

Paper & Paperboard Interlaboratory Testing Program

Summary Report #277S - July 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.

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 SA21			Sample SA22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
29ANRC		26.59	-0.08	-0.03	28.96	-0.76	-0.32
2EVPVW		23.55	-3.12	-1.09	28.45	-1.27	-0.54
3J4J6Y	*	30.41	3.74	1.30	35.25	5.53	2.35
4J32NE		26.77	0.10	0.04	28.68	-1.03	-0.44
72ECLX		22.85	-3.82	-1.33	28.85	-0.87	-0.37
9JRQXC		25.08	-1.58	-0.55	28.30	-1.41	-0.60
A2MJJB		24.84	-1.83	-0.64	28.96	-0.75	-0.32
BNUC2Z		26.12	-0.54	-0.19	30.72	1.00	0.42
C2EB8T		24.75	-1.92	-0.67	28.49	-1.23	-0.52
DN4362		23.48	-3.18	-1.11	27.72	-2.00	-0.85
FL97LK		21.50	-5.17	-1.80	25.55	-4.17	-1.77
J3MWXF		26.22	-0.44	-0.15	29.22	-0.50	-0.21
JDZ6DT		26.43	-0.23	-0.08	29.11	-0.61	-0.26
JG3YGP		22.10	-4.56	-1.59	25.22	-4.49	-1.91
JWHXLQ		25.73	-0.94	-0.33	28.85	-0.87	-0.37
K4CLFY		28.75	2.08	0.73	32.65	2.93	1.24
MLKBZB		31.70	5.03	1.75	32.35	2.63	1.12
N4GDYQ		29.97	3.30	1.15	31.51	1.79	0.76
NJUTXF		31.80	5.13	1.79	31.90	2.18	0.93
PK33PD	*	32.81	6.15	2.14	35.92	6.20	2.63
Q2MBZF		26.97	0.30	0.10	30.36	0.64	0.27
QQP7EU		28.73	2.07	0.72	30.46	0.74	0.31
QTVXZG		25.54	-1.13	-0.39	28.27	-1.45	-0.61
UDN44N		27.79	1.12	0.39	30.34	0.63	0.27
VUQ8XE		27.80	1.13	0.39	30.43	0.71	0.30
VXR4RE		28.40	1.73	0.60	29.70	-0.02	-0.01
W3G3HF		26.30	-0.36	-0.13	29.17	-0.55	-0.23
WRGKYZ		23.89	-2.78	-0.97	27.15	-2.57	-1.09
WTVNVC		26.44	-0.23	-0.08	29.27	-0.45	-0.19

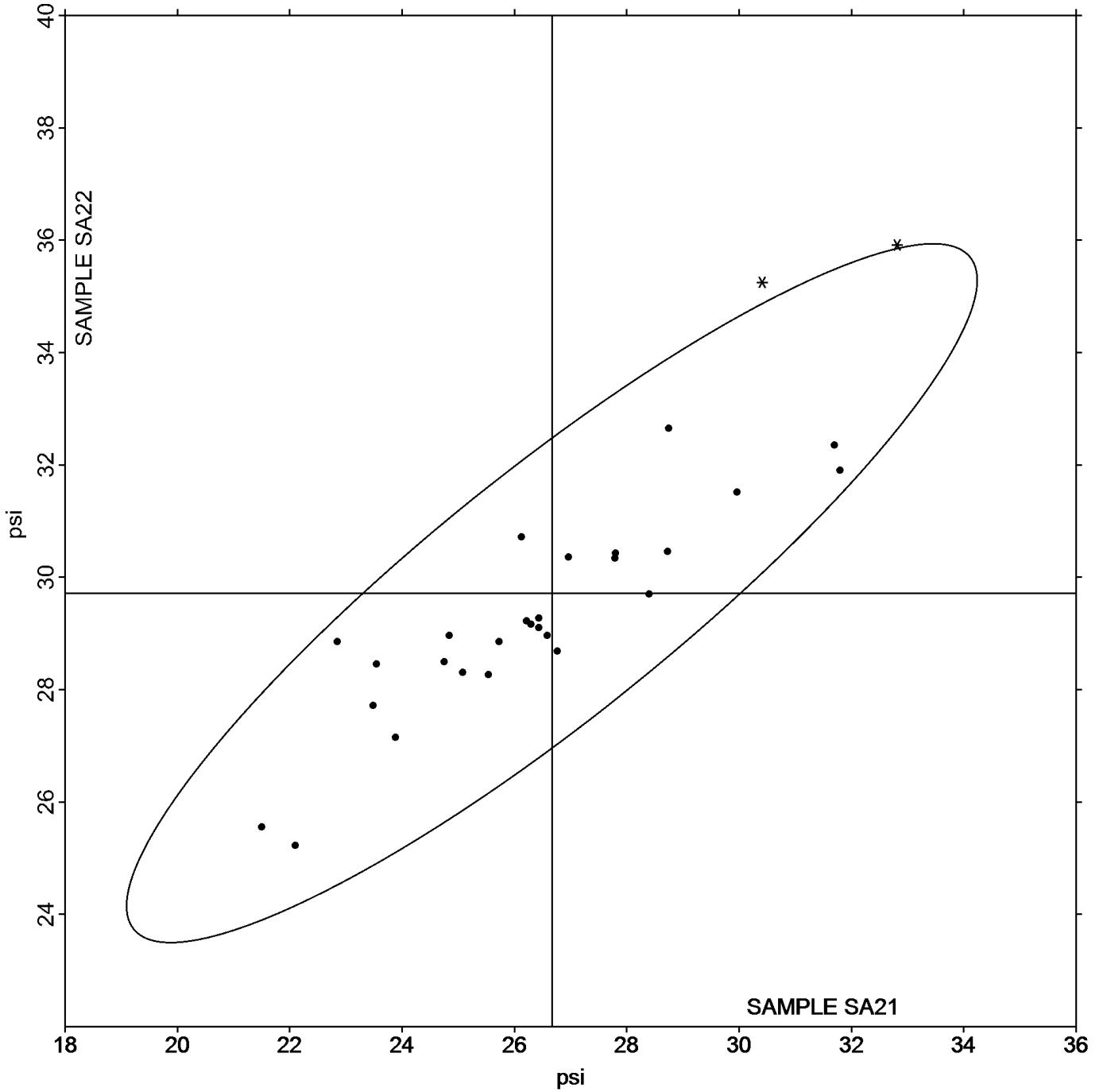
	Sample SA21	Summary Statistics	Sample SA22
Grand Means	26.666 psi		29.717 psi
SD Btwn Labs	2.870 psi		2.358 psi
Statistics based on 29 of 29 reporting participants			

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

Grand Mean Sample SA21 = 26.666 psi

Grand Mean Sample SA22 = 29.717 psi

ANALYSIS 305



TAPPI-CTS Interlaboratory Testing Program

Analysis 310

Bursting Strength - Packaging Papers

WebCode	Data Flag	Sample SB21			Sample SB22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
29ANRC		86.73	10.38	1.81	98.12	7.30	1.50
4EN9PA		73.33	-3.03	-0.53	87.81	-3.02	-0.62
4T9QHD		70.82	-5.53	-0.96	86.99	-3.83	-0.79
6U4J23		80.29	3.93	0.68	92.91	2.08	0.43
7PLQF3		78.90	2.54	0.44	94.90	4.07	0.84
ANZAW6		70.35	-6.01	-1.05	81.04	-9.78	-2.01
B2JBR3		73.48	-2.87	-0.50	88.57	-2.25	-0.46
CW3CRT		85.57	9.22	1.60	97.99	7.16	1.47
DHZ7CN		78.66	2.30	0.40	91.44	0.61	0.13
EM9YQK		69.81	-6.55	-1.14	89.60	-1.23	-0.25
F7GLRH		68.20	-8.16	-1.42	84.50	-6.33	-1.30
GXXLNQ		73.64	-2.72	-0.47	90.34	-0.48	-0.10
JEKPKK		80.33	3.97	0.69	98.60	7.77	1.60
KDERMU		87.70	11.34	1.97	98.50	7.67	1.58
LC47DK		78.90	2.54	0.44	97.35	6.52	1.34
MXJ9NA		72.80	-3.56	-0.62	87.15	-3.68	-0.76
MYT9TG		84.22	7.86	1.37	95.14	4.31	0.89
PK33PD		80.66	4.31	0.75	92.29	1.47	0.30
Q2MBZF		73.74	-2.62	-0.46	90.47	-0.35	-0.07
T6FW7A		69.65	-6.71	-1.17	86.37	-4.46	-0.92
UDN44N		71.71	-4.65	-0.81	90.90	0.07	0.01
Y82R8H		69.65	-6.71	-1.17	84.65	-6.18	-1.27
YVAZPY		75.30	-1.06	-0.18	89.20	-1.63	-0.33
ZEL36J		75.36	-0.99	-0.17	87.44	-3.38	-0.70
ZZ4AJX		79.11	2.75	0.48	88.37	-2.46	-0.51

Sample SB21

Summary Statistics

Sample SB22

Grand Means 76.356 psi
SD Btwn Labs 5.748 psi

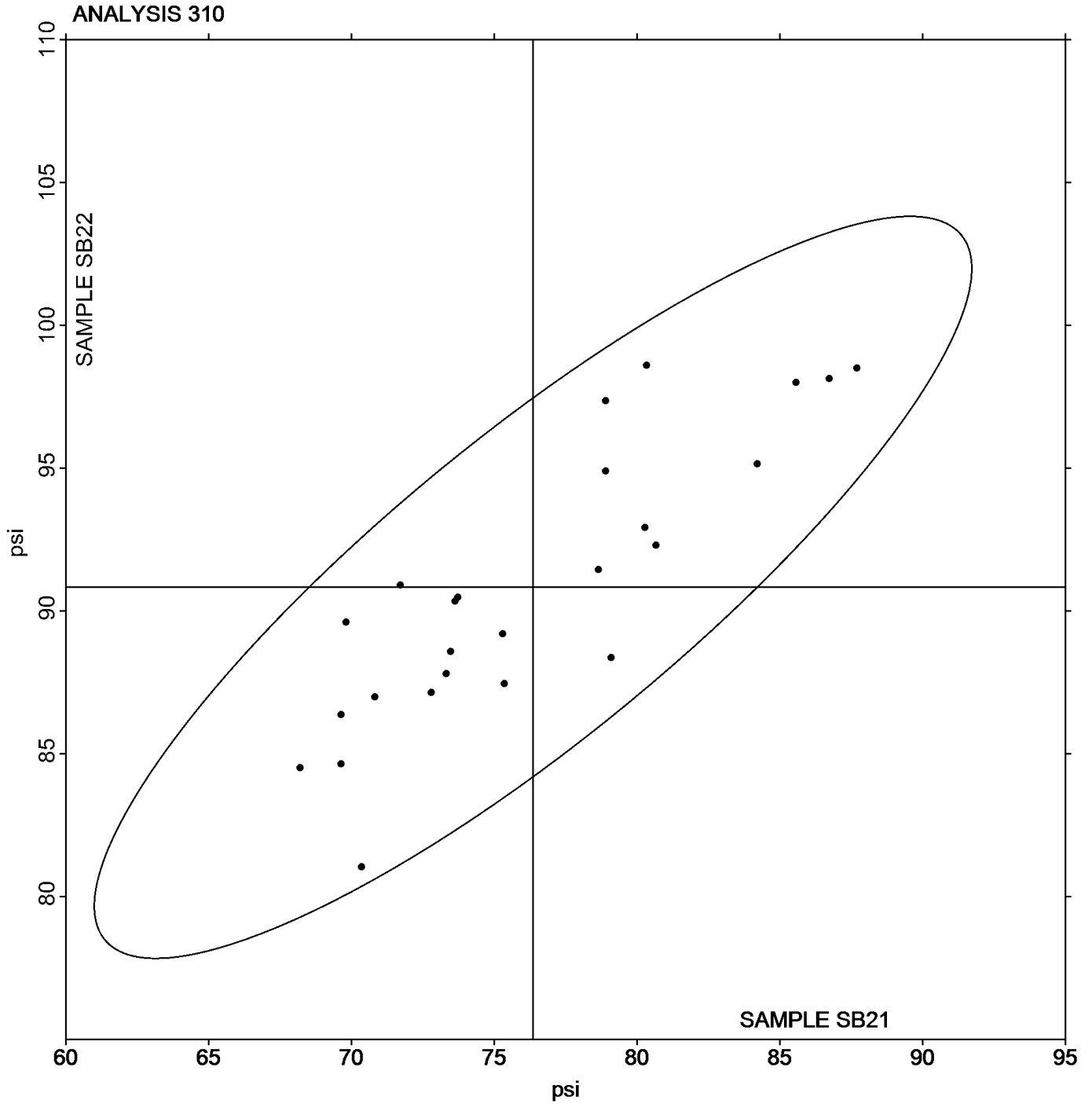
90.826 psi
4.859 psi

Statistics based on 25 of 25 reporting participants

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

Grand Mean Sample **SB21** = 76.356 psi

Grand Mean Sample **SB22** = 90.826 psi



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

WebCode	Data Flag	Sample SK21			Sample SK22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
8VMFHR	X	32.47	5.87	5.40	31.90	5.61	6.27
ETWJWK	X	32.88	6.28	5.77	32.41	6.12	6.84
EY3FDZ		26.99	0.40	0.36	26.36	0.08	0.09
HT6XRJ		27.64	1.05	0.96	27.35	1.07	1.19
N4GDYQ		27.66	1.07	0.98	27.03	0.75	0.83
Q2MBZF		25.89	-0.70	-0.65	25.78	-0.50	-0.56
Q3HWQL		26.53	-0.06	-0.06	26.33	0.05	0.05
W3G3HF		24.85	-1.74	-1.60	24.85	-1.43	-1.60

		Summary Statistics	
	Sample SK21		Sample SK22
Grand Means	26.593 Grams		26.283 Grams
SD Btwn Labs	1.089 Grams		0.896 Grams
Statistics based on 6 of 8 reporting participants			

Comments on assigned Data Flags for Test #311

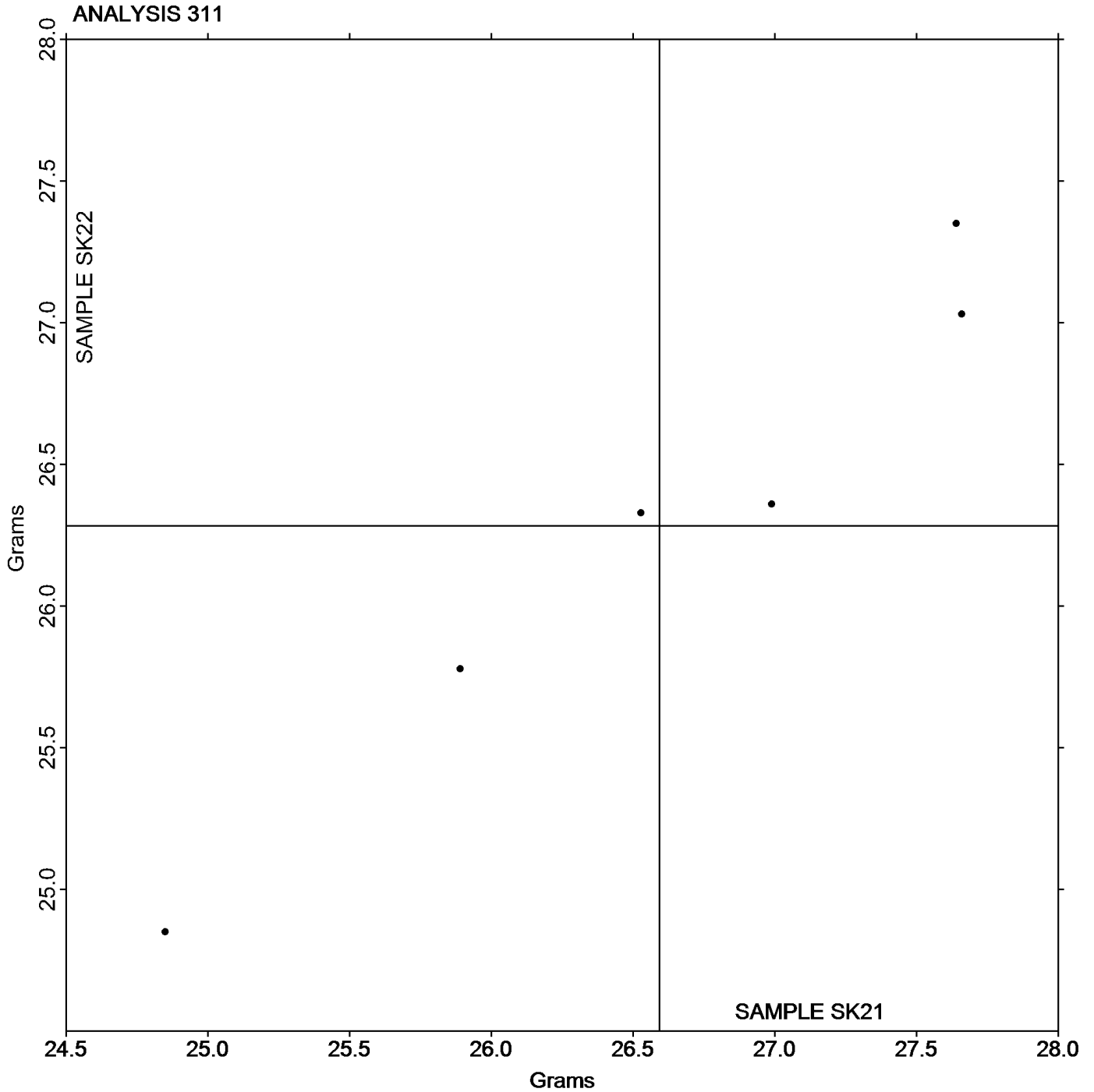
8VMFHR (X) - Extreme data.

ETWJWK (X) - Extreme data.

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

Grand Mean Sample **SK21** = 26.593 Grams

Grand Mean Sample **SK22** = 26.283 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 SC21			Sample SC22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
29ANRC		79.20	11.44	2.28	56.00	6.66	2.01
3JL8PE		66.47	-1.29	-0.26	47.55	-1.79	-0.54
3ZUCZX		64.39	-3.37	-0.67	44.53	-4.81	-1.45
4J32NE		78.92	11.16	2.22	55.10	5.76	1.74
4T9QHD		66.62	-1.14	-0.23	48.90	-0.44	-0.13
6DPMB9		58.71	-9.05	-1.80	47.71	-1.63	-0.49
6QHZWY	X	67.04	-0.72	-0.14	49.16	-0.18	-0.05
6U4J23		63.18	-4.58	-0.91	44.75	-4.59	-1.39
72ECLX		72.01	4.25	0.85	51.57	2.23	0.67
8743P8		68.91	1.15	0.23	50.52	1.18	0.36
8C7HR2		66.44	-1.32	-0.26	47.32	-2.02	-0.61
8UQ72V	*	56.92	-10.84	-2.16	48.60	-0.74	-0.22
9JRQXC		68.42	0.66	0.13	49.45	0.11	0.03
9LWED3	X	63.30	-4.46	-0.89	46.00	-3.34	-1.01
A2MJJB		71.70	3.94	0.79	51.78	2.44	0.74
A6LUEB		65.40	-2.36	-0.47	46.97	-2.37	-0.72
ANZAW6		64.80	-2.96	-0.59	46.20	-3.14	-0.95
B2JBR3		72.35	4.59	0.91	52.80	3.46	1.05
BJJBVV		59.24	-8.52	-1.70	42.36	-6.98	-2.11
C2EB8T		67.98	0.22	0.04	53.30	3.96	1.20
CK8476	X	111.60	43.84	8.73	68.20	18.86	5.70
CXHR6U	X	46.45	-21.31	-4.24	52.60	3.26	0.99
D7KDLT		70.92	3.16	0.63	50.88	1.54	0.47
DN4362	*	63.02	-4.73	-0.94	53.36	4.03	1.22
EXQLXZ		76.66	8.90	1.77	52.62	3.28	0.99
GXXLNQ		68.29	0.53	0.11	48.01	-1.33	-0.40
HQZACU		71.20	3.44	0.69	52.40	3.06	0.93
J3MWWF		71.74	3.98	0.79	49.55	0.21	0.06
JDZ6DT		66.60	-1.16	-0.23	46.30	-3.04	-0.92
JG3YGP		65.20	-2.56	-0.51	45.60	-3.74	-1.13
JWHXLQ		69.03	1.28	0.25	48.42	-0.91	-0.28
K4CLFY		68.80	1.04	0.21	49.84	0.50	0.15
KDERMU	X	65.00	-2.76	-0.55	47.20	-2.14	-0.65
KFQJMN		66.22	-1.54	-0.31	48.37	-0.97	-0.29
LC47DK		61.25	-6.51	-1.30	44.09	-5.25	-1.59
MLKBZB		62.52	-5.24	-1.04	44.24	-5.10	-1.54
MXJ9NA		65.04	-2.72	-0.54	44.80	-4.54	-1.37
PM9J6V		66.78	-0.98	-0.19	49.22	-0.12	-0.04
Q2MBZF		67.21	-0.55	-0.11	47.73	-1.61	-0.49
Q8F9WJ		73.24	5.48	1.09	50.26	0.92	0.28
QDYJZM	*	58.98	-8.78	-1.75	51.08	1.74	0.53
QQP7EU		66.41	-1.35	-0.27	46.04	-3.30	-1.00
QTVXZG		71.59	3.84	0.76	49.72	0.38	0.12

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

WebCode	Data Flag	Sample SC21			Sample SC22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
T6FW7A		76.24	8.49	1.69	54.12	4.78	1.44
UDN44N		64.62	-3.14	-0.62	46.49	-2.85	-0.86
UGALLA		76.40	8.64	1.72	55.00	5.66	1.71
UUFWTV		65.40	-2.36	-0.47	50.50	1.16	0.35
UV73B8		67.26	-0.50	-0.10	54.32	4.98	1.51
VC7JNJ		61.80	-5.96	-1.19	48.18	-1.16	-0.35
VUQ8XE		71.00	3.24	0.65	47.40	-1.94	-0.59
VXR4RE		68.42	0.66	0.13	47.78	-1.56	-0.47
WRGKYZ		69.60	1.84	0.37	52.00	2.66	0.80
WTVNVC		69.54	1.79	0.36	49.84	0.51	0.15
ZEL36J		63.72	-4.03	-0.80	47.97	-1.37	-0.41
ZWHTZC		71.48	3.72	0.74	55.38	6.04	1.83

	Sample SC21	Summary Statistics	Sample SC22
Grand Means	67.757 Grams		49.338 Grams
SD Btwn Labs	5.021 Grams		3.309 Grams
Statistics based on 50 of 55 reporting participants			

Comments on assigned Data Flags for Test #312

6QHZWY (X) - Data appear to be off by a factor of .5; data converted by CTS (x2).

9LWED3 (X) - Data appear to be off by a factor of .5; data converted by CTS (x2).

CK8476 (X) - Extreme data.

CXHR6U (X) - Data for Sample SC21 are low.

KDERMU (X) - Data appear to be off by a factor of .5; data converted by CTS (x2).

Analysis Notes:

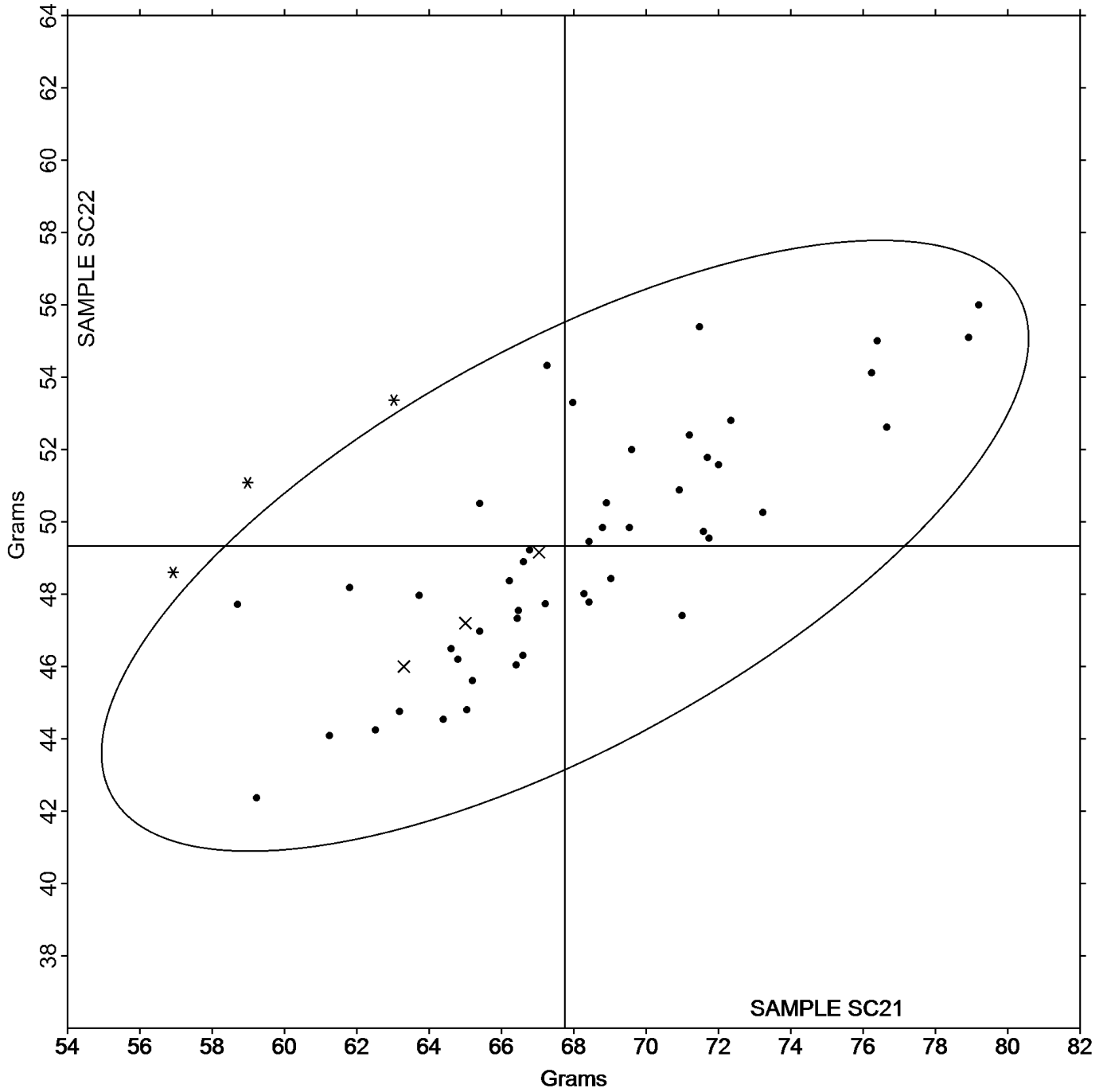
72ECLX - Data appears to be transposed between samples. Data Switched by CTS.

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

Grand Mean Sample **SC21** = 67.757 Grams

Grand Mean Sample **SC22** = 49.338 Grams

ANALYSIS 312



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

WebCode	Data Flag	Sample SD21			Sample SD22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
26PUTQ		86.92	-0.82	-0.19	86.00	-1.73	-0.39
2EVPVW		87.60	-0.14	-0.03	89.60	1.87	0.42
2J9EBY		77.94	-9.80	-2.23	78.35	-9.38	-2.10
3J4J6Y		84.20	-3.54	-0.81	87.60	-0.13	-0.03
3YK6X6	*	100.70	12.96	2.95	91.51	3.78	0.85
47WTZ6	X	66.28	-21.46	-4.89	72.40	-15.33	-3.43
4EN9PA		83.93	-3.81	-0.87	85.05	-2.68	-0.60
A4MWV3		91.24	3.51	0.80	86.81	-0.92	-0.21
C6WDEX	X	84.84	-2.90	-0.66	88.84	1.11	0.25
CW3CRT	X	112.80	25.06	5.71	88.60	0.87	0.20
DHZ7CN		93.36	5.62	1.28	93.51	5.78	1.29
EM9YQK		82.60	-5.14	-1.17	79.60	-8.13	-1.82
F6L3PG		89.84	2.10	0.48	91.97	4.24	0.95
F7GLRH		89.20	1.46	0.33	92.16	4.43	0.99
FKDMKJ	X	37.07	-50.67	-11.54	36.58	-51.14	-11.44
FL97LK		89.80	2.06	0.47	95.00	7.27	1.63
HVQGWN	X	87.33	-0.41	-0.09	81.25	-6.48	-1.45
HZJJZN		86.70	-1.04	-0.24	86.76	-0.97	-0.22
KDERMU	X	84.80	-2.94	-0.67	84.00	-3.73	-0.83
MKQRWN		96.57	8.83	2.01	92.56	4.83	1.08
MNXXKA		90.28	2.54	0.58	90.58	2.85	0.64
MYEKUB		87.01	-0.73	-0.17	83.80	-3.93	-0.88
Q2MBZF		87.31	-0.43	-0.10	88.92	1.19	0.27
Q3HWQL		83.40	-4.34	-0.99	86.24	-1.49	-0.33
RKYDJ7		88.08	0.34	0.08	93.46	5.73	1.28
TGTA8A		90.80	3.06	0.70	95.20	7.47	1.67
UP6QCP		85.26	-2.48	-0.56	84.06	-3.67	-0.82
VCCLL4		88.51	0.77	0.18	86.93	-0.80	-0.18
VXR4RE		82.48	-5.26	-1.20	83.52	-4.21	-0.94
W3LA2B		85.43	-2.31	-0.53	86.37	-1.36	-0.30
XYDEVD		85.41	-2.33	-0.53	83.28	-4.45	-1.00
XZVFN8		83.20	-4.54	-1.03	84.00	-3.73	-0.83
Y82R8H		87.80	0.06	0.01	91.80	4.07	0.91
YVAZPY		90.00	2.26	0.52	80.80	-6.93	-1.55
ZZ4AJX		87.74	0.00	0.00	88.03	0.30	0.07
ZZ4J43		88.80	1.06	0.24	88.38	0.65	0.15

Summary Statistics	
Sample SD21	Sample SD22
Grand Means	87.737 Grams
SD Btwn Labs	4.392 Grams
	87.728 Grams
	4.470 Grams
Statistics based on 30 of 36 reporting participants	

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

Comments on assigned Data Flags for Test #314

47WTZ6 (X) - Data for both samples are low.

C6WDEX (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).

CW3CRT (X) - Data for Sample SD21 are high. Inconsistent in testing within determinations for Sample SD21.

FKDMKJ (X) - Extreme data.

HVQGWN (X) - Data appear to be off by a factor of .5; data converted by CTS (x2).

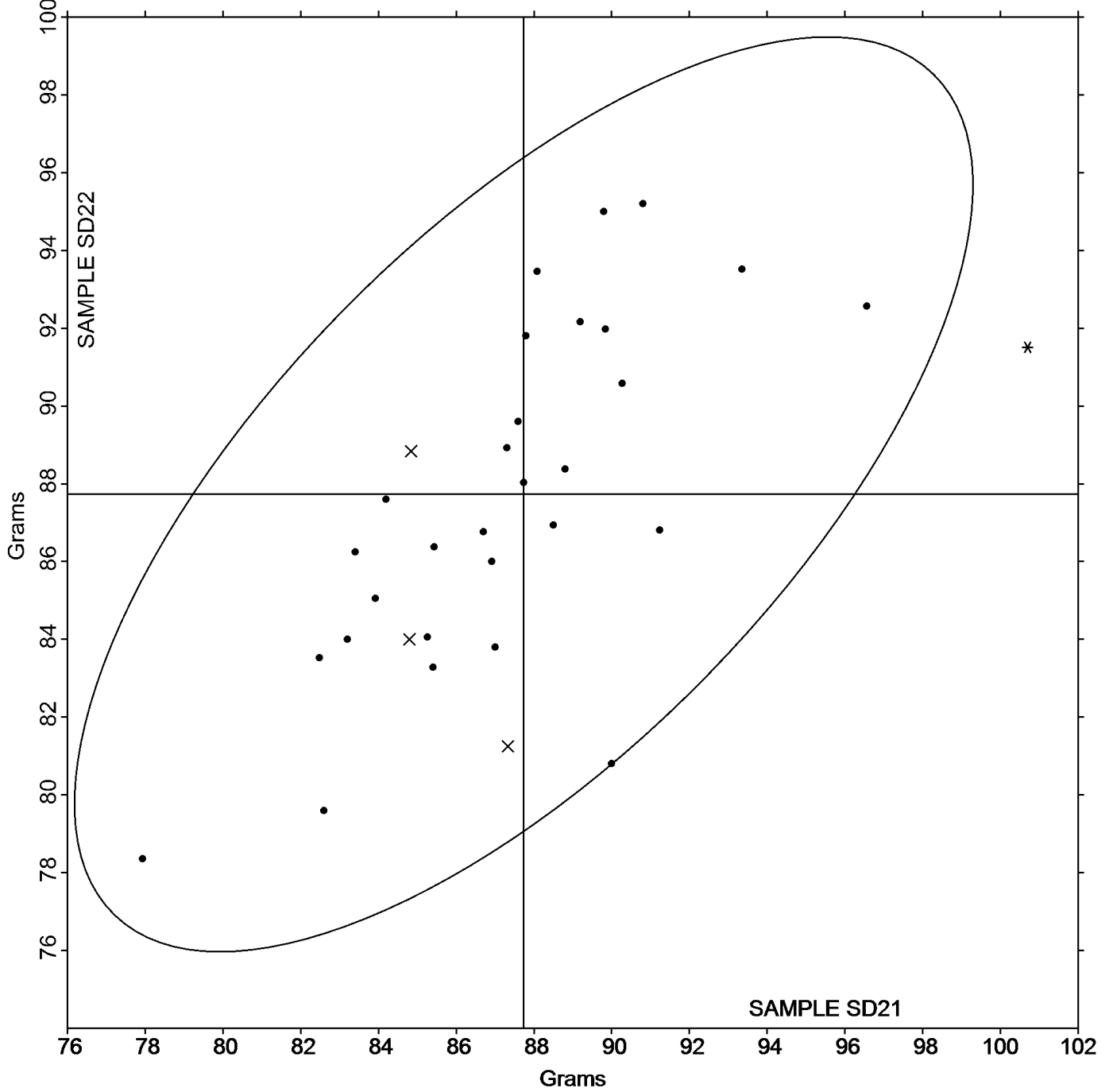
KDERMU (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).

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

Grand Mean Sample **SD21** = 87.737 Grams

Grand Mean Sample **SD22** = 87.728 Grams

ANALYSIS 314



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

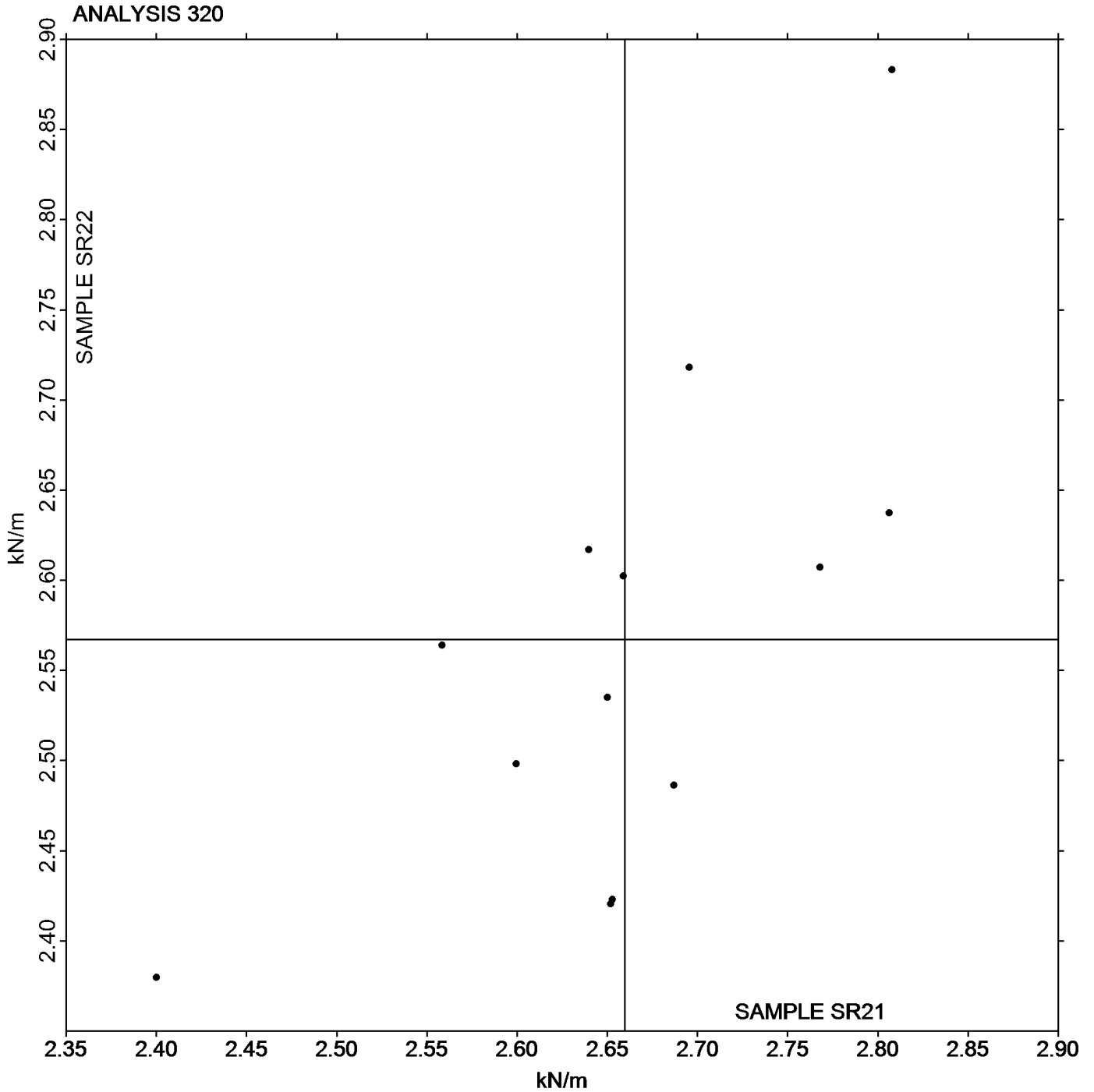
WebCode	Data Flag	Sample SR21			Sample SR22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
7PLQF3		2.600	-0.060	-0.56	2.498	-0.069	-0.51
8VMFHR		2.559	-0.101	-0.94	2.564	-0.003	-0.02
BNUC2Z		2.687	0.027	0.25	2.486	-0.081	-0.59
ETWJWK		2.696	0.036	0.33	2.718	0.151	1.11
EY3FDZ		2.650	-0.010	-0.09	2.535	-0.032	-0.24
HT6XRJ		2.652	-0.008	-0.07	2.421	-0.146	-1.08
N4GDYQ		2.768	0.108	1.01	2.607	0.040	0.30
Q3HWQL		2.659	-0.001	-0.01	2.602	0.035	0.26
UDN44N		2.653	-0.007	-0.06	2.423	-0.144	-1.06
VJT7KA		2.808	0.148	1.38	2.883	0.316	2.32
VUQ8XE		2.806	0.147	1.36	2.637	0.070	0.52
W3G3HF		2.640	-0.020	-0.18	2.617	0.050	0.37
ZJUR2X		2.400	-0.260	-2.41	2.380	-0.187	-1.38

		Summary Statistics	
	Sample SR21		Sample SR22
Grand Means	2.6598 kN/m		2.5670 kN/m
SD Btwn Labs	0.1077 kN/m		0.1362 kN/m
Statistics based on 13 of 13 reporting participants			

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

Grand Mean Sample **SR21** = 2.6598 kN/m

Grand Mean Sample **SR22** = 2.5670 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 SR21			Sample SR22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
7PLQF3		16.71	-0.67	-0.45	20.00	0.71	0.35
8VMFHR		14.34	-3.03	-2.04	17.69	-1.60	-0.78
BNUC2Z		18.45	1.07	0.72	17.62	-1.66	-0.81
ETWJWK		16.27	-1.11	-0.75	18.90	-0.38	-0.19
EY3FDZ		17.79	0.41	0.28	20.08	0.79	0.39
N4GDYQ		18.73	1.35	0.91	18.94	-0.35	-0.17
Q3HWQL		16.13	-1.25	-0.84	17.94	-1.34	-0.65
UDN44N		16.66	-0.71	-0.48	15.77	-3.52	-1.71
VJT7KA		18.46	1.09	0.73	23.87	4.58	2.24
VUQ8XE		19.61	2.24	1.51	20.10	0.81	0.40
W3G3HF		18.64	1.26	0.85	21.20	1.92	0.94
ZJUR2X		16.74	-0.64	-0.43	19.31	0.02	0.01

Summary Statistics

Sample SR21

Sample SR22

Grand Means 17.377 Joules/sq m
SD Btwn Labs 1.486 Joules/sq m

19.285 Joules/sq m
2.050 Joules/sq m

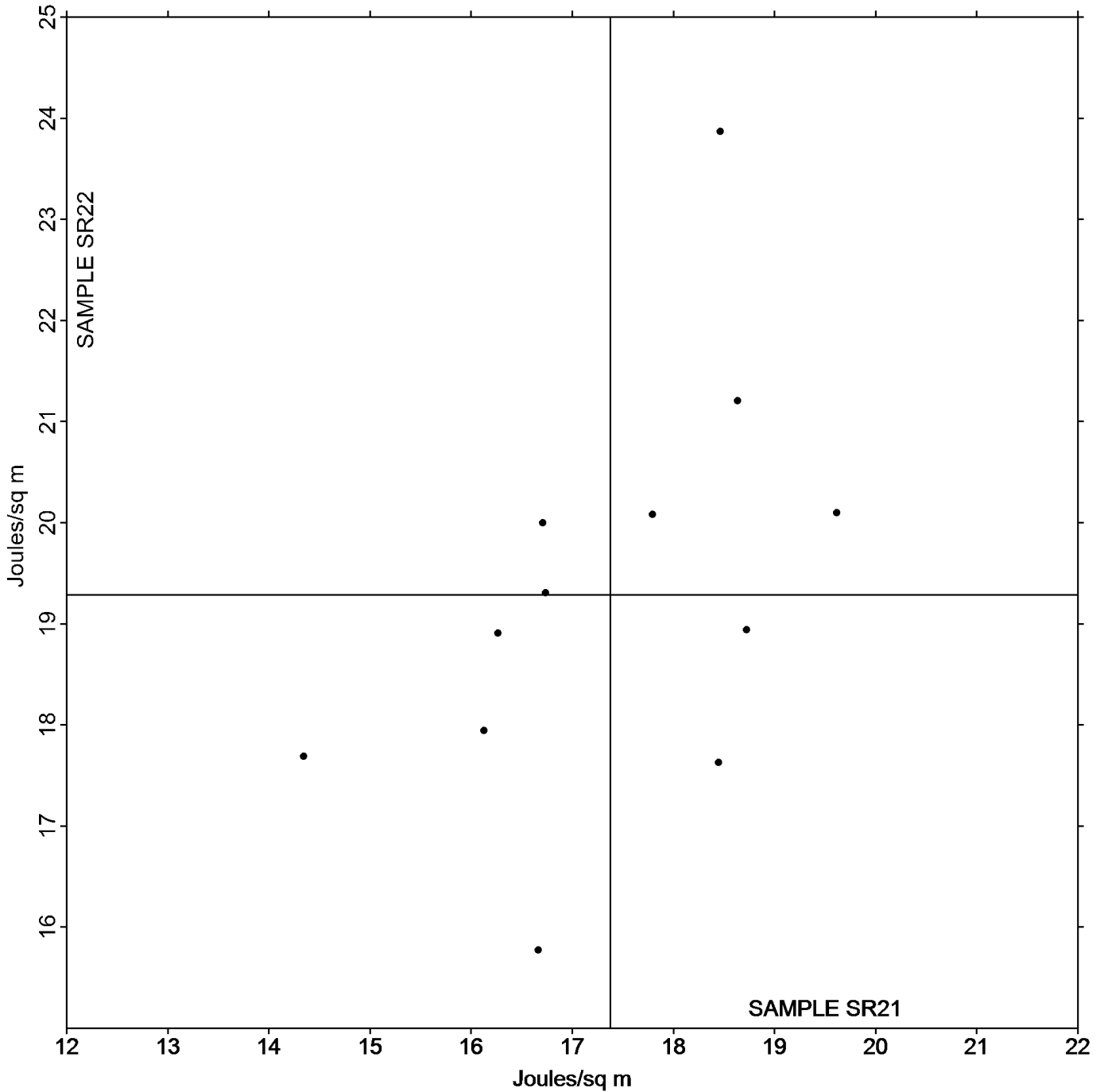
Statistics based on 12 of 12 reporting participants

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

Grand Mean Sample **SR21** = 17.377 Joules/sq m

Grand Mean Sample **SR22** = 19.285 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

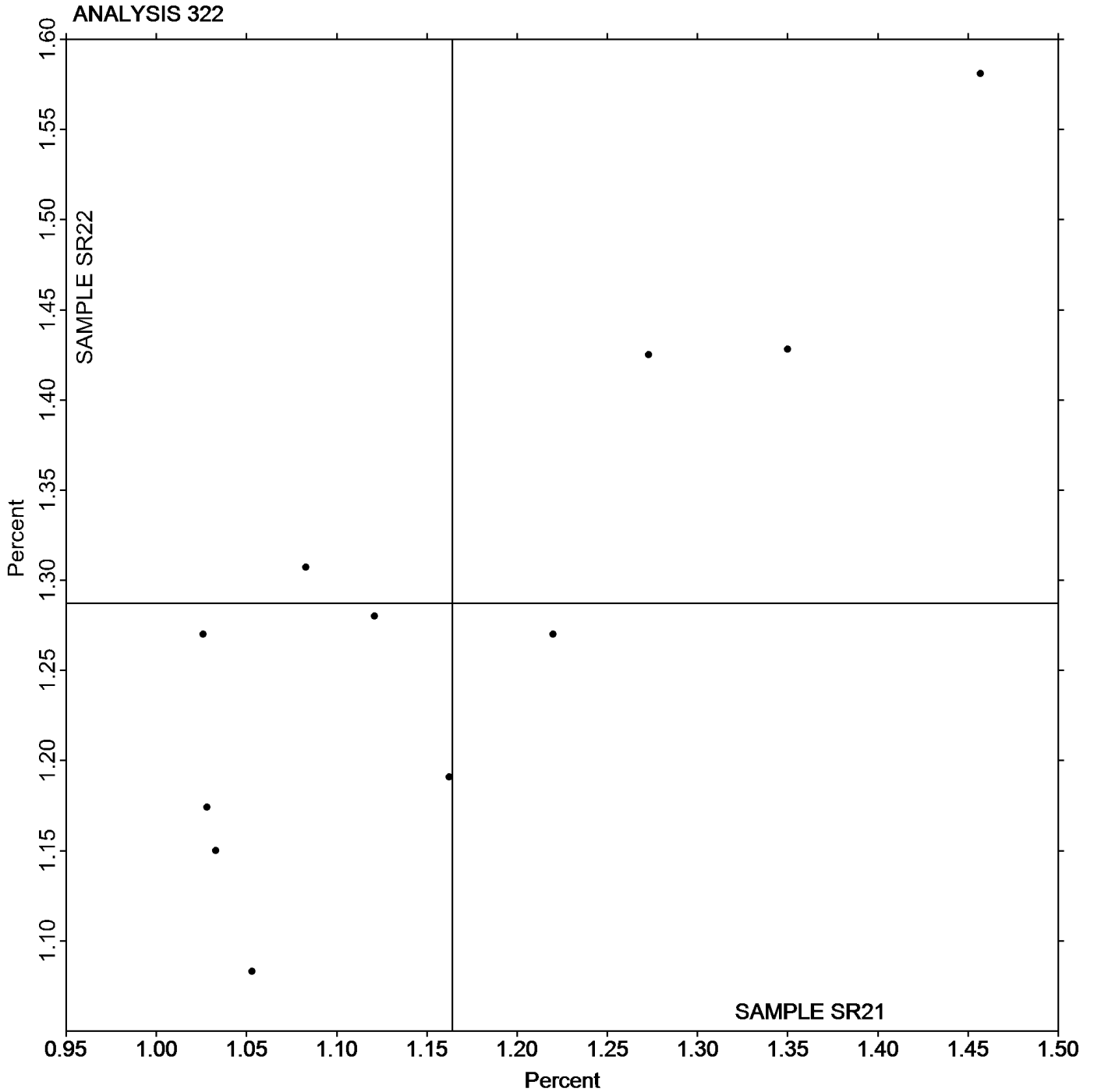
WebCode	Data Flag	Sample SR21			Sample SR22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
7PLQF3		1.083	-0.081	-0.56	1.307	0.020	0.14
BNUC2Z		1.162	-0.002	-0.01	1.191	-0.096	-0.67
ETWJWK		1.028	-0.136	-0.94	1.174	-0.113	-0.78
EY3FDZ		1.121	-0.043	-0.30	1.280	-0.007	-0.05
N4GDYQ		1.350	0.186	1.28	1.428	0.141	0.97
Q3HWQL		1.033	-0.131	-0.90	1.150	-0.137	-0.95
UDN44N		1.053	-0.111	-0.77	1.083	-0.204	-1.41
VJT7KA		1.026	-0.138	-0.95	1.270	-0.017	-0.12
VUQ8XE		1.220	0.056	0.38	1.270	-0.017	-0.12
W3G3HF		1.457	0.293	2.02	1.581	0.294	2.03
ZJUR2X		1.273	0.109	0.75	1.425	0.138	0.95

		Summary Statistics	
		Sample SR21	Sample SR22
Grand Means		1.1642 Percent	1.2872 Percent
SD Btwn Labs		0.1452 Percent	0.1445 Percent
Statistics based on 11 of 11 reporting participants			

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

Grand Mean Sample **SR21** = 1.1642 Percent

Grand Mean Sample **SR22** = 1.2872 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 SF21			Sample SF22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
29ANRC		5.539	-0.008	-0.03	4.692	-0.087	-0.32	DL
36768P		5.722	0.174	0.57	4.900	0.122	0.44	XX
3ZUCZX		5.842	0.295	0.96	4.745	-0.034	-0.12	LF
4J32NE	*	4.764	-0.783	-2.56	4.353	-0.426	-1.55	LH
4T9QHD		5.630	0.082	0.27	4.846	0.067	0.24	LH
67QXU4		5.448	-0.099	-0.32	4.349	-0.430	-1.56	LH
6DPMB9	*	6.063	0.516	1.68	5.458	0.680	2.48	TP
6QHZWY		5.650	0.102	0.33	4.814	0.036	0.13	TI
72ECLX		5.800	0.253	0.83	4.988	0.209	0.76	TO
8743P8		4.997	-0.550	-1.80	4.164	-0.615	-2.24	IM
8C7HR2		6.045	0.497	1.62	5.071	0.293	1.07	TB
8UQ72V		5.328	-0.219	-0.71	4.518	-0.261	-0.95	TB
8XDJBY		6.124	0.577	1.88	5.246	0.467	1.70	TJ
9JRQXC		5.459	-0.088	-0.29	4.564	-0.215	-0.78	IM
9LWED3		5.913	0.365	1.19	5.005	0.226	0.82	TO
9RGLQZ		5.077	-0.470	-1.54	4.394	-0.384	-1.40	RE
A2MJJB		4.931	-0.616	-2.01	4.323	-0.456	-1.66	ID
A6LUEB	*	5.546	-0.001	0.00	5.182	0.403	1.47	TJ
ANZAW6	*	5.491	-0.057	-0.19	5.193	0.414	1.51	TA
AQ3AW3		5.586	0.038	0.12	4.831	0.052	0.19	TB
BJJBVV		6.215	0.668	2.18	5.224	0.446	1.62	LH
C2EB8T		5.389	-0.159	-0.52	4.638	-0.141	-0.51	TB
CXHR6U		5.622	0.075	0.24	4.832	0.054	0.20	XX
D7KDLT		5.381	-0.166	-0.54	4.724	-0.055	-0.20	LX
DN4362		5.025	-0.522	-1.70	4.535	-0.243	-0.89	LA
EM9YQK		5.606	0.059	0.19	4.778	0.000	0.00	IM
EQ28QK		5.263	-0.285	-0.93	4.657	-0.122	-0.44	LA
EXQLXZ		5.521	-0.026	-0.09	4.587	-0.192	-0.70	LH
FQ7RDM		5.687	0.140	0.46	4.802	0.023	0.09	LI
FRE27K		5.663	0.116	0.38	4.797	0.019	0.07	XX
J3MWXF		5.796	0.249	0.81	4.944	0.166	0.60	LH
JG3YGP		6.005	0.458	1.49	5.294	0.515	1.88	LX
JWHXLQ		5.882	0.335	1.09	4.968	0.189	0.69	LH
K4CLFY		5.475	-0.073	-0.24	4.864	0.086	0.31	LH
KFQJMN		5.281	-0.266	-0.87	4.748	-0.031	-0.11	CB
LC47DK		5.729	0.181	0.59	4.606	-0.173	-0.63	TP
MLKBZB		5.651	0.104	0.34	4.804	0.025	0.09	TO
PM9J6V		5.604	0.057	0.19	4.766	-0.013	-0.05	LE
Q2MBZF		5.502	-0.046	-0.15	4.923	0.145	0.53	LH
Q8F9WJ		5.402	-0.145	-0.47	4.718	-0.061	-0.22	LI
QDYJZM		5.361	-0.186	-0.61	4.714	-0.065	-0.24	TF
QQP7EU	X	6.404	0.857	2.80	5.045	0.267	0.97	TJ
QTVXZG		5.341	-0.206	-0.67	4.551	-0.228	-0.83	LI

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

WebCode	Data Flag	Sample SF21			Sample SF22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
T6FW7A		5.167	-0.380	-1.24	4.506	-0.273	-0.99	LI
TRQ9UA		6.044	0.497	1.62	5.373	0.595	2.17	TB
UDN44N		5.420	-0.127	-0.42	4.624	-0.155	-0.56	LH
UKTPA7		5.511	-0.036	-0.12	4.560	-0.218	-0.80	TP
UUFWTV		5.354	-0.193	-0.63	4.531	-0.248	-0.90	TC
UV73B8		5.751	0.203	0.66	4.777	-0.002	-0.01	MR
VC7JNJ		5.622	0.075	0.25	4.786	0.007	0.03	XX
WRGKYZ		5.257	-0.290	-0.95	4.468	-0.311	-1.13	LH
WTVNVC		5.655	0.108	0.35	4.808	0.029	0.11	LH
ZEL36J		5.409	-0.138	-0.45	4.760	-0.018	-0.07	XX
ZWHTZC		5.460	-0.087	-0.28	4.961	0.183	0.67	LA

Summary Statistics			
	Sample SF21		Sample SF22
Grand Means	5.5473 kN/m		4.7785 kN/m
SD Btwn Labs	0.3065 kN/m		0.2745 kN/m
Statistics based on 53 of 54 reporting participants			

Comments on assigned Data Flags for Test #325

QQP7EU (X) - Inconsistent in testing between samples, data for Sample SF21 are high.

Instrument Code List

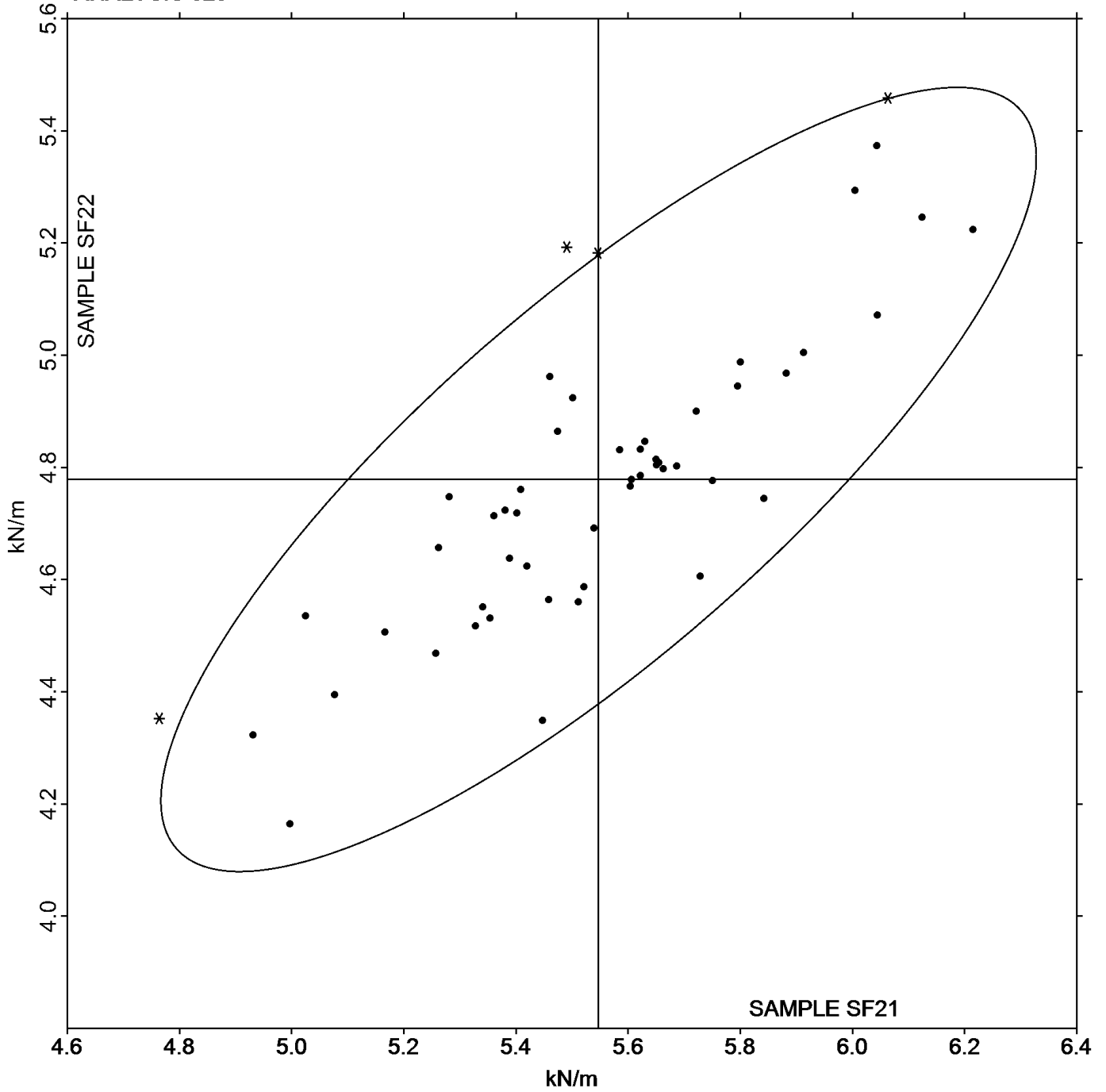
- | | |
|---|--|
| (CB) - Chatillon DFIS 50 (Digital Gauge)/TCD 200 | (DL) - EMIC DL500 Universal Testing Machines |
| (ID) - Instron 4201/4202 | (IM) - Instron 5500 Series |
| (LA) - L & W Tensile - Autoline 300 | (LE) - L & W Tensile Tester 066 |
| (LF) - L & W Tensile/Fracture Toughness Tester SE 064 | (LH) - L & W Alwetron TH1 (Horizontal) SE 060/065F |
| (LI) - L & W Tensile Tester SE 062 | (LX) - L & W (model not specified) |
| (MR) - MTS Alliance RT series | (RE) - Regmed |
| (TA) - Testometric AX | (TB) - Thwing-Albert EJA/1000 |
| (TC) - Thwing-Albert Electro-Hydraulic, Model 30LT | (TF) - Thwing-Albert EJA Vantage-1 |
| (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 SF21 = 5.5473 kN/m

Grand Mean Sample SF22 = 4.7785 kN/m

ANALYSIS 325



TAPPI-CTS Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

WebCode	Data Flag	Sample SF21			Sample SF22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
29ANRC		91.13	10.47	1.35	74.02	7.22	1.22	DL
36768P		80.14	-0.52	-0.07	69.25	2.45	0.41	LX
3ZUCZX		74.01	-6.65	-0.86	56.84	-9.96	-1.69	LW
4J32NE	*	66.32	-14.34	-1.85	66.57	-0.24	-0.04	LH
4T9QHD		85.52	4.87	0.63	67.65	0.85	0.14	LH
67QXU4		77.50	-3.15	-0.41	56.90	-9.91	-1.68	LH
6DPMB9	X	31.20	-49.45	-6.39	31.67	-35.14	-5.96	TP
6QHZWY		82.75	2.09	0.27	67.72	0.91	0.15	TI
8743P8		75.07	-5.58	-0.72	59.89	-6.92	-1.17	IM
8C7HR2		90.98	10.32	1.33	77.10	10.30	1.75	TB
8XDJBY		98.64	17.99	2.32	76.15	9.34	1.58	TJ
9JRQXC		87.99	7.33	0.95	70.39	3.58	0.61	IM
9LWED3		78.08	-2.57	-0.33	63.45	-3.36	-0.57	TO
9RGLQZ		73.67	-6.99	-0.90	63.99	-2.82	-0.48	RE
A2MJJB		73.73	-6.93	-0.89	65.32	-1.48	-0.25	ID
BJJBVV		82.71	2.05	0.27	64.83	-1.98	-0.34	LH
C2EB8T		84.20	3.55	0.46	71.26	4.45	0.76	TB
CXHR6U		94.29	13.63	1.76	75.47	8.66	1.47	XX
D7KDLT		78.28	-2.37	-0.31	69.42	2.62	0.44	LX
DN4362		61.98	-18.67	-2.41	53.97	-12.84	-2.18	LA
EM9YQK		82.57	1.92	0.25	66.83	0.02	0.00	IM
EXQLXZ		76.68	-3.98	-0.51	61.63	-5.18	-0.88	LH
FQ7RDM		81.01	0.35	0.05	64.91	-1.89	-0.32	LI
J3MWWF		81.81	1.16	0.15	67.53	0.72	0.12	LH
JG3YGP		83.41	2.76	0.36	75.14	8.33	1.41	LX
JWHXLQ		85.21	4.55	0.59	67.68	0.87	0.15	LH
K4CLFY		76.28	-4.37	-0.56	66.83	0.02	0.00	LH
LC47DK	X	58.94	-21.71	-2.80	42.75	-24.06	-4.08	TP
MLKBZB		97.05	16.39	2.12	76.33	9.52	1.61	TO
Q2MBZF		79.99	-0.67	-0.09	71.25	4.45	0.75	LH
Q8F9WJ		75.15	-5.50	-0.71	64.32	-2.49	-0.42	LI
QTVXZG		75.70	-4.95	-0.64	64.83	-1.98	-0.34	LI
T6FW7A		73.26	-7.40	-0.96	63.22	-3.59	-0.61	LI
TRQ9UA		82.52	1.87	0.24	70.78	3.98	0.67	TB
UDN44N		74.13	-6.52	-0.84	60.34	-6.47	-1.10	LH
UV73B8		81.48	0.83	0.11	59.50	-7.31	-1.24	MR
WTVNVC		76.00	-4.65	-0.60	59.14	-7.67	-1.30	LH
ZEL36J		76.98	-3.68	-0.48	68.09	1.28	0.22	XX
ZWHTZC		88.03	7.38	0.95	73.33	6.52	1.11	LA

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

	Sample SF21	Summary Statistics	Sample SF22
Grand Means	80.655 Joules/sq m		66.807 Joules/sq m
SD Btwn Labs	7.740 Joules/sq m		5.896 Joules/sq m
Statistics based on 37 of 39 reporting participants			

Comments on assigned Data Flags for Test #327

6DPMB9 (X) - Extreme data.

LC47DK (X) - Data for both samples are low.

Instrument Code List

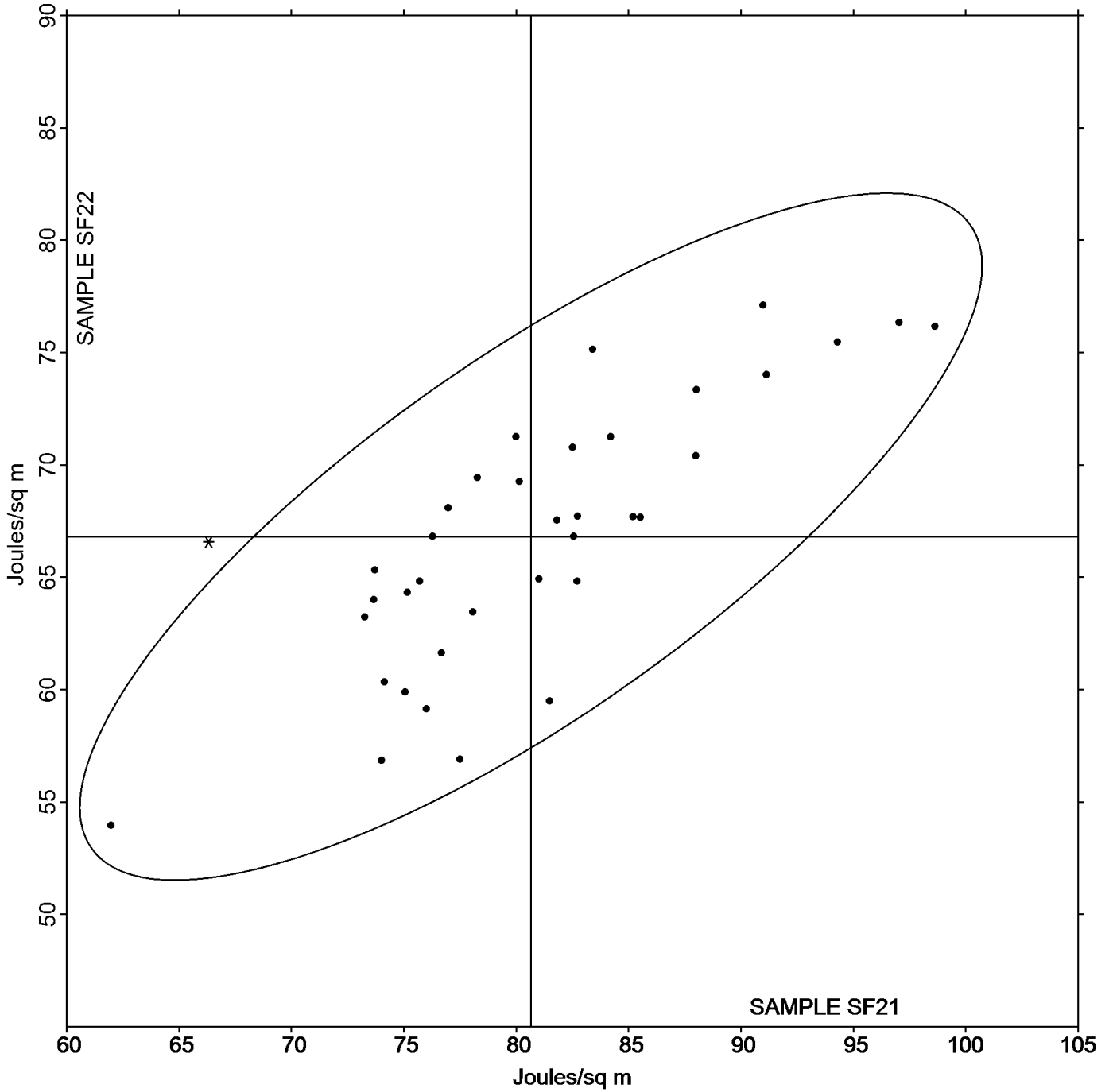
(DL) - EMIC DL500 Universal Testing Machines	(ID) - Instron 4201
(IM) - Instron 5500 Series	(LA) - L & W Tensile - Autoline 300
(LH) - L & W Alwetron TH1 (Horizontal) SE 060	(LI) - L & W Tensile Tester SE 062
(LW) - L & W Tensile Tester SE 064	(LX) - L & W (model not specified)
(MR) - MTS Alliance RT series	(RE) - Regmed
(TB) - Thwing-Albert EJA/1000	(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 SF21 = 80.655 Joules/sq m

Grand Mean Sample SF22 = 66.807 Joules/sq m

ANALYSIS 327



TAPPI-CTS Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

WebCode	Data Flag	Sample SF21			Sample SF22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
29ANRC	*	2.654	0.475	2.88	2.580	0.487	2.91	DL
36768P	*	2.360	0.181	1.10	1.991	-0.102	-0.61	LX
3ZUCZX		1.928	-0.251	-1.52	1.813	-0.280	-1.68	LX
4J32NE	*	2.047	-0.132	-0.80	2.265	0.172	1.03	LH
4T9QHD		2.224	0.045	0.27	2.063	-0.030	-0.18	LH
67QXU4		2.137	-0.042	-0.25	1.979	-0.114	-0.68	LH
6DPMB9	X	4.843	2.664	16.17	4.669	2.576	15.41	TP
6QHZWY		2.208	0.029	0.18	2.113	0.020	0.12	TI
72ECLX	X	2.936	0.757	4.60	2.986	0.893	5.34	TO
8743P8		2.344	0.165	1.00	2.234	0.141	0.84	XX
8C7HR2		2.240	0.061	0.37	2.222	0.128	0.77	TB
8UQ72V		2.260	0.081	0.49	2.020	-0.073	-0.44	TF
8XDJBY		2.452	0.273	1.66	2.270	0.177	1.06	TJ
9JRQXC		2.425	0.246	1.49	2.317	0.223	1.34	IM
9LWED3		1.956	-0.223	-1.35	1.860	-0.233	-1.40	TG
9RGLQZ		2.228	0.049	0.30	2.207	0.114	0.68	RE
A2MJJB		2.203	0.024	0.14	2.239	0.146	0.87	ID
A6LUEB		2.390	0.211	1.28	2.160	0.067	0.40	LH
AQ3AW3		2.331	0.153	0.93	2.235	0.142	0.85	TB
BJJBVV		1.967	-0.212	-1.29	1.840	-0.253	-1.52	LH
C2EB8T		2.386	0.208	1.26	2.371	0.277	1.66	TB
CXHR6U		2.425	0.246	1.49	2.308	0.215	1.28	XX
D7KDLT		2.131	-0.048	-0.29	2.155	0.062	0.37	LX
DN4362		2.134	-0.045	-0.27	2.101	0.008	0.05	LA
EM9YQK		2.197	0.018	0.11	2.097	0.004	0.02	IM
EXQLXZ		1.978	-0.201	-1.22	1.930	-0.163	-0.98	LH
FQ7RDM		2.112	-0.067	-0.41	2.013	-0.080	-0.48	LI
J3MWXF		2.080	-0.099	-0.60	2.022	-0.071	-0.43	LH
JG3YGP		2.089	-0.090	-0.55	2.129	0.036	0.21	LX
JWHXLQ		2.133	-0.046	-0.28	2.002	-0.091	-0.55	LH
K4CLFY		2.064	-0.115	-0.70	2.042	-0.051	-0.31	LH
LC47DK		2.171	-0.008	-0.05	1.942	-0.151	-0.91	TP
MLKBZB	X	2.849	0.670	4.07	2.642	0.549	3.28	TO
Q2MBZF		2.063	-0.116	-0.70	2.113	0.020	0.12	LH
Q8F9WJ		2.057	-0.122	-0.74	2.019	-0.074	-0.44	LI
QDYJZM	X	2.090	-0.089	-0.54	2.390	0.297	1.77	TF
QTVXZG		2.090	-0.089	-0.54	2.108	0.015	0.09	LI
T6FW7A		2.093	-0.086	-0.52	2.081	-0.012	-0.07	LI
TRQ9UA	X	56.397	54.218	329.15	54.853	52.760	315.65	TB
UDN44N		2.019	-0.160	-0.97	1.929	-0.164	-0.98	LH
UV73B8		2.171	-0.008	-0.05	1.936	-0.158	-0.94	MR
WTVNVC		1.873	-0.306	-1.86	1.744	-0.349	-2.09	LH
ZEL36J		2.190	0.011	0.07	2.171	0.078	0.46	XX

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

WebCode	Data Flag	Sample SF21			Sample SF22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
ZWHTZC		2.163	-0.016	-0.10	2.020	-0.073	-0.44	LA

		Summary Statistics			
		Sample SF21		Sample SF22	
Grand Means		2.1788	Percent	2.0933	Percent
SD Btwn Labs		0.1647	Percent	0.1671	Percent
Statistics based on 39 of 44 reporting participants					

Comments on assigned Data Flags for Test #328

- 6DPMB9 (X) - Extreme data.
- 72ECLX (X) - Systematic error (data for both samples are high).
- MLKBZB (X) - Systematic error (data for both samples are high).
- QDYJZM (X) - Inconsistent in testing between samples.
- TRQ9UA (X) - Extreme data.

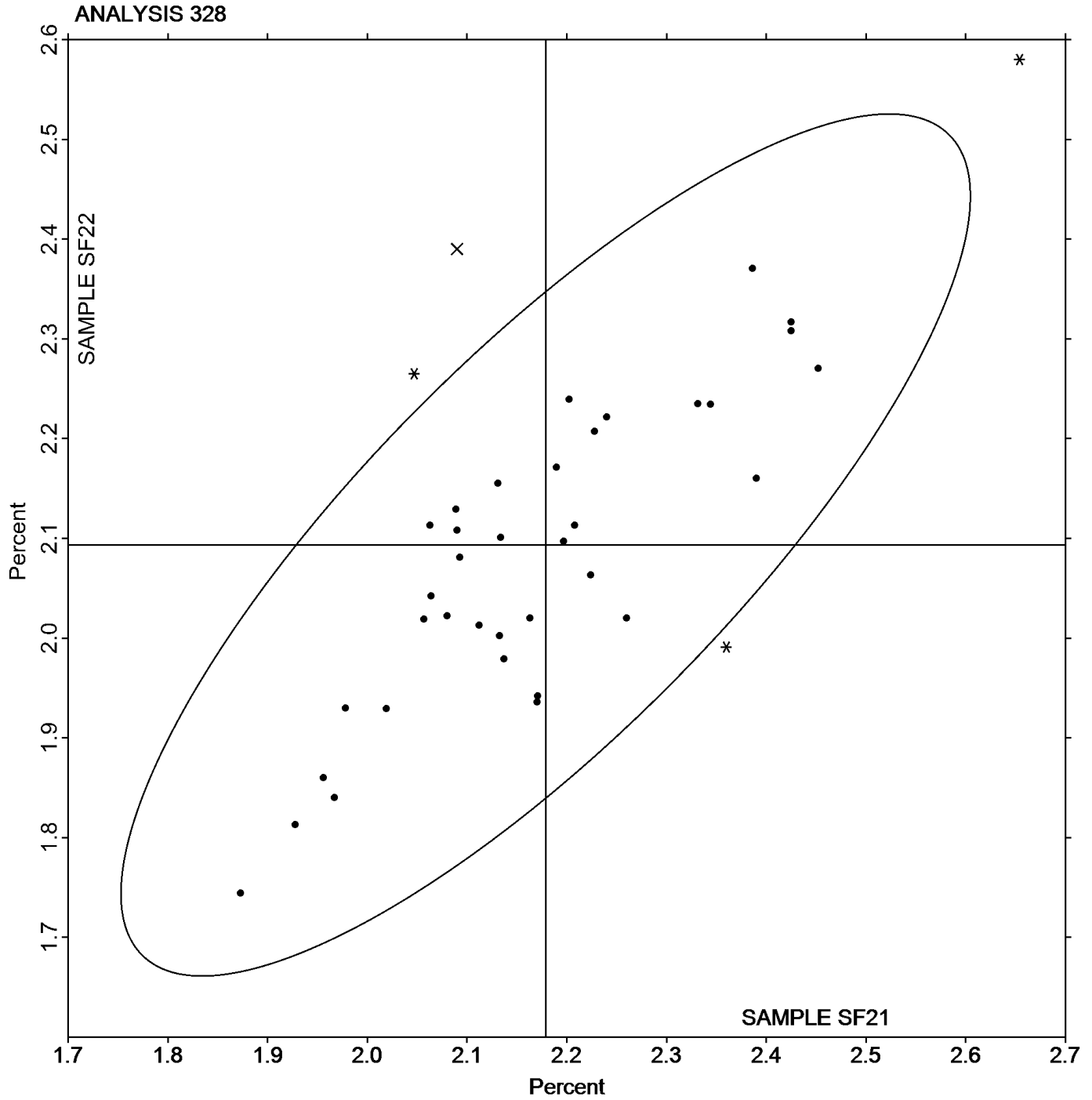
Instrument Code List

- | | |
|---|---|
| (DL) - EMIC DL500 Universal Testing Machines | (ID) - Instron 4201 |
| (IM) - Instron 5500 | (LA) - L & W Tensile - Autoline 300 |
| (LH) - L & W Alwetron TH1 (Horizontal) SE 060 | (LI) - L & W Tensile Tester SE 062 |
| (LX) - L & W (model not specified) | (MR) - MTS Alliance RT series |
| (RE) - Regmed | (TB) - Thwing-Albert EJA/1000 |
| (TF) - Thwing-Albert EJA Vantage-1 | (TG) - Thwing-Albert QC |
| (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 **SF21** = 2.1788 Percent

Grand Mean Sample **SF22** = 2.0933 Percent



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

WebCode	Data Flag	Sample SE21			Sample SE22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
26PUTQ		11.83	0.67	0.86	10.166	0.501	0.69	TA
2EVPVW	*	12.10	0.94	1.22	9.898	0.233	0.32	TK
3J4J6Y		10.94	-0.22	-0.29	9.343	-0.323	-0.44	TH
6U4J23		10.68	-0.48	-0.62	8.879	-0.786	-1.08	IF
A4MWV3		11.74	0.57	0.75	10.394	0.729	1.00	LA
B2JBR3		10.65	-0.51	-0.66	9.218	-0.447	-0.61	LE
B7CKTN	*	9.10	-2.06	-2.67	8.012	-1.653	-2.27	ID
BEQ9RW		11.69	0.53	0.69	10.441	0.776	1.06	TX
C9ETJJ		10.55	-0.61	-0.79	8.968	-0.697	-0.96	IM
CFUHXX		10.27	-0.90	-1.16	8.665	-1.000	-1.37	TH
CHLBFW	X	18.56	7.40	9.61	15.670	6.005	8.24	LE
CW3CRT		10.84	-0.32	-0.42	9.260	-0.405	-0.56	TP
DHZ7CN		12.82	1.66	2.15	11.352	1.686	2.31	LA
EAJ3M2		10.35	-0.81	-1.05	9.024	-0.641	-0.88	LW
F6L3PG		11.45	0.29	0.38	9.765	0.100	0.14	IM
F7GLRH		10.30	-0.86	-1.12	9.404	-0.261	-0.36	TK
FKDMKJ		10.72	-0.44	-0.57	9.807	0.142	0.19	IN
FL97LK		10.36	-0.80	-1.03	8.721	-0.945	-1.30	TH
G3QQHV		11.54	0.38	0.49	10.332	0.667	0.92	TO
GT6H4Y		10.56	-0.60	-0.78	9.028	-0.638	-0.87	LA
HZJJZN		11.07	-0.09	-0.12	9.372	-0.293	-0.40	SA
JEKPKK		11.88	0.72	0.94	10.447	0.782	1.07	XX
KDERMU		12.02	0.86	1.11	10.415	0.750	1.03	IF
LC47DK		11.75	0.59	0.77	10.058	0.392	0.54	TO
MKQRWN	X	7.85	-3.31	-4.30	7.354	-2.312	-3.17	TP
MNXXKA		10.68	-0.48	-0.62	9.131	-0.534	-0.73	LW
MYEKUB		10.44	-0.72	-0.94	8.959	-0.706	-0.97	TK
PK33PD		12.20	1.04	1.35	10.585	0.919	1.26	XX
Q2MBZF		11.27	0.11	0.15	9.691	0.026	0.04	LH
QJRK78	*	10.43	-0.73	-0.94	8.343	-1.323	-1.81	IM
RKYDJ7		10.49	-0.67	-0.87	9.239	-0.426	-0.58	XX
TGTA8A		11.56	0.40	0.52	9.964	0.299	0.41	LE
TRDJV4		13.06	1.90	2.46	11.423	1.758	2.41	LA
U2EDGF		10.95	-0.21	-0.27	9.439	-0.226	-0.31	LI
UP6QCP		11.12	-0.04	-0.05	9.481	-0.184	-0.25	LE
VCCLL4		12.06	0.90	1.16	10.602	0.937	1.28	TP
VXR4RE		11.10	-0.06	-0.08	9.638	-0.027	-0.04	TB
W3LA2B		11.31	0.15	0.19	9.716	0.051	0.07	TO
W AFC68		11.29	0.13	0.17	9.776	0.110	0.15	TA
WKLAXG		10.84	-0.33	-0.42	9.753	0.087	0.12	LH
WZ9XYZ		10.60	-0.56	-0.73	9.342	-0.323	-0.44	TB
XYDEVD		10.80	-0.37	-0.47	9.300	-0.365	-0.50	ID
XZVFN8		11.67	0.51	0.66	10.193	0.528	0.72	TO

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

WebCode	Data Flag	Sample SE21			Sample SE22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
YVAZPY		10.62	-0.54	-0.71	9.088	-0.578	-0.79	IK
ZZ4AJX		10.91	-0.25	-0.33	10.040	0.375	0.51	LH
ZZ4J43		12.47	1.31	1.70	10.604	0.938	1.29	LA

		Summary Statistics			
		Sample SE21			Sample SE22
Grand Means		11.161 kN/m			9.6654 kN/m
SD Btwn Labs		0.770 kN/m			0.7290 kN/m
Statistics based on 44 of 46 reporting participants					

Comments on assigned Data Flags for Test #330

CHLBFW (X) - Extreme data.

MKQRWN (X) - Systematic error (data for both samples are low).

Analysis Notes:

F7GLRH - Data appear to be reported as lb/inch, not kN/m as indicated on datasheet. Units corrected by CTS.

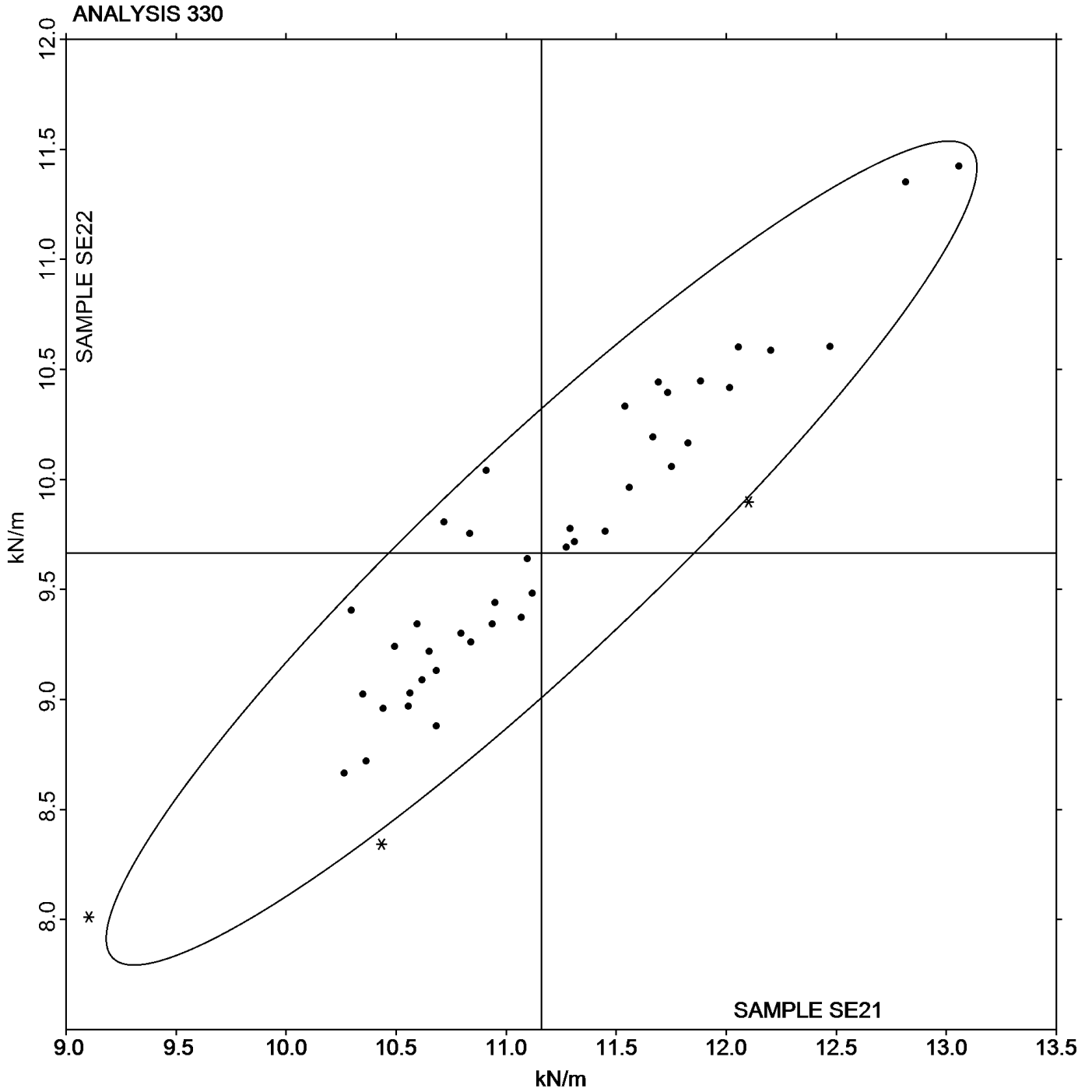
Instrument Code List

(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
(LI) - Lloyds Instruments	(LW) - L & W Tensile Tester SE062
(SA) - Shimadzu Autograph AG 2000 A	(TA) - Thwing-Albert Tensile Tester
(TB) - Thwing-Albert EJA/1000	(TH) - Thwing-Albert QC-3A
(TK) - Thwing-Albert Model 37-4	(TO) - Thwing-Albert QC-1000
(TP) - TMI Monitor/Tensile 100 (84-21-01)	(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 **SE21** = 11.161 kN/m

Grand Mean Sample **SE22** = 9.6654 kN/m



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

WebCode	Data Flag	Sample SE21			Sample SE22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
26PUTQ		241.1	34.2	1.17	124.5	11.5	0.79	TA
3J4J6Y		256.9	50.1	1.72	135.6	22.5	1.55	TH
47WTZ6	X	61.4	-145.4	-4.99	52.4	-60.6	-4.16	XX
6U4J23		191.0	-15.9	-0.54	98.1	-15.0	-1.03	IF
A4MWV3		211.8	5.0	0.17	119.0	6.0	0.41	LA
B7CKTN		131.9	-75.0	-2.57	80.6	-32.5	-2.23	ID
BEQ9RW		234.6	27.7	0.95	137.1	24.0	1.65	XX
C9ETJJ		196.3	-10.6	-0.36	102.2	-10.9	-0.75	IM
CFUHXX		207.2	0.4	0.01	114.6	1.6	0.11	TH
CW3CRT		210.2	3.3	0.11	116.5	3.5	0.24	TP
DHZ7CN		226.3	19.5	0.67	128.7	15.7	1.08	LA
F6L3PG		208.9	2.0	0.07	108.5	-4.6	-0.31	IM
FKDMKJ	X	193.3	-13.5	-0.46	134.8	21.8	1.50	IN
FL97LK		234.1	27.3	0.93	126.3	13.2	0.91	TH
G3QQHV		217.7	10.9	0.37	127.8	14.8	1.02	XX
GT6H4Y		202.1	-4.8	-0.16	113.3	0.2	0.02	LA
HZJJZN		205.3	-1.6	-0.06	108.5	-4.6	-0.32	SA
JEKPKK		254.9	48.0	1.65	140.5	27.4	1.88	XX
KDERMU		220.3	13.5	0.46	115.3	2.3	0.16	IN
LC47DK		222.8	16.0	0.55	114.0	0.9	0.06	TO
MNXXKA		192.6	-14.3	-0.49	96.7	-16.3	-1.12	LW
MYEKUB		207.9	1.1	0.04	113.3	0.3	0.02	TK
PK33PD	X	363.3	156.4	5.36	201.4	88.4	6.07	XX
Q2MBZF		199.3	-7.6	-0.26	105.1	-7.9	-0.54	LH
QJRK78		178.7	-28.1	-0.96	88.0	-25.1	-1.72	IM
RKYDJ7		193.7	-13.1	-0.45	106.7	-6.3	-0.43	XX
TGTA8A		195.4	-11.5	-0.39	108.7	-4.3	-0.30	LE
TRDJV4		215.5	8.6	0.29	121.7	8.7	0.60	LA
UP6QCP		206.0	-0.9	-0.03	107.1	-6.0	-0.41	LE
VCCLL4	*	124.5	-82.4	-2.82	78.2	-34.8	-2.39	TP
W3LA2B		253.4	46.5	1.59	134.4	21.4	1.47	TO
WKLAXG		192.9	-13.9	-0.48	108.4	-4.6	-0.32	LH
WZ9XYZ		176.1	-30.7	-1.05	109.2	-3.8	-0.26	TB
XZVFN8		220.5	13.6	0.47	116.3	3.2	0.22	TO
YVAZPY		212.1	5.3	0.18	114.7	1.7	0.12	XX
ZZ4AJX		167.2	-39.7	-1.36	107.1	-6.0	-0.41	LH
ZZ4J43		224.0	17.2	0.59	116.8	3.7	0.26	LA

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

	Sample SE21	Summary Statistics	Sample SE22
Grand Means	206.86 Joules/sq m		113.04 Joules/sq m
SD Btwn Labs	29.17 Joules/sq m		14.57 Joules/sq m
Statistics based on 34 of 37 reporting participants			

Comments on assigned Data Flags for Test #331

47WTZ6 (X) - Data for both samples are low.

FKDMKJ (X) - Inconsistent in testing between samples.

PK33PD (X) - Extreme data.

Analysis Notes:

BEQ9RW - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

CW3CRT - Data appear to be reported as J/sq m, not kg-m/sq m as indicated on datasheet. Units corrected by CTS.

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

Instrument Code List

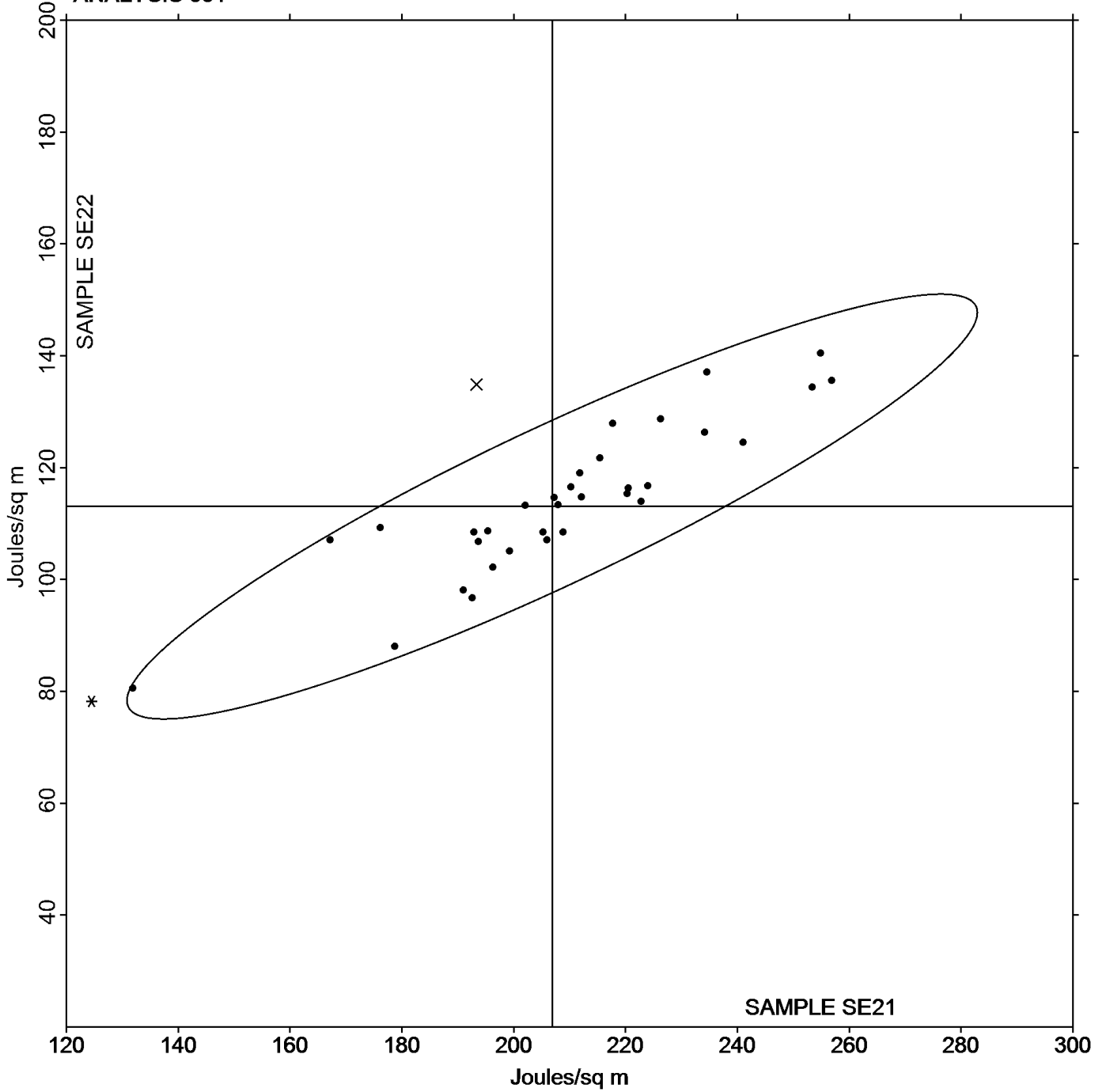
- | | |
|---|---|
| (ID) - Instron 4201 | (IF) - Instron 3340 Series |
| (IM) - Instron 5500 Series | (IN) - Instron 3360 Series |
| (LA) - L & W Autoline | (LE) - L & W Tensile Tester 066 |
| (LH) - L & W Alwetron TH1 (Horizontal) SE 060 | (LW) - L & W Tensile Tester SE062 |
| (SA) - Shimadzu Autograph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

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

Grand Mean Sample **SE21** = 206.86 Joules/sq m

Grand Mean Sample **SE22** = 113.04 Joules/sq m

ANALYSIS 331



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

WebCode	Data Flag	Sample SE21			Sample SE22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
26PUTQ		3.009	0.218	0.71	1.862	0.000	0.00	TA
3J4J6Y		3.510	0.719	2.35	2.255	0.393	1.79	TH
6U4J23		2.763	-0.028	-0.09	1.838	-0.024	-0.11	IF
A4MWV3		2.575	-0.216	-0.71	1.697	-0.165	-0.75	LA
B7CKTN		2.518	-0.273	-0.89	1.885	0.023	0.10	ID
BEQ9RW		3.054	0.263	0.86	2.135	0.273	1.24	XX
C9ETJJ		3.020	0.229	0.75	2.055	0.193	0.88	IM
CFUHXX		3.188	0.397	1.30	2.147	0.285	1.30	TH
CW3CRT		3.410	0.619	2.02	2.380	0.518	2.36	TP
DHZ7CN		2.472	-0.319	-1.04	1.766	-0.096	-0.44	LA
EAJ3M2		2.549	-0.242	-0.79	1.625	-0.237	-1.08	LW
F6L3PG		2.726	-0.065	-0.21	1.726	-0.136	-0.62	IM
FKDMKJ		2.940	0.149	0.49	2.200	0.338	1.54	IN
FL97LK		3.356	0.565	1.85	2.221	0.359	1.63	TH
G3QQHV		2.940	0.149	0.49	2.080	0.218	0.99	XX
GT6H4Y		2.381	-0.410	-1.34	1.613	-0.249	-1.14	LA
HZJJZN		2.787	-0.004	-0.01	1.832	-0.030	-0.14	SA
JEKPKK		3.225	0.434	1.42	2.130	0.268	1.22	XX
KDERMU		2.716	-0.075	-0.24	1.733	-0.129	-0.59	IN
LC47DK		2.826	0.035	0.11	1.805	-0.057	-0.26	TO
MNXXKA		2.653	-0.138	-0.45	1.645	-0.217	-0.99	LW
MYEKUB		2.972	0.181	0.59	1.984	0.122	0.56	TK
PK33PD		2.675	-0.116	-0.38	1.819	-0.043	-0.20	XX
Q2MBZF		2.595	-0.196	-0.64	1.637	-0.225	-1.03	LH
QJRK78		2.650	-0.141	-0.46	1.725	-0.137	-0.63	IM
RKYDJ7		2.705	-0.086	-0.28	1.760	-0.102	-0.47	XX
TGTA8A		2.482	-0.309	-1.01	1.686	-0.176	-0.80	LE
TRDJV4		2.399	-0.392	-1.28	1.636	-0.226	-1.03	XX
UP6QCP		2.747	-0.044	-0.14	1.743	-0.119	-0.54	LE
VCCLL4	X	0.228	-2.563	-8.37	0.162	-1.701	-7.75	TP
VXR4RE		2.845	0.054	0.18	1.841	-0.021	-0.10	TB
W3LA2B		3.392	0.601	1.96	2.237	0.375	1.71	TO
WKLAXG		2.610	-0.181	-0.59	1.670	-0.192	-0.88	LH
WZ9XYZ	*	2.554	-0.237	-0.77	1.976	0.113	0.52	TB
XYDEVD		2.659	-0.132	-0.43	1.781	-0.081	-0.37	ID
XZVFN8		2.733	-0.058	-0.19	1.738	-0.124	-0.57	TO
YVAZPY		2.580	-0.211	-0.69	1.610	-0.252	-1.15	XX
ZZ4AJX		2.261	-0.530	-1.73	1.640	-0.222	-1.01	LH
ZZ4J43		2.577	-0.214	-0.70	1.653	-0.209	-0.95	LA

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

	Sample SE21	Summary Statistics	Sample SE22
Grand Means	2.7909 Percent		1.8623 Percent
SD Btwn Labs	0.3061 Percent		0.2195 Percent
Statistics based on 38 of 39 reporting participants			

Comments on assigned Data Flags for Test #332

VCCLL4 (X) - Extreme data.

Instrument Code List

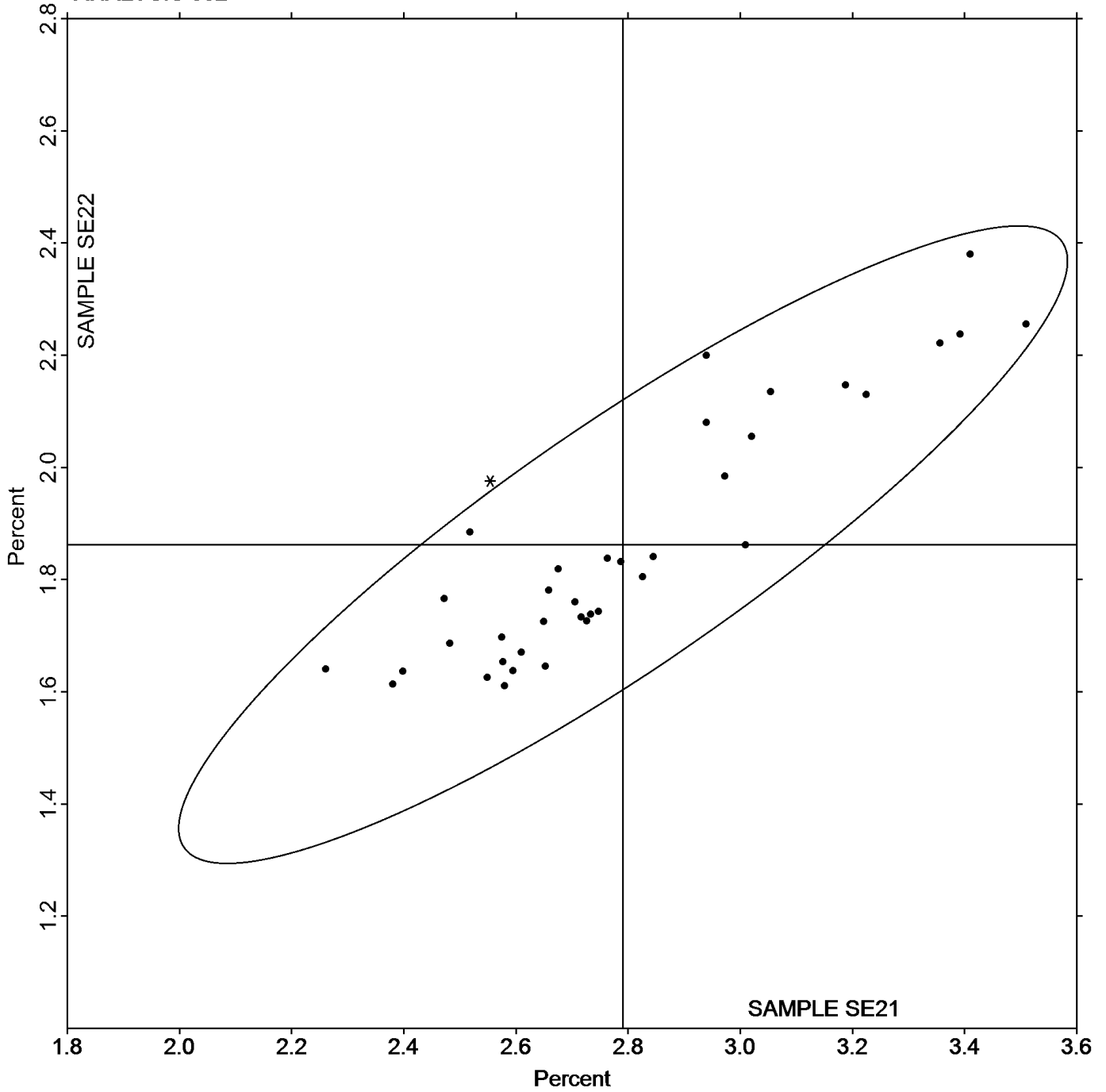
(ID) - Instron 4201	(IF) - Instron 3340 Series
(IM) - Instron 5500 Series	(IN) - Instron 3360 Series
(LA) - L & W Autoline 300	(LE) - L & W Tensile Tester 066
(LH) - L & W Alwetron TH1 (Horizontal) SE 060	(LW) - L & W Tensile Tester SE062
(SA) - Shimadzu Autograph AG 2000 A	(TA) - Thwing-Albert Tensile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

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

Grand Mean Sample **SE21** = 2.7909 Percent

Grand Mean Sample **SE22** = 1.8623 Percent

ANALYSIS 332



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

WebCode	Data Flag	Sample SG21			Sample SG22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2EVPVW		33.40	-13.54	-1.38	39.30	-10.66	-0.97	MT
8743P8		48.00	1.06	0.11	54.11	4.15	0.38	MT
9JRQXC		53.20	6.26	0.64	50.80	0.84	0.08	MT
A2MJJB		41.00	-5.94	-0.61	47.90	-2.06	-0.19	MT
A4MWV3		46.60	-0.34	-0.04	51.80	1.84	0.17	XX
A6LUEB		55.70	8.76	0.89	66.10	16.14	1.46	MT
EAJ3M2		39.50	-7.44	-0.76	35.70	-14.26	-1.29	MT
MKQRWN		21.60	-25.34	-2.58	29.80	-20.16	-1.83	MT
NJUTXF		49.50	2.56	0.26	51.20	1.24	0.11	MT
PM9J6V		54.40	7.46	0.76	54.20	4.24	0.38	MT
Q8F9WJ		58.60	11.66	1.19	57.70	7.74	0.70	MT
QDYJZM		48.50	1.56	0.16	72.80	22.84	2.07	MT
QG3ELB		57.30	10.36	1.05	58.40	8.44	0.76	MT
QQP7EU		40.40	-6.54	-0.67	42.80	-7.16	-0.65	XX
VXR4RE		48.80	1.86	0.19	45.80	-4.16	-0.38	MT
XC4BWB		54.60	7.66	0.78	41.00	-8.96	-0.81	XX

		Summary Statistics	
	Sample SG21		Sample SG22
Grand Means	46.944 Double Folds		49.963 Double Folds
SD Btwn Labs	9.819 Double Folds		11.047 Double Folds
Statistics based on 16 of 16 reporting participants			

Instrument Code List

(MT) - MIT - Tinius Olsen

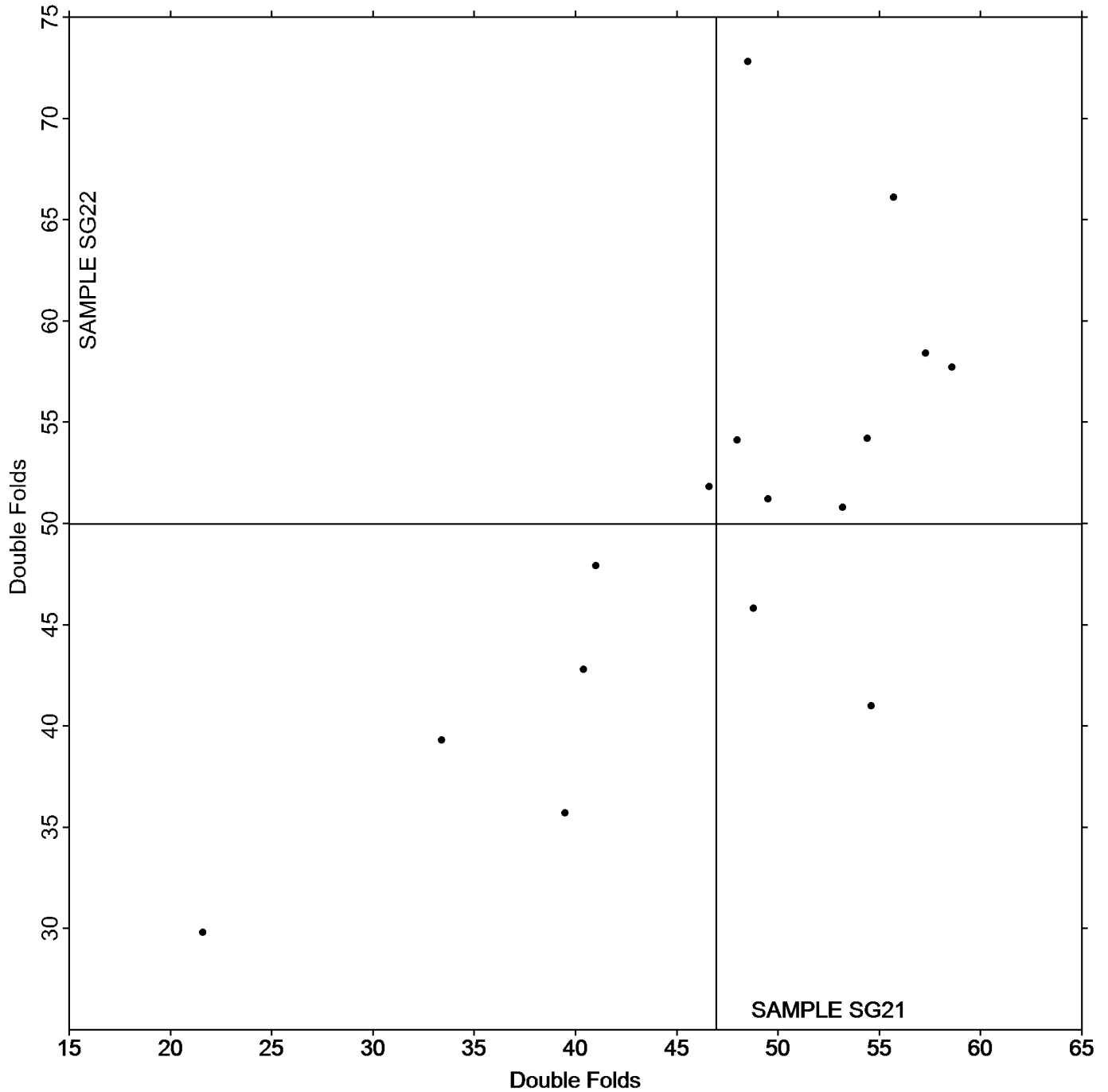
(XX) - Instrument make/model not specified by lab

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

Grand Mean Sample **SG21** = 46.944 Double Folds

Grand Mean Sample **SG22** = 49.963 Double Folds

ANALYSIS 334



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 SH21			Sample SH22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3JL8PE		346.6	7.8	0.33	125.0	0.3	0.02
4J32NE		280.8	-58.0	-2.44	107.4	-17.3	-1.60
6QHZWY		321.9	-16.9	-0.71	129.1	4.4	0.41
6U4J23	X	185.4	-153.5	-6.45	76.0	-48.7	-4.52
9JRQXC		340.0	1.2	0.05	120.5	-4.2	-0.39
A6LUEB		325.4	-13.5	-0.57	121.0	-3.7	-0.34
AQ3AW3	*	346.3	7.4	0.31	94.9	-29.8	-2.77
BJJBVV		394.7	55.9	2.35	133.4	8.7	0.80
DN4362		340.5	1.7	0.07	132.2	7.5	0.69
HT6XRJ		354.3	15.4	0.65	136.0	11.3	1.05
J3MWXF		339.6	0.8	0.03	126.5	1.8	0.17
MLKBZB		331.3	-7.5	-0.32	113.2	-11.5	-1.07
UGALLA		337.4	-1.4	-0.06	128.1	3.4	0.31
UUFWTV		316.5	-22.3	-0.94	125.6	0.9	0.08
UV73B8		321.9	-16.9	-0.71	132.0	7.3	0.67
VXR4RE		354.6	15.8	0.66	131.6	6.9	0.64
WRGKYZ		344.1	5.3	0.22	134.3	9.6	0.89
Y82R8H		364.0	25.2	1.06	129.4	4.7	0.43

Summary Statistics		
	Sample SH21	Sample SH22
Grand Means	338.82 Gurley Units	124.74 Gurley Units
SD Btwn Labs	23.81 Gurley Units	10.78 Gurley Units
Statistics based on 17 of 18 reporting participants		

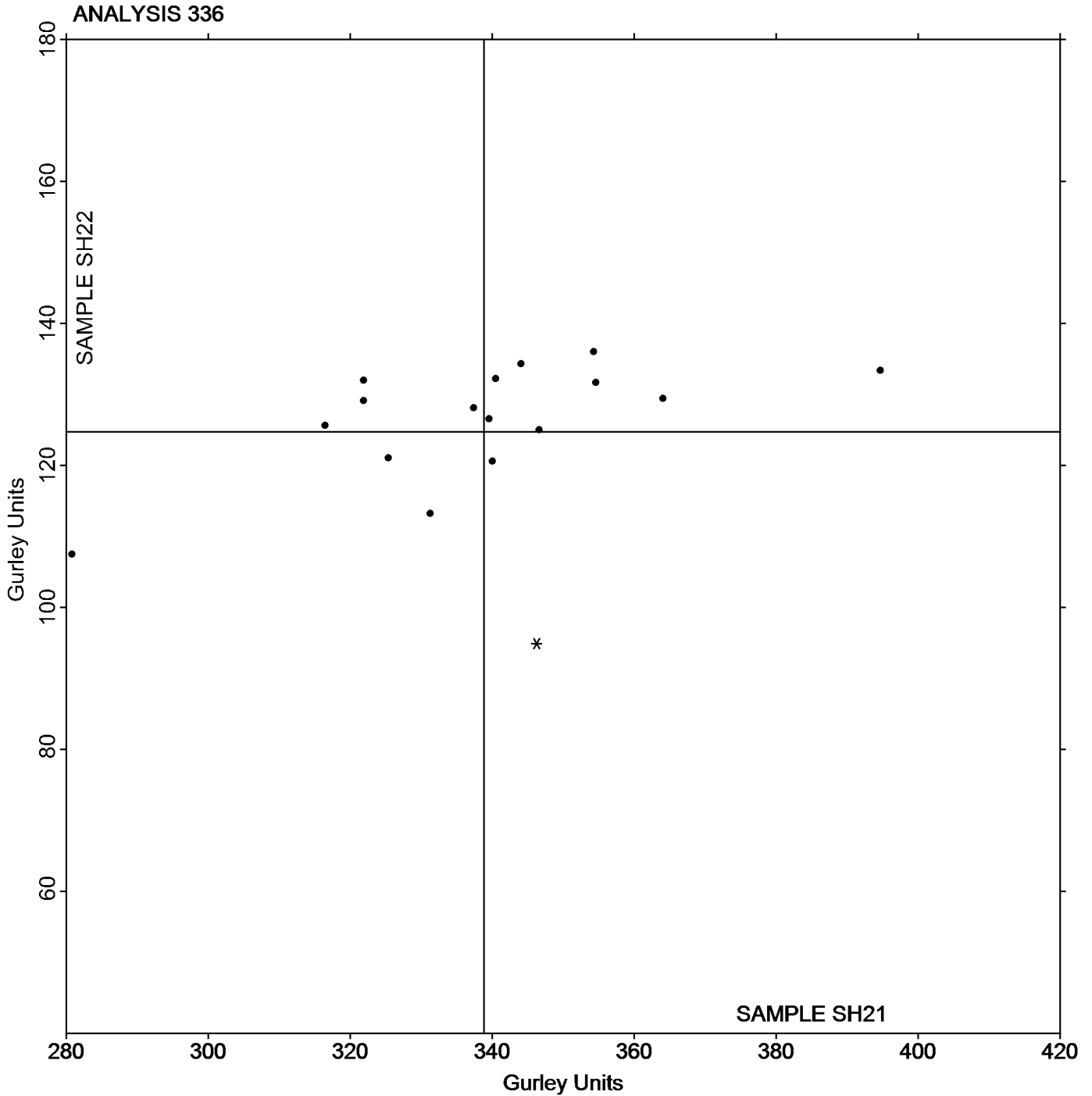
Comments on assigned Data Flags for Test #336

6U4J23 (X) - Extreme data.

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

Grand Mean Sample **SH21** = 338.82 Gurley Units

Grand Mean Sample **SH22** = 124.74 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

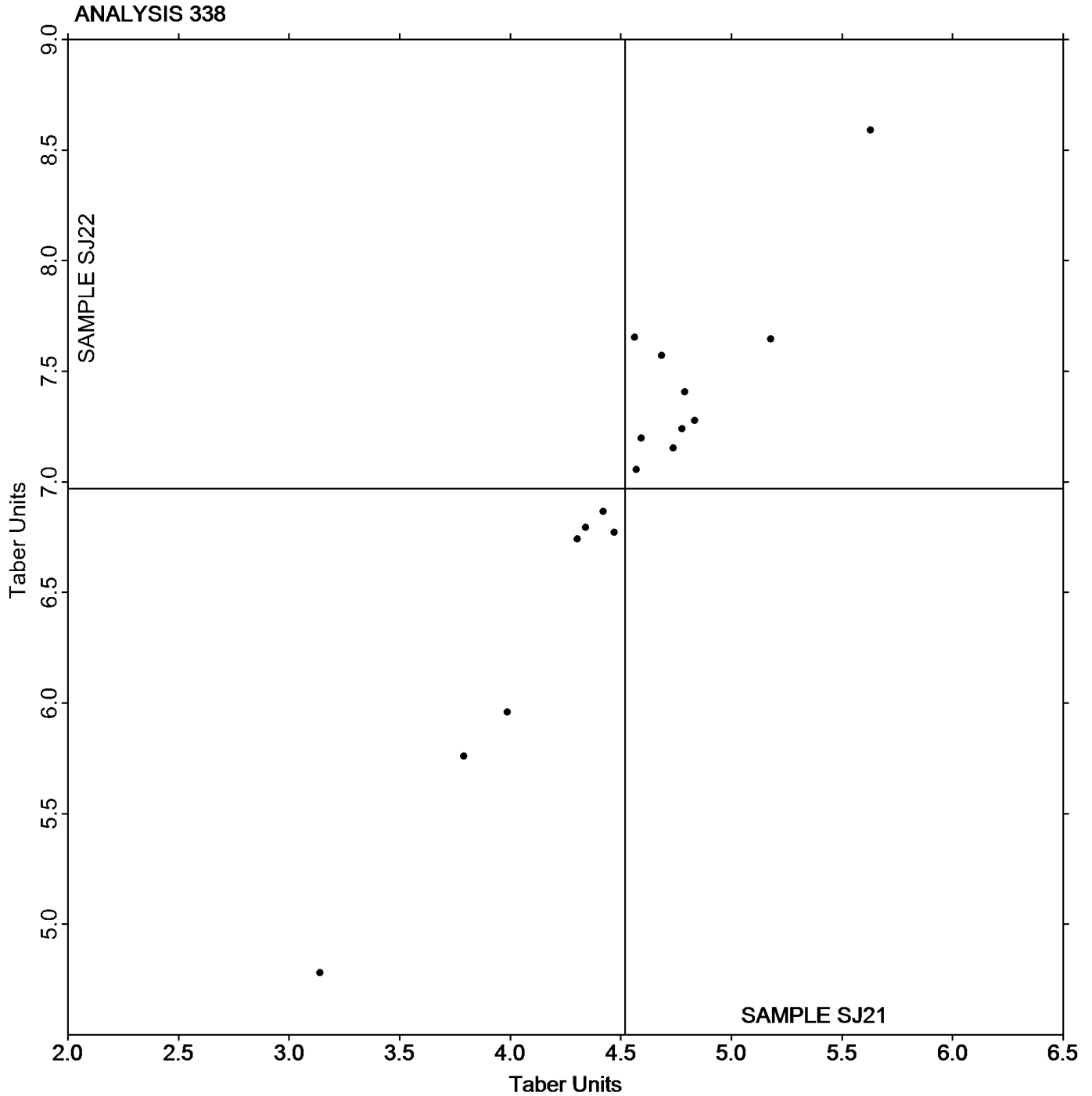
WebCode	Data Flag	Sample SJ21			Sample SJ22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
36768P		4.778	0.259	0.47	7.240	0.272	0.32
6U4J23		4.686	0.168	0.31	7.570	0.602	0.70
8XDJBY		5.177	0.659	1.20	7.645	0.677	0.79
9JRQXC		4.571	0.053	0.10	7.054	0.086	0.10
A2MJJB		4.420	-0.098	-0.18	6.867	-0.101	-0.12
AQ3AW3		4.472	-0.047	-0.09	6.771	-0.198	-0.23
C2EB8T		4.594	0.075	0.14	7.199	0.230	0.27
CK8476		4.304	-0.214	-0.39	6.742	-0.226	-0.26
FRE27K		4.340	-0.178	-0.33	6.793	-0.175	-0.20
J3MWWF		4.738	0.220	0.40	7.152	0.184	0.21
KDERMU		5.630	1.112	2.03	8.590	1.622	1.89
QG3ELB		4.836	0.317	0.58	7.277	0.309	0.36
QQP7EU		4.563	0.045	0.08	7.653	0.685	0.80
TGTA8A		3.790	-0.728	-1.33	5.760	-1.208	-1.41
UKTPA7		4.789	0.271	0.49	7.406	0.438	0.51
UV73B8		3.139	-1.379	-2.52	4.781	-2.187	-2.55
ZWHTZC		3.986	-0.532	-0.97	5.958	-1.010	-1.18

		Summary Statistics	
	Sample SJ21		Sample SJ22
Grand Means	4.5183 Taber Units		6.9680 Taber Units
SD Btwn Labs	0.5479 Taber Units		0.8577 Taber Units
Statistics based on 17 of 17 reporting participants			

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

Grand Mean Sample **SJ21** = 4.5183 Taber Units

Grand Mean Sample **SJ22** = 6.9680 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 SQ21			Sample SQ22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
29ANRC		34.89	-1.31	-0.53	21.17	-1.55	-0.90
6DPMB9		31.67	-4.52	-1.82	20.63	-2.09	-1.22
9JRQXC		37.05	0.85	0.34	23.36	0.64	0.37
9LWED3		37.45	1.25	0.50	22.60	-0.12	-0.07
A4MWV3		37.12	0.92	0.37	21.93	-0.79	-0.46
CHLBFW		40.30	4.10	1.65	26.30	3.58	2.09
CXHR6U		31.67	-4.52	-1.82	20.63	-2.09	-1.22
EAJ3M2		35.88	-0.32	-0.13	21.78	-0.94	-0.55
EM9YQK		38.05	1.85	0.75	23.60	0.88	0.51
GT6H4Y		35.37	-0.83	-0.34	24.84	2.12	1.24
TGTA8A		38.95	2.75	1.11	24.65	1.93	1.12
W3G3HF		37.95	1.75	0.71	23.14	0.42	0.25
WZ9XYZ		35.70	-0.50	-0.20	22.50	-0.22	-0.13
Y82R8H		34.72	-1.48	-0.60	20.92	-1.80	-1.05

Summary Statistics

Sample SQ21

Sample SQ22

Grand Means 36.198 Taber Units
SD Btwn Labs 2.479 Taber Units

22.717 Taber Units
1.718 Taber Units

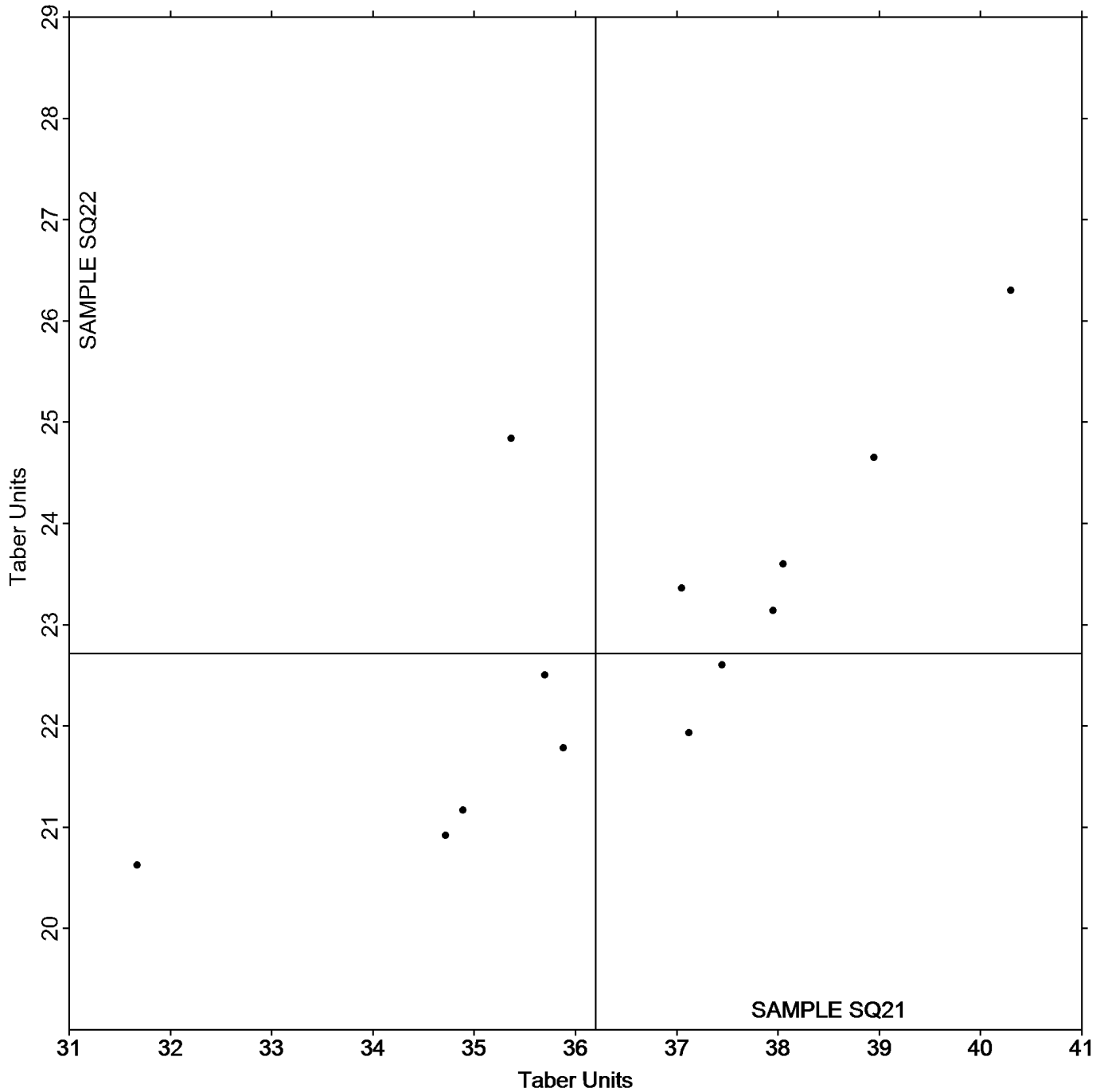
Statistics based on 14 of 14 reporting participants

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

Grand Mean Sample **SQ21** = 36.198 Taber Units

Grand Mean Sample **SQ22** = 22.717 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 ST21			Sample ST22		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
47WTZ6		247.7	5.4	0.39	306.9	19.7	1.48
4EN9PA		224.8	-17.5	-1.27	270.3	-16.9	-1.27
64KFW9		238.5	-3.8	-0.28	289.6	2.4	0.18
6LHVWY		258.5	16.2	1.18	316.1	28.9	2.17
C6WDEX		251.2	8.9	0.65	291.2	4.0	0.30
CFUHXX		214.4	-27.9	-2.03	274.0	-13.2	-0.99
CW3CRT		238.2	-4.1	-0.30	277.5	-9.7	-0.73
HVQGWN		255.8	13.5	0.98	277.4	-9.8	-0.74
HZJJZN		237.9	-4.4	-0.32	286.2	-1.0	-0.08
LGF9KA	X	90.8	-151.5	-11.03	114.5	-172.7	-12.96
TGTA8A		237.8	-4.6	-0.33	278.3	-8.9	-0.67
U7MWF9		232.2	-10.1	-0.73	279.1	-8.1	-0.61
WAFC68		251.5	9.2	0.67	291.5	4.3	0.32
XYDEV D		261.5	19.2	1.40	295.5	8.3	0.62

Summary Statistics		
	Sample ST21	Sample ST22
Grand Means	242.31 Taber Units	287.19 Taber Units
SD Btwn Labs	13.73 Taber Units	13.32 Taber Units
Statistics based on 13 of 14 reporting participants		

Comments on assigned Data Flags for Test #340

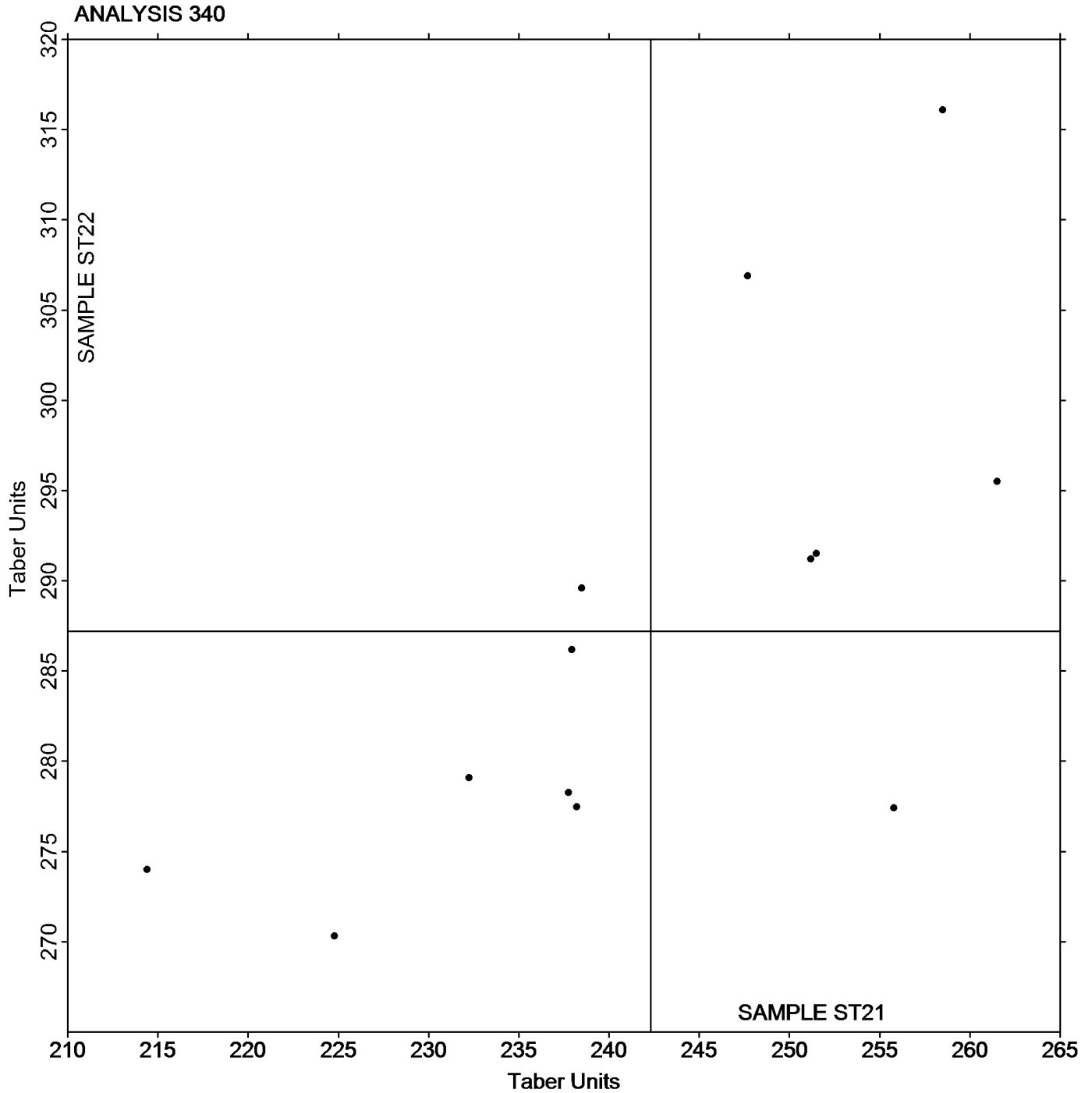
LGF9KA (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program Analysis 340

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

Grand Mean Sample **ST21** = 242.31 Taber Units

Grand Mean Sample **ST22** = 287.19 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 SM21			Sample SM22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3YK6X6		74.44	0.47	0.05	96.26	10.87	0.95	TA
6U4J23		89.78	15.81	1.83	103.52	18.13	1.58	TL
9JRQXC		64.98	-8.99	-1.04	74.64	-10.75	-0.94	TZ
A2MJJB		71.94	-2.03	-0.23	92.18	6.79	0.59	CD
A4MWV3		85.52	11.55	1.34	95.54	10.15	0.88	LW
CFUHXX	*	73.18	-0.79	-0.09	66.88	-18.51	-1.61	LW
CHLBFW		75.14	1.17	0.14	88.08	2.69	0.23	TA
CW3CRT		63.85	-10.12	-1.17	72.40	-12.99	-1.13	XX
CXHR6U		76.71	2.74	0.32	91.19	5.80	0.51	LW
EAJ3M2		74.48	0.51	0.06	88.46	3.07	0.27	LW
EXQJ9V		71.10	-2.87	-0.33	74.30	-11.09	-0.97	DT
G3QQHV		76.20	2.23	0.26	81.40	-3.99	-0.35	TA
HQZACU		81.44	7.47	0.87	95.96	10.57	0.92	LW
JEKPKK		64.18	-9.79	-1.13	79.30	-6.09	-0.53	DT
LGF9KA		86.96	12.99	1.50	101.24	15.85	1.38	CA
N3LR8K		69.50	-4.47	-0.52	78.30	-7.09	-0.62	DT
QTVXZG		59.55	-14.41	-1.67	68.08	-17.31	-1.51	LW
TRQ9UA		77.20	3.23	0.37	94.40	9.01	0.79	TA
W3G3HF		60.30	-13.66	-1.58	71.74	-13.65	-1.19	TZ
WZ9XYZ		82.86	8.89	1.03	93.90	8.51	0.74	TA

Sample SM21		Summary Statistics	Sample SM22	
Grand Means	73.965 psi		85.389 psi	
SD Btwn Labs	8.640 psi		11.475 psi	
Statistics based on 20 of 20 reporting participants				

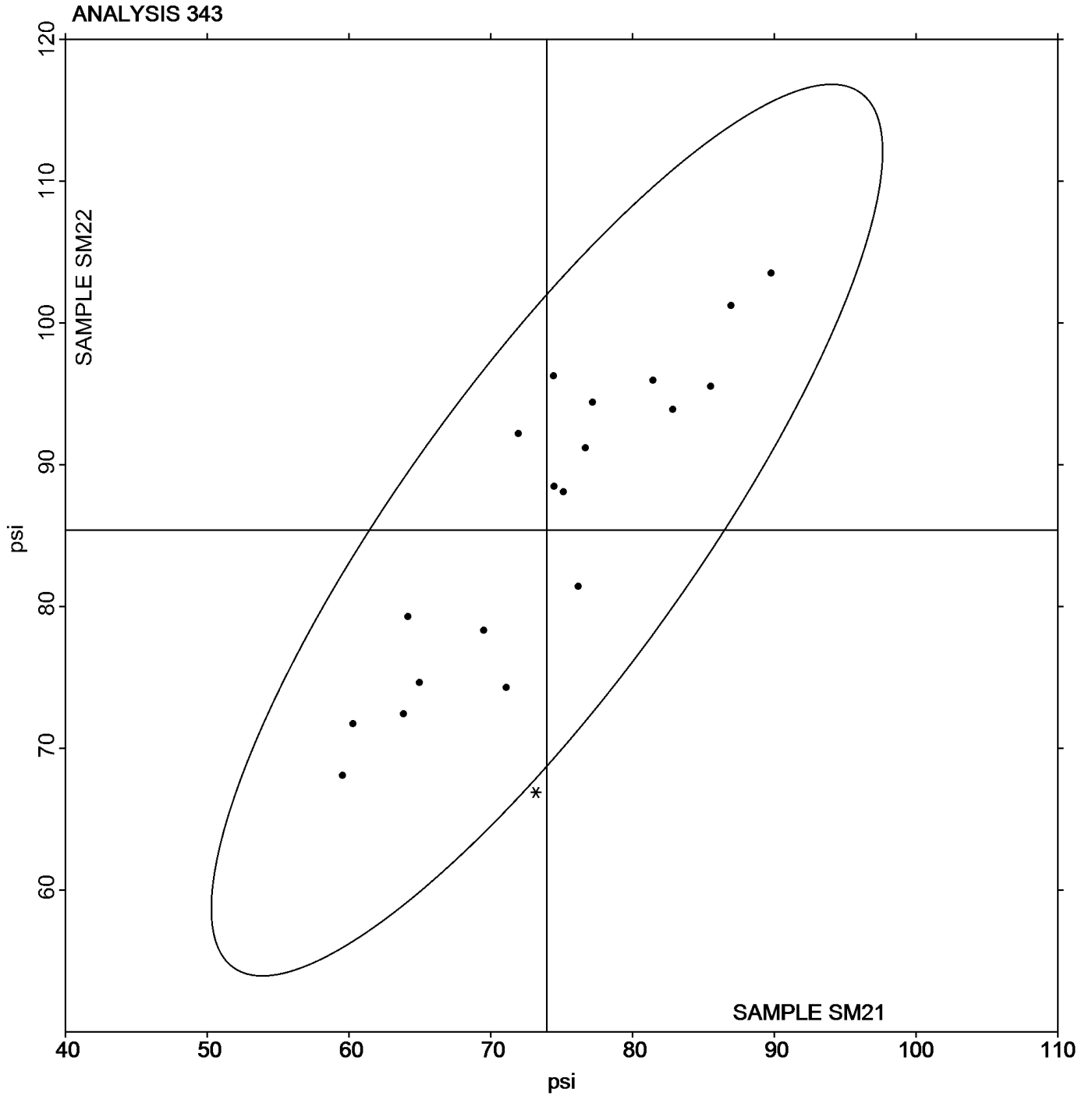
Instrument Code List

- | | |
|-------------------------------------|---|
| (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 **SM21** = 73.965 psi

Grand Mean Sample **SM22** = 85.389 psi



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

WebCode	Data Flag	Sample SZ21			Sample SZ22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2J9EBY		38.72	-1.30	-0.41	33.48	-1.47	-0.91	TL
4EN9PA		44.20	4.18	1.31	37.00	2.05	1.27	CA
64KFW9		40.80	0.78	0.24	36.80	1.85	1.14	CA
6LHVWY		37.26	-2.76	-0.86	34.86	-0.09	-0.06	TL
77R3VY		36.62	-3.40	-1.07	33.52	-1.43	-0.88	LW
BNUC2Z		36.66	-3.36	-1.05	33.44	-1.51	-0.93	CA
BWMMBV		41.04	1.02	0.32	33.44	-1.51	-0.93	TL
GE34KG		40.46	0.44	0.14	32.98	-1.97	-1.22	LW
HVQGWN		38.36	-1.66	-0.52	35.60	0.65	0.40	TL
MYT9TG	X	39.78	-0.24	-0.08	25.10	-9.85	-6.09	LW
Q3HWQL		36.84	-3.18	-1.00	34.44	-0.51	-0.32	CA
U2EDGF		46.22	6.20	1.94	36.83	1.88	1.16	CH
ZZ4J43		43.06	3.04	0.95	37.03	2.08	1.28	XX

Sample SZ21		Summary Statistics	Sample SZ22	
Grand Means	40.020 psi		34.951 psi	
SD Btwn Labs	3.192 psi		1.618 psi	
Statistics based on 12 of 13 reporting participants				

Comments on assigned Data Flags for Test #345

MYT9TG (X) - Extreme data for Sample SZ22.

Instrument Code List

(CA) - CSI CS-163

(CH) - Chatillon Ametek

(LW) - L & W ZD Tensile Tester

(TL) - TMI Lab Master

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

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

WebCode	Data Flag	Sample SN21			Sample SN22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3YK6X6		82.00	5.16	0.80	108.20	10.26	1.38	HY
72ECLX		73.20	-3.64	-0.57	93.60	-4.34	-0.58	HY
9JRQXC		85.60	8.76	1.36	102.60	4.66	0.62	HY
9RGLQZ		78.80	1.96	0.30	100.50	2.56	0.34	HY
A2MJJB		76.20	-0.64	-0.10	100.80	2.86	0.38	HY
A4MWV3		86.20	9.36	1.45	108.80	10.86	1.46	XX
A6LUEB		69.80	-7.04	-1.09	93.80	-4.14	-0.55	HY
AQ3AW3		75.40	-1.44	-0.22	91.56	-6.38	-0.85	HY
BJJBVV		78.68	1.84	0.29	95.44	-2.50	-0.33	HZ
C83Y4J		69.20	-7.64	-1.19	88.20	-9.74	-1.31	XX
CFUHXX		69.60	-7.24	-1.12	81.60	-16.34	-2.19	HZ
CHLBFW		92.20	15.36	2.38	112.20	14.26	1.91	HY
D7KDLT		79.68	2.84	0.44	105.60	7.66	1.03	HY
EAJ3M2		72.60	-4.24	-0.66	97.80	-0.14	-0.02	HY
J3MWXF		75.84	-1.00	-0.16	95.08	-2.86	-0.38	KR
MLKBZB		74.80	-2.04	-0.32	95.40	-2.54	-0.34	HY
W3G3HF		67.80	-9.04	-1.40	92.00	-5.94	-0.80	HY
W3LA2B		75.20	-1.64	-0.25	97.00	-0.94	-0.13	HZ
WZ9XYZ		82.60	5.76	0.89	103.60	5.66	0.76	HZ
XZVFN8		71.40	-5.44	-0.84	95.00	-2.94	-0.39	HY

		Summary Statistics			
		Sample SN21		Sample SN22	
Grand Means		76.840	1000th ft-lbs	97.939	1000th ft-lbs
SD Btwn Labs		6.442	1000th ft-lbs	7.462	1000th ft-lbs
Statistics based on 20 of 20 reporting participants					

Instrument Code List

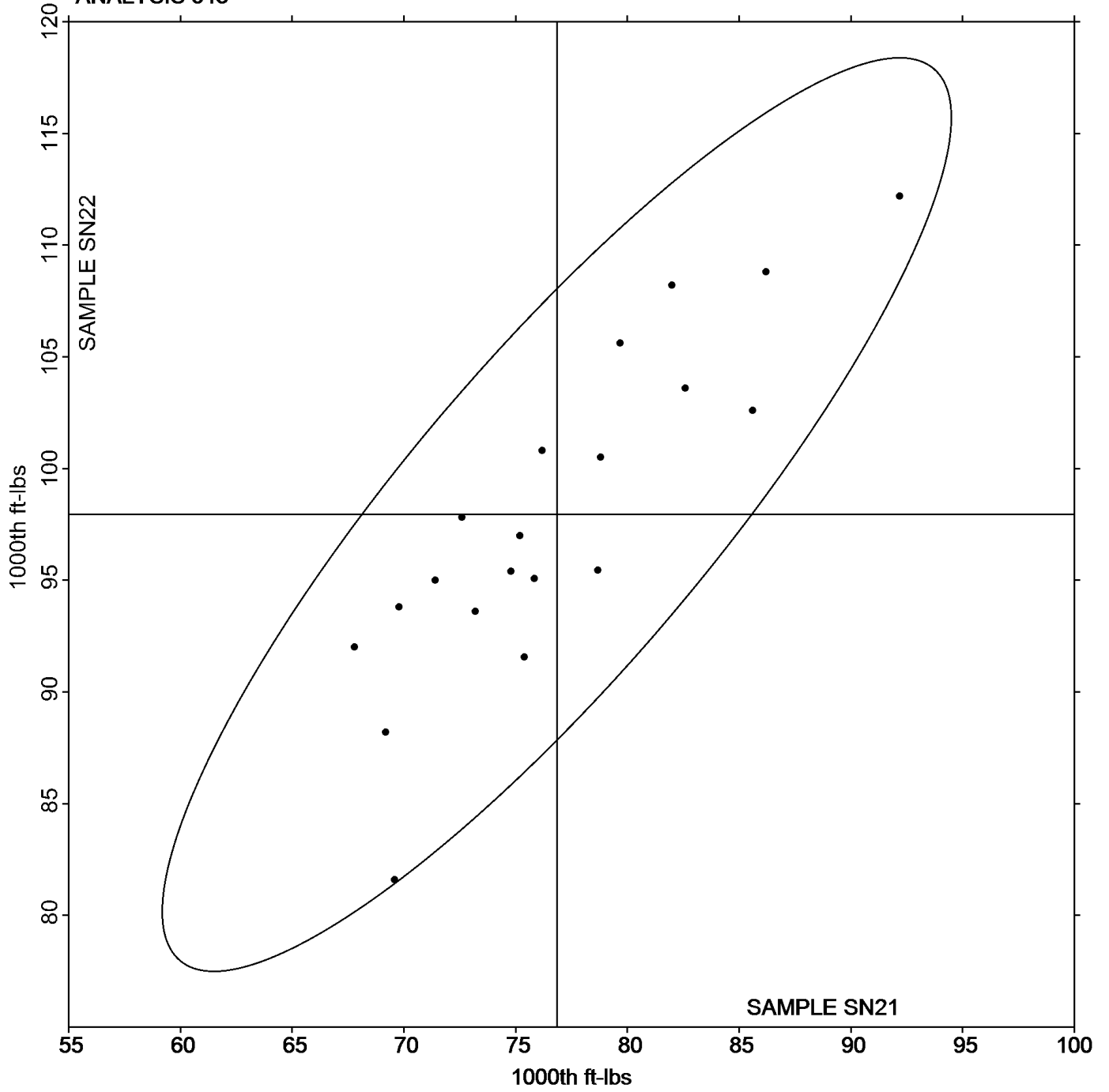
- | | |
|--|---|
| (HY) - Huygen Digitized Scott Internal Bond Tester | (HZ) - Huygen Internal Bond Tester with AccuPress |
| (KR) - Kumagai Riki Kogyo Internal Bond Tester | (XX) - Instrument make/model not specified by lab |

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

Grand Mean Sample **SN21** = 76.840 1000th ft-lbs

Grand Mean Sample **SN22** = 97.939 1000th ft-lbs

ANALYSIS 348



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

WebCode	Data Flag	Sample SP21			Sample SP22			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
29ANRC		49.41	-18.64	-1.08	89.78	-5.21	-0.37	TM
CW3CRT		46.06	-21.99	-1.27	76.90	-18.09	-1.28	TM
MYT9TG		84.40	16.34	0.94	76.60	-18.39	-1.30	XX
Q2MBZF		59.79	-8.26	-0.48	89.43	-5.56	-0.39	TM
QQP7EU		67.00	-1.06	-0.06	101.40	6.41	0.45	TM
TGTA8A		74.08	6.02	0.35	118.48	23.49	1.66	SC
U2EDGF		101.60	33.54	1.94	111.60	16.61	1.18	TM
UDN44N		59.77	-8.29	-0.48	95.93	0.94	0.07	XX
XF6CW9		70.40	2.34	0.13	94.80	-0.19	-0.01	TM

Summary Statistics			
	Sample SP21		Sample SP22
Grand Means	68.057	1000th ft-lbs	94.991
SD Btwn Labs	17.333	1000th ft-lbs	14.112
Statistics based on 9 of 9 reporting participants			

Instrument Code List

(SC) - Scott Internal Bond Tester (Manual)

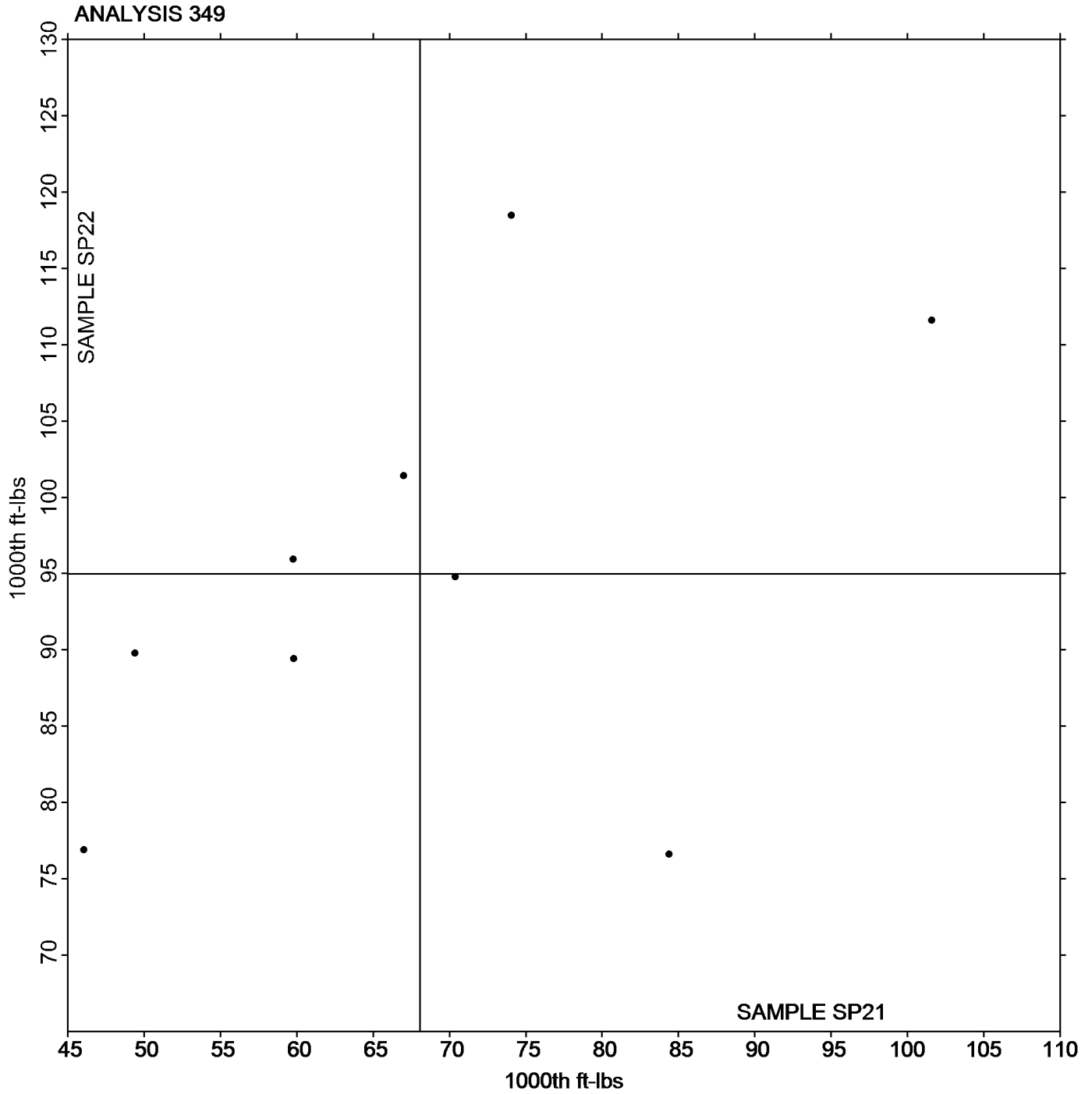
(TM) - TMI Monitor/Internal Bond Tester

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

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

Grand Mean Sample **SP21** = 68.057 1000th ft-lbs

Grand Mean Sample **SP22** = 94.991 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.