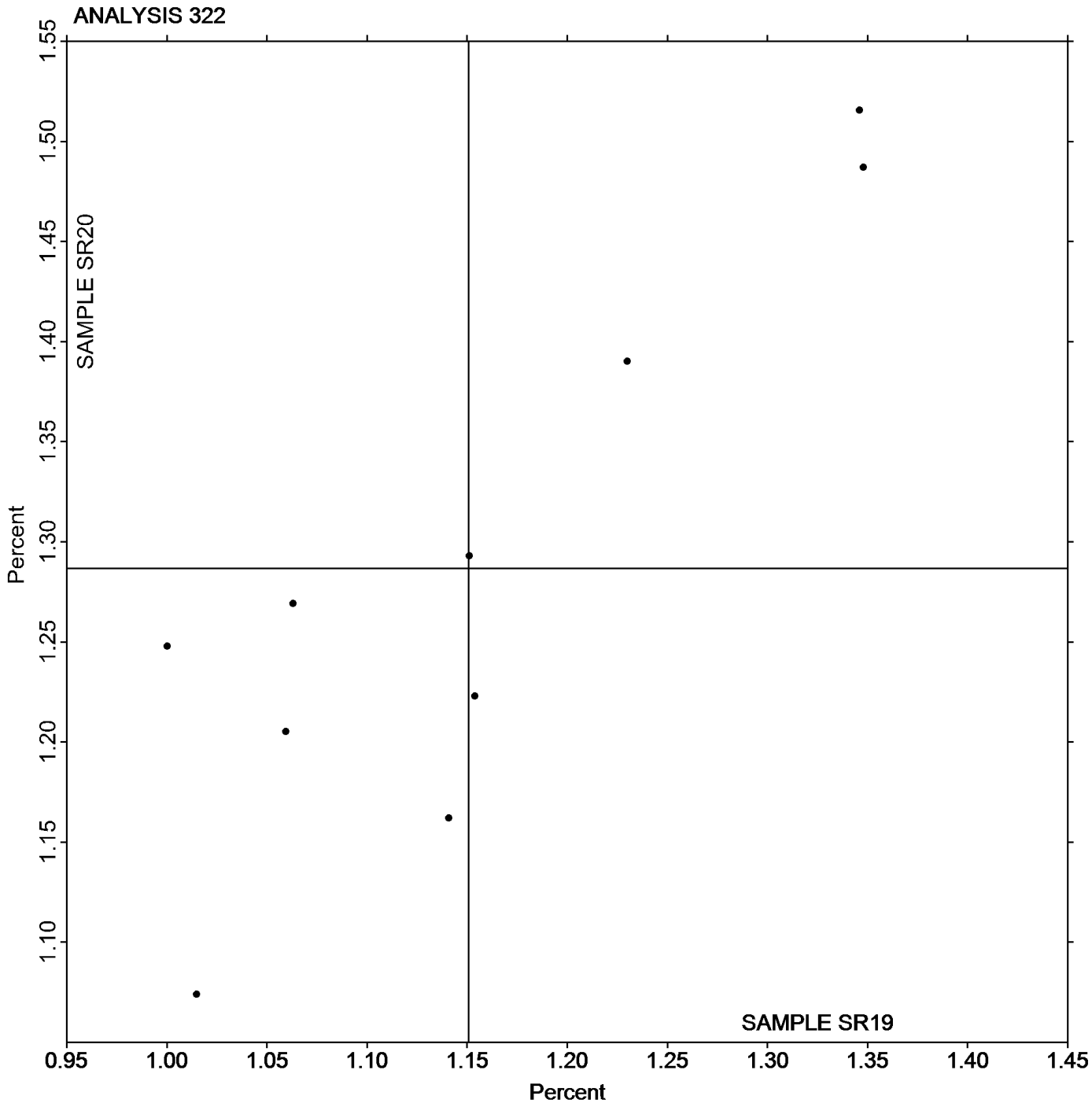
	Sample SR19	Sample SR20
Grand Means	1.1508 Percent	1.2867 Percent
SD Btwn Labs	0.1250 Percent	0.1400 Percent

Statistics based on 10 of 10 reporting participants

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

Grand Mean Sample **SR19** = 1.1508 Percent

Grand Mean Sample **SR20** = 1.2867 Percent



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 SF19 Lab Mean	Sample SF19 Diff from Grand Mean	Sample SF19 CPV	Sample SF20 Lab Mean	Sample SF20 Diff from Grand Mean	Sample SF20 CPV	Instr Code
27XDHR		5.201	-0.338	-0.99	5.818	-0.125	-0.38	LI
2FJVUY		6.128	0.589	1.72	6.375	0.433	1.31	LF
2KCWWD		5.467	-0.072	-0.21	5.704	-0.239	-0.72	TI
3YDQ62		5.391	-0.148	-0.43	5.942	0.000	0.00	XX
4CJ42T		5.626	0.087	0.25	5.909	-0.034	-0.10	LE
4JDFQU		5.600	0.060	0.18	6.360	0.418	1.27	XX
4Y9VY2		4.884	-0.656	-1.92	5.274	-0.669	-2.02	ID
678LWW		6.310	0.770	2.25	6.366	0.423	1.28	LH
6H3NJY		5.407	-0.133	-0.39	5.930	-0.013	-0.04	TC
6K8ENT		5.487	-0.053	-0.15	6.188	0.246	0.74	LH
6PE34F		5.466	-0.073	-0.21	5.856	-0.087	-0.26	LI
76BG2N		5.864	0.325	0.95	6.309	0.366	1.11	LH
76MFWX		5.042	-0.498	-1.45	5.576	-0.367	-1.11	LH
7MMC92		5.718	0.179	0.52	6.243	0.300	0.91	LI
7U8FF4		5.642	0.103	0.30	6.067	0.124	0.38	TB
88VTDY		5.502	-0.037	-0.11	5.655	-0.287	-0.87	TB
8Y3FGK		6.088	0.548	1.60	6.282	0.339	1.03	TJ
A7CNWC		5.348	-0.192	-0.56	6.113	0.170	0.52	TF
CALM6N		5.632	0.093	0.27	6.285	0.343	1.04	TA
CN2LAN		5.763	0.223	0.65	6.099	0.156	0.47	LH
E3TA8R		5.492	-0.047	-0.14	5.879	-0.064	-0.19	IN
E6ZLRE		5.737	0.198	0.58	6.066	0.123	0.37	LH
FEJKVP	M	No data reported for this sample			6.323	0.381	1.15	XX
H28WXC		5.237	-0.302	-0.88	5.295	-0.648	-1.96	LH
H8CN9V		5.729	0.190	0.55	6.095	0.153	0.46	MR
HCA8CE		5.580	0.041	0.12	6.199	0.257	0.78	TB
HVER3M		5.132	-0.407	-1.19	5.852	-0.091	-0.27	LH
HYGT3J		5.443	-0.097	-0.28	6.058	0.116	0.35	LX
J9YUXK		5.717	0.177	0.52	6.011	0.068	0.21	TP
JFN3RC		5.471	-0.068	-0.20	5.647	-0.295	-0.89	LH
JKXHYE		5.167	-0.372	-1.09	5.499	-0.443	-1.34	LA
JLCMXD	X	5.433	-0.106	-0.31	6.632	0.689	2.09	TJ
JRHGR9		5.347	-0.193	-0.56	5.785	-0.158	-0.48	XX
LE7RRA		5.596	0.056	0.16	5.977	0.035	0.11	IM
LTKX2N		5.632	0.093	0.27	6.238	0.295	0.89	IM
M7644G		5.860	0.320	0.94	6.397	0.455	1.38	TO
MV7988		6.239	0.700	2.04	6.752	0.810	2.45	TB
RCKYH3		4.914	-0.626	-1.83	5.222	-0.720	-2.18	SP
RFYWN4		5.162	-0.377	-1.10	5.641	-0.301	-0.91	TO
RV8QFD		5.297	-0.242	-0.71	5.942	-0.001	0.00	LH
UEGB7D		5.351	-0.188	-0.55	5.778	-0.165	-0.50	LI
V284RT		5.706	0.167	0.49	5.604	-0.339	-1.03	TP
VDE4DK		5.156	-0.384	-1.12	5.547	-0.396	-1.20	RE

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

WebCode	Data Flag	Sample SF19 Lab Mean	Sample SF19 Diff from Grand Mean	Sample SF19 CPV	Sample SF20 Lab Mean	Sample SF20 Diff from Grand Mean	Sample SF20 CPV	Instr Code
WYXFRT		4.818	-0.721	-2.11	5.404	-0.539	-1.63	IM
X2ECKC		5.322	-0.218	-0.64	5.528	-0.415	-1.26	TF
XCWV49		5.937	0.397	1.16	6.126	0.183	0.56	LA
XKNA48		5.632	0.093	0.27	6.194	0.252	0.76	TP
XW4CBR		6.054	0.515	1.50	6.061	0.118	0.36	XX
YHXFRP		5.639	0.100	0.29	6.065	0.122	0.37	LH
Z29UK4		6.084	0.544	1.59	6.142	0.199	0.60	TJ
Z8CL7U		5.416	-0.123	-0.36	5.831	-0.112	-0.34	LH

Summary Statistics

	Sample SF19	Sample SF20
Grand Means	5.5395 kN/m	5.9426 kN/m
SD Btwn Labs	0.3424 kN/m	0.3302 kN/m

Statistics based on 49 of 51 reporting participants

Comments on assigned Data Flags for Test #325

FEJKVP (M) - No data for Sample SF19.

JLCMXD (X) - Inconsistent in testing between samples.

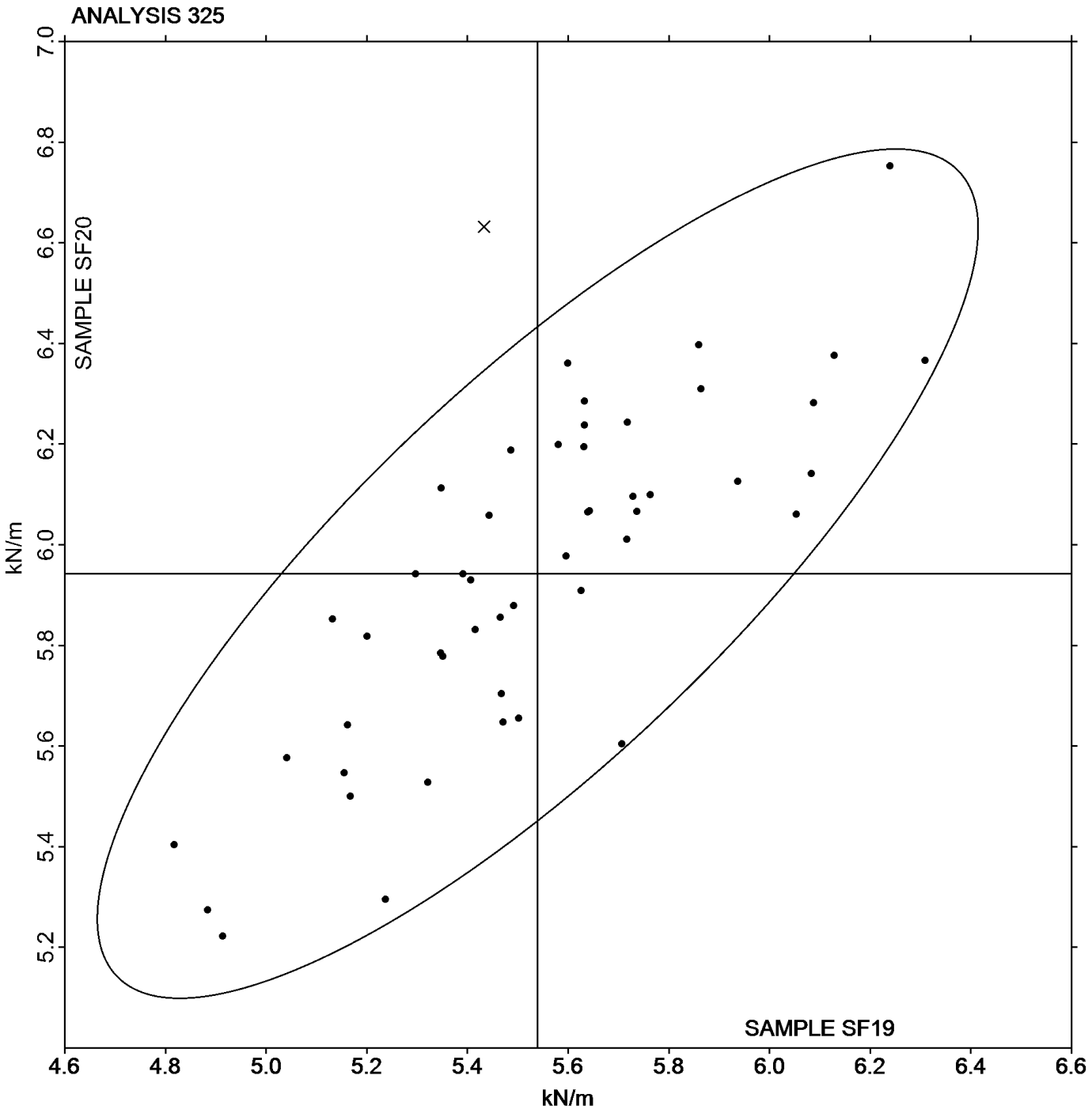
Instrument Code List

(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
(RE) - Regmed
(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 **SF19** = 5.5395 kN/m

Grand Mean Sample **SF20** = 5.9426 kN/m



TAPPI-CTS Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

WebCode	Data Flag	Sample SF19 Lab Mean	Sample SF19 Diff from Grand Mean	Sample SF19 CPV	Sample SF20 Lab Mean	Sample SF20 Diff from Grand Mean	Sample SF20 CPV	Instr Code
27XDHR		72.86	-6.14	-0.68	84.31	1.28	0.13	LI
2FJVUY		72.46	-6.54	-0.73	71.64	-11.39	-1.19	LW
2KCWWD		83.91	4.92	0.55	87.27	4.24	0.44	TI
3YDQ62		75.05	-3.95	-0.44	85.21	2.18	0.23	XX
4JDFQU		81.97	2.97	0.33	93.93	10.90	1.14	LX
4Y9VY2		70.44	-8.56	-0.95	72.85	-10.18	-1.06	ID
678LWW		88.43	9.43	1.05	80.03	-3.00	-0.31	LH
6K8ENT		66.31	-12.69	-1.41	80.64	-2.39	-0.25	LH
6PE34F		77.60	-1.40	-0.15	81.25	-1.78	-0.19	LI
76BG2N		86.41	7.41	0.82	88.60	5.57	0.58	LH
76MFWX		76.56	-2.44	-0.27	80.90	-2.13	-0.22	LH
7MMC92		80.93	1.93	0.21	90.57	7.54	0.79	LI
88VTDY		87.65	8.65	0.96	88.54	5.51	0.58	TB
8Y3FGK		90.82	11.82	1.31	92.35	9.32	0.97	TJ
CN2LAN		83.24	4.24	0.47	81.52	-1.51	-0.16	LH
E6ZLRE		78.66	-0.34	-0.04	80.60	-2.43	-0.25	LH
H28WXC		75.76	-3.24	-0.36	74.14	-8.89	-0.93	LH
H8CN9V		86.39	7.39	0.82	87.17	4.14	0.43	MR
HYGT3J		77.74	-1.26	-0.14	87.05	4.02	0.42	LX
J9YUXK		61.13	-17.86	-1.98	58.65	-24.38	-2.55	TP
JFN3RC		64.65	-14.35	-1.59	71.29	-11.74	-1.23	LH
JKXHYE		63.51	-15.48	-1.72	62.90	-20.13	-2.11	LA
JRHGR9		90.77	11.77	1.31	94.39	11.36	1.19	XX
LE7RRA		86.13	7.13	0.79	93.78	10.75	1.12	IM
LTKX2N		81.39	2.39	0.27	94.25	11.22	1.17	IM
M7644G		98.65	19.66	2.18	99.82	16.79	1.76	TO
MV7988		93.09	14.09	1.56	103.98	20.95	2.19	TB
RFYWN4		76.55	-2.44	-0.27	82.23	-0.80	-0.08	TO
RV8QFD		74.94	-4.06	-0.45	85.33	2.30	0.24	LH
UEGB7D		74.78	-4.22	-0.47	80.88	-2.15	-0.22	LI
V284RT		83.71	4.71	0.52	74.76	-8.27	-0.86	TP
VDE4DK		78.23	-0.77	-0.08	79.93	-3.10	-0.32	RE
WYXFRT		64.60	-14.40	-1.60	76.05	-6.98	-0.73	IM
X2ECKC		86.88	7.88	0.87	80.51	-2.52	-0.26	TF
YHXFRP		83.89	4.89	0.54	87.73	4.70	0.49	LH
Z8CL7U		67.82	-11.18	-1.24	74.01	-9.02	-0.94	LH

Summary Statistics

	Sample SF19	Sample SF20
Grand Means	78.997 Joules/sq m	83.030 Joules/sq m
SD Btwn Labs	9.015 Joules/sq m	9.562 Joules/sq m

Statistics based on 36 of 36 reporting participants

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

Instrument Code List

(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
(TB) - Thwing-Albert EJA/1000
(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

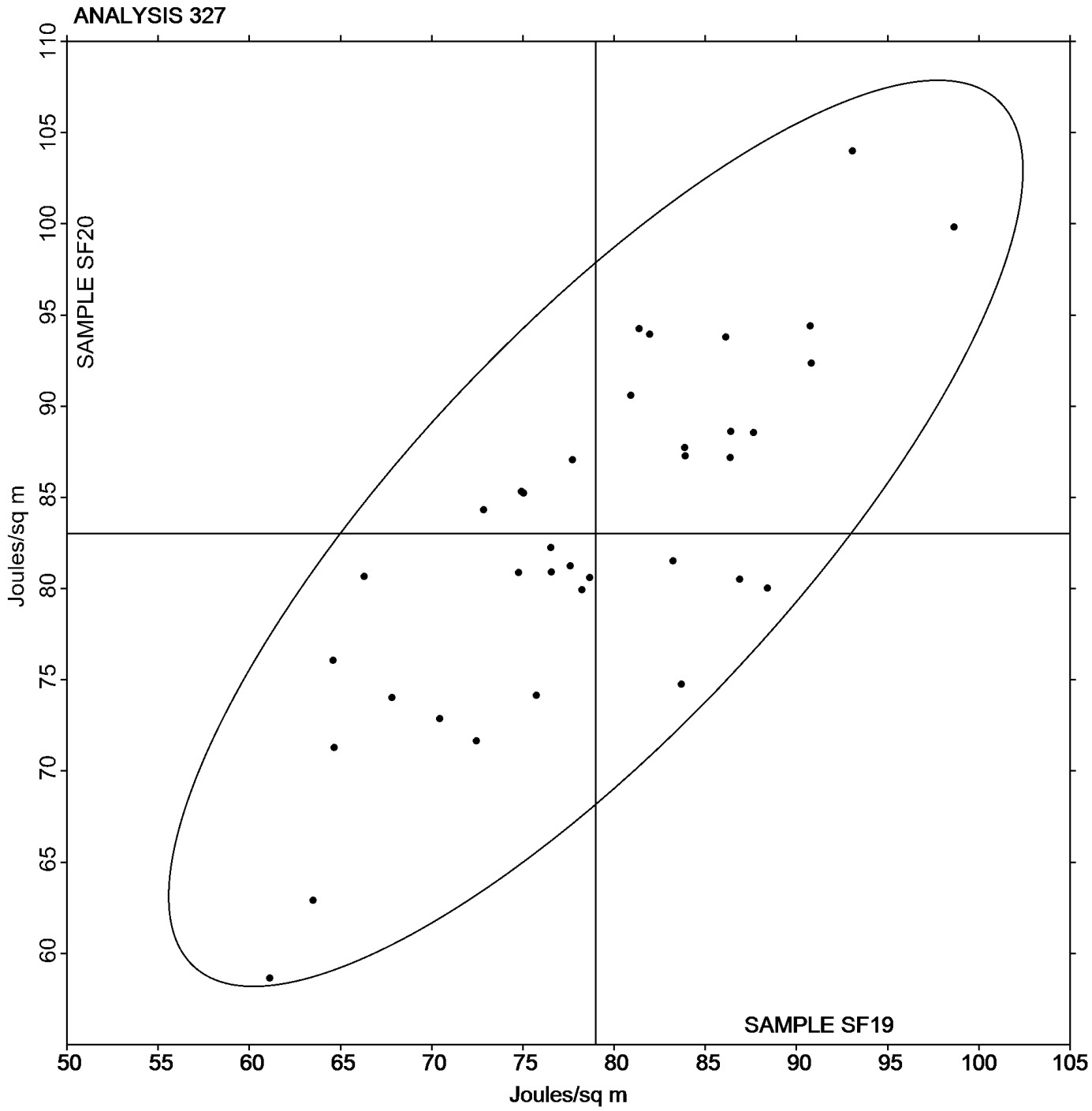
TAPPI-CTS Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

Grand Mean Sample **SF19** = 78.997 Joules/sq m

Grand Mean Sample **SF20** = 83.030 Joules/sq m



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

WebCode	Data Flag	Sample SF19 Lab Mean	Sample SF19 Diff from Grand Mean	Sample SF19 CPV	Sample SF20 Lab Mean	Sample SF20 Diff from Grand Mean	Sample SF20 CPV	Instr Code
27XDHR		2.061	-0.095	-0.55	2.170	0.005	0.03	LI
2FJVUY		1.820	-0.336	-1.93	1.760	-0.405	-2.25	LX
2KCWWD		2.324	0.168	0.96	2.352	0.187	1.04	TI
3YDQ62		2.179	0.023	0.13	2.282	0.117	0.65	XX
4JDFQU	X	2.155	-0.001	-0.01	2.665	0.500	2.78	LX
4Y9VY2		2.115	-0.042	-0.24	2.069	-0.096	-0.53	ID
678LWW		2.070	-0.086	-0.49	1.902	-0.263	-1.46	LH
6K8ENT	*	1.747	-0.409	-2.35	1.908	-0.257	-1.43	LH
6PE34F		2.088	-0.068	-0.39	2.083	-0.082	-0.46	LI
76BG2N		2.156	0.000	0.00	2.093	-0.072	-0.40	LH
76MFWX		2.249	0.093	0.53	2.195	0.030	0.17	LH
7MMC92		2.099	-0.057	-0.33	2.189	0.024	0.13	LI
7U8FF4		2.300	0.144	0.83	2.320	0.155	0.86	TF
88VTDY		2.429	0.273	1.57	2.438	0.273	1.51	TB
8Y3FGK		2.265	0.109	0.63	2.339	0.174	0.97	TJ
A7CNWC		2.200	0.044	0.25	2.320	0.155	0.86	TF
CN2LAN		2.145	-0.011	-0.06	2.022	-0.143	-0.79	LH
E3TA8R		2.282	0.126	0.72	2.275	0.110	0.61	IN
E6ZLRE		2.013	-0.143	-0.82	1.994	-0.171	-0.95	LH
H28WXC		2.184	0.028	0.16	2.103	-0.062	-0.34	LH
H8CN9V		2.275	0.119	0.68	2.204	0.039	0.22	MR
HCA8CE		2.221	0.065	0.37	2.286	0.121	0.67	TB
HYGT3J		2.092	-0.064	-0.37	2.145	-0.020	-0.11	LX
J9YUXK		2.074	-0.082	-0.47	2.110	-0.055	-0.31	TP
JFN3RC		1.766	-0.390	-2.24	1.883	-0.282	-1.57	LH
JKXHYE		2.136	-0.020	-0.11	2.018	-0.147	-0.82	LA
JLCMXD		2.020	-0.136	-0.78	1.850	-0.315	-1.75	LH
JRHGR9		2.422	0.266	1.53	2.459	0.294	1.63	XX
LE7RRA		2.337	0.181	1.04	2.392	0.227	1.26	IM
LTKX2N		2.173	0.017	0.10	2.307	0.142	0.79	IM
M7644G	X	2.852	0.696	3.99	2.721	0.556	3.09	TO
MV7988		2.227	0.071	0.41	2.341	0.176	0.98	TB
RFYWN4		2.169	0.013	0.07	2.188	0.023	0.13	TG
RV8QFD		2.091	-0.065	-0.37	2.155	-0.010	-0.06	LH
UEGB7D		2.062	-0.094	-0.54	2.098	-0.067	-0.37	LI
V284RT		2.446	0.290	1.66	2.433	0.268	1.49	TP
VDE4DK		2.316	0.160	0.92	2.273	0.108	0.60	RE
WYXFRT		2.145	-0.011	-0.06	2.286	0.121	0.67	XX
X2ECKC	*	2.437	0.281	1.61	2.214	0.049	0.27	TF
YHXFRP		2.185	0.029	0.17	2.170	0.005	0.03	LH
Z8CL7U		1.765	-0.391	-2.24	1.808	-0.357	-1.98	LH

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

Summary Statistics

	Sample SF19	Sample SF20
Grand Means	2.1560 Percent	2.1650 Percent
SD Btwn Labs	0.1743 Percent	0.1800 Percent

Statistics based on 39 of 41 reporting participants

Comments on assigned Data Flags for Test #328

4JDFQU (X) - Inconsistent in testing between samples, data for Sample SF20 are high. Inconsistent within the determinations for Sample SF19.

M7644G (X) - Systematic error (data for both samples are high).

Instrument Code List

(ID) - Instron 4201
(IM) - Instron 5500
(IN) - Instron 3340 Series
(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
(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

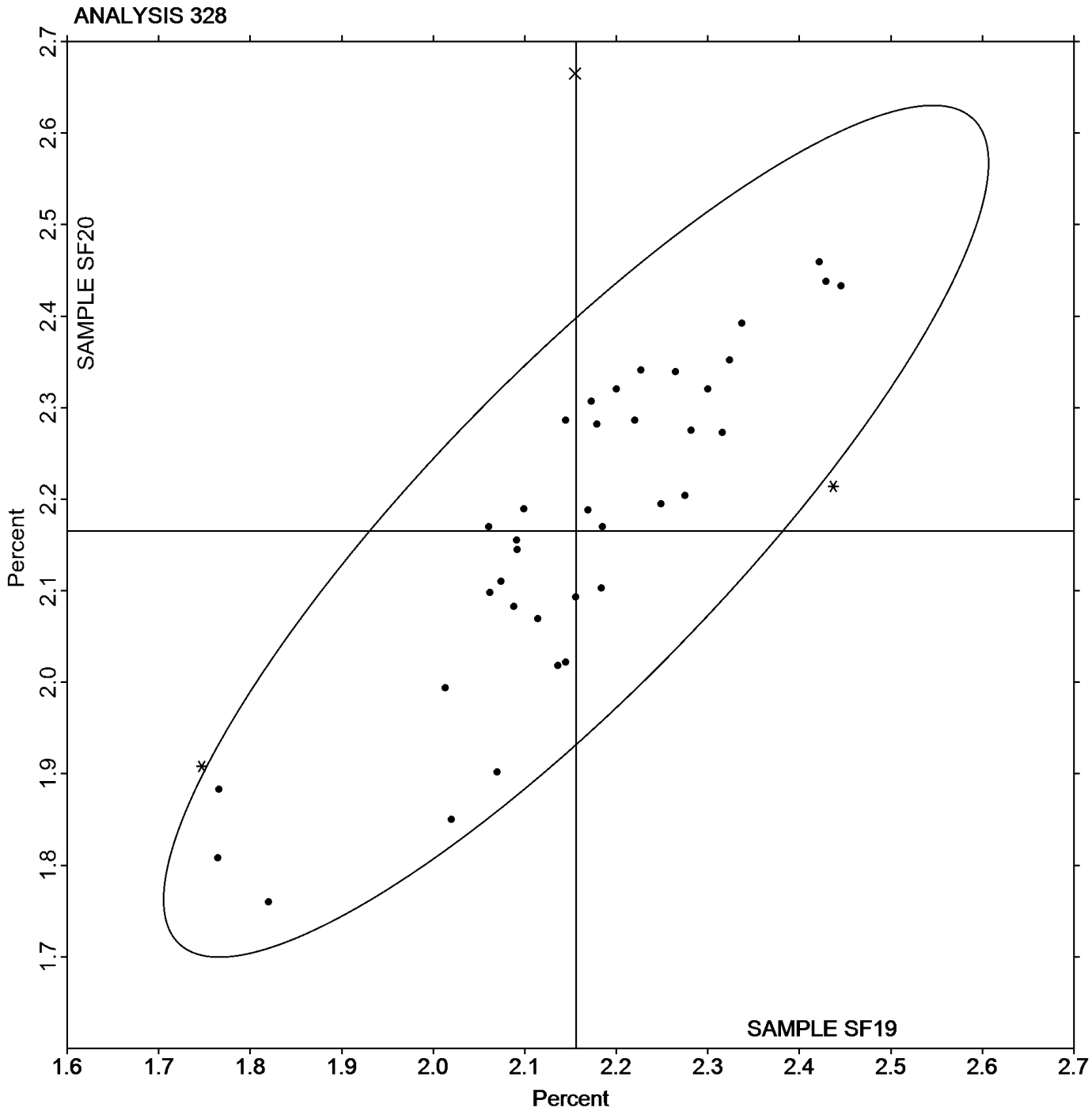
TAPPI-CTS Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

Grand Mean Sample **SF19** = 2.1560 Percent

Grand Mean Sample **SF20** = 2.1650 Percent



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

WebCode	Data Flag	Sample SE19 Lab Mean	Sample SE19 Diff from Grand Mean	Sample SE19 CPV	Sample SE20 Lab Mean	Sample SE20 Diff from Grand Mean	Sample SE20 CPV	Instr Code
3B6E3M		14.25	-1.18	-0.89	18.84	0.89	0.73	IF
4MDQLU		17.64	2.21	1.65	20.21	2.26	1.86	LA
6MT8E3		13.13	-2.31	-1.73	17.59	-0.36	-0.30	LA
6XCN89	X	10.68	-4.75	-3.56	9.57	-8.38	-6.91	TP
7BWLNX		16.04	0.61	0.46	17.92	-0.04	-0.03	IK
7J8XQM		13.20	-2.23	-1.67	17.58	-0.37	-0.31	IF
9FJ32Y		17.67	2.24	1.67	20.80	2.84	2.34	LA
9UG6UZ		15.90	0.47	0.35	19.22	1.27	1.04	TA
BQEXCZ		15.90	0.46	0.35	18.21	0.26	0.21	XX
E6ZLRE		15.89	0.45	0.34	18.94	0.98	0.81	LH
EU2TG3		17.54	2.10	1.57	19.61	1.66	1.37	LA
F7R3GG	M	15.09	-0.35	-0.26	No data reported for this sample			TH
FL4LDN		16.53	1.09	0.82	19.16	1.21	0.99	TB
GH4KYC		13.59	-1.84	-1.38	16.11	-1.85	-1.52	IK
H6LKFN		15.12	-0.31	-0.24	17.05	-0.91	-0.75	SA
HPGVMW		16.25	0.81	0.61	18.82	0.86	0.71	LW
HPXCHP		15.17	-0.27	-0.20	16.61	-1.34	-1.11	LW
HTCWHJ		15.04	-0.39	-0.29	18.37	0.41	0.34	TX
HWWL3W		15.72	0.28	0.21	17.43	-0.52	-0.43	ID
J9YUXK		15.71	0.27	0.20	16.21	-1.74	-1.44	TO
KNW67N		16.03	0.59	0.44	17.59	-0.37	-0.30	XX
KXGERW		15.93	0.49	0.37	17.99	0.03	0.03	XX
LWJLAH	*	12.24	-3.20	-2.39	14.08	-3.87	-3.19	IM
MZZ9JG		13.20	-2.23	-1.67	17.41	-0.55	-0.45	IN
P88LG4		16.65	1.22	0.91	18.08	0.13	0.10	TO
PFJT2D		15.85	0.42	0.31	17.81	-0.15	-0.12	LE
PQYRM9		16.79	1.36	1.02	18.93	0.98	0.80	XX
PZUNTJ		15.67	0.24	0.18	17.93	-0.02	-0.02	TO
Q47ZZK		15.76	0.33	0.24	18.85	0.89	0.74	TP
QFYEBE		17.02	1.58	1.18	18.98	1.02	0.84	TO
R9TAMN		14.53	-0.90	-0.68	17.29	-0.67	-0.55	TH
UF7T8Y	X	26.95	11.52	8.62	31.09	13.13	10.82	LE
UWEM2U		15.34	-0.10	-0.07	17.78	-0.18	-0.15	SP
VFN4JC		15.13	-0.30	-0.23	17.45	-0.50	-0.41	IM
VPB3C4		15.57	0.14	0.10	16.94	-1.02	-0.84	LE
X92TL3		14.81	-0.63	-0.47	16.92	-1.04	-0.85	LW
XD8N63		16.57	1.13	0.85	18.56	0.61	0.50	LH
XYRLKT		15.72	0.28	0.21	17.52	-0.44	-0.36	LA
XZJQT7	*	12.83	-2.60	-1.95	17.79	-0.16	-0.13	ID
YVP8B9		15.17	-0.27	-0.20	17.77	-0.18	-0.15	XX

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

Summary Statistics

	Sample SE19	Sample SE20
Grand Means	15.435 kN/m	17.956 kN/m
SD Btwn Labs	1.336 kN/m	1.214 kN/m

Statistics based on 37 of 40 reporting participants

Comments on assigned Data Flags for Test #330

6XCN89 (X) - Extreme data.

F7R3GG (M) - No data for Sample SE20.

UF7T8Y (X) - Extreme data.

Analysis Notes:

KXGERW - 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
(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

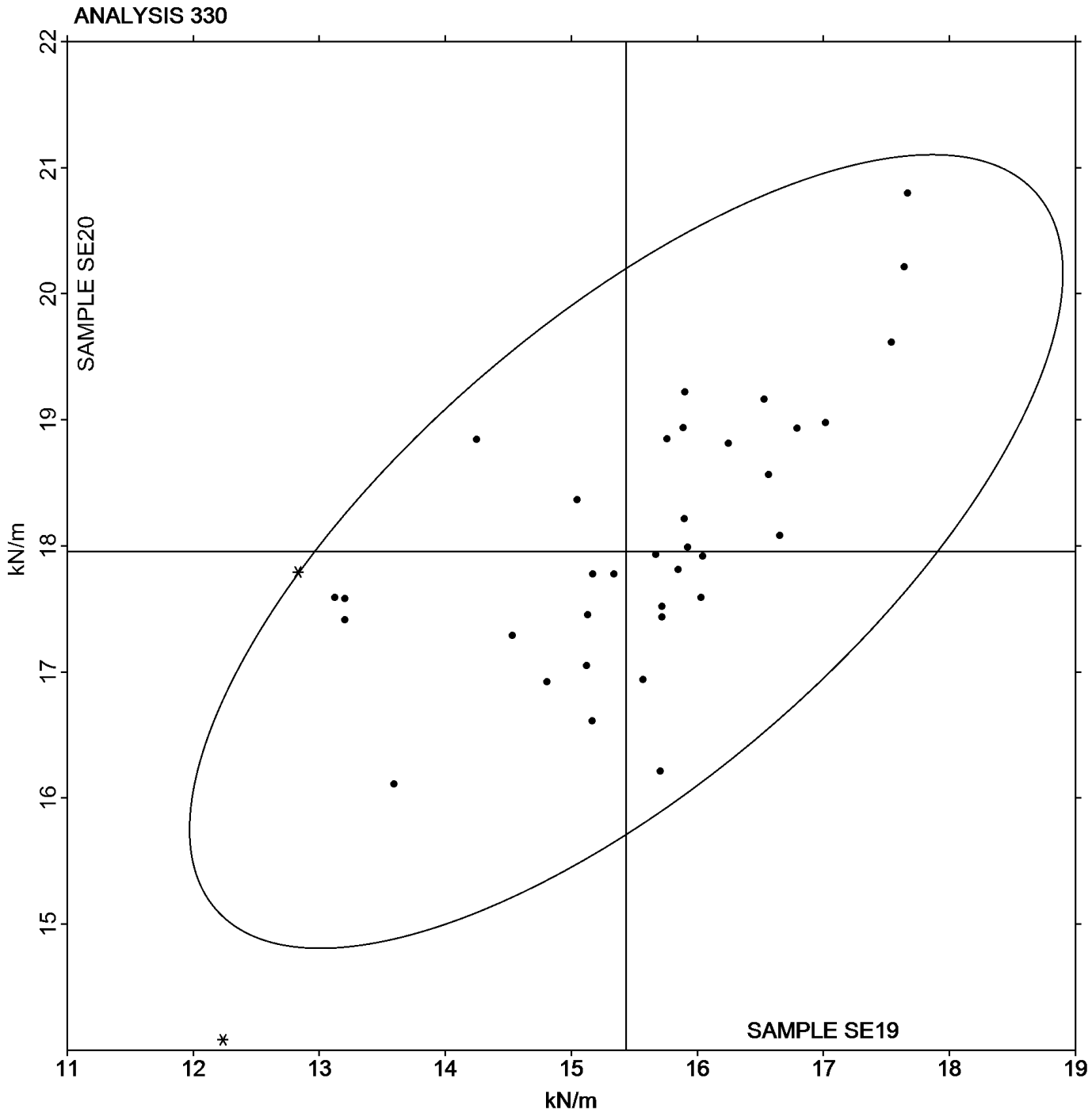
TAPPI-CTS Interlaboratory Testing Program

Analysis 330

Tensile Breaking Strength - Packaging Papers

Grand Mean Sample **SE19** = 15.435 kN/m

Grand Mean Sample **SE20** = 17.956 kN/m



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

WebCode	Data Flag	Sample SE19 Lab Mean	Sample SE19 Diff from Grand Mean	Sample SE19 CPV	Sample SE20 Lab Mean	Sample SE20 Diff from Grand Mean	Sample SE20 CPV	Instr Code
3B6E3M		147.2	-30.4	-1.30	177.8	-17.7	-0.64	IN
4MDQLU		190.6	13.1	0.56	190.6	-5.0	-0.18	LA
6MT8E3		189.0	11.5	0.49	202.9	7.4	0.27	LA
7BWLNX		176.6	-0.9	-0.04	159.7	-35.9	-1.29	XX
7J8XQM		162.5	-15.1	-0.65	208.7	13.2	0.48	IF
9FJ32Y		162.8	-14.7	-0.63	191.4	-4.1	-0.15	LA
BQEXCZ		166.0	-11.6	-0.50	196.4	0.9	0.03	XX
E6ZLRE		156.1	-21.5	-0.92	183.2	-12.4	-0.45	LH
EU2TG3		194.4	16.8	0.72	200.0	4.5	0.16	LA
F7R3GG	M	187.9	10.4	0.45	No data reported for this sample			TH
FL4LDN		219.6	42.1	1.81	255.2	59.7	2.15	TB
GH4KYC		190.3	12.8	0.55	220.1	24.6	0.89	IK
H6LKFN		168.9	-8.7	-0.37	185.9	-9.6	-0.35	SA
HPGVMW		136.3	-41.3	-1.77	132.9	-62.6	-2.26	LW
HPXCHP		171.2	-6.3	-0.27	176.5	-19.1	-0.69	LW
HTCWHJ		199.2	21.7	0.93	208.0	12.5	0.45	XX
J9YUXK		192.2	14.7	0.63	175.6	-19.9	-0.72	TO
KNW67N		184.3	6.8	0.29	217.1	21.6	0.78	XX
LWJLAH	*	125.1	-52.5	-2.25	180.5	-15.0	-0.54	IM
MZZ9JG	X	240.1	62.6	2.69	334.8	139.3	5.02	IN
P88LG4	X	182.1	4.6	0.20	307.9	112.4	4.05	TO
PFJT2D		170.1	-7.4	-0.32	171.4	-24.1	-0.87	LE
PQYRM9		191.2	13.6	0.59	207.1	11.6	0.42	XX
PZUNTJ		210.5	32.9	1.42	214.5	19.0	0.69	TO
Q47ZZK	*	225.2	47.7	2.05	275.2	79.7	2.87	TP
QFYEBE		197.3	19.8	0.85	203.9	8.4	0.30	TO
R9TAMN		159.7	-17.9	-0.77	193.6	-1.9	-0.07	TH
UF7T8Y	X	312.2	134.7	5.79	366.5	171.0	6.17	LE
VFN4JC		156.2	-21.3	-0.92	178.3	-17.2	-0.62	IM
XD8N63		159.4	-18.1	-0.78	163.6	-31.9	-1.15	LH
XYRLKT		193.9	16.3	0.70	208.9	13.4	0.48	LA
XZJQT7		173.0	-4.5	-0.19	176.7	-18.8	-0.68	ID
YVP8B9		179.9	2.3	0.10	214.3	18.8	0.68	XX

Summary Statistics

	Sample SE19	Sample SE20
Grand Means	177.54 Joules/sq m	195.51 Joules/sq m
SD Btwn Labs	23.28 Joules/sq m	27.73 Joules/sq m

Statistics based on 29 of 33 reporting participants

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

Comments on assigned Data Flags for Test #331

F7R3GG (M) - No data for Sample SE20.

MZZ9JG (X) - Data for both samples are high. Inconsistent in testing within the determinations for both samples.

P88LG4 (X) - Data for Sample SE20 are high. Inconsistent in testing within determinations for Sample SE20.

UF7T8Y (X) - Extreme data.

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
(TB) - Thwing-Albert EJA/1000
(TH) - Thwing-Albert QC-3A
(TO) - Thwing-Albert QC-1000
(TP) - TMI Monitor/Tensile 100 (84-21-01)
(XX) - Instrument make/model not specified by lab

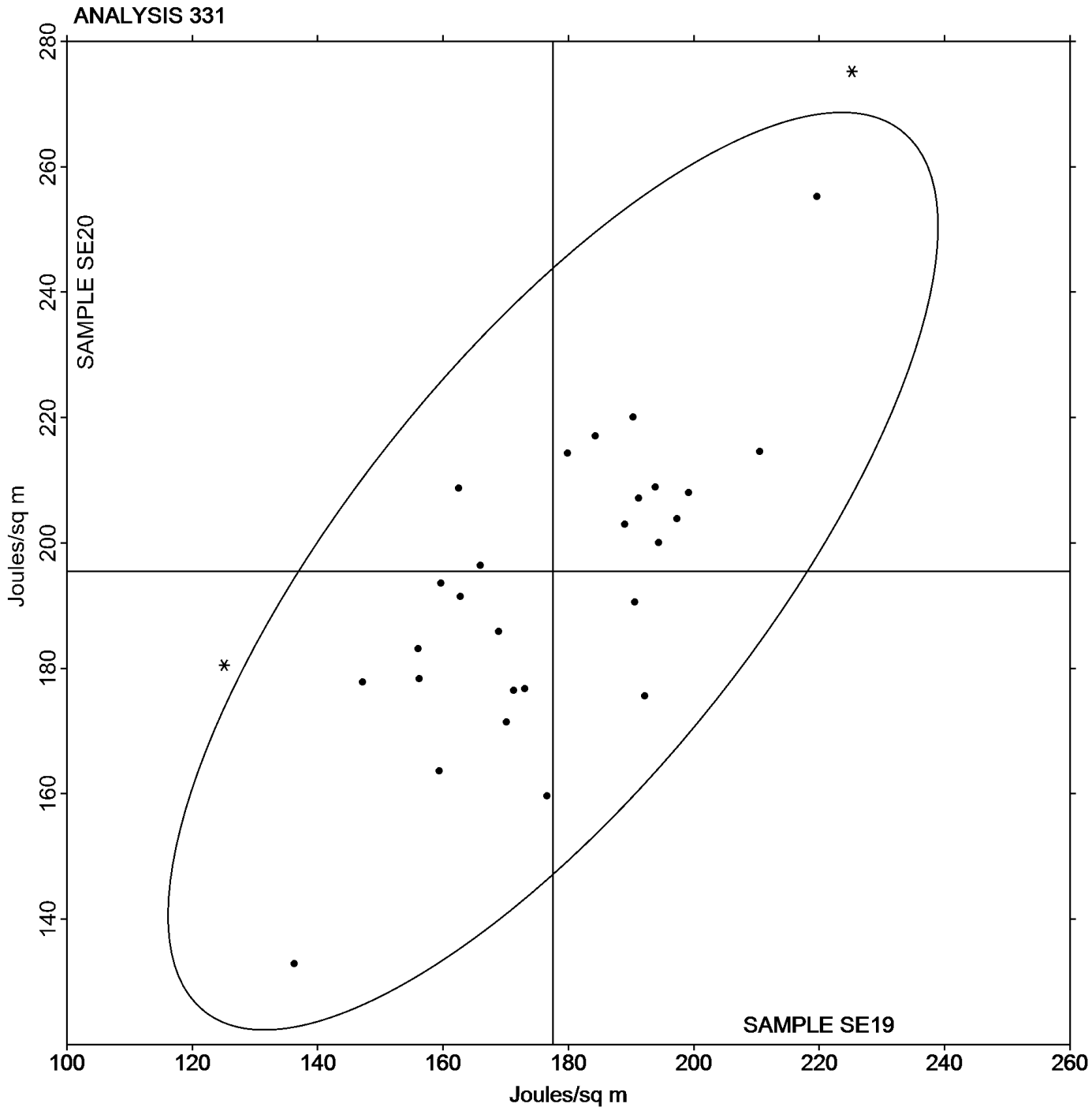
TAPPI-CTS Interlaboratory Testing Program

Analysis 331

Tensile Energy Absorption - Packaging Papers

Grand Mean Sample **SE19** = 177.54 Joules/sq m

Grand Mean Sample **SE20** = 195.51 Joules/sq m



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

WebCode	Data Flag	Sample SE19 Lab Mean	Sample SE19 Diff from Grand Mean	Sample SE19 CPV	Sample SE20 Lab Mean	Sample SE20 Diff from Grand Mean	Sample SE20 CPV	Instr Code
3B6E3M		1.579	-0.331	-0.75	1.616	-0.160	-0.39	IN
4MDQLU		1.651	-0.259	-0.58	1.484	-0.292	-0.72	LA
6MT8E3	*	2.325	0.415	0.94	1.710	-0.066	-0.16	LA
7BWLNX		1.434	-0.476	-1.08	1.267	-0.509	-1.26	XX
7J8XQM		2.269	0.359	0.81	2.090	0.314	0.78	IF
9FJ32Y		1.398	-0.512	-1.16	1.378	-0.398	-0.98	XX
BQEXCZ		1.583	-0.327	-0.74	1.602	-0.174	-0.43	XX
E6ZLRE		1.480	-0.430	-0.97	1.451	-0.325	-0.80	LH
EU2TG3		1.594	-0.316	-0.71	1.450	-0.326	-0.81	LA
F7R3GG	M	2.000	0.090	0.20	No data reported for this sample			TH
FL4LDN		2.460	0.550	1.24	2.220	0.444	1.10	TB
GH4KYC		2.308	0.399	0.90	2.292	0.516	1.27	IK
H6LKFN		1.749	-0.161	-0.36	1.692	-0.084	-0.21	SA
HPGVMW		1.385	-0.525	-1.19	1.207	-0.569	-1.41	LW
HPXCHP		1.711	-0.199	-0.45	1.609	-0.167	-0.41	LW
HTCWHJ		2.313	0.403	0.91	1.904	0.128	0.32	XX
HWWL3W		1.776	-0.134	-0.30	1.593	-0.183	-0.45	ID
J9YUXK		1.886	-0.024	-0.05	1.644	-0.132	-0.33	TO
KNW67N		1.799	-0.111	-0.25	1.834	0.057	0.14	XX
LWJLAH	X	1.563	-0.347	-0.78	2.173	0.397	0.98	IM
MZZ9JG	*	3.060	1.150	2.60	2.910	1.134	2.80	IN
P88LG4	X	1.768	-0.142	-0.32	2.580	0.804	1.99	TO
PFJT2D		1.606	-0.304	-0.69	1.449	-0.327	-0.81	LE
PQYRM9		1.773	-0.137	-0.31	1.790	0.014	0.03	XX
PZUNTJ		3.018	1.108	2.50	2.726	0.950	2.35	TO
Q47ZZK		2.490	0.580	1.31	2.550	0.774	1.91	TP
QFYEBE		1.814	-0.096	-0.22	1.695	-0.081	-0.20	TO
R9TAMN		1.922	0.012	0.03	1.938	0.162	0.40	TH
UF7T8Y		1.776	-0.134	-0.30	1.771	-0.005	-0.01	LE
VFN4JC		1.975	0.065	0.15	1.964	0.188	0.46	IM
X92TL3		1.593	-0.317	-0.72	1.498	-0.278	-0.69	LW
XD8N63		1.488	-0.422	-0.95	1.378	-0.398	-0.98	LH
XYRLKT		1.560	-0.350	-0.79	1.473	-0.303	-0.75	LA
XZJQT7	*	2.442	0.532	1.20	1.742	-0.034	-0.08	ID
YVP8B9		1.895	-0.015	-0.03	1.911	0.135	0.33	XX

Summary Statistics

	Sample SE19	Sample SE20
Grand Means	1.9097 Percent	1.7762 Percent
SD Btwn Labs	0.4424 Percent	0.4047 Percent

Statistics based on 32 of 35 reporting participants

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

Comments on assigned Data Flags for Test #332

F7R3GG (M) - No data for Sample SE20.

LWJLAH (X) - Inconsistent in testing between samples.

P88LG4 (X) - Inconsistent in testing between samples.

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

(TO) - Thwing-Albert QC-1000

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

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

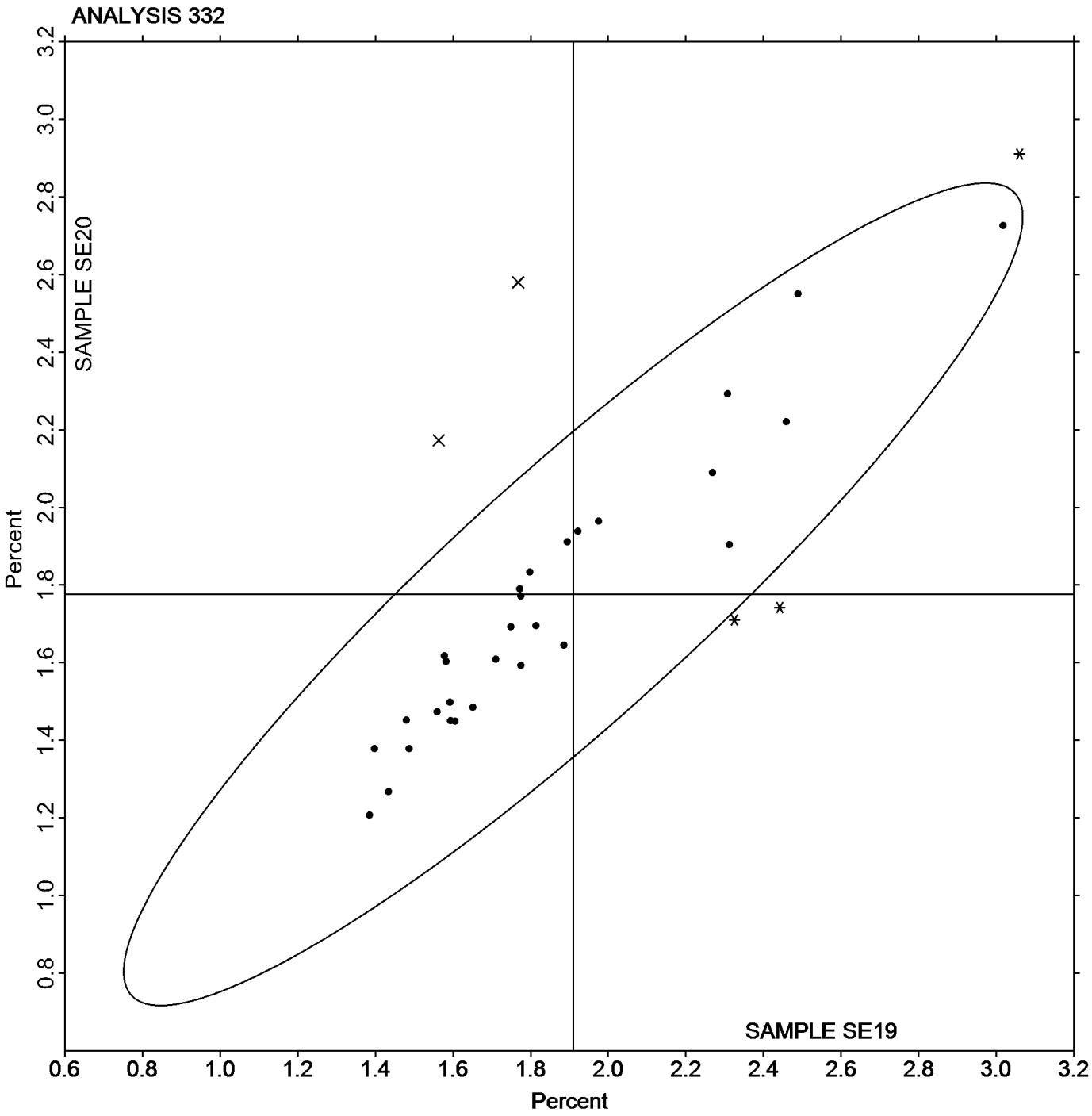
TAPPI-CTS Interlaboratory Testing Program

Analysis 332

Elongation to Break - Packaging Papers

Grand Mean Sample **SE19** = 1.9097 Percent

Grand Mean Sample **SE20** = 1.7762 Percent



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

WebCode	Data Flag	Sample SG19 Lab Mean	Sample SG19 Diff from Grand Mean	Sample SG19 CPV	Sample SG20 Lab Mean	Sample SG20 Diff from Grand Mean	Sample SG20 CPV	Instr Code
4CJ42T		36.60	2.08	0.26	108.60	19.86	0.73	MT
4Y9VY2		30.80	-3.72	-0.46	83.90	-4.84	-0.18	MT
69DZNW		40.20	5.68	0.70	89.80	1.06	0.04	MT
6PE34F		49.50	14.98	1.84	117.60	28.86	1.06	MT
6XCN89		21.20	-13.32	-1.64	44.60	-44.14	-1.62	MT
A7CNWC		19.60	-14.92	-1.84	68.50	-20.24	-0.74	MT
EU2TG3		38.30	3.78	0.46	113.30	24.56	0.90	XX
JLCMXD		29.30	-5.22	-0.64	119.80	31.06	1.14	MT
LE7RRA		37.50	2.98	0.37	94.70	5.96	0.22	MT
WVVR27		33.40	-1.12	-0.14	113.70	24.96	0.92	MT
WYXFRT		41.38	6.85	0.84	88.70	-0.04	0.00	MT
X92TL3		26.00	-8.52	-1.05	54.20	-34.54	-1.27	MT
YVP8B9		28.00	-6.52	-0.80	111.40	22.66	0.83	MT
Z29UK4		41.80	7.28	0.90	31.40	-57.34	-2.11	XX
ZHCBMV		40.20	5.68	0.70	101.20	12.46	0.46	MT
ZYJ87V		38.60	4.08	0.50	78.40	-10.34	-0.38	XX

Summary Statistics

	Sample SG19	Sample SG20
Grand Means	34.523 Double Folds	88.738 Double Folds
SD Btwn Labs	8.126 Double Folds	27.194 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

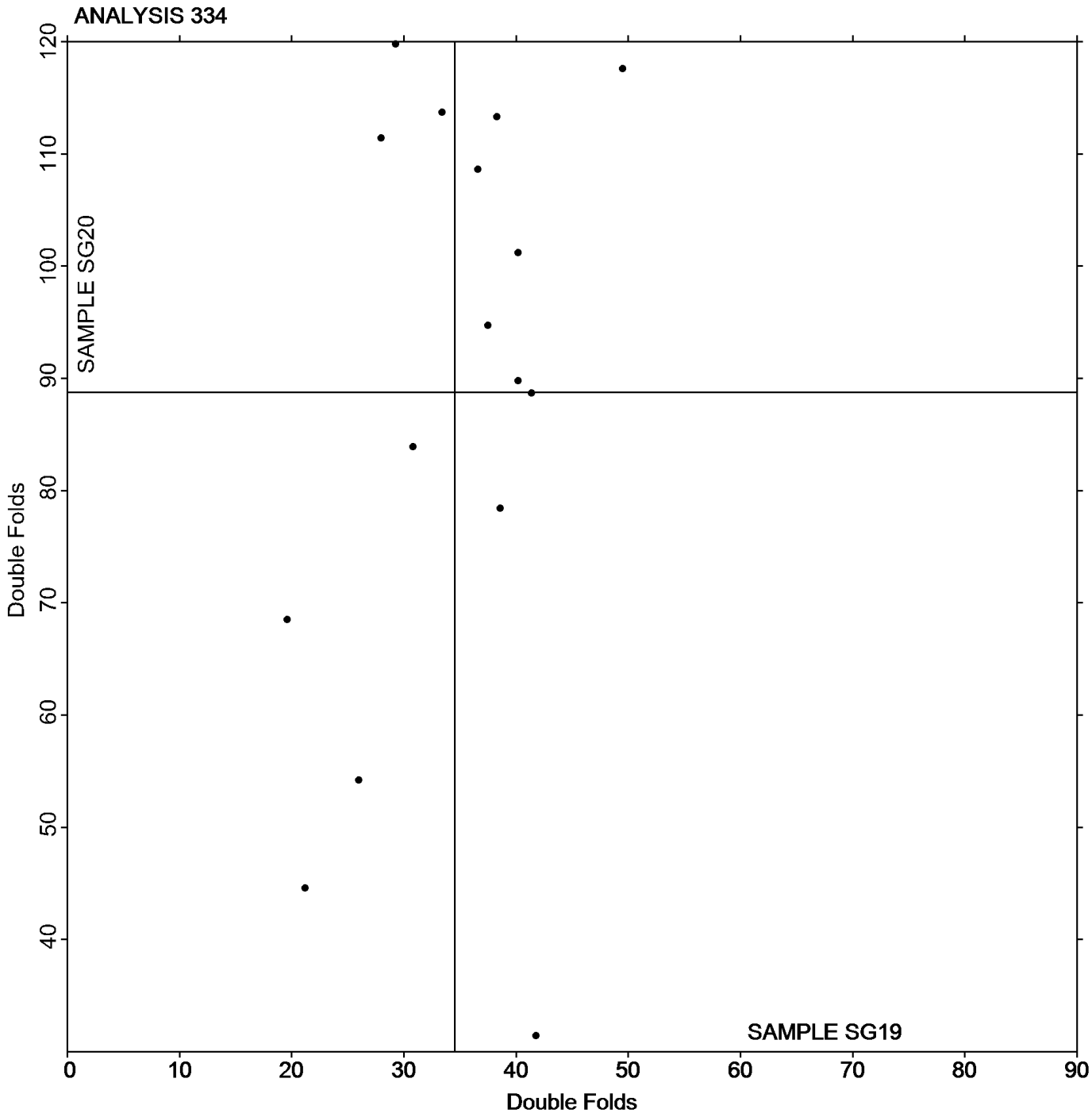
TAPPI-CTS Interlaboratory Testing Program

Analysis 334

Folding Endurance (MIT) - Double Folds

Grand Mean Sample **SG19** = 34.523 Double Folds

Grand Mean Sample **SG20** = 88.738 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 SH19 Lab Mean	Sample SH19 Diff from Grand Mean	Sample SH19 CPV	Sample SH20 Lab Mean	Sample SH20 Diff from Grand Mean	Sample SH20 CPV
2KCWWD		326.7	-17.5	-0.76	267.7	-15.9	-0.77
678LWW		367.2	23.0	1.00	300.5	16.8	0.82
6H3NJY		324.8	-19.3	-0.84	267.3	-16.3	-0.79
76MFWX		296.6	-47.5	-2.06	269.2	-14.4	-0.70
7J8XQM		375.2	31.1	1.35	294.2	10.5	0.51
CN2LAN		355.6	11.5	0.50	295.6	12.0	0.58
DUHKWE		381.8	37.7	1.63	325.4	41.7	2.03
H8CN9V		298.3	-45.9	-1.99	239.6	-44.1	-2.14
HCA8CE		346.3	2.1	0.09	288.9	5.3	0.26
HVER3M		329.4	-14.7	-0.64	293.0	9.4	0.46
JKXHYE		349.0	4.9	0.21	292.0	8.4	0.41
JLCMXD		332.9	-11.2	-0.48	261.4	-22.3	-1.08
L9C326		361.0	16.9	0.73	301.4	17.7	0.86
LE7RRA		350.7	6.6	0.29	280.0	-3.6	-0.18
M7644G		328.0	-16.1	-0.70	258.7	-24.9	-1.21
PZUNTJ		350.7	6.6	0.29	297.0	13.4	0.65
UN3THK		346.6	2.5	0.11	280.8	-2.8	-0.14
YBZQ8E		352.5	8.4	0.36	268.0	-15.6	-0.76
YVP8B9		364.9	20.8	0.90	308.5	24.8	1.21

Summary Statistics

	Sample SH19	Sample SH20
Grand Means	344.11 Gurley Units	283.64 Gurley Units
SD Btwn Labs	23.10 Gurley Units	20.58 Gurley Units

Statistics based on 19 of 19 reporting participants

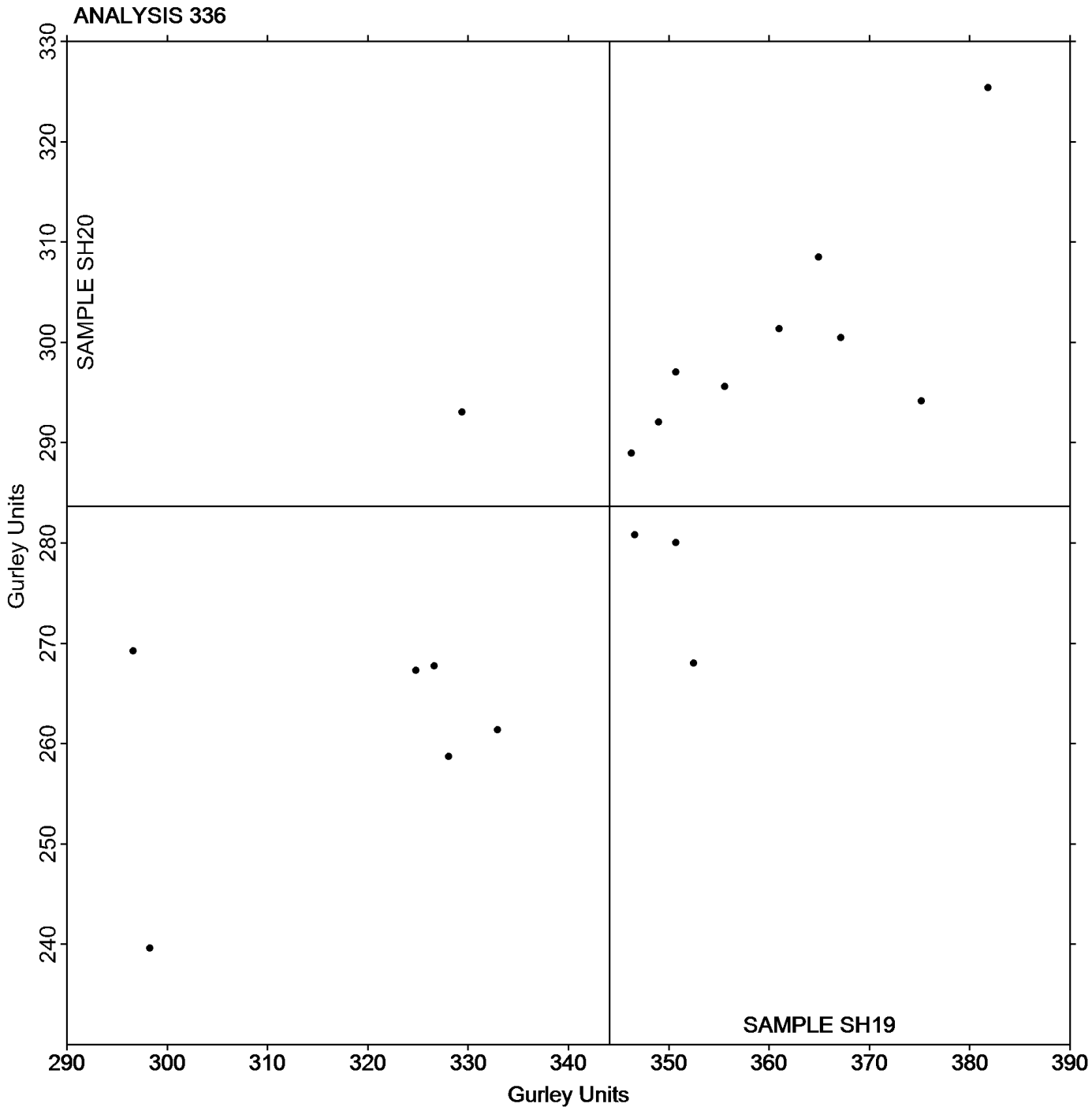
TAPPI-CTS Interlaboratory Testing Program

Analysis 336

Bending Resistance, Gurley Type

Grand Mean Sample **SH19** = 344.11 Gurley Units

Grand Mean Sample **SH20** = 283.64 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 SJ19 Lab Mean	Sample SJ19 Diff from Grand Mean	Sample SJ19 CPV	Sample SJ20 Lab Mean	Sample SJ20 Diff from Grand Mean	Sample SJ20 CPV
3B6E3M		3.890	0.527	1.68	4.390	0.685	2.06
4JDFQU		3.220	-0.143	-0.46	3.800	0.095	0.29
4Y9VY2		3.468	0.105	0.33	3.696	-0.009	-0.03
7J8XQM		3.290	-0.073	-0.23	3.669	-0.036	-0.11
88VTDY		3.420	0.056	0.18	3.783	0.078	0.23
8Y3FGK		3.129	-0.234	-0.75	3.459	-0.246	-0.74
CN2LAN		3.613	0.249	0.79	3.993	0.288	0.86
DAJDNB		3.316	-0.047	-0.15	3.775	0.070	0.21
FEJKVP		3.421	0.058	0.18	3.571	-0.134	-0.40
H8CN9V		2.753	-0.610	-1.95	3.047	-0.658	-1.98
HCA8CE		3.382	0.018	0.06	3.596	-0.109	-0.33
HPGVMW		2.720	-0.643	-2.05	3.050	-0.655	-1.97
LE7RRA		3.647	0.284	0.90	3.946	0.241	0.73
XKNA48		3.672	0.309	0.98	3.863	0.158	0.48
Z29UK4		3.614	0.251	0.80	3.936	0.231	0.70
ZHCBMV		3.261	-0.102	-0.33	3.702	-0.003	-0.01

Summary Statistics

	Sample SJ19	Sample SJ20
Grand Means	3.3634 Taber Units	3.7047 Taber Units
SD Btwn Labs	0.3137 Taber Units	0.3329 Taber Units

Statistics based on 16 of 16 reporting participants

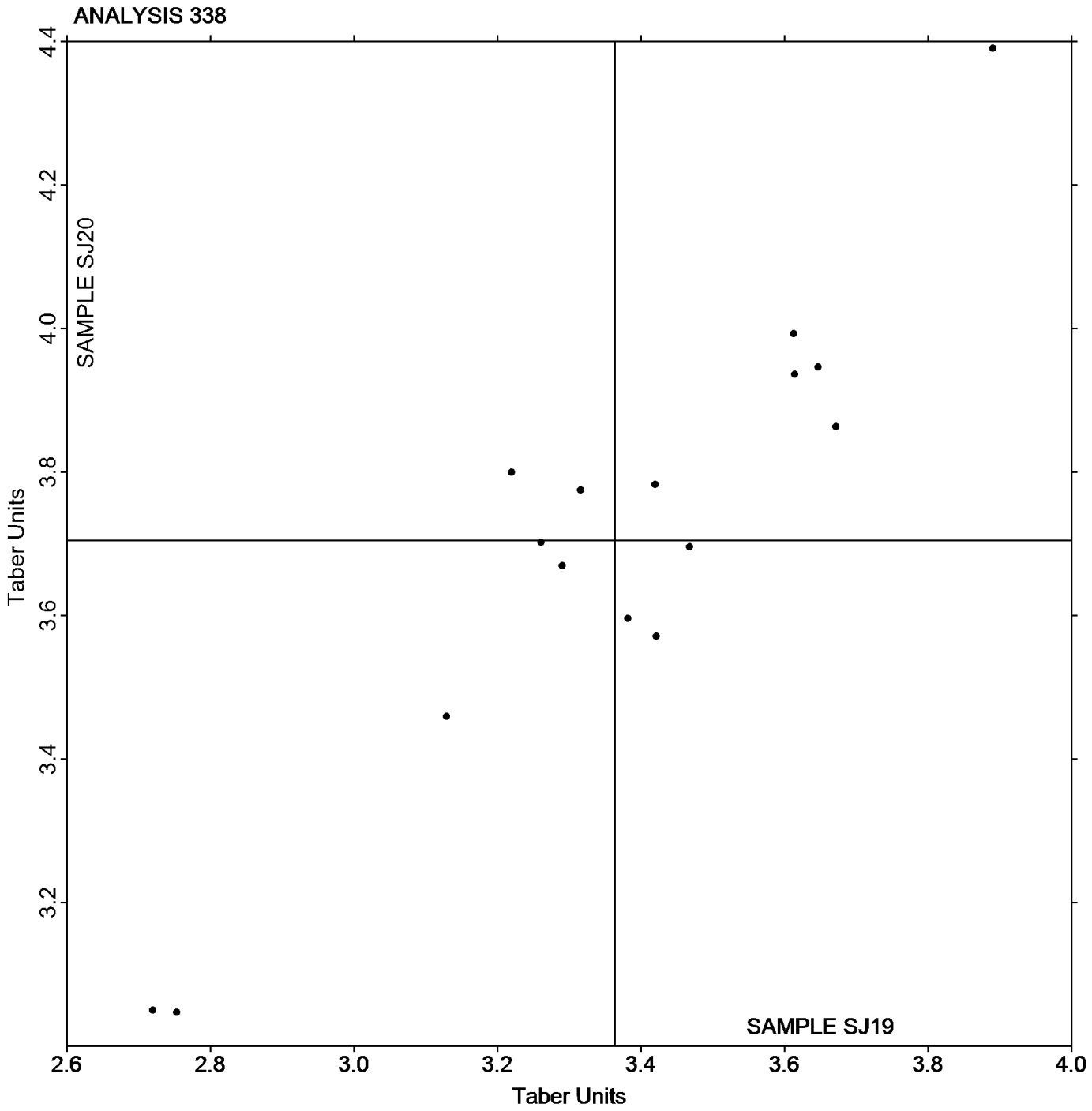
TAPPI-CTS Interlaboratory Testing Program

Analysis 338

Bending Resistance, Taber Type - 0 to 10 Units

Grand Mean Sample **SJ19** = 3.3634 Taber Units

Grand Mean Sample **SJ20** = 3.7047 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 SQ19 Lab Mean	Sample SQ19 Diff from Grand Mean	Sample SQ19 CPV	Sample SQ20 Lab Mean	Sample SQ20 Diff from Grand Mean	Sample SQ20 CPV
DUHKWE		123.7	-5.9	-0.84	233.6	-4.8	-0.47
EU2TG3		138.9	9.3	1.32	254.9	16.5	1.60
FL4LDN		130.0	0.4	0.05	236.5	-1.9	-0.19
HPGVMW		126.3	-3.3	-0.47	234.3	-4.1	-0.40
JRHGR9	X	45.4	-84.1	-11.94	79.4	-159.0	-15.47
LE7RRA		134.0	4.4	0.63	239.7	1.3	0.13
LTKX2N		134.5	4.9	0.70	248.5	10.1	0.98
RFYWN4		126.5	-3.1	-0.44	231.8	-6.6	-0.65
UF7T8Y		135.7	6.1	0.87	249.7	11.3	1.10
X92TL3		131.6	2.0	0.28	235.5	-2.9	-0.28
XYRLKT		114.8	-14.8	-2.10	219.7	-18.7	-1.82

Summary Statistics

	Sample SQ19	Sample SQ20
Grand Means	129.58 Taber Units	238.40 Taber Units
SD Btwn Labs	7.04 Taber Units	10.28 Taber Units

Statistics based on 10 of 11 reporting participants

Comments on assigned Data Flags for Test #339

JRHGR9 (X) - Extreme data.

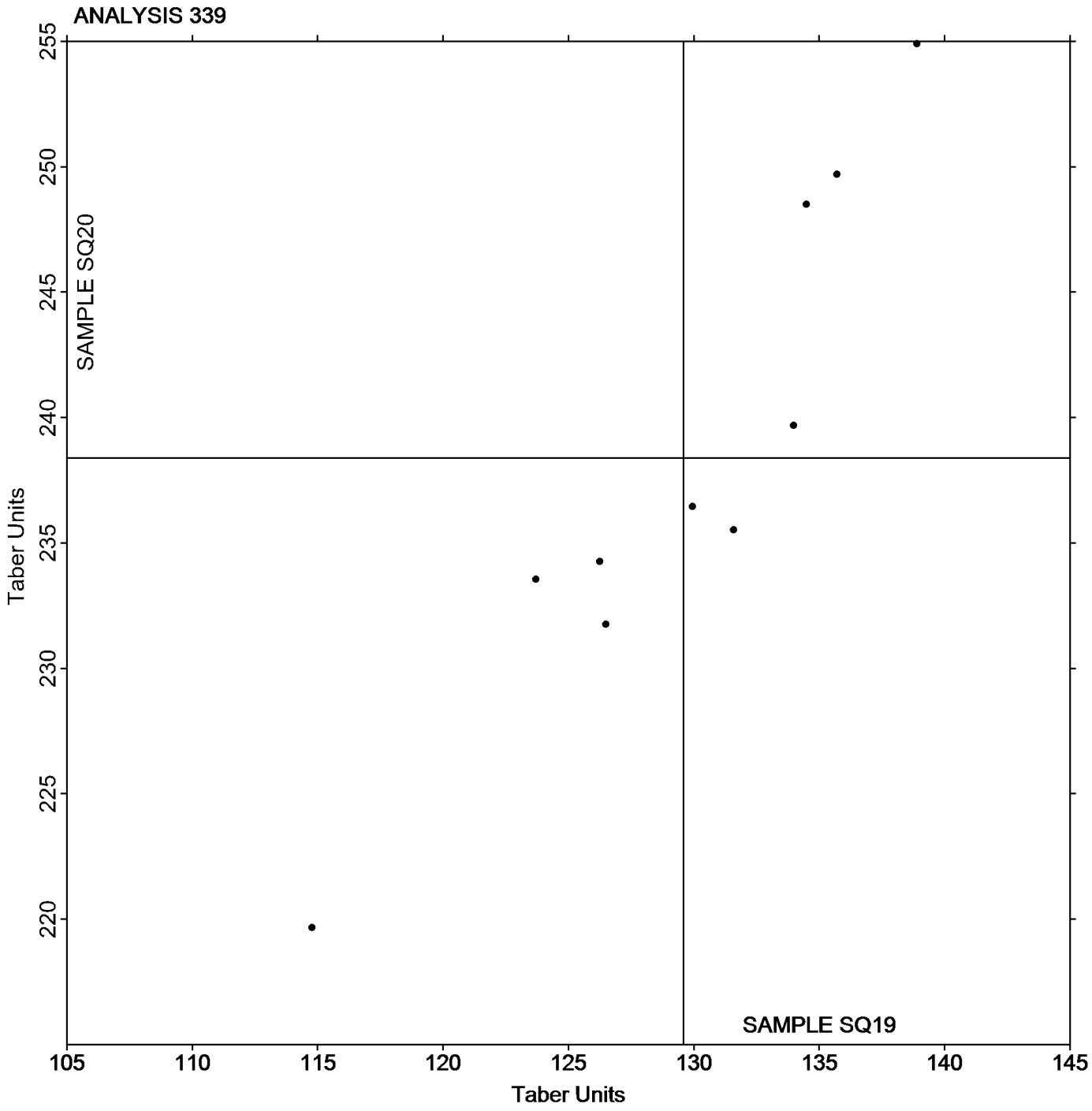
TAPPI-CTS Interlaboratory Testing Program

Analysis 339

Bending Resistance, Taber Type - 10 to 100 Taber Units

Grand Mean Sample **SQ19** = 129.58 Taber Units

Grand Mean Sample **SQ20** = 238.40 Taber Units



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

TAPPI-CTS Interlaboratory Testing Program

Analysis 340

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

WebCode	Data Flag	Sample ST19 Lab Mean	Sample ST19 Diff from Grand Mean	Sample ST19 CPV	Sample ST20 Lab Mean	Sample ST20 Diff from Grand Mean	Sample ST20 CPV
3RF2QJ		296.7	4.4	0.25	250.0	2.2	0.12
4UZAB4		285.0	-7.3	-0.41	247.3	-0.6	-0.03
63Q8EH		312.5	20.2	1.13	242.5	-5.3	-0.30
8CJJFZ	X	363.9	71.6	4.01	399.2	151.3	8.60
9HL42W		325.4	33.1	1.85	292.7	44.8	2.55
9UG6UZ		283.0	-9.3	-0.52	255.0	7.2	0.41
ACGJFC		272.2	-20.1	-1.13	236.7	-11.1	-0.63
H6LKFN		284.7	-7.6	-0.42	232.9	-14.9	-0.85
HPGVMW		274.8	-17.6	-0.98	246.3	-1.6	-0.09
HQ6MC9		292.5	0.2	0.01	256.8	9.0	0.51
HWWL3W		291.0	-1.3	-0.07	251.5	3.7	0.21
KZ6WW3		288.0	-4.3	-0.24	243.1	-4.7	-0.27
Q47ZZK		279.6	-12.7	-0.71	223.0	-24.8	-1.41
QQF7QC		333.2	40.9	2.29	274.2	26.4	1.50
R9TAMN		283.3	-9.0	-0.50	235.1	-12.7	-0.72
YVP8B9		282.6	-9.8	-0.55	230.6	-17.2	-0.98

Summary Statistics

	Sample ST19	Sample ST20
Grand Means	292.30 Taber Units	247.84 Taber Units
SD Btwn Labs	17.85 Taber Units	17.59 Taber Units

Statistics based on 15 of 16 reporting participants

Comments on assigned Data Flags for Test #340

8CJJFZ (X) - Extreme data.

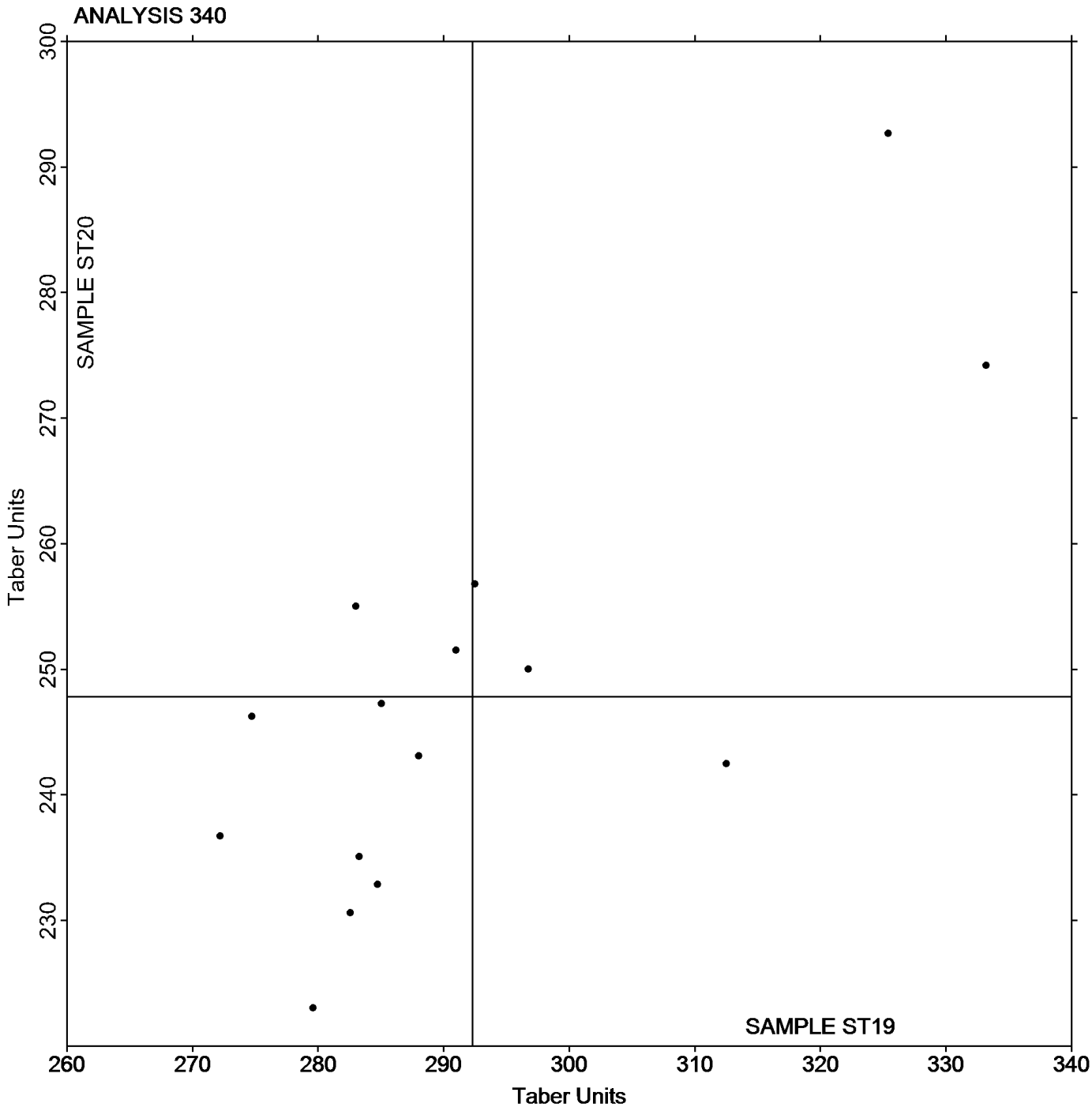
TAPPI-CTS Interlaboratory Testing Program

Analysis 340

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

Grand Mean Sample **ST19** = 292.30 Taber Units

Grand Mean Sample **ST20** = 247.84 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 SM19 Lab Mean	Sample SM19 Diff from Grand Mean	Sample SM19 CPV	Sample SM20 Lab Mean	Sample SM20 Diff from Grand Mean	Sample SM20 CPV	Instr Code
27XDHR		66.86	-8.90	-1.13	43.31	-14.21	-2.08	LW
4UZAB4		85.24	9.48	1.20	65.66	8.14	1.19	CA
4Y9VY2		78.96	3.20	0.41	55.58	-1.94	-0.28	CD
6JDTXM		80.74	4.98	0.63	59.52	2.00	0.29	TA
7J8XQM		77.00	1.24	0.16	63.88	6.36	0.93	TL
EU2TG3		83.28	7.52	0.95	62.54	5.02	0.73	LW
FL4LDN		91.62	15.86	2.01	68.82	11.30	1.65	TA
JRHGR9		65.72	-10.04	-1.27	47.37	-10.15	-1.48	LW
KNW67N		64.68	-11.08	-1.40	49.34	-8.18	-1.20	DT
LE7RRA		76.21	0.45	0.06	54.39	-3.13	-0.46	TZ
LNQYRY		74.06	-1.70	-0.22	56.02	-1.50	-0.22	DT
NTZYYB		81.00	5.24	0.66	57.00	-0.52	-0.08	XX
Q47ZZK	*	67.79	-7.97	-1.01	66.46	8.94	1.31	XX
R9TAMN		63.86	-11.90	-1.51	54.64	-2.88	-0.42	LW
RNPCET		75.50	-0.26	-0.03	59.00	1.48	0.22	DT
UF7T8Y		80.70	4.94	0.63	58.88	1.36	0.20	TA
X92TL3		74.68	-1.08	-0.14	55.40	-2.12	-0.31	LW

Summary Statistics

	Sample SM19	Sample SM20
Grand Means	75.759 psi	57.518 psi
SD Btwn Labs	7.900 psi	6.839 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

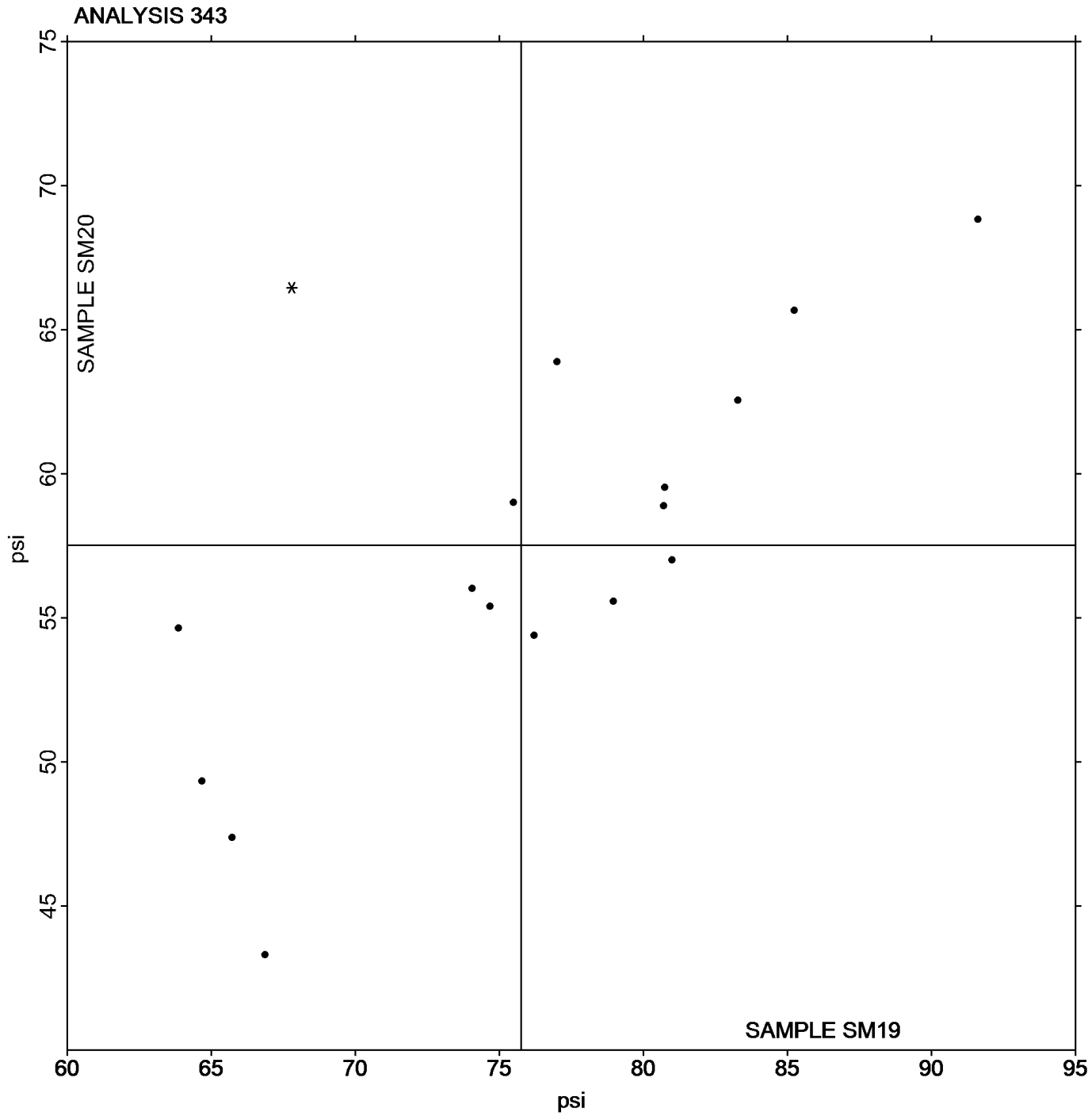
TAPPI-CTS Interlaboratory Testing Program

Analysis 343

Z-Direction Tensile

Grand Mean Sample **SM19** = 75.759 psi

Grand Mean Sample **SM20** = 57.518 psi



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 SZ19 Lab Mean	Sample SZ19 Diff from Grand Mean	Sample SZ19 CPV	Sample SZ20 Lab Mean	Sample SZ20 Diff from Grand Mean	Sample SZ20 CPV	Instr Code
63Q8EH		38.40	3.08	1.28	43.00	3.10	1.01	CA
6APWU2		34.20	-1.12	-0.47	39.40	-0.50	-0.16	LW
6LFQ4A		35.84	0.52	0.22	35.98	-3.92	-1.28	LW
6MT8E3		32.75	-2.57	-1.07	39.02	-0.88	-0.29	XX
7FBABF		33.98	-1.34	-0.56	40.04	0.14	0.05	CA
8CJJFZ		35.63	0.31	0.13	41.11	1.21	0.40	TZ
9HL42W		36.40	1.08	0.45	41.20	1.30	0.42	CA
ACGJFC		37.00	1.68	0.70	38.80	-1.10	-0.36	CA
AQWUVM		33.56	-1.76	-0.73	39.02	-0.88	-0.29	TL
GH4KYC		38.97	3.65	1.52	43.84	3.94	1.28	PG
HQ6MC9		36.30	0.98	0.41	44.98	5.08	1.66	TL
KXGERW		33.00	-2.32	-0.97	35.10	-4.80	-1.56	TL
KZ6WW3		38.68	3.36	1.40	33.64	-6.26	-2.04	CA
QQF7QC		35.20	-0.12	-0.05	38.80	-1.10	-0.36	TL
TZJVTY		37.44	2.12	0.88	43.60	3.70	1.21	TL
W9LEFD		30.60	-4.72	-1.97	39.82	-0.08	-0.03	LW
YVP8B9		32.50	-2.82	-1.17	40.90	1.00	0.33	CA

Summary Statistics

	Sample SZ19	Sample SZ20
Grand Means	35.320 psi	39.897 psi
SD Btwn Labs	2.401 psi	3.068 psi

Statistics based on 17 of 17 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

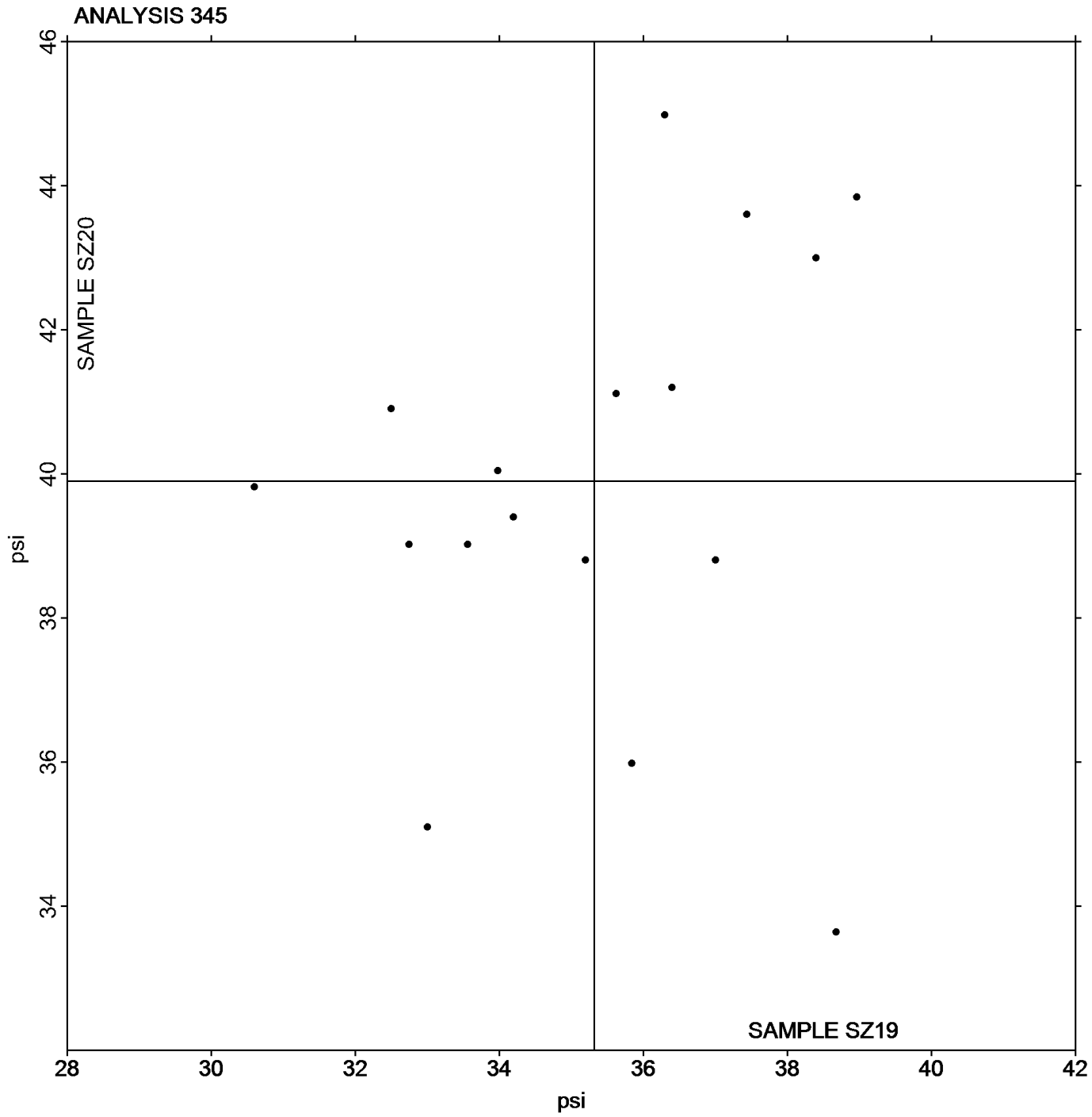
TAPPI-CTS Interlaboratory Testing Program

Analysis 345

Z-Direction Tensile, Recycled Paperboard

Grand Mean Sample **SZ19** = 35.320 psi

Grand Mean Sample **SZ20** = 39.897 psi



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 SN19 Lab Mean	Sample SN19 Diff from Grand Mean	Sample SN19 CPV	Sample SN20 Lab Mean	Sample SN20 Diff from Grand Mean	Sample SN20 CPV	Instr Code
4Y9VY2		101.20	3.31	0.41	80.60	4.39	0.65	HY
678LWW		95.00	-2.89	-0.36	81.04	4.83	0.72	HZ
6JDTXM		112.20	14.31	1.77	87.60	11.39	1.70	HY
9HL42W		82.16	-15.73	-1.95	63.92	-12.29	-1.83	HY
CN2LAN		96.23	-1.66	-0.21	75.39	-0.82	-0.12	KR
EU2TG3		108.20	10.31	1.28	87.00	10.79	1.61	XX
FL4LDN		95.60	-2.29	-0.28	77.60	1.39	0.21	HZ
HCA8CE		93.20	-4.69	-0.58	76.04	-0.17	-0.03	HY
HYGT3J		98.00	0.11	0.01	73.80	-2.41	-0.36	HY
JLCMXD		95.80	-2.09	-0.26	66.60	-9.61	-1.43	HY
LE7RRA		101.40	3.51	0.43	76.20	-0.01	0.00	HY
M7644G		96.60	-1.29	-0.16	76.80	0.59	0.09	HY
P88LG4		101.00	3.11	0.39	76.20	-0.01	0.00	HZ
QFYEBE		93.60	-4.29	-0.53	70.60	-5.61	-0.84	HY
R9TAMN		82.60	-15.29	-1.90	67.20	-9.01	-1.34	HZ
UF7T8Y		111.20	13.31	1.65	88.00	11.79	1.76	HY
X2ECKC		94.80	-3.09	-0.38	73.80	-2.41	-0.36	HY
X92TL3		94.20	-3.69	-0.46	72.80	-3.41	-0.51	HY
YVP8B9		107.00	9.11	1.13	76.80	0.59	0.09	HZ

Summary Statistics

	Sample SN19	Sample SN20
Grand Means	97.894 1000th ft-lbs	76.210 1000th ft-lbs
SD Btwn Labs	8.067 1000th ft-lbs	6.710 1000th ft-lbs

Statistics based on 19 of 19 reporting participants

Instrument Code List

(HY) - Huygen Digitized Scott Internal Bond Tester

(HZ) - Huygen Internal Bond Tester with AccuPress

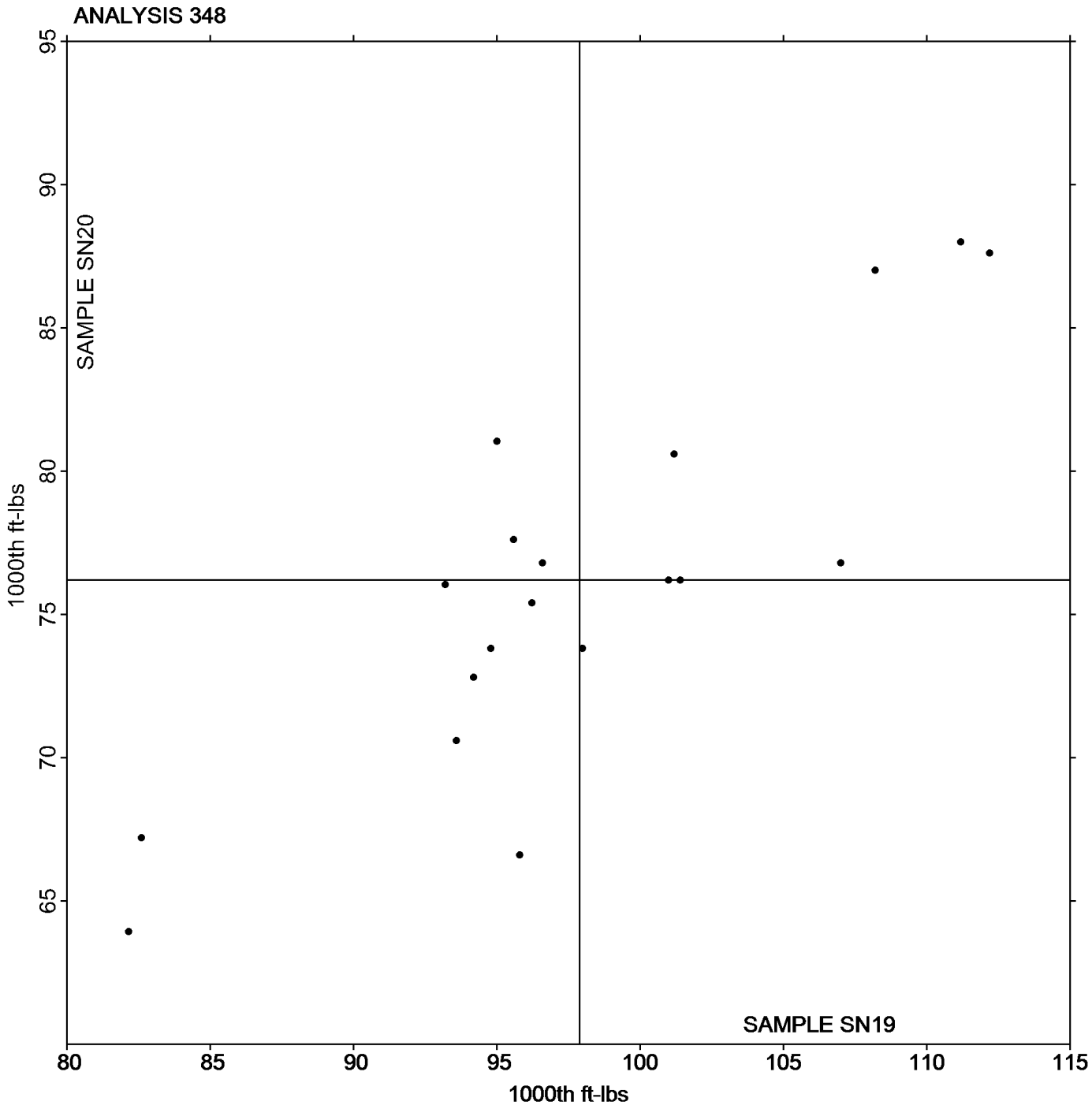
(KR) - Kumagai Riki Kogyo Internal Bond Tester

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

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

Grand Mean Sample **SN19** = 97.894 1000th ft-lbs

Grand Mean Sample **SN20** = 76.210 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.

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

WebCode	Data Flag	Sample SP19 Lab Mean	Sample SP19 Diff from Grand Mean	Sample SP19 CPV	Sample SP20 Lab Mean	Sample SP20 Diff from Grand Mean	Sample SP20 CPV	Instr Code
E6ZLRE		83.75	-0.99	-0.10	70.55	5.25	0.83	TM
GH4KYC		96.00	11.26	1.11	72.20	6.90	1.10	TM
HPGVMW		100.10	15.36	1.52	68.30	3.00	0.48	SC
JJ3LQK		75.99	-8.75	-0.86	57.61	-7.69	-1.22	TM
KXGERW	X	61.80	-22.94	-2.27	36.20	-29.10	-4.62	TM
Q47ZZK		72.23	-12.51	-1.24	55.86	-9.43	-1.50	TM
RV8QFD		84.51	-0.23	-0.02	67.57	2.27	0.36	XX
Z29UK4		80.60	-4.14	-0.41	65.00	-0.30	-0.05	TM

Summary Statistics

	Sample SP19	Sample SP20
Grand Means	84.741 1000th ft-lbs	65.299 1000th ft-lbs
SD Btwn Labs	10.115 1000th ft-lbs	6.293 1000th ft-lbs

Statistics based on 7 of 8 reporting participants

Comments on assigned Data Flags for Test #349

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

Instrument Code List

(SC) - Scott Internal Bond Tester (Manual)

(TM) - TMI Monitor/Internal Bond Tester

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

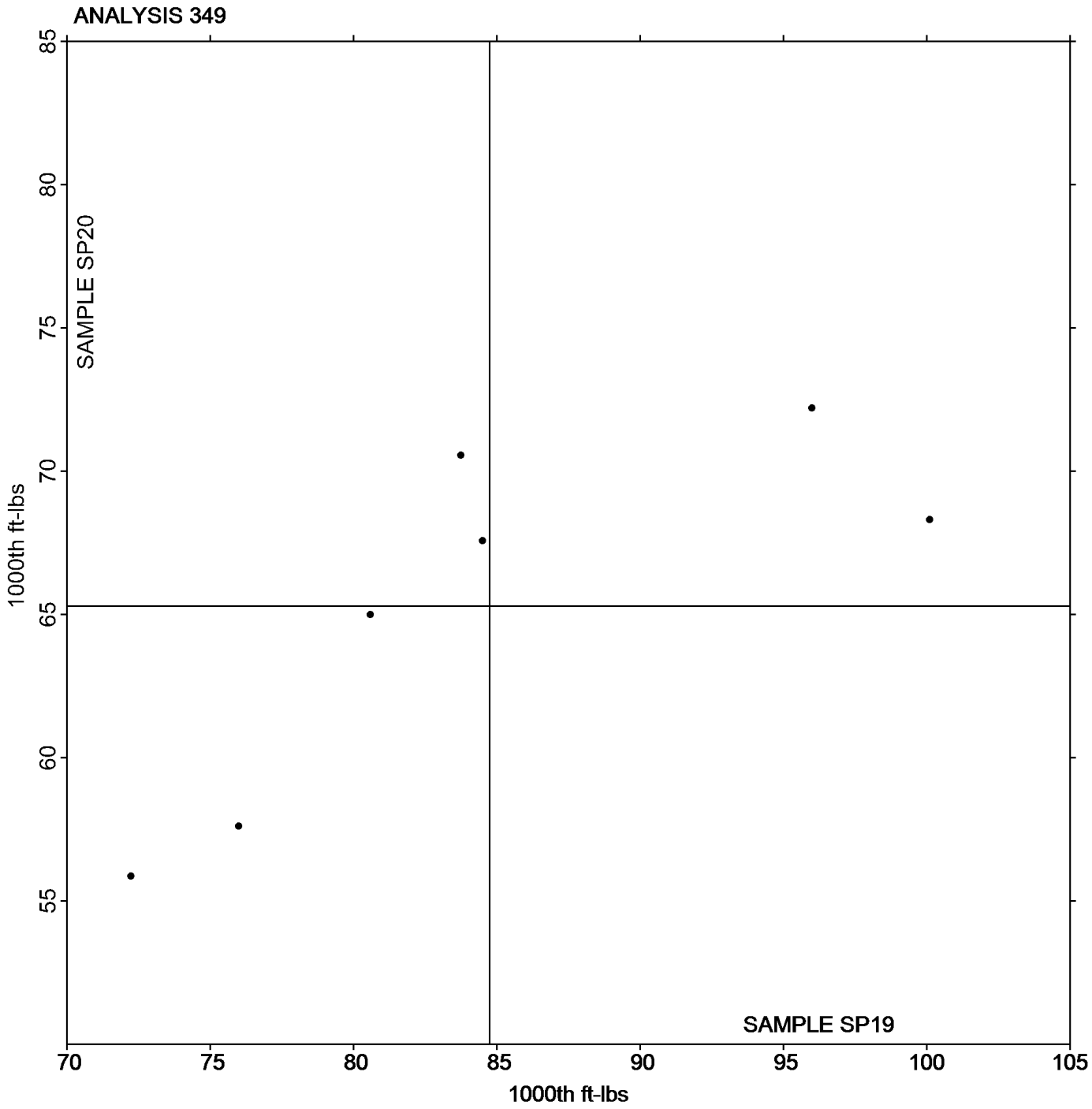
TAPPI-CTS Interlaboratory Testing Program

Analysis 349

Internal Bond Strength - Scott Bond Models

Grand Mean Sample **SP19** = 84.741 1000th ft-lbs

Grand Mean Sample **SP20** = 65.299 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.