

Paper & Paperboard Interlaboratory Testing Program

Summary Report #278S - September 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 SA23			Sample SA24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2MWC2X		26.00	-3.54	-1.61	23.70	-2.85	-1.42
6KENQ9		27.60	-1.94	-0.88	25.10	-1.45	-0.72
84Y2H3		31.07	1.53	0.70	27.35	0.81	0.40
8V9J4U		26.83	-2.71	-1.23	25.70	-0.85	-0.42
CME644		27.30	-2.24	-1.02	25.64	-0.91	-0.45
D8FEMX		32.20	2.66	1.21	28.60	2.05	1.02
F7Y6MW		27.63	-1.91	-0.87	24.47	-2.08	-1.04
FDG3H		31.30	1.76	0.80	28.78	2.23	1.11
FR2TER		30.13	0.59	0.27	26.47	-0.08	-0.04
K4EMWL		24.73	-4.81	-2.19	22.81	-3.73	-1.86
KK7KXG		29.04	-0.50	-0.23	27.12	0.57	0.29
KM7T3R		29.28	-0.26	-0.12	26.36	-0.19	-0.09
LBDNB7		31.04	1.50	0.68	25.38	-1.17	-0.58
LEDY87		32.10	2.56	1.17	30.60	4.05	2.02
LNYZMF		29.29	-0.25	-0.11	26.12	-0.43	-0.21
RLBH9B		30.28	0.74	0.34	26.36	-0.19	-0.10
RWB9RX	X	35.54	6.00	2.73	35.25	8.70	4.34
T7DQ2F		28.70	-0.84	-0.38	27.10	0.55	0.28
U2GLKG		28.81	-0.74	-0.33	25.36	-1.19	-0.59
UB2RK7		29.47	-0.07	-0.03	25.50	-1.05	-0.52
VFUB2U		28.85	-0.69	-0.31	24.20	-2.35	-1.17
W32CKC		31.95	2.41	1.10	28.31	1.76	0.88
XC4UVE		32.63	3.09	1.41	28.64	2.09	1.04
Y87R86		27.12	-2.42	-1.10	25.80	-0.74	-0.37
YNEL2Z		33.98	4.44	2.02	30.35	3.80	1.90
YUKEVV		30.25	0.71	0.32	25.77	-0.78	-0.39
Z9YZTU	X	111.50	81.96	37.33	56.10	29.55	14.75
ZDNKWA		28.65	-0.89	-0.41	25.12	-1.43	-0.72
ZUFGX6		31.38	1.84	0.84	30.11	3.56	1.78

	Sample SA23	Summary Statistics	Sample SA24
Grand Means	29.541 psi		26.549 psi
SD Btwn Labs	2.195 psi		2.003 psi
Statistics based on 27 of 29 reporting participants			

Comments on assigned Data Flags for Test #305

RWB9RX (X) - Systematic error (data for both samples are high).

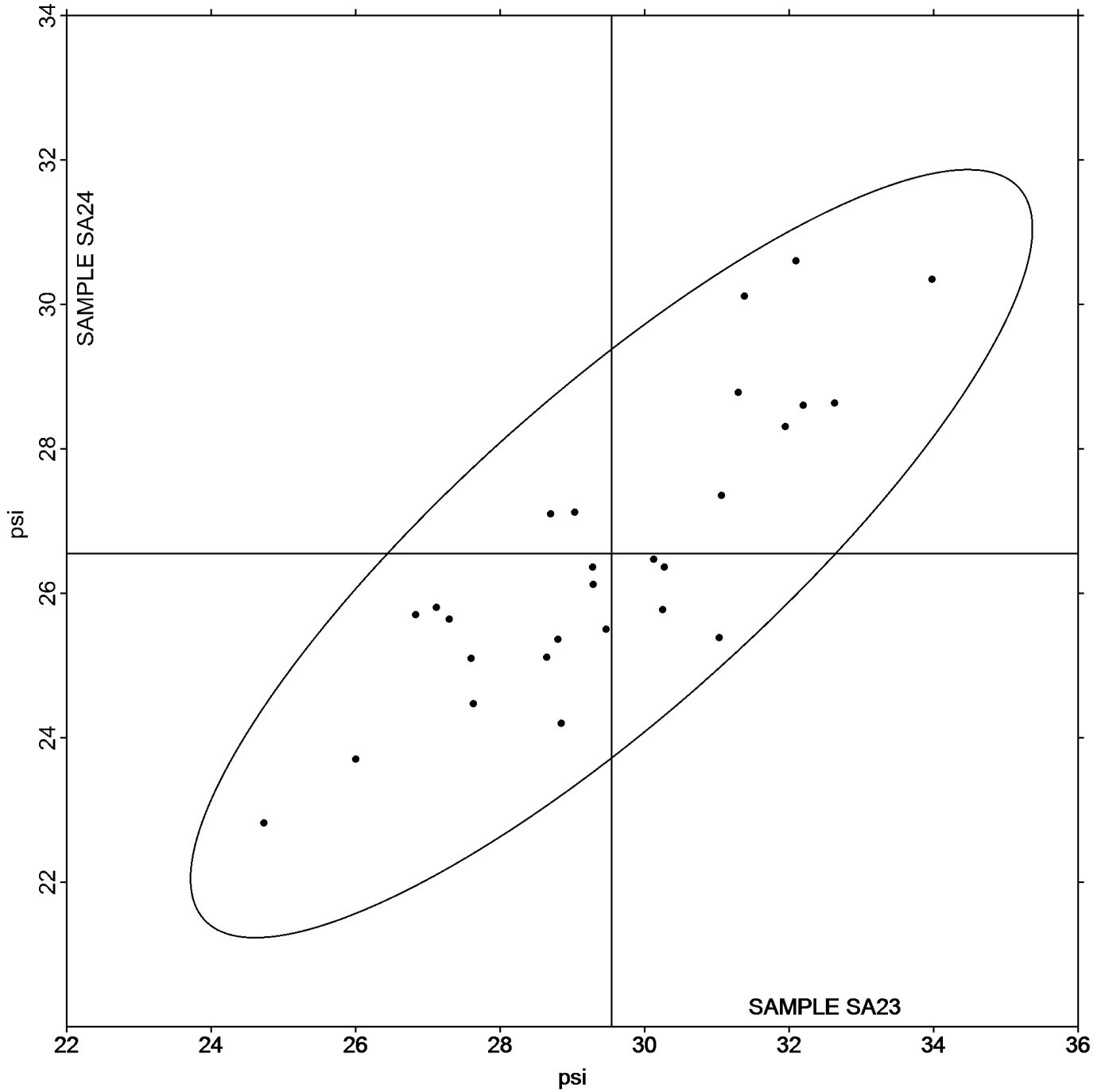
Z9YZTU (X) - Extreme data.

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

Grand Mean Sample SA23 = 29.541 psi

Grand Mean Sample SA24 = 26.549 psi

ANALYSIS 305



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

WebCode	Data Flag	Sample SB23			Sample SB24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3C6DMX		89.15	0.04	0.01	66.10	-3.94	-0.60
6UYRY9	*	71.79	-17.32	-3.01	51.71	-18.33	-2.78
744YFT		85.08	-4.03	-0.70	64.85	-5.19	-0.79
77BGEP		100.74	11.63	2.02	81.59	11.55	1.75
7CFDXP		86.45	-2.66	-0.46	70.55	0.51	0.08
7Z7KT4		82.95	-6.16	-1.07	64.49	-5.55	-0.84
84Y2H3		86.02	-3.09	-0.54	67.81	-2.23	-0.34
8BH8EA		92.66	3.55	0.62	77.69	7.65	1.16
AVWQ3N		82.24	-6.88	-1.20	61.28	-8.76	-1.33
BC2K9N		98.92	9.80	1.71	82.09	12.05	1.83
CL7RNN		90.56	1.45	0.25	67.31	-2.73	-0.41
DN8CPT		89.43	0.32	0.06	73.24	3.20	0.49
DZXAQQ		90.50	1.39	0.24	72.86	2.82	0.43
GRWTRX		89.30	0.19	0.03	66.00	-4.04	-0.61
GW3PBX		87.12	-1.99	-0.35	64.43	-5.61	-0.85
HH4ZWC	X	116.21	27.09	4.71	89.82	19.78	3.00
HJYHYD		91.85	2.74	0.48	67.40	-2.64	-0.40
KAKFQH		88.70	-0.41	-0.07	75.40	5.36	0.81
MLQBXC		94.20	5.09	0.88	71.20	1.16	0.18
N44AHZ		89.07	-0.04	-0.01	74.25	4.21	0.64
QUN8A6		88.40	-0.71	-0.12	70.60	0.56	0.09
RRFETB		97.60	8.49	1.48	73.60	3.56	0.54
UB2RK7		93.38	4.27	0.74	69.26	-0.78	-0.12
WQ67RD		85.66	-3.45	-0.60	68.43	-1.61	-0.24
X27TJB		83.70	-5.42	-0.94	64.87	-5.17	-0.79
XQN9YD		85.19	-3.92	-0.68	67.12	-2.92	-0.44
Y87R86		93.89	4.78	0.83	80.21	10.17	1.54
YACA7Z		87.53	-1.58	-0.28	69.05	-0.99	-0.15
YNEL2Z		93.09	3.97	0.69	77.69	7.66	1.16

	Sample SB23	Summary Statistics	Sample SB24
Grand Means	89.113 psi		70.038 psi
SD Btwn Labs	5.748 psi		6.587 psi
Statistics based on 28 of 29 reporting participants			

Comments on assigned Data Flags for Test #310

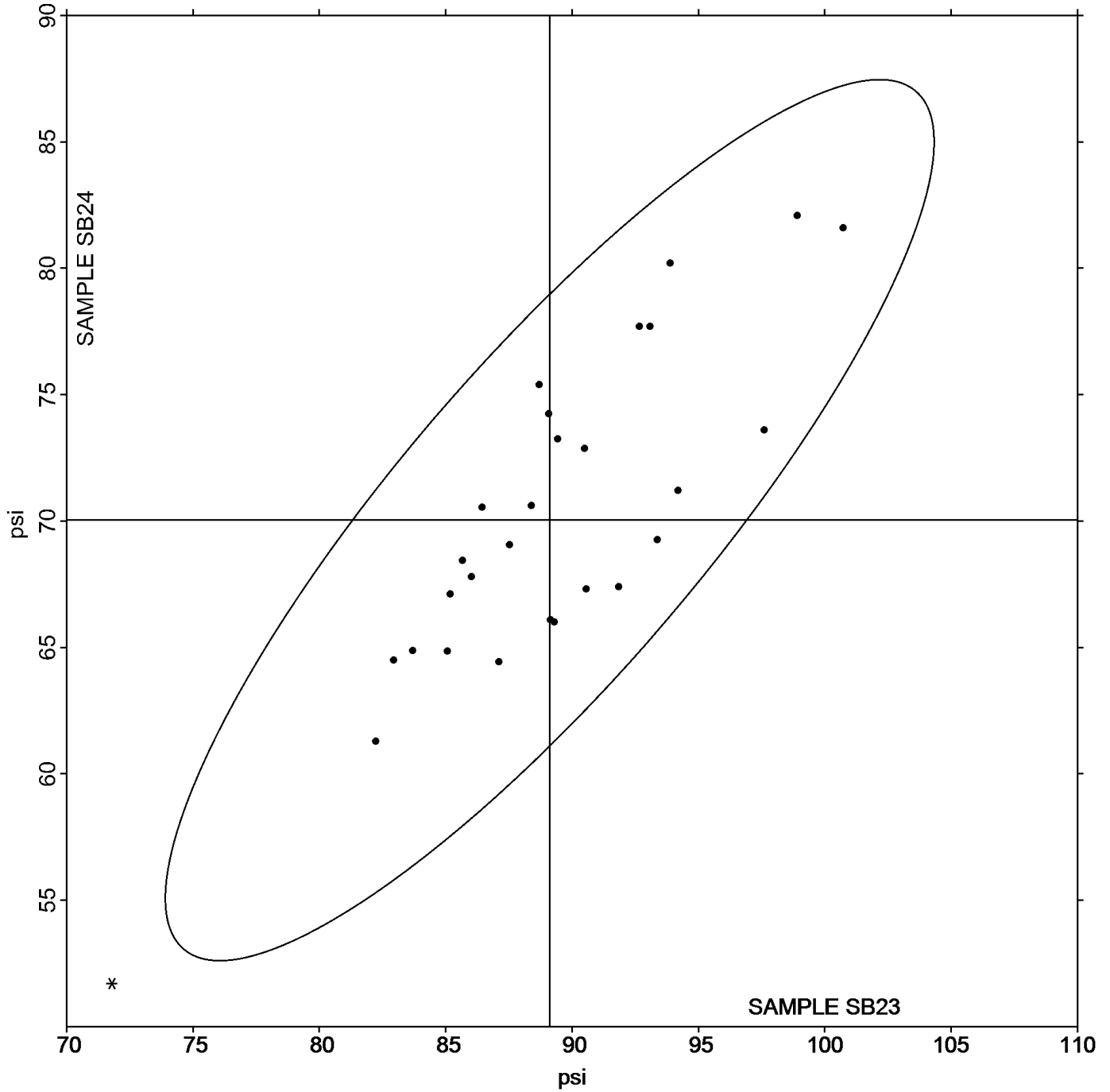
HH4ZWC (X) - Systematic error (data for both samples are high).

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

Grand Mean Sample **SB23** = 89.113 psi

Grand Mean Sample **SB24** = 70.038 psi

ANALYSIS 310



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

WebCode	Data Flag	Sample SK23			Sample SK24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
6F3DZZ		21.21	0.10	0.14	26.36	0.04	0.07
FR2TER		19.75	-1.36	-1.86	25.15	-1.16	-1.99
H9YRFQ		21.66	0.55	0.75	26.53	0.22	0.37
PJAX7K	X	28.12	7.01	9.57	33.07	6.75	11.53
UB2RK7		20.86	-0.25	-0.34	26.47	0.16	0.27
UGPCML		21.56	0.45	0.61	26.74	0.43	0.73
UXGAPG	X	29.21	8.10	11.06	35.10	8.78	14.99
ZUFGX6		21.62	0.51	0.70	26.64	0.33	0.55

Sample SK23		Summary Statistics	Sample SK24	
Grand Means	21.111 Grams		26.315 Grams	
SD Btwn Labs	0.733 Grams		0.586 Grams	
Statistics based on 6 of 8 reporting participants				

Comments on assigned Data Flags for Test #311

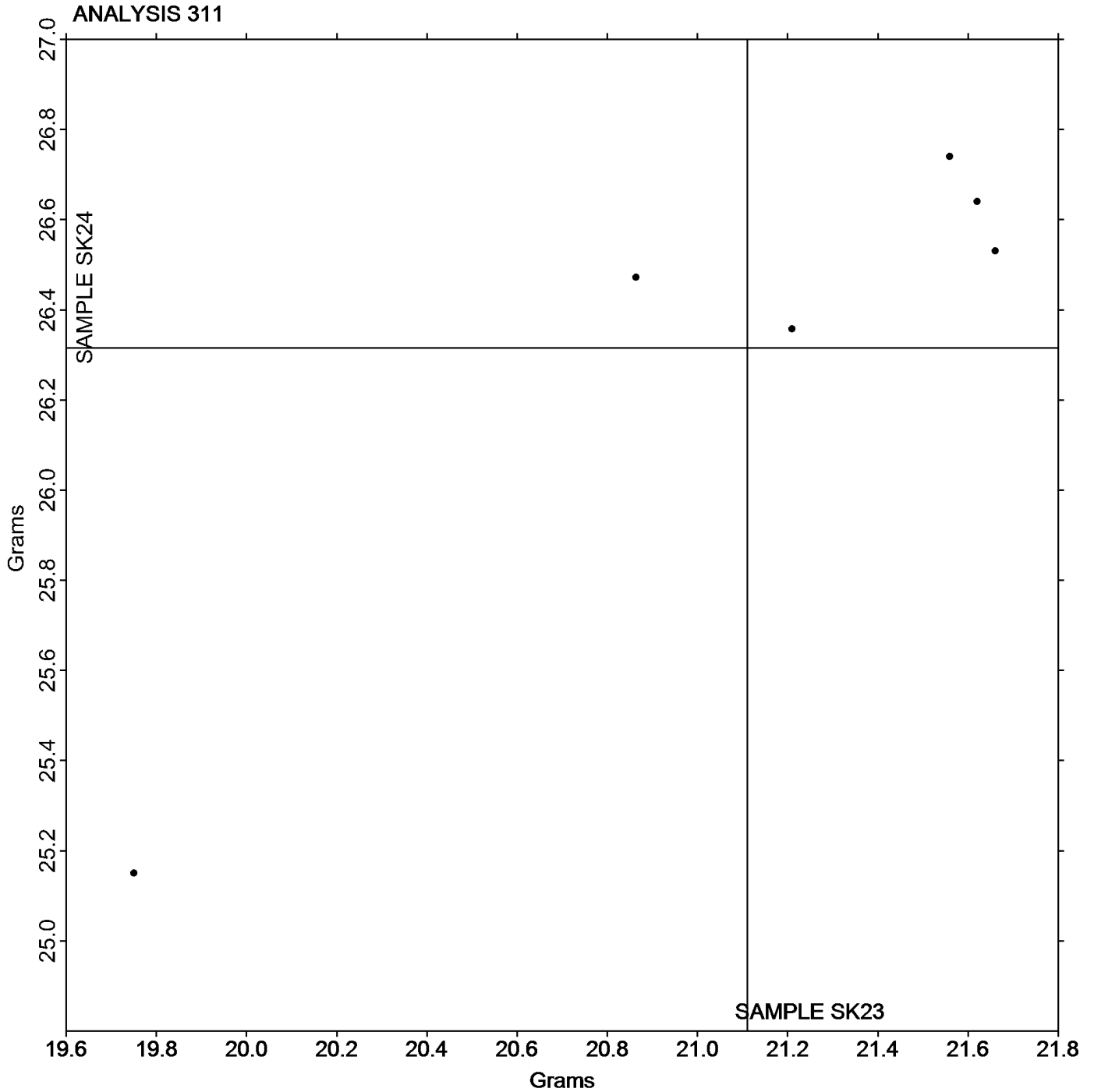
PJAX7K (X) - Extreme data.

UXGAPG (X) - Extreme data.

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

Grand Mean Sample **SK23** = 21.111 Grams

Grand Mean Sample **SK24** = 26.315 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 SC23			Sample SC24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
44V8A8		52.20	3.16	0.87	56.50	1.00	0.24
4NYTAD		50.00	0.96	0.26	56.22	0.72	0.17
744YFT		51.33	2.29	0.63	58.74	3.23	0.77
7CFDXP		45.60	-3.44	-0.95	51.16	-4.34	-1.03
7Z7KT4		46.64	-2.40	-0.66	50.56	-4.94	-1.17
84Y2H3		47.21	-1.83	-0.50	52.80	-2.70	-0.64
8V9J4U		49.52	0.47	0.13	56.59	1.09	0.26
92PCTY		55.20	6.16	1.69	61.00	5.50	1.30
AVWQ3N		51.50	2.45	0.67	58.62	3.12	0.74
BC2K83		45.61	-3.43	-0.94	52.26	-3.24	-0.77
CAN96R		51.40	2.36	0.65	58.20	2.70	0.64
CL7RNN		48.60	-0.44	-0.12	55.88	0.38	0.09
CME644		53.04	4.00	1.10	56.40	0.90	0.21
CW4T2R		48.87	-0.17	-0.05	58.14	2.64	0.62
D2TRTT	X	53.99	4.95	1.36	55.06	-0.44	-0.10
D8FEMX		50.59	1.55	0.43	58.99	3.49	0.83
DR7QCH		50.32	1.28	0.35	56.60	1.10	0.26
DZXAQQ		46.07	-2.97	-0.82	50.79	-4.71	-1.12
EQ9KT4		52.00	2.96	0.81	58.80	3.30	0.78
EXNJ2M		49.44	0.40	0.11	54.38	-1.12	-0.27
F7Y6MW		50.84	1.80	0.49	58.04	2.54	0.60
FDG3H		46.20	-2.84	-0.78	52.30	-3.20	-0.76
GWN32V		51.76	2.72	0.75	59.78	4.28	1.01
HG7UEW		46.88	-2.16	-0.59	54.72	-0.78	-0.19
HJYHYD		44.82	-4.22	-1.16	49.46	-6.04	-1.43
JEZQ4L		50.54	1.50	0.41	60.36	4.86	1.15
JNAVGC		48.04	-1.00	-0.28	52.13	-3.37	-0.80
JY67MX		46.94	-2.10	-0.58	54.02	-1.48	-0.35
K4EMWL		45.11	-3.94	-1.08	50.37	-5.14	-1.22
KK7KXG		48.10	-0.94	-0.26	56.19	0.68	0.16
KM7T3R	X	64.93	15.89	4.37	54.88	-0.62	-0.15
LBDNB7		50.50	1.46	0.40	59.10	3.60	0.85
LEDY87		43.12	-5.92	-1.63	48.76	-6.74	-1.60
LNYZMF		45.50	-3.54	-0.97	50.40	-5.10	-1.21
PEYKNM		48.70	-0.34	-0.09	57.42	1.92	0.45
PTYJCJ	X	52.56	3.51	0.97	58.25	2.75	0.65
QG4R76		42.72	-6.32	-1.74	47.24	-8.26	-1.96
QZCU6B		48.34	-0.70	-0.19	53.92	-1.58	-0.37
RRFETB	*	39.20	-9.84	-2.71	44.00	-11.50	-2.72
T7DQ2F		48.42	-0.62	-0.17	52.48	-3.02	-0.72
TB9KYG		56.36	7.32	2.01	62.12	6.62	1.57
TXL8M8		54.04	5.00	1.37	61.90	6.40	1.51
U2GLKG		50.34	1.30	0.36	59.06	3.56	0.84

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

WebCode	Data Flag	Sample SC23			Sample SC24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
UB2RK7		48.54	-0.50	-0.14	56.33	0.83	0.20
VBWRWB		48.42	-0.63	-0.17	54.50	-1.00	-0.24
W32CKC		55.83	6.78	1.87	63.28	7.78	1.84
WQ67RD		47.61	-1.43	-0.39	52.23	-3.27	-0.77
X27TJB		51.29	2.25	0.62	57.92	2.42	0.57
X8BP3B		46.70	-2.34	-0.64	53.20	-2.30	-0.55
XC4UVE		44.70	-4.34	-1.19	51.06	-4.44	-1.05
Y87R86		57.20	8.16	2.24	64.00	8.50	2.01
YACA7Z		48.73	-0.31	-0.09	56.18	0.67	0.16
YUKEVV		52.52	3.48	0.96	57.92	2.42	0.57
YV8R8R	*	43.68	-5.36	-1.47	53.83	-1.67	-0.40
ZDNKWA		53.42	4.38	1.20	59.32	3.82	0.90

	Sample SC23	Summary Statistics	Sample SC24
Grand Means	49.043 Grams		55.503 Grams
SD Btwn Labs	3.636 Grams		4.226 Grams
Statistics based on 52 of 55 reporting participants			

Comments on assigned Data Flags for Test #312

D2TRTT (X) - Inconsistent in testing between samples and within the determinations for Sample SC23.

KM7T3R (X) - Inconsistent in testing between samples, data for Sample SC23 are high.

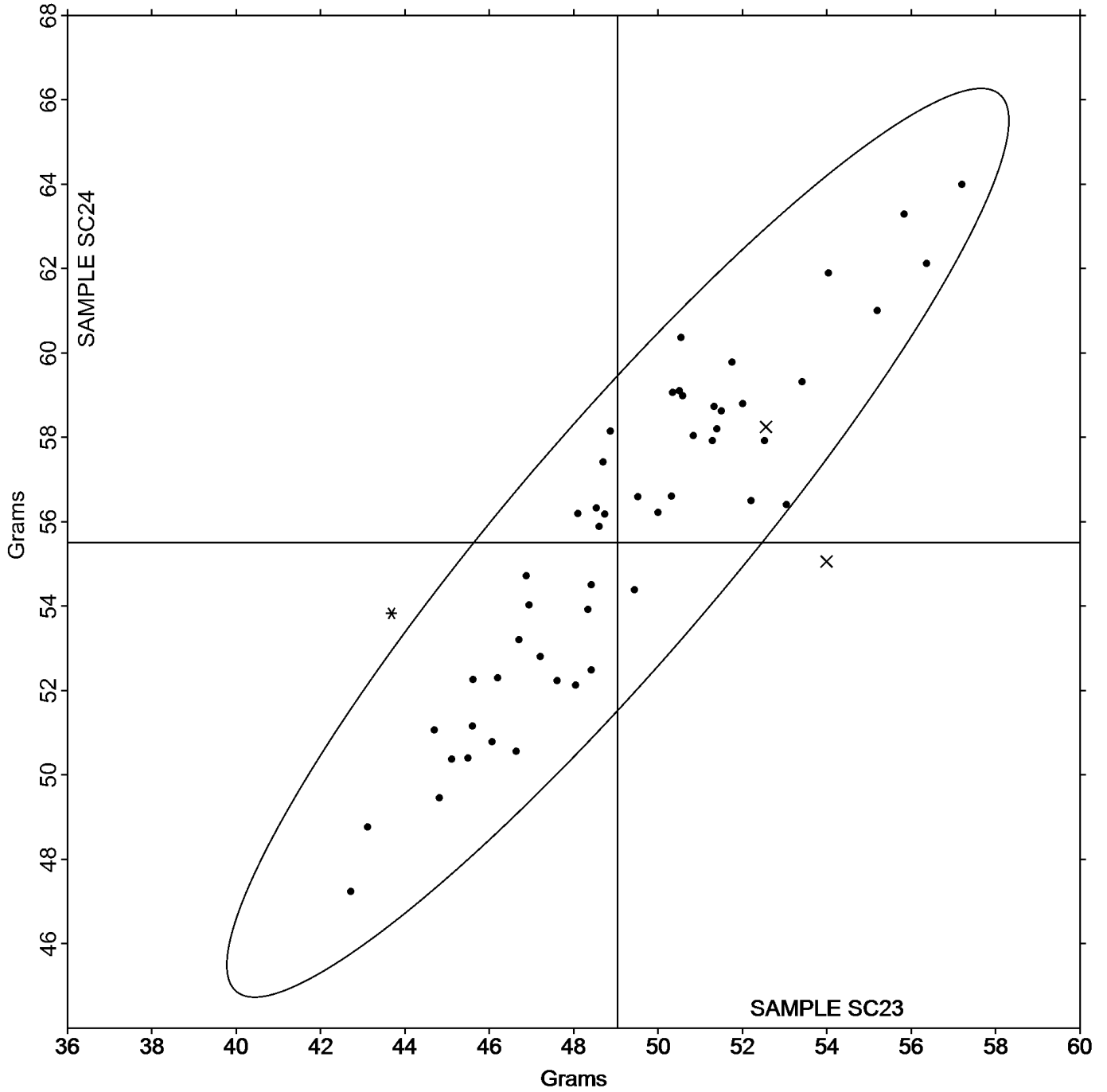
PTYJCY (X) - Data appear to be off by a factor of 0.5; data converted by CTS (x2).

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

Grand Mean Sample **SC23** = 49.043 Grams

Grand Mean Sample **SC24** = 55.503 Grams

ANALYSIS 312



TAPPI-CTS Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

WebCode	Data Flag	Sample SD23			Sample SD24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
38VY6Y		139.6	-6.4	-0.83	103.5	-2.1	-0.35
3C6DMX		146.0	-0.1	-0.01	107.6	2.0	0.34
44AWBY	X	37.2	-108.9	-14.05	24.9	-80.7	-13.87
4YYJUJ		136.0	-10.1	-1.30	97.6	-8.0	-1.37
4ZBHQU		146.4	0.3	0.04	107.6	2.0	0.34
6F3DZZ		140.3	-5.8	-0.74	98.5	-7.1	-1.22
6KENQ9		146.8	0.7	0.09	113.6	8.0	1.38
6UYRY9		150.8	4.7	0.61	107.3	1.7	0.29
8WE23Q		143.3	-2.8	-0.36	104.8	-0.8	-0.13
BC2K9N		155.4	9.4	1.21	112.9	7.3	1.26
C466WP		147.8	1.7	0.22	100.9	-4.7	-0.80
C9UHYD		141.4	-4.7	-0.61	99.7	-5.9	-1.02
DN8CPT		145.8	-0.3	-0.04	112.6	7.0	1.21
GRWTRX		165.8	19.7	2.54	116.0	10.4	1.79
GW3PBX		140.8	-5.3	-0.68	98.4	-7.2	-1.23
GW6CTB		136.8	-9.3	-1.20	100.9	-4.7	-0.81
HH2CFX		147.6	1.5	0.20	107.5	1.9	0.33
HH4ZWC	*	125.8	-20.3	-2.62	98.3	-7.3	-1.25
J98JKD		150.0	3.9	0.51	108.5	2.9	0.50
KAKFQH		152.2	6.1	0.79	103.8	-1.8	-0.31
KXQY2G		144.1	-2.0	-0.26	105.7	0.1	0.03
N44AHZ		150.5	4.4	0.56	105.1	-0.5	-0.09
PP3XM2		153.8	7.8	1.00	111.9	6.3	1.09
Q68LBL		148.8	2.7	0.35	110.1	4.5	0.78
QF6LMQ		144.4	-1.7	-0.22	104.0	-1.6	-0.27
QUN8A6	*	160.8	14.7	1.90	123.2	17.6	3.03
QUQ2QP		139.6	-6.4	-0.83	103.3	-2.3	-0.40
RQLTYK		147.3	1.2	0.16	98.7	-6.9	-1.18
RRFETB		128.2	-17.9	-2.31	94.2	-11.4	-1.96
RWB9RX		151.6	5.5	0.71	106.0	0.4	0.07
T7DQ2F		139.5	-6.6	-0.85	101.4	-4.1	-0.71
UB2RK7		144.4	-1.6	-0.21	106.9	1.4	0.23
VFUB2U		147.2	1.1	0.14	106.8	1.2	0.21
XH9PFE		153.2	7.1	0.92	109.1	3.5	0.60
XQN9YD		151.5	5.4	0.70	109.0	3.4	0.58
Y48DKF		152.2	6.1	0.79	104.8	-0.8	-0.13
YGTME		143.4	-2.7	-0.35	104.1	-1.5	-0.25
YTAD8B		145.9	-0.1	-0.02	102.3	-3.3	-0.57
ZYABV7	X	192.1	46.0	5.94	133.6	28.0	4.81

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

	Sample SD23	Summary Statistics	Sample SD24
Grand Means	146.09 Grams		105.58 Grams
SD Btwn Labs	7.75 Grams		5.82 Grams
Statistics based on 37 of 39 reporting participants			

Comments on assigned Data Flags for Test #314

44AWBY (X) - Extreme data.

ZYABV7 (X) - Data for both samples are high.

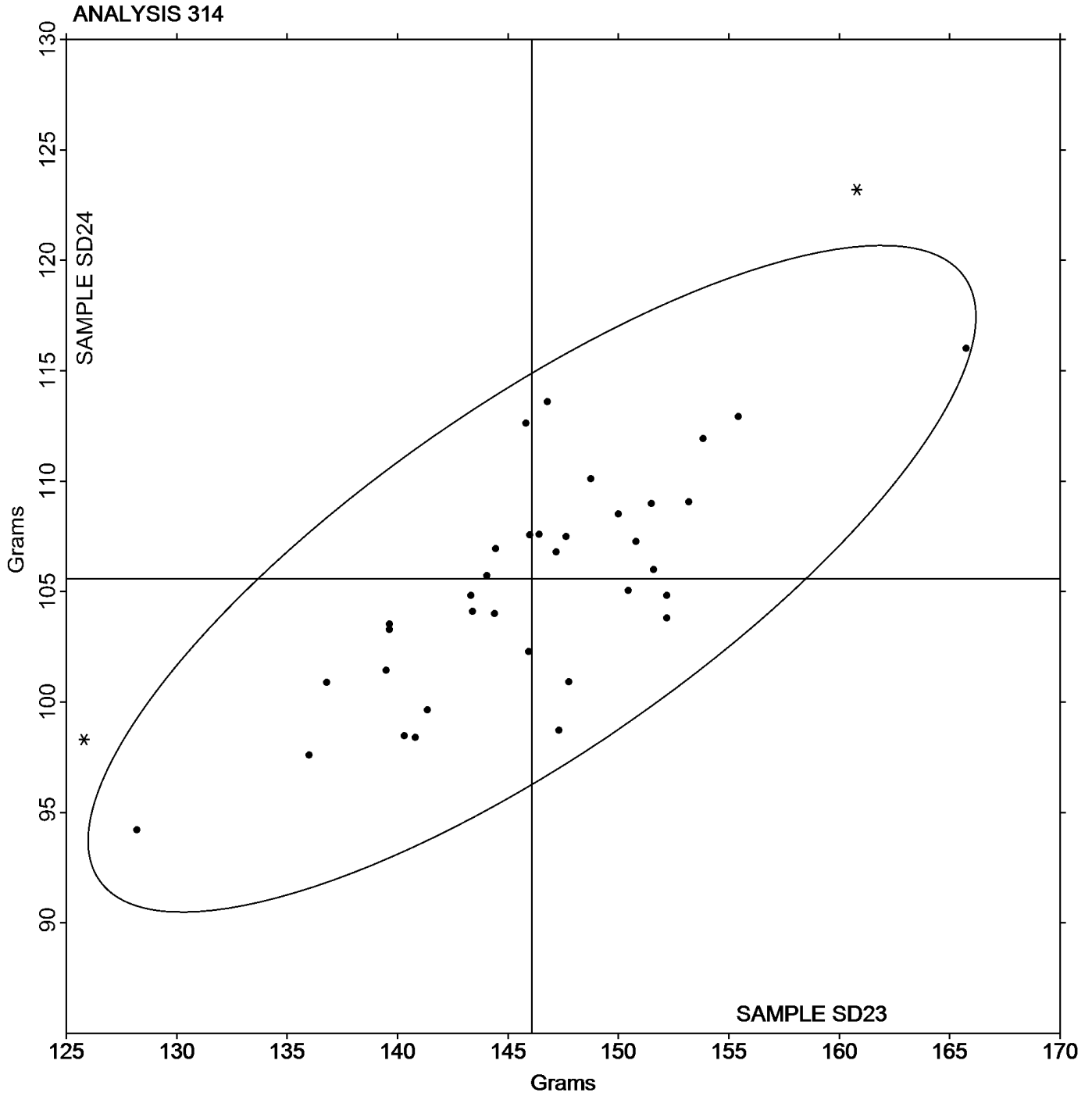
Analysis Notes:

4YYJUJZ - Data appears to be transposed between samples. Data Switched by CTS.

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

Grand Mean Sample **SD23** = 146.09 Grams

Grand Mean Sample **SD24** = 105.58 Grams



TAPPI-CTS Interlaboratory Testing Program

Analysis 320

Tensile Breaking Strength - Newsprint

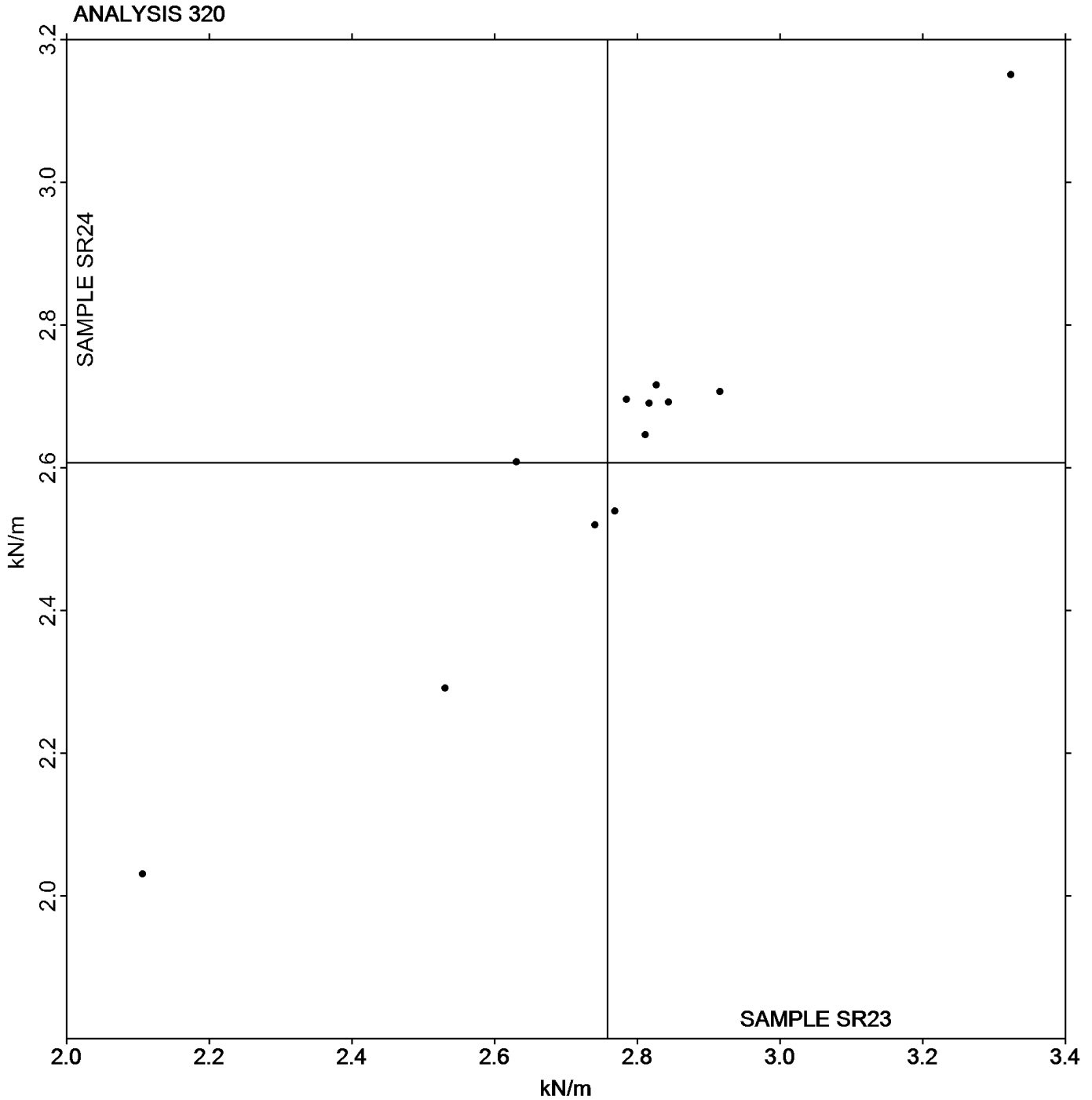
WebCode	Data Flag	Sample SR23			Sample SR24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
84Y2H3		2.631	-0.127	-0.46	2.608	0.001	0.00
FDFG3H		2.844	0.085	0.31	2.692	0.085	0.32
FR2TER		2.769	0.010	0.04	2.539	-0.068	-0.25
H9YRFQ		2.817	0.059	0.21	2.690	0.083	0.31
MLQBXC		2.827	0.069	0.25	2.716	0.109	0.41
PJAX7K		2.107	-0.652	-2.34	2.031	-0.576	-2.16
RLBH9B		2.811	0.053	0.19	2.646	0.039	0.14
RLTN92		2.531	-0.228	-0.82	2.291	-0.316	-1.18
UGPCML		2.741	-0.018	-0.06	2.520	-0.087	-0.33
UHNH72		3.324	0.566	2.03	3.151	0.544	2.04
UXGAPG		2.785	0.026	0.09	2.696	0.089	0.33
ZUFGX6		2.916	0.157	0.56	2.707	0.099	0.37

		Summary Statistics	
	Sample SR23		Sample SR24
Grand Means	2.7584 kN/m		2.6072 kN/m
SD Btwn Labs	0.2791 kN/m		0.2672 kN/m
Statistics based on 12 of 12 reporting participants			

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

Grand Mean Sample **SR23** = 2.7584 kN/m

Grand Mean Sample **SR24** = 2.6072 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 SR23			Sample SR24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
6F3DZZ		18.61	-1.70	-1.01	17.62	0.31	0.25
84Y2H3		17.87	-2.44	-1.45	17.72	0.41	0.33
FDFG3H		21.91	1.60	0.95	15.37	-1.95	-1.59
FR2TER		21.61	1.30	0.77	18.03	0.71	0.58
H9YRFQ		21.60	1.30	0.77	18.31	0.99	0.81
MLQBXC		19.15	-1.16	-0.69	17.01	-0.31	-0.25
PJAX7K	X	10.79	-9.51	-5.66	9.31	-8.01	-6.55
RLBH9B		20.69	0.39	0.23	17.72	0.41	0.33
RLTN92		19.23	-1.07	-0.64	15.40	-1.92	-1.57
UHNH72		22.81	2.50	1.49	19.53	2.21	1.81
UXGAPG		18.48	-1.83	-1.09	16.56	-0.76	-0.62
ZUFGX6		21.43	1.12	0.67	17.21	-0.10	-0.09

		Summary Statistics	
	Sample SR23		Sample SR24
Grand Means	20.309 Joules/sq m		17.314 Joules/sq m
SD Btwn Labs	1.682 Joules/sq m		1.223 Joules/sq m
Statistics based on 11 of 12 reporting participants			

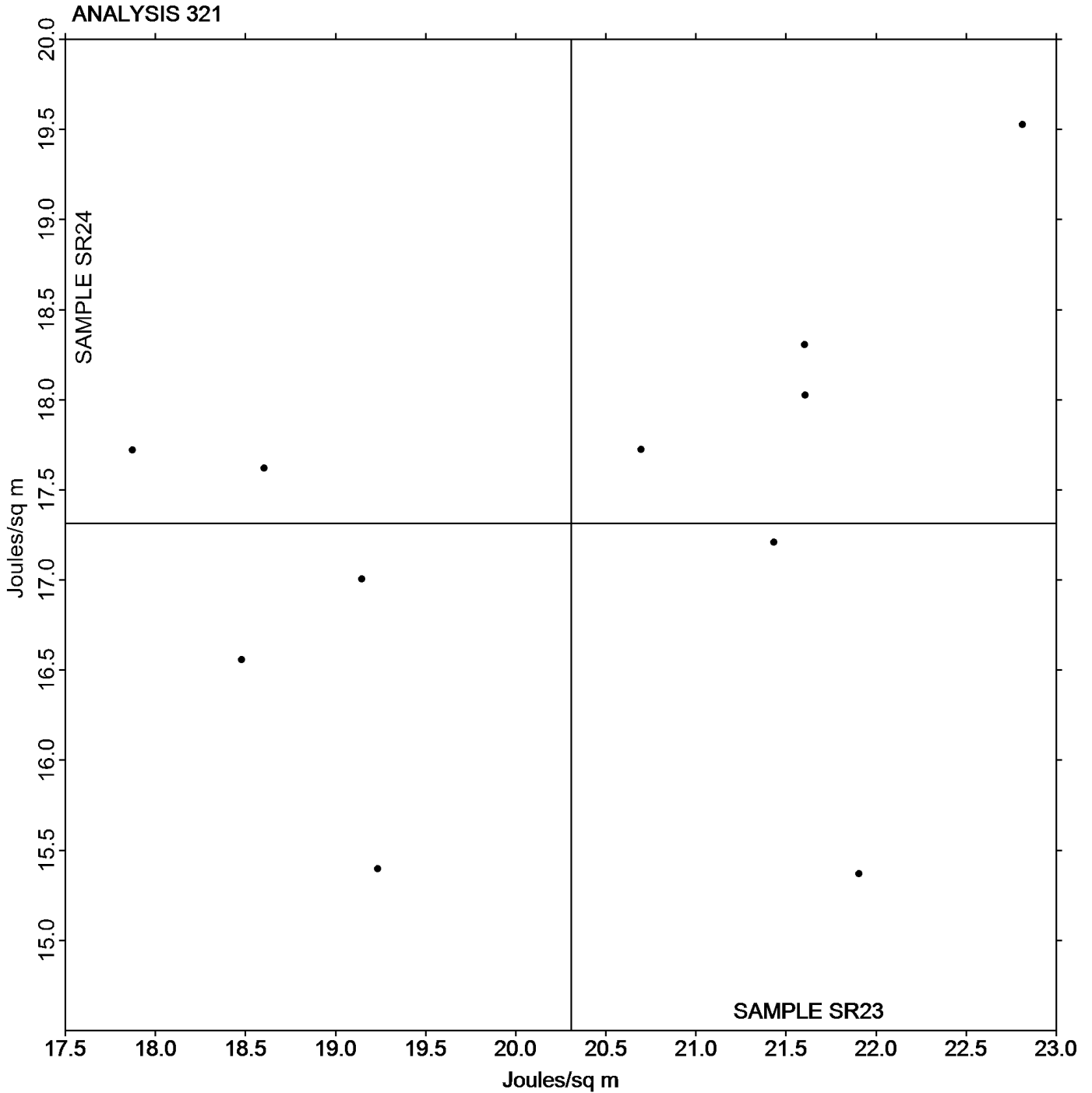
Comments on assigned Data Flags for Test #321

PJAX7K (X) - Extreme data.

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

Grand Mean Sample **SR23** = 20.309 Joules/sq m

Grand Mean Sample **SR24** = 17.314 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 SR23			Sample SR24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
6F3DZZ		1.135	-0.123	-0.79	1.110	-0.057	-0.44
84Y2H3		1.122	-0.136	-0.87	1.132	-0.035	-0.27
FDFG3H		1.290	0.032	0.21	1.150	-0.017	-0.13
FR2TER		1.556	0.298	1.91	1.428	0.261	2.01
H9YRFQ		1.253	-0.005	-0.03	1.128	-0.039	-0.30
MLQBXC		1.152	-0.106	-0.68	1.076	-0.092	-0.71
RLBH9B		1.231	-0.027	-0.17	1.134	-0.034	-0.26
RLTN92		1.456	0.198	1.27	1.349	0.182	1.40
UHNH72		1.118	-0.140	-0.90	1.006	-0.161	-1.24
UXGAPG		1.107	-0.151	-0.97	1.050	-0.117	-0.90
ZUFGX6		1.418	0.160	1.03	1.277	0.110	0.85

Summary Statistics

Sample SR23

Sample SR24

Grand Means 1.2580 Percent
SD Btwn Labs 0.1558 Percent

1.1672 Percent
0.1299 Percent

Statistics based on 11 of 11 reporting participants

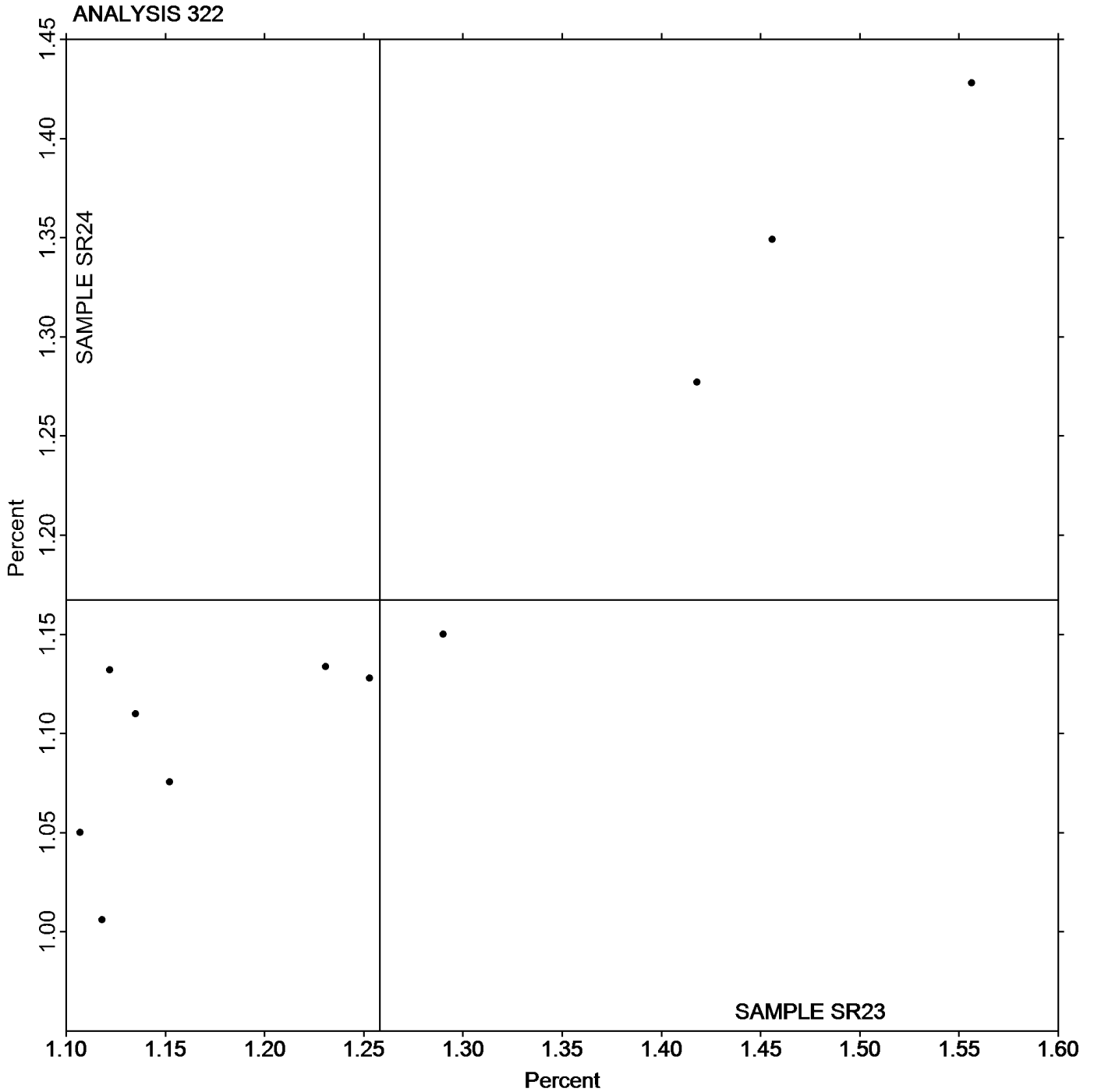
TAPPI-CTS Interlaboratory Testing Program

Analysis 322

Elongation to Break - Newsprint

Grand Mean Sample **SR23** = 1.2580 Percent

Grand Mean Sample **SR24** = 1.1672 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 SF23			Sample SF24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2QURDR		4.921	0.214	0.88	4.882	0.023	0.08	XX
3DZVPY		4.390	-0.317	-1.30	4.477	-0.382	-1.32	LH
3NJCH7		4.758	0.050	0.21	4.879	0.020	0.07	TB
44V8A8		4.622	-0.085	-0.35	4.622	-0.237	-0.82	TC
744YFT		4.855	0.148	0.61	4.993	0.134	0.46	LI
7Z7KT4		4.802	0.095	0.39	4.890	0.032	0.11	TA
84Y2H3		4.621	-0.086	-0.36	4.771	-0.088	-0.30	LH
8V9J4U		4.793	0.086	0.35	4.755	-0.104	-0.36	LI
AVWQ3N		4.373	-0.334	-1.37	4.581	-0.278	-0.96	LI
BC2K83		4.688	-0.019	-0.08	4.975	0.116	0.40	LF
CME644		4.537	-0.171	-0.70	4.904	0.046	0.16	TB
CW4T2R		4.562	-0.145	-0.60	4.636	-0.222	-0.77	TP
D2TRTT		4.694	-0.013	-0.05	4.835	-0.024	-0.08	LI
D8FEMX		4.818	0.110	0.45	4.797	-0.061	-0.21	LH
DR7QCH		4.777	0.070	0.29	4.954	0.095	0.33	LX
EXNJ2M		4.661	-0.046	-0.19	4.531	-0.328	-1.13	TF
F7Y6MW		4.660	-0.047	-0.20	4.803	-0.055	-0.19	IM
GW3PBX		4.732	0.024	0.10	4.877	0.018	0.06	IM
GWN32V		4.660	-0.047	-0.19	4.848	-0.011	-0.04	LE
HG7UEW		4.839	0.132	0.54	4.957	0.098	0.34	MR
HJYHYD		4.898	0.190	0.78	5.012	0.153	0.53	TP
JEZQ4L		4.581	-0.126	-0.52	4.887	0.028	0.10	XX
JNAVGC		4.583	-0.124	-0.51	4.478	-0.380	-1.32	TB
JY67MX		4.730	0.023	0.09	5.180	0.322	1.11	TI
K4EMWL		5.143	0.435	1.79	5.375	0.517	1.79	LX
KK7KXG		4.763	0.056	0.23	4.959	0.100	0.35	LH
KM7T3R	*	4.119	-0.589	-2.42	4.531	-0.328	-1.14	LH
LBDNB7		4.679	-0.029	-0.12	4.989	0.130	0.45	LH
LEDY87	X	4.524	-0.184	-0.76	5.252	0.393	1.36	TO
N2WRJ6		4.767	0.060	0.24	4.798	-0.060	-0.21	TP
PEYKNM		4.812	0.105	0.43	5.101	0.242	0.84	TJ
PTYJCJ		4.369	-0.338	-1.39	4.446	-0.412	-1.43	IM
QG4R76	*	5.390	0.683	2.81	5.508	0.649	2.25	LH
QZCU6B		5.074	0.367	1.51	5.377	0.519	1.79	TB
TB9KYG		4.317	-0.390	-1.60	4.230	-0.629	-2.18	LH
U2GLKG		4.889	0.182	0.75	5.053	0.195	0.67	LH
UB2RK7		4.665	-0.042	-0.17	4.918	0.059	0.20	LH
UP6DMV		4.751	0.044	0.18	4.872	0.013	0.05	LA
VBWRWB		4.304	-0.403	-1.66	4.488	-0.371	-1.28	CB
W32CKC		4.346	-0.361	-1.48	4.552	-0.307	-1.06	LA
WF86EA		4.958	0.251	1.03	5.220	0.362	1.25	TJ
WN4ZET		5.005	0.297	1.22	5.106	0.247	0.85	XX
WQ67RD		4.671	-0.037	-0.15	4.828	-0.030	-0.11	XX

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

WebCode	Data Flag	Sample SF23			Sample SF24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
X8BP3B	*	4.949	0.242	0.99	5.441	0.582	2.01	TO
XC4UVE		4.972	0.264	1.09	5.170	0.311	1.08	TJ
Y87R86		4.628	-0.079	-0.33	4.737	-0.122	-0.42	DL
YACA7Z		4.785	0.077	0.32	5.018	0.160	0.55	LH
YUKEVV		4.648	-0.059	-0.24	4.847	-0.012	-0.04	TF
YV8V8R		4.918	0.210	0.86	4.876	0.017	0.06	LA
ZDNKWA	*	4.184	-0.523	-2.15	4.112	-0.747	-2.58	ID

Sample SF23		Summary Statistics	Sample SF24	
Grand Means	4.7074 kN/m		4.8587 kN/m	
SD Btwn Labs	0.2433 kN/m		0.2890 kN/m	
Statistics based on 49 of 50 reporting participants				

Comments on assigned Data Flags for Test #325

LEDY87 (X) - Inconsistent in testing between samples.

Instrument Code List

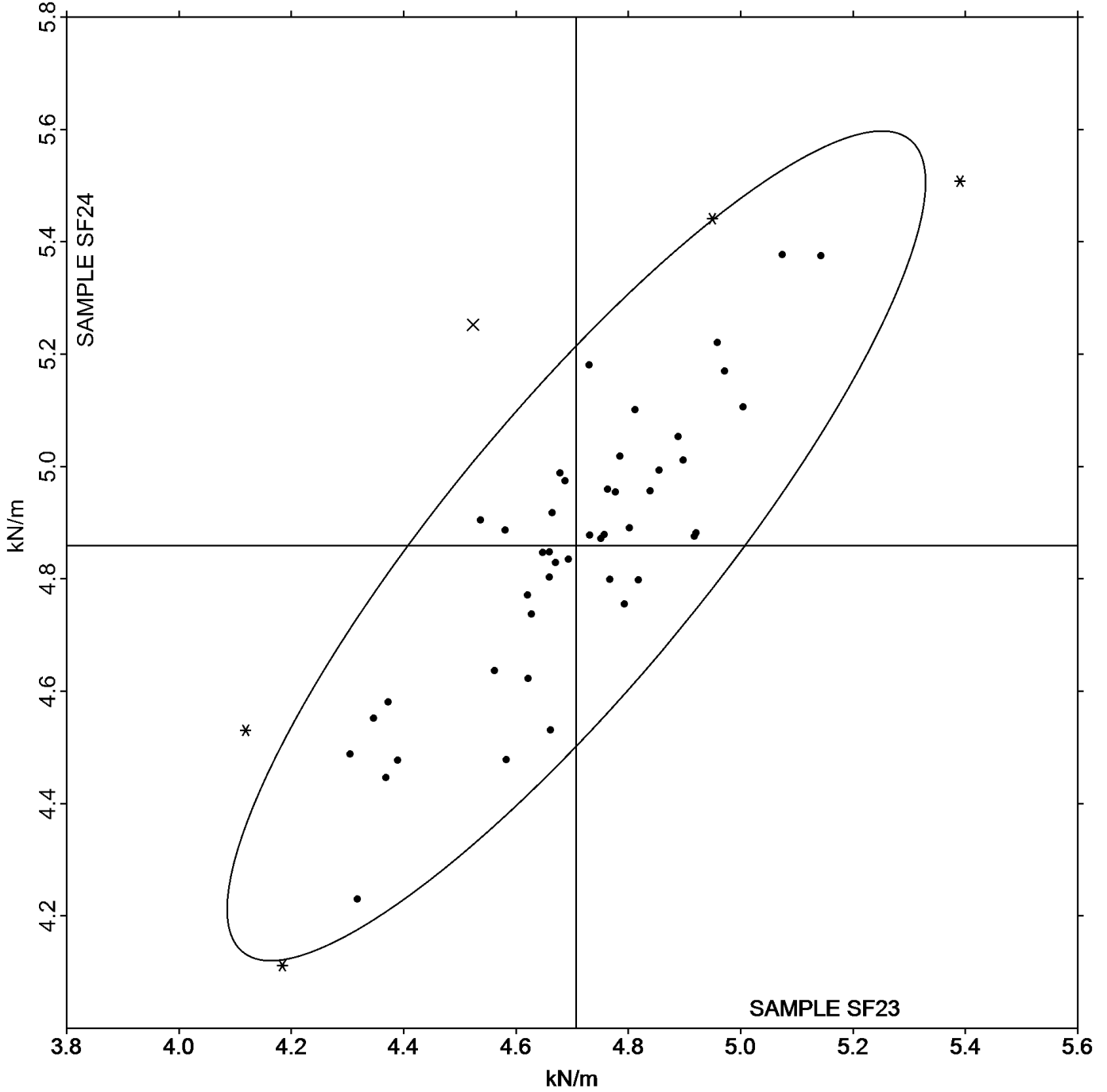
(CB) - Chatillon DFIS 50 (Digital Gauge)/TCD 200	(DL) - EMIC DL500 Universal Testing Machines
(ID) - Instron 4201/4202	(IM) - Instron 5500 Series
(LA) - L & W Tensile - Autoline 300	(LE) - L & W Tensile Tester 066
(LF) - L & W Tensile/Fracture Toughness Tester SE 064	(LH) - L & W Alwetron TH1 (Horizontal) SE 060/065F
(LI) - L & W Tensile Tester SE 062	(LX) - L & W (model not specified)
(MR) - MTS Alliance RT series	(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 **SF23** = 4.7074 kN/m

Grand Mean Sample **SF24** = 4.8587 kN/m

ANALYSIS 325



TAPPI-CTS Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

WebCode	Data Flag	Sample SF23			Sample SF24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DZVPY		57.67	-7.75	-1.09	45.46	-6.41	-0.98	LH
744YFT		70.57	5.15	0.72	51.92	0.06	0.01	LI
84Y2H3		62.06	-3.36	-0.47	49.16	-2.70	-0.41	LH
8V9J4U		70.26	4.83	0.68	48.64	-3.23	-0.49	LI
AVWQ3N		60.69	-4.74	-0.66	49.56	-2.30	-0.35	LI
BC2K83		56.27	-9.15	-1.28	45.50	-6.36	-0.97	LW
CME644		68.33	2.91	0.41	57.51	5.65	0.86	TB
CW4T2R	X	28.44	-36.98	-5.18	24.09	-27.77	-4.24	TP
D2TRTT		63.60	-1.82	-0.26	49.84	-2.02	-0.31	LI
D8FEMX		67.60	2.18	0.31	47.55	-4.32	-0.66	LH
DR7QCH		68.52	3.09	0.43	57.53	5.66	0.86	LX
F7Y6MW		73.89	8.47	1.19	56.60	4.73	0.72	IM
GW3PBX		64.64	-0.78	-0.11	52.22	0.35	0.05	IM
HG7UEW		59.81	-5.61	-0.79	46.40	-5.46	-0.83	MR
HJYHYD		48.74	-16.68	-2.34	35.74	-16.13	-2.46	TP
JEZQ4L		73.06	7.64	1.07	58.97	7.10	1.08	XX
JY67MX		63.48	-1.94	-0.27	57.79	5.93	0.90	TI
K4EMWL		70.93	5.51	0.77	54.44	2.57	0.39	LX
KK7KXG		59.56	-5.87	-0.82	44.44	-7.43	-1.13	LH
KM7T3R		57.27	-8.15	-1.14	54.41	2.55	0.39	LH
LEDY87	*	66.26	0.84	0.12	65.53	13.66	2.09	TO
PTYJCJ		63.43	-1.99	-0.28	47.77	-4.10	-0.63	IM
QG4R76		68.67	3.25	0.46	50.56	-1.31	-0.20	LH
QZCU6B		74.32	8.90	1.25	59.69	7.83	1.19	TB
TB9KYG		64.52	-0.91	-0.13	49.72	-2.15	-0.33	LH
U2GLKG		68.20	2.78	0.39	52.16	0.29	0.04	LH
UB2RK7		64.03	-1.39	-0.19	53.80	1.93	0.29	LH
W32CKC		52.52	-12.90	-1.81	39.78	-12.08	-1.84	LA
WF86EA		83.64	18.22	2.55	64.58	12.71	1.94	TJ
WN4ZET		70.71	5.29	0.74	54.08	2.21	0.34	LX
WQ67RD		64.04	-1.38	-0.19	52.25	0.39	0.06	XX
X8BP3B		60.58	-4.84	-0.68	53.51	1.65	0.25	TO
Y87R86		70.47	5.05	0.71	55.55	3.69	0.56	DL
YACA7Z		65.11	-0.32	-0.04	54.44	2.57	0.39	LH
YUKEVV		78.26	12.84	1.80	58.49	6.63	1.01	TF
ZDNKWA		58.02	-7.40	-1.04	39.72	-12.15	-1.85	ID

Sample SF23		Summary Statistics	Sample SF24	
Grand Means	65.420 Joules/sq m		51.866 Joules/sq m	
SD Btwn Labs	7.134 Joules/sq m		6.552 Joules/sq m	
Statistics based on 35 of 36 reporting participants				

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

Comments on assigned Data Flags for Test #327

CW4T2R (X) - Systematic error (data for both samples are low).

Instrument Code List

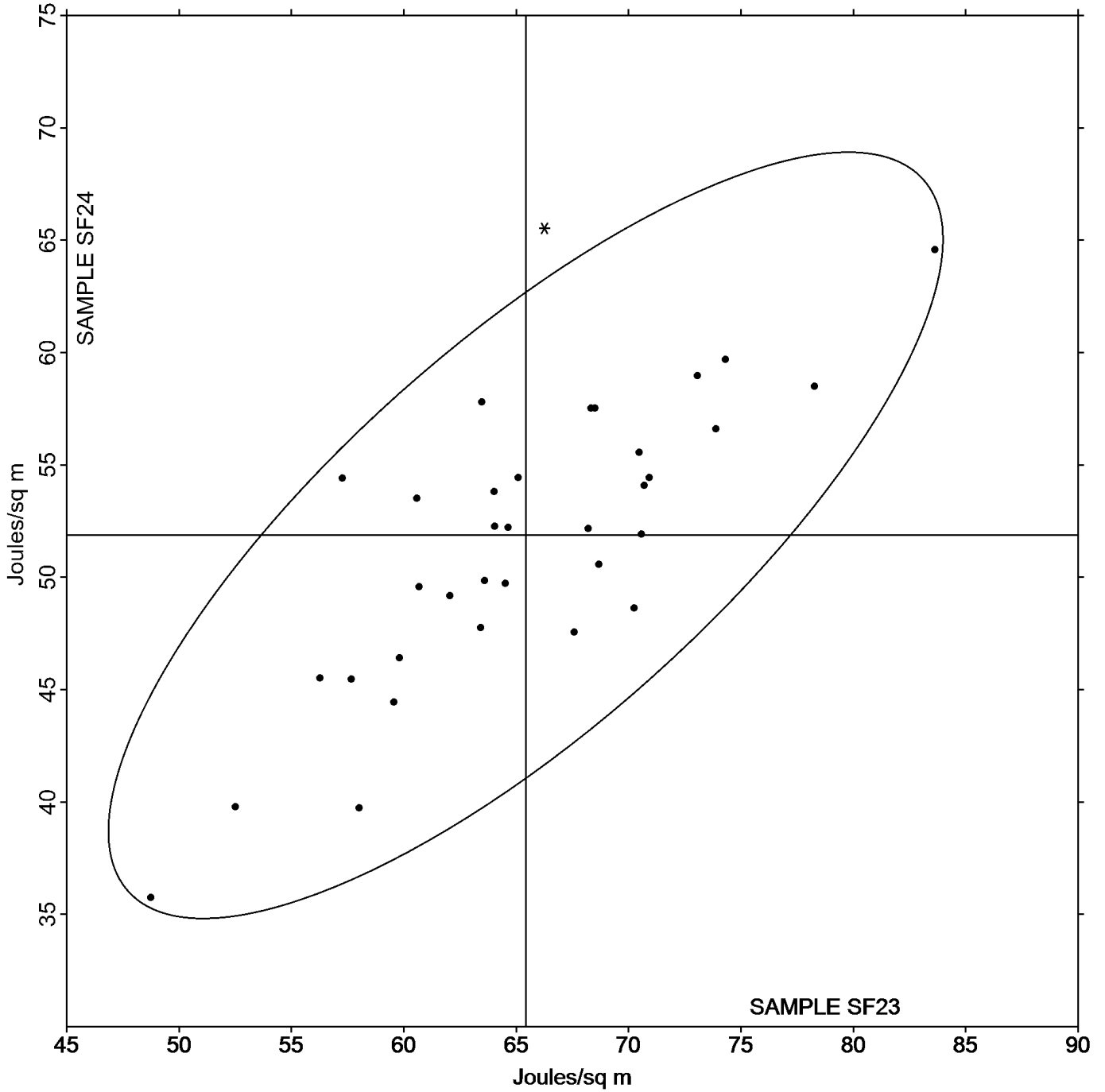
(DL) - EMIC DL500 Universal Testing Machines	(ID) - Instron 4201
(IM) - Instron 5500 Series	(LA) - L & W Tensile - Autoline 300
(LH) - L & W Alwetron TH1 (Horizontal) SE 060	(LI) - L & W Tensile Tester SE 062
(LW) - L & W Tensile Tester SE 064	(LX) - L & W (model not specified)
(MR) - MTS Alliance RT series	(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 **SF23** = 65.420 Joules/sq m

Grand Mean Sample **SF24** = 51.866 Joules/sq m

ANALYSIS 327



TAPPI-CTS Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

WebCode	Data Flag	Sample SF23			Sample SF24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DZVPY		2.028	-0.108	-0.53	1.606	-0.067	-0.38	LH
3NJCH7		2.193	0.057	0.28	1.668	-0.005	-0.03	TB
744YFT		2.153	0.017	0.08	1.601	-0.072	-0.41	LI
84Y2H3		1.999	-0.137	-0.67	1.595	-0.078	-0.44	LH
8V9J4U		2.171	0.035	0.17	1.572	-0.101	-0.58	LI
AVWQ3N		2.050	-0.086	-0.42	1.644	-0.029	-0.16	LI
BC2K83		1.812	-0.324	-1.59	1.455	-0.218	-1.24	LX
CME644		2.315	0.179	0.88	1.890	0.217	1.24	TB
CW4T2R	X	3.265	1.129	5.54	2.705	1.032	5.90	TP
D2TRTT		2.017	-0.119	-0.59	1.585	-0.088	-0.50	LI
D8FEMX		2.084	-0.052	-0.26	1.546	-0.127	-0.72	LH
DR7QCH		2.101	-0.035	-0.17	1.746	0.073	0.42	LX
EXNJ2M		2.380	0.244	1.20	1.860	0.187	1.07	TF
F7Y6MW		2.368	0.231	1.14	1.835	0.162	0.93	IM
GW3PBX		2.031	-0.105	-0.52	1.658	-0.015	-0.08	IM
HG7UEW		1.876	-0.261	-1.28	1.485	-0.188	-1.08	MR
HJYHYD		2.101	-0.035	-0.17	1.566	-0.107	-0.61	TP
JEZQ4L		2.326	0.190	0.93	1.808	0.135	0.77	XX
JNAVGC	*	2.250	0.114	0.56	1.470	-0.203	-1.16	TF
JY67MX		2.021	-0.115	-0.57	1.774	0.101	0.58	TI
K4EMWL		2.069	-0.067	-0.33	1.590	-0.083	-0.47	LX
KK7KXG		1.762	-0.374	-1.84	1.314	-0.359	-2.05	LH
KM7T3R		2.069	-0.067	-0.33	1.829	0.156	0.89	LH
LEDY87	*	2.436	0.300	1.47	2.129	0.456	2.61	TO
PEYKNM		2.340	0.204	1.00	1.690	0.017	0.10	LH
PTYJCJ		2.286	0.149	0.73	1.789	0.116	0.66	XX
QG4R76		1.892	-0.244	-1.20	1.439	-0.234	-1.34	LH
QZCU6B		2.185	0.049	0.24	1.732	0.059	0.34	TB
TB9KYG		2.187	0.051	0.25	1.732	0.059	0.34	LH
U2GLKG		2.057	-0.079	-0.39	1.597	-0.076	-0.43	LH
UB2RK7		2.021	-0.115	-0.57	1.654	-0.019	-0.11	LH
W32CKC		2.121	-0.015	-0.08	1.595	-0.078	-0.44	LA
WF86EA	*	2.694	0.558	2.74	2.047	0.374	2.14	TJ
WN4ZET		2.006	-0.130	-0.64	1.547	-0.126	-0.72	LX
WQ67RD		2.083	-0.053	-0.26	1.665	-0.008	-0.04	XX
X8BP3B		1.783	-0.353	-1.74	1.493	-0.180	-1.03	TG
Y87R86		2.473	0.337	1.65	2.013	0.340	1.94	DL
YACA7Z		2.005	-0.131	-0.65	1.659	-0.014	-0.08	LH
YUKEVV		2.515	0.379	1.86	1.876	0.203	1.16	TF
ZDNKWA		2.060	-0.077	-0.38	1.487	-0.186	-1.06	ID

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

	Sample SF23	Summary Statistics	Sample SF24
Grand Means	2.1364 Percent		1.6728 Percent
SD Btwn Labs	0.2037 Percent		0.1750 Percent
Statistics based on 39 of 40 reporting participants			

Comments on assigned Data Flags for Test #328

CW4T2R (X) - Systematic error (data for both samples are high).

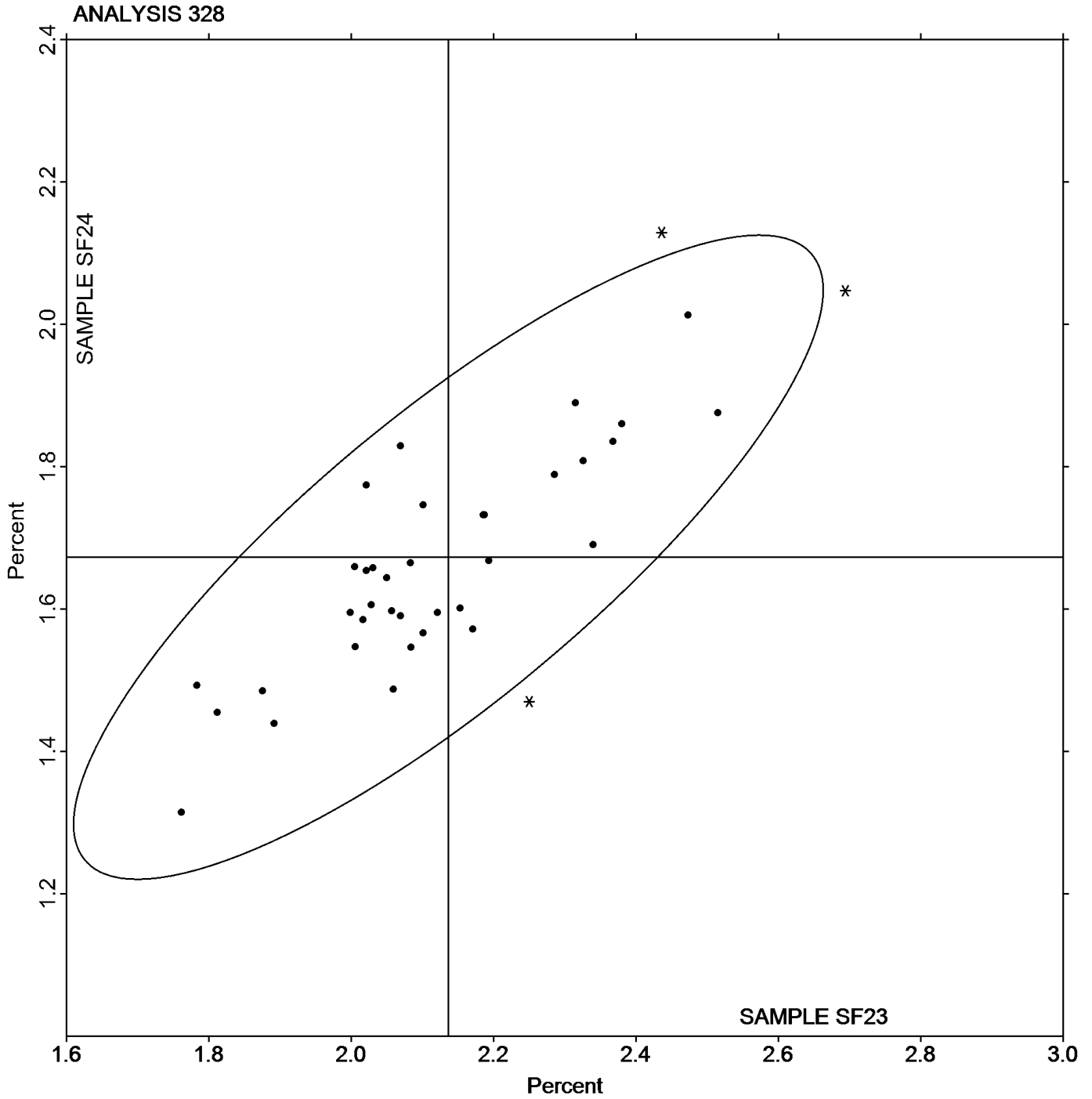
Instrument Code List

(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
(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 **SF23** = 2.1364 Percent

Grand Mean Sample **SF24** = 1.6728 Percent



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

WebCode	Data Flag	Sample SE23			Sample SE24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
38VY6Y		10.65	-0.13	-0.19	8.898	-0.207	-0.34	IF
4NYTAD		10.15	-0.63	-0.93	8.672	-0.433	-0.70	XX
4YYJUJ	X	9.15	-1.63	-2.39	10.741	1.636	2.66	SP
4ZBHQU		11.49	0.71	1.04	9.821	0.716	1.16	LA
6KENQ9	X	10.67	-0.12	-0.17	7.460	-1.645	-2.67	TK
6UYRY9		11.21	0.43	0.63	9.391	0.286	0.46	LH
778WNZ		11.70	0.91	1.34	9.892	0.787	1.28	LE
77BGEP		11.29	0.50	0.74	9.521	0.416	0.68	XX
7DQZV4	X	6.06	-4.72	-6.93	5.080	-4.025	-6.54	LW
8GL7RK	X	9.76	-1.03	-1.50	7.424	-1.681	-2.73	ID
8WE23Q	X	7.81	-2.97	-4.36	6.938	-2.167	-3.52	TP
BZ84JM		10.79	0.00	0.01	8.772	-0.333	-0.54	LI
C466WP		10.84	0.06	0.08	9.402	0.297	0.48	TO
CGCVYW		9.87	-0.91	-1.33	8.371	-0.734	-1.19	LW
DN8CPT	X	8.78	-2.01	-2.94	8.081	-1.024	-1.66	IK
DZXAQQ		10.31	-0.47	-0.68	8.879	-0.226	-0.37	IF
EUD9BE		10.34	-0.44	-0.65	8.555	-0.550	-0.89	TB
GRWTRX		9.94	-0.84	-1.24	8.425	-0.680	-1.10	TK
GW6CTB		10.62	-0.16	-0.23	9.191	0.086	0.14	IN
HH2CFX		10.42	-0.36	-0.53	8.751	-0.354	-0.57	SA
HH4ZWC		10.10	-0.68	-1.00	8.390	-0.715	-1.16	TP
HJYHYD		10.81	0.03	0.05	9.168	0.063	0.10	TO
J98JKD		11.66	0.88	1.29	9.861	0.756	1.23	LA
KXQY2G		10.68	-0.10	-0.15	9.051	-0.054	-0.09	ID
LDEUNR		10.37	-0.41	-0.60	8.625	-0.480	-0.78	IM
N44AHZ	X	12.64	1.86	2.73	10.110	1.005	1.63	LA
PKPUYK		10.86	0.08	0.12	8.714	-0.391	-0.64	LH
PP3XM2		10.36	-0.43	-0.62	8.903	-0.202	-0.33	TA
Q68LBL		11.11	0.33	0.49	9.423	0.318	0.52	IM
Q77RU2		9.77	-1.01	-1.48	7.943	-1.162	-1.89	IM
QF6LMQ		10.56	-0.22	-0.33	8.899	-0.206	-0.33	LE
QUN8A6		10.55	-0.23	-0.34	8.983	-0.122	-0.20	IK
QUQ2QP		11.44	0.66	0.97	9.693	0.588	0.96	TO
RLTQX7		11.65	0.87	1.28	9.739	0.634	1.03	TA
RQLTYK		10.27	-0.51	-0.75	8.722	-0.383	-0.62	TK
RRFETB		11.59	0.81	1.18	9.875	0.770	1.25	IF
RWB9RX	*	10.79	0.00	0.01	8.516	-0.589	-0.96	TH
T7DQ2F		10.43	-0.35	-0.51	9.039	-0.066	-0.11	TB
TKX9V6		9.85	-0.93	-1.36	8.093	-1.012	-1.64	TH
UB2RK7		10.75	-0.03	-0.04	9.091	-0.014	-0.02	LH
VFUB2U		11.61	0.82	1.21	9.934	0.829	1.35	TH
X27TJB		10.34	-0.44	-0.65	8.764	-0.341	-0.55	LE
XH9PFE		9.50	-1.28	-1.88	8.193	-0.912	-1.48	LW

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

WebCode	Data Flag	Sample SE23			Sample SE24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
XQN9YD	*	11.89	1.11	1.63	9.560	0.455	0.74	LH
Y48DKF		9.83	-0.95	-1.39	8.494	-0.611	-0.99	XX
YFWALD		12.35	1.57	2.30	10.590	1.485	2.41	LA
YGTME	*	11.01	0.23	0.33	9.853	0.748	1.21	TP
YNEL2Z		12.03	1.25	1.83	10.148	1.043	1.69	TT
YTAD8B		10.37	-0.41	-0.60	8.834	-0.271	-0.44	LE
ZKNYJW		11.44	0.65	0.96	9.877	0.772	1.25	TO

Sample SE23		Summary Statistics	Sample SE24	
Grand Means	10.782 kN/m		9.1050 kN/m	
SD Btwn Labs	0.682 kN/m		0.6158 kN/m	
Statistics based on 43 of 50 reporting participants				

Comments on assigned Data Flags for Test #330

- 4YYJUZ (X) - Inconsistent in testing between samples.
- 6KENQ9 (X) - Inconsistent in testing between samples.
- 7DQZV4 (X) - Extreme data.
- 8GL7RK (X) - Inconsistent in testing between samples, data for Sample SE24 are low. Inconsistent in testing within the determinations for both samples.
- 8WE23Q (X) - Systematic error (data for both samples are low). Inconsistent within the determinations for Sample SE23.
- DN8CPT (X) - Inconsistent in testing between samples, data for Sample SE23 are low.
- N44AHZ (X) - Inconsistent in testing between samples, data for Sample SE23 are high.

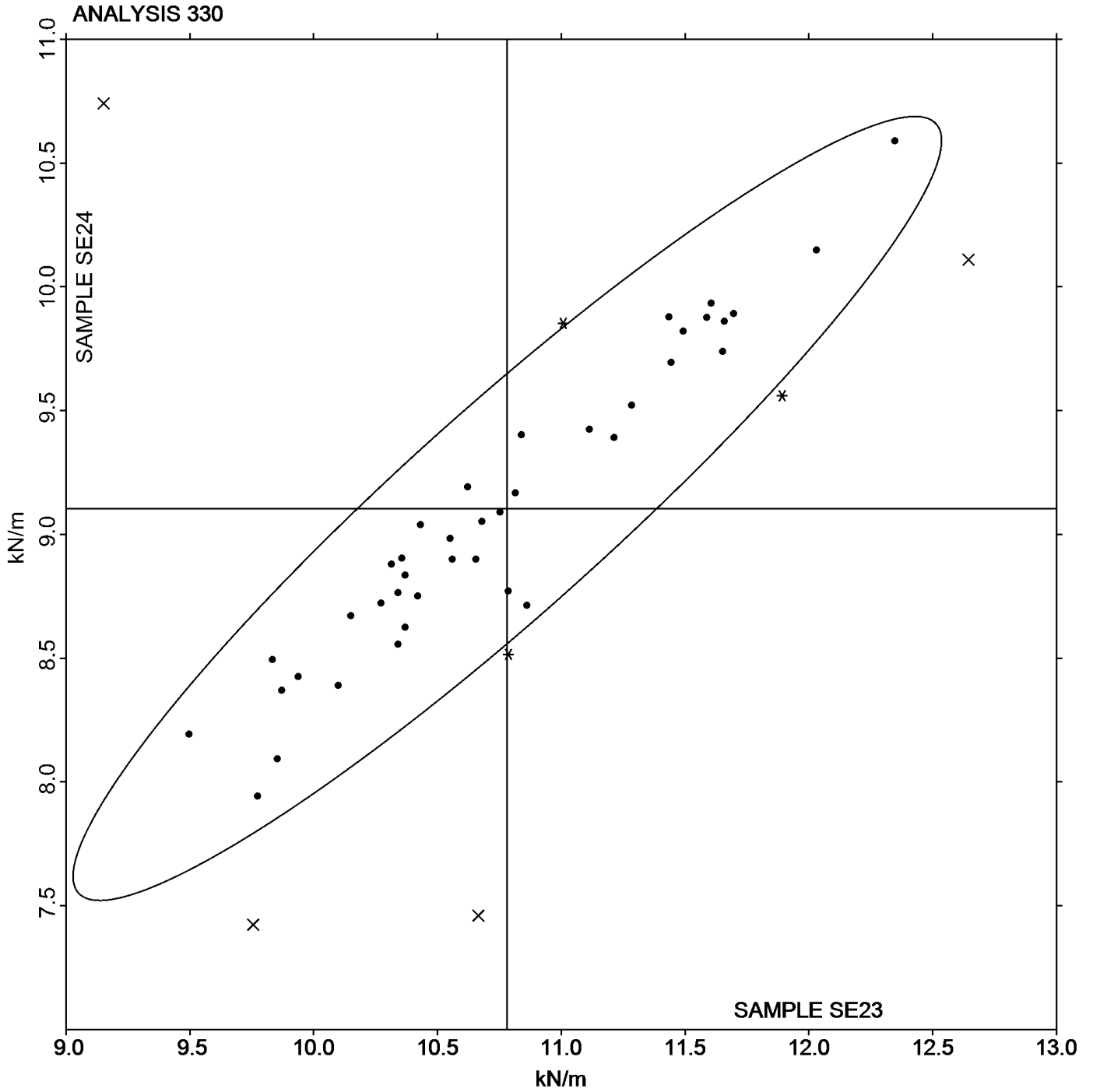
Instrument Code List

- | | |
|-------------------------------------|---|
| (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 | (SP) - Schopper Type Tensile Tester (TMI) |
| (TA) - Thwing-Albert Tensile Tester | (TB) - Thwing-Albert EJA/1000 |
| (TH) - Thwing-Albert QC-3A | (TK) - Thwing-Albert Model 37-4 |
| (TO) - Thwing-Albert QC-1000 | (TP) - TMI Monitor/Tensile 100 (84-21-01) |
| (TT) - Tinius Olsen Model MHT | (XX) - Instrument make/model not specified by lab |

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

Grand Mean Sample **SE23** = 10.782 kN/m

Grand Mean Sample **SE24** = 9.1050 kN/m



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

WebCode	Data Flag	Sample SE23			Sample SE24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4NYTAD		196.5	2.5	0.17	143.4	2.4	0.18	XX
4ZBHQU		214.8	20.8	1.38	156.9	16.0	1.20	LA
6UYRY9		196.1	2.1	0.14	142.0	1.1	0.08	LH
77BGEP		189.4	-4.6	-0.30	134.4	-6.5	-0.49	XX
7DQZV4		197.1	3.1	0.20	138.6	-2.3	-0.17	LA
8GL7RK	X	151.7	-42.3	-2.80	84.8	-56.1	-4.22	ID
C466WP		216.0	22.0	1.45	171.3	30.4	2.28	TO
CGCVYW		171.5	-22.5	-1.49	128.2	-12.7	-0.96	LA
DN8CPT	*	198.0	4.0	0.26	164.8	23.9	1.80	IK
DZXAQQ		201.0	7.0	0.46	136.2	-4.8	-0.36	IF
EUD9BE		184.6	-9.4	-0.62	126.5	-14.4	-1.08	TB
GRWTRX		184.3	-9.7	-0.64	136.5	-4.4	-0.33	LH
GW6CTB		186.3	-7.7	-0.51	142.4	1.5	0.11	IN
HH2CFX		186.6	-7.4	-0.49	134.2	-6.7	-0.50	SA
HH4ZWC		177.4	-16.6	-1.10	119.3	-21.6	-1.62	TP
HJYHYD		210.7	16.7	1.11	148.1	7.2	0.54	TO
J98JKD		198.5	4.5	0.30	144.7	3.8	0.29	LA
LDEUNR		189.0	-5.0	-0.33	125.4	-15.5	-1.16	IM
N44AHZ		211.4	17.4	1.15	148.1	7.2	0.54	LA
PKPUYK		191.3	-2.7	-0.18	131.1	-9.8	-0.74	LH
PP3XM2		183.3	-10.7	-0.70	138.6	-2.3	-0.17	TA
Q68LBL		194.0	0.0	0.00	147.4	6.5	0.49	IM
Q77RU2		177.8	-16.2	-1.07	120.7	-20.2	-1.52	IM
QF6LMQ		181.3	-12.7	-0.84	139.6	-1.3	-0.10	LE
QUN8A6		194.8	0.8	0.05	132.2	-8.7	-0.65	XX
QUQ2QP		214.0	20.0	1.32	151.0	10.1	0.76	TO
RQLTYK		193.0	-1.0	-0.07	145.7	4.8	0.36	TK
RRFETB		201.9	7.9	0.52	150.3	9.4	0.71	IN
RWB9RX		220.8	26.8	1.77	152.0	11.1	0.83	TH
TKX9V6		199.1	5.1	0.34	134.5	-6.4	-0.48	TH
UB2RK7		192.6	-1.4	-0.09	144.2	3.3	0.25	LH
VFUB2U		223.1	29.1	1.92	173.1	32.2	2.42	TH
XH9PFE		165.0	-29.0	-1.92	123.0	-17.9	-1.35	LW
XQN9YD		191.1	-2.9	-0.19	127.3	-13.6	-1.03	LA
Y48DKF	*	155.3	-38.7	-2.56	122.6	-18.3	-1.38	XX
YFWALD		195.8	1.8	0.12	149.9	9.0	0.67	LA
YGTME	X	114.2	-79.8	-5.28	94.5	-46.5	-3.49	TP
YNEL2Z	X	358.3	164.3	10.86	255.9	115.0	8.65	TT
YTAD8B		181.0	-13.0	-0.86	132.9	-8.0	-0.60	LE
ZKNYJW		213.8	19.8	1.31	156.6	15.7	1.18	XX

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

	Sample SE23	Summary Statistics	Sample SE24
Grand Means	194.01 Joules/sq m		140.91 Joules/sq m
SD Btwn Labs	15.13 Joules/sq m		13.31 Joules/sq m
Statistics based on 37 of 40 reporting participants			

Comments on assigned Data Flags for Test #331

8GL7RK (X) - Systematic error (data for both samples are low). Inconsistent in testing within the determinations for both samples.

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

YNEL2Z (X) - Extreme data.

Instrument Code List

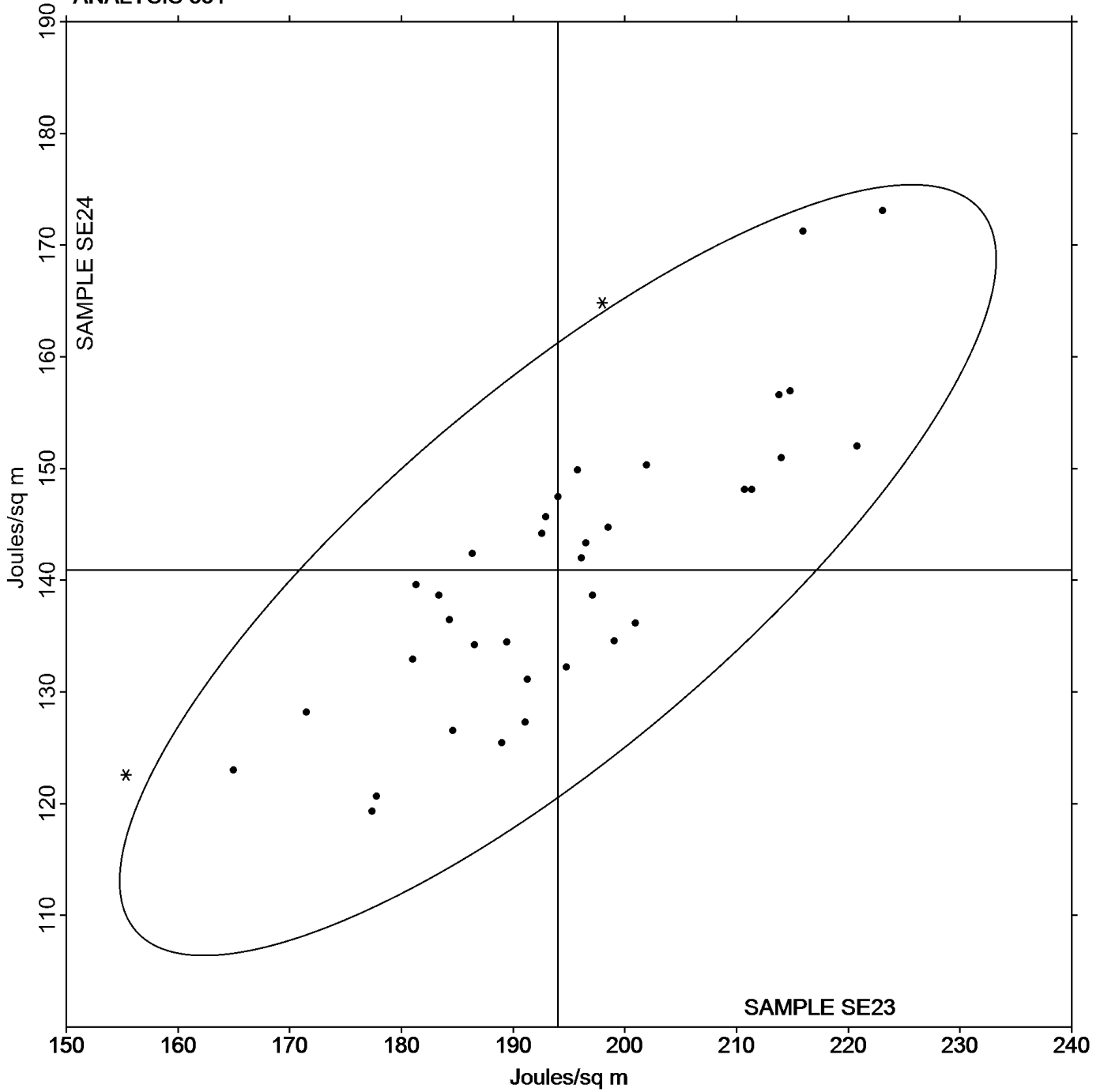
(ID) - Instron 4201	(IF) - Instron 3340 Series
(IK) - Instron 4400 Series	(IM) - Instron 5500 Series
(IN) - Instron 3360 Series	(LA) - L & W Autoline
(LE) - L & W Tensile Tester 066	(LH) - L & W Alwetron TH1 (Horizontal) SE 060
(LW) - L & W Tensile Tester SE062	(SA) - Shimadzu Autograph AG 2000 A
(TA)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

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

Grand Mean Sample **SE23** = 194.01 Joules/sq m

Grand Mean Sample **SE24** = 140.91 Joules/sq m

ANALYSIS 331



TAPPI-CTS Interlaboratory Testing Program

Analysis 332

Elongation to Break - Packaging Papers

WebCode	Data Flag	Sample SE23			Sample SE24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4NYTAD		2.900	0.156	0.58	2.550	0.149	0.64	XX
4ZBHQU		2.667	-0.077	-0.29	2.320	-0.081	-0.35	LA
6UYRY9		2.555	-0.189	-0.70	2.198	-0.203	-0.88	LH
77BGEP		3.410	0.666	2.48	2.899	0.498	2.15	XX
7DQZV4		2.384	-0.360	-1.34	2.015	-0.386	-1.66	LA
8GL7RK	X	2.493	-0.251	-0.94	1.857	-0.544	-2.35	ID
C466WP		3.036	0.292	1.09	2.793	0.392	1.69	TO
CGCVYW		2.538	-0.206	-0.77	2.254	-0.147	-0.63	LW
DN8CPT	*	3.423	0.679	2.53	3.071	0.670	2.89	IK
DZXAQQ		2.989	0.245	0.91	2.436	0.035	0.15	IF
EUD9BE		2.750	0.006	0.02	2.310	-0.091	-0.39	TB
GRWTRX		2.708	-0.036	-0.13	2.391	-0.010	-0.04	LH
GW6CTB		2.770	0.026	0.10	2.520	0.119	0.51	IN
HH2CFX		2.669	-0.075	-0.28	2.309	-0.092	-0.40	SA
HH4ZWC		3.084	0.340	1.27	2.601	0.200	0.86	TP
HJYHYD		2.931	0.187	0.70	2.458	0.057	0.25	TO
J98JKD		2.464	-0.280	-1.04	2.120	-0.281	-1.21	LA
KXQY2G		2.675	-0.069	-0.26	2.338	-0.063	-0.27	ID
LDEUNR		2.907	0.163	0.61	2.426	0.025	0.11	IM
N44AHZ		2.339	-0.405	-1.51	2.126	-0.275	-1.19	LA
PKPUYK		2.585	-0.159	-0.59	2.248	-0.153	-0.66	LH
PP3XM2		2.661	-0.083	-0.31	2.353	-0.048	-0.21	TA
Q68LBL		2.593	-0.151	-0.56	2.342	-0.059	-0.25	IM
Q77RU2		2.802	0.058	0.22	2.395	-0.006	-0.03	IM
QF6LMQ		2.554	-0.190	-0.71	2.352	-0.049	-0.21	LE
QUN8A6		2.690	-0.054	-0.20	2.300	-0.101	-0.44	XX
QUQ2QP		2.687	-0.057	-0.21	2.308	-0.093	-0.40	TO
RQLTYK		2.811	0.067	0.25	2.520	0.119	0.51	TK
RRFETB		2.561	-0.183	-0.68	2.255	-0.146	-0.63	IN
RWB9RX		3.027	0.283	1.05	2.655	0.254	1.10	TH
T7DQ2F		2.600	-0.144	-0.54	2.474	0.073	0.32	TB
TKX9V6		3.172	0.428	1.59	2.724	0.323	1.39	TH
UB2RK7		2.617	-0.127	-0.47	2.287	-0.114	-0.49	LH
VFUB2U		2.938	0.194	0.72	2.661	0.260	1.12	TH
XH9PFE		2.561	-0.183	-0.68	2.243	-0.158	-0.68	LW
XQN9YD		2.516	-0.228	-0.85	2.110	-0.291	-1.25	LX
Y48DKF		2.327	-0.417	-1.55	2.154	-0.247	-1.07	XX
YFWALD		2.307	-0.437	-1.63	2.082	-0.319	-1.38	XX
YGTME		3.149	0.405	1.51	2.800	0.399	1.72	TP
YNEL2Z		2.681	-0.063	-0.24	2.302	-0.099	-0.43	TT
YTAD8B		2.549	-0.195	-0.73	2.228	-0.173	-0.75	LE
ZKNYJW		2.920	0.176	0.66	2.510	0.109	0.47	XX

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

	Sample SE23	Summary Statistics	Sample SE24
Grand Means	2.7441 Percent		2.4009 Percent
SD Btwn Labs	0.2685 Percent		0.2318 Percent
Statistics based on 41 of 42 reporting participants			

Comments on assigned Data Flags for Test #332

8GL7RK (X) - Inconsistent in testing between samples. Inconsistent in testing within the determinations for both samples.

Instrument Code List

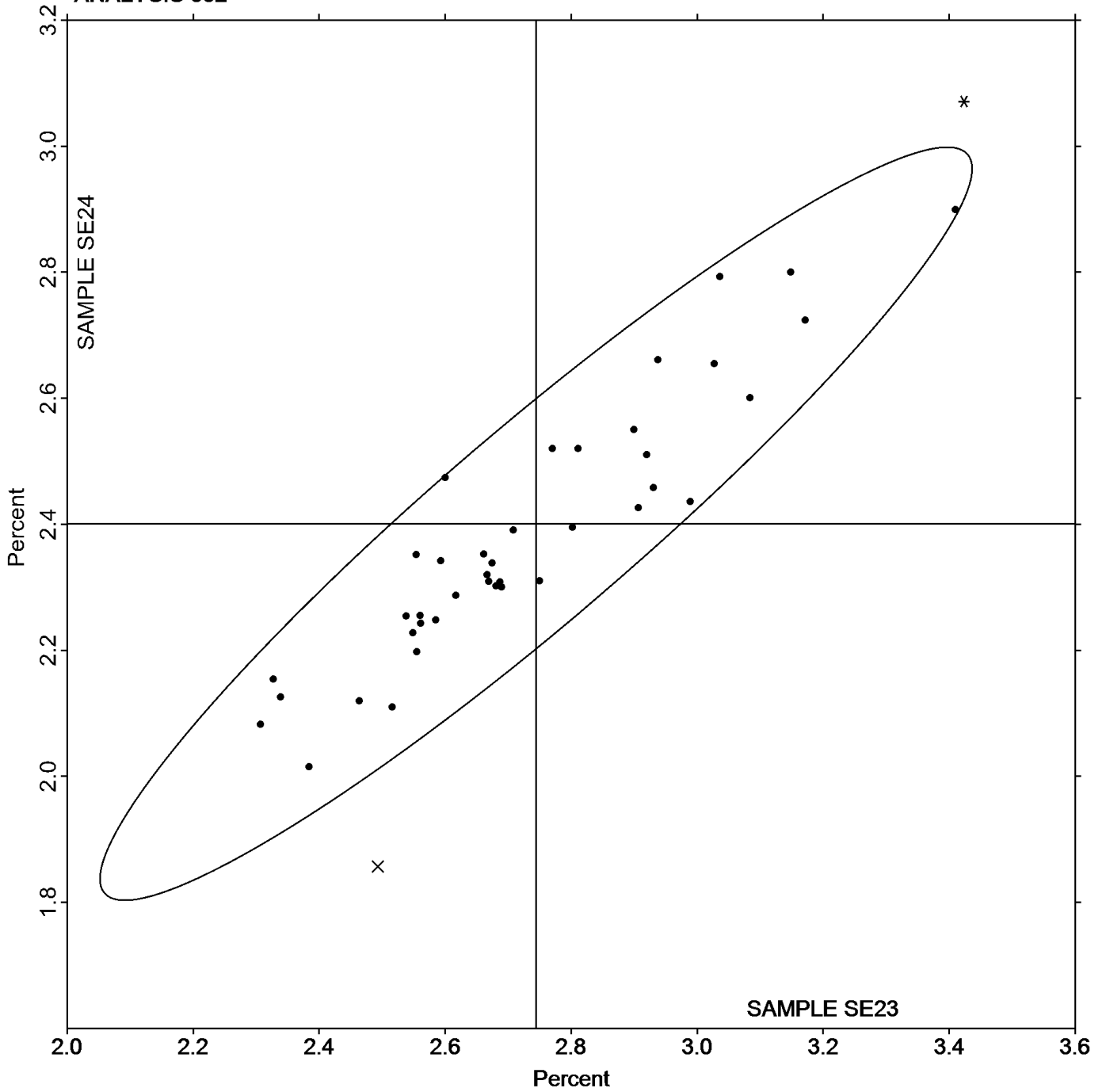
(ID) - Instron 4201	(IF) - Instron 3340 Series
(IK) - Instron 4400 Series	(IM) - Instron 5500 Series
(IN) - Instron 3360 Series	(LA) - L & W Autoline 300
(LE) - L & W Tensile Tester 066	(LH) - L & W Alwetron TH1 (Horizontal) SE 060
(LW) - L & W Tensile Tester SE062	(LX) - L & W (model not specified)
(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)	(TT) - Tinius Olsen Model MHT
(XX) - Instrument make/model not specified by lab	

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

Grand Mean Sample **SE23** = 2.7441 Percent

Grand Mean Sample **SE24** = 2.4009 Percent

ANALYSIS 332



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

WebCode	Data Flag	Sample SG23			Sample SG24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4NYTAD		52.80	5.82	0.37	46.10	2.65	0.20	MT
6KENQ9		27.10	-19.88	-1.28	36.70	-6.75	-0.51	MT
7QE3EV		38.00	-8.98	-0.58	52.90	9.45	0.71	XX
8WE23Q		13.20	-33.78	-2.17	12.10	-31.35	-2.37	MT
CGCVYW		40.40	-6.58	-0.42	36.10	-7.35	-0.55	MT
D2TRTT		56.50	9.52	0.61	53.80	10.35	0.78	MT
EXNJ2M		43.50	-3.48	-0.22	39.10	-4.35	-0.33	MT
F7Y6MW		69.70	22.72	1.46	47.60	4.15	0.31	MT
GWN32V		61.20	14.22	0.91	47.40	3.95	0.30	MT
HCFC37		71.40	24.42	1.57	53.20	9.75	0.74	MT
J98JKD		52.20	5.22	0.34	50.00	6.55	0.49	XX
PEYKNM		60.90	13.92	0.89	70.20	26.75	2.02	MT
PTYJCJ		53.00	6.02	0.39	44.80	1.35	0.10	MT
T7DQ2F		30.40	-16.58	-1.07	27.50	-15.95	-1.20	MT
XC4UVE		50.10	3.12	0.20	54.80	11.35	0.86	XX
Z9YZTU		32.30	-14.68	-0.94	29.70	-13.75	-1.04	MT
ZDNKWA		46.00	-0.98	-0.06	36.70	-6.75	-0.51	MT

		Summary Statistics	
	Sample SG23		Sample SG24
Grand Means	46.982 Double Folds		43.453 Double Folds
SD Btwn Labs	15.552 Double Folds		13.254 Double Folds
Statistics based on 17 of 17 reporting participants			

Instrument Code List

(MT) - MIT - Tinius Olsen

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

TAPPI-CTS Interlaboratory Testing Program

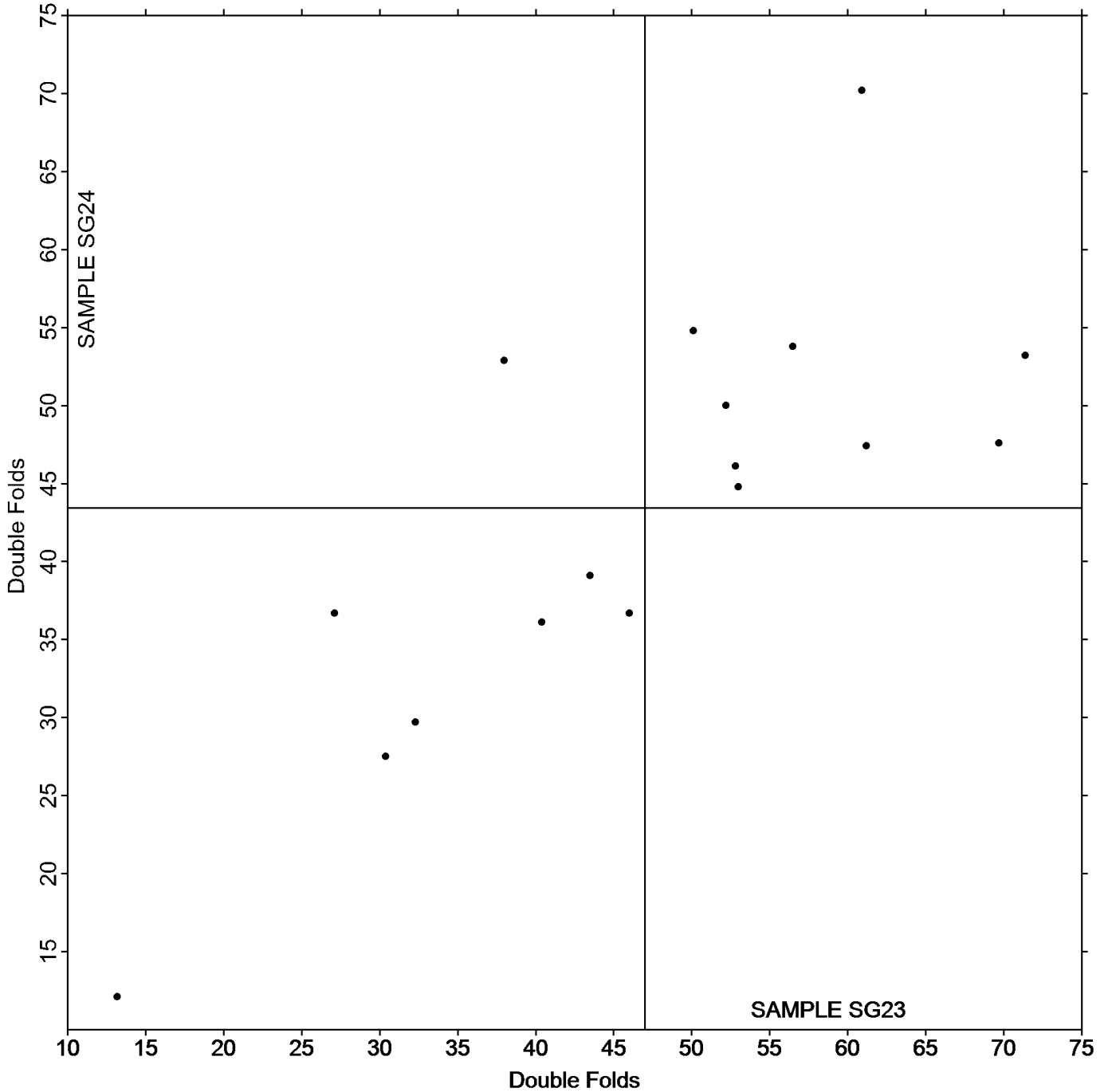
Analysis 334

Folding Endurance (MIT) - Double Folds

Grand Mean Sample **SG23** = 46.982 Double Folds

Grand Mean Sample **SG24** = 43.453 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 SH23			Sample SH24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3C6DMX		612.5	72.7	1.23	376.5	31.5	1.26
3NJCH7		524.1	-15.8	-0.27	340.5	-4.5	-0.18
44V8A8		537.7	-2.2	-0.04	335.3	-9.7	-0.39
4NYTAD		572.2	32.3	0.55	358.3	13.3	0.53
DZXAQQ		577.2	37.3	0.63	395.2	50.2	2.00
EQ9KT4		541.1	1.2	0.02	344.1	-0.9	-0.04
F7Y6MW		542.8	2.9	0.05	343.5	-1.5	-0.06
HG7UEW		530.6	-9.3	-0.16	329.7	-15.3	-0.61
JY67MX		479.0	-60.9	-1.03	320.2	-24.7	-0.99
KM7T3R	*	371.6	-168.2	-2.85	299.0	-45.9	-1.84
LBDNB7		568.2	28.3	0.48	355.0	10.0	0.40
LEDY87		536.1	-3.8	-0.06	327.4	-17.6	-0.70
PEYKNM		526.1	-13.7	-0.23	336.1	-8.9	-0.36
QG4R76		613.9	74.0	1.25	382.7	37.7	1.51
T7DQ2F		511.7	-28.2	-0.48	308.0	-37.0	-1.48
TXL8M8	X	93.8	-446.1	-7.55	93.1	-251.9	-10.06
U2GLKG		632.7	92.8	1.57	357.4	12.4	0.50
UGPCML		556.5	16.7	0.28	364.5	19.5	0.78
W32CKC		483.6	-56.2	-0.95	336.3	-8.7	-0.35

	Sample SH23	Summary Statistics	Sample SH24
Grand Means	539.86 Gurley Units		344.98 Gurley Units
SD Btwn Labs	59.12 Gurley Units		25.03 Gurley Units
Statistics based on 18 of 19 reporting participants			

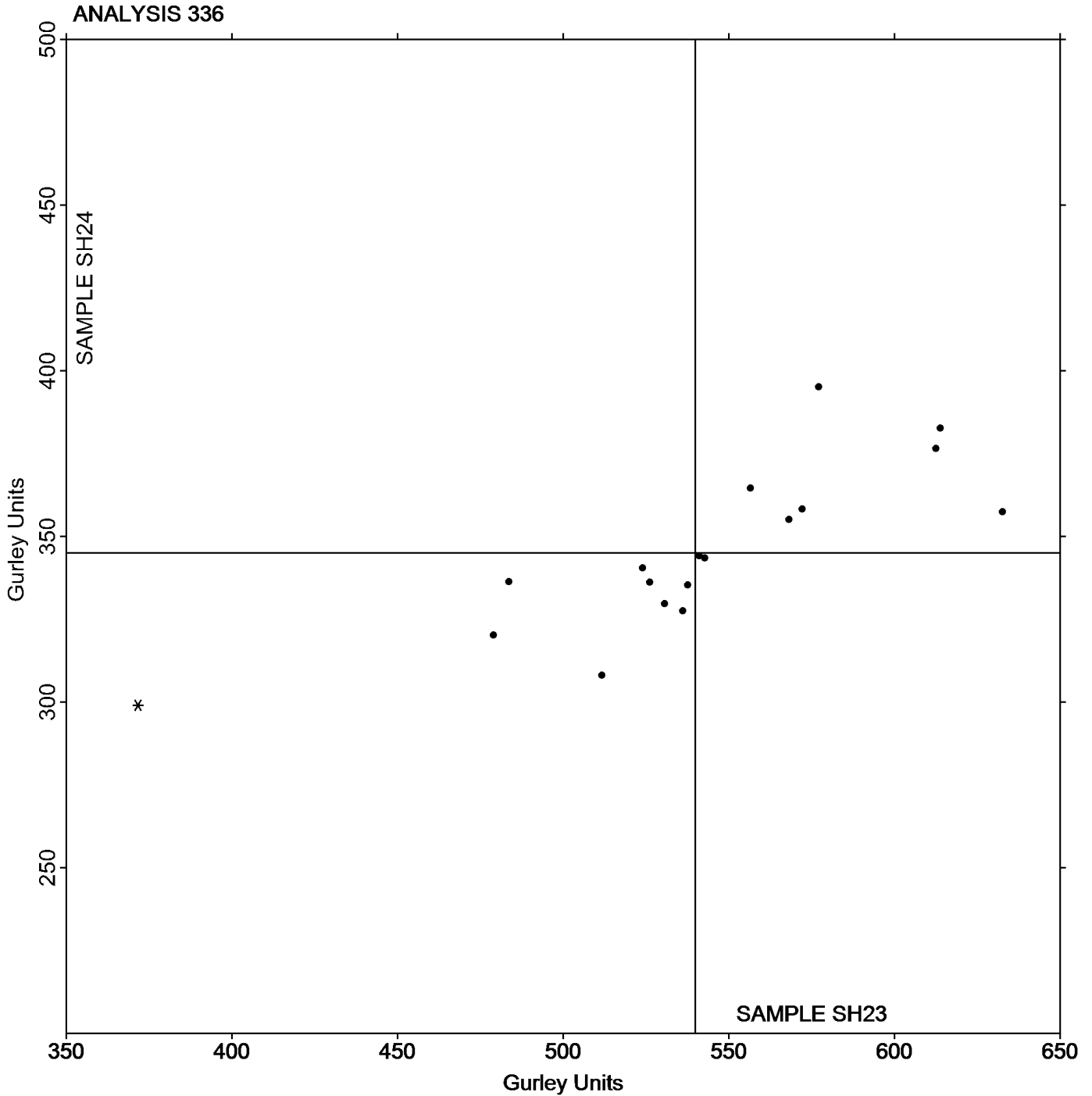
Comments on assigned Data Flags for Test #336

TXL8M8 (X) - Extreme data.

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

Grand Mean Sample **SH23** = 539.86 Gurley Units

Grand Mean Sample **SH24** = 344.98 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 SJ23			Sample SJ24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2QURDR		3.684	-0.068	-0.13	4.544	-0.080	-0.13
3NJCH7		3.552	-0.200	-0.39	4.414	-0.210	-0.33
CAN96R		3.865	0.113	0.22	4.922	0.298	0.47
CME644		3.879	0.127	0.25	4.684	0.060	0.10
DZXAQQ		3.946	0.194	0.37	5.020	0.396	0.63
F7Y6MW		4.013	0.261	0.50	4.516	-0.108	-0.17
HCFC37		3.596	-0.156	-0.30	4.534	-0.090	-0.14
HG7UEW	*	2.254	-1.498	-2.89	2.772	-1.852	-2.95
N2WRJ6		3.907	0.155	0.30	4.550	-0.074	-0.12
QF6LMQ		3.160	-0.592	-1.14	4.080	-0.544	-0.87
RRFETB		4.470	0.718	1.39	5.570	0.946	1.51
U2GLKG		3.957	0.205	0.40	4.838	0.214	0.34
WF86EA	X	38.343	34.591	66.73	35.776	31.152	49.59
WN4ZET		3.688	-0.064	-0.12	4.773	0.149	0.24
XC4UVE		4.321	0.569	1.10	5.307	0.683	1.09
ZDNKWA		3.985	0.233	0.45	4.833	0.209	0.33

		Summary Statistics	
	Sample SJ23		Sample SJ24
Grand Means	3.7517 Taber Units		4.6237 Taber Units
SD Btwn Labs	0.5184 Taber Units		0.6281 Taber Units
Statistics based on 15 of 16 reporting participants			

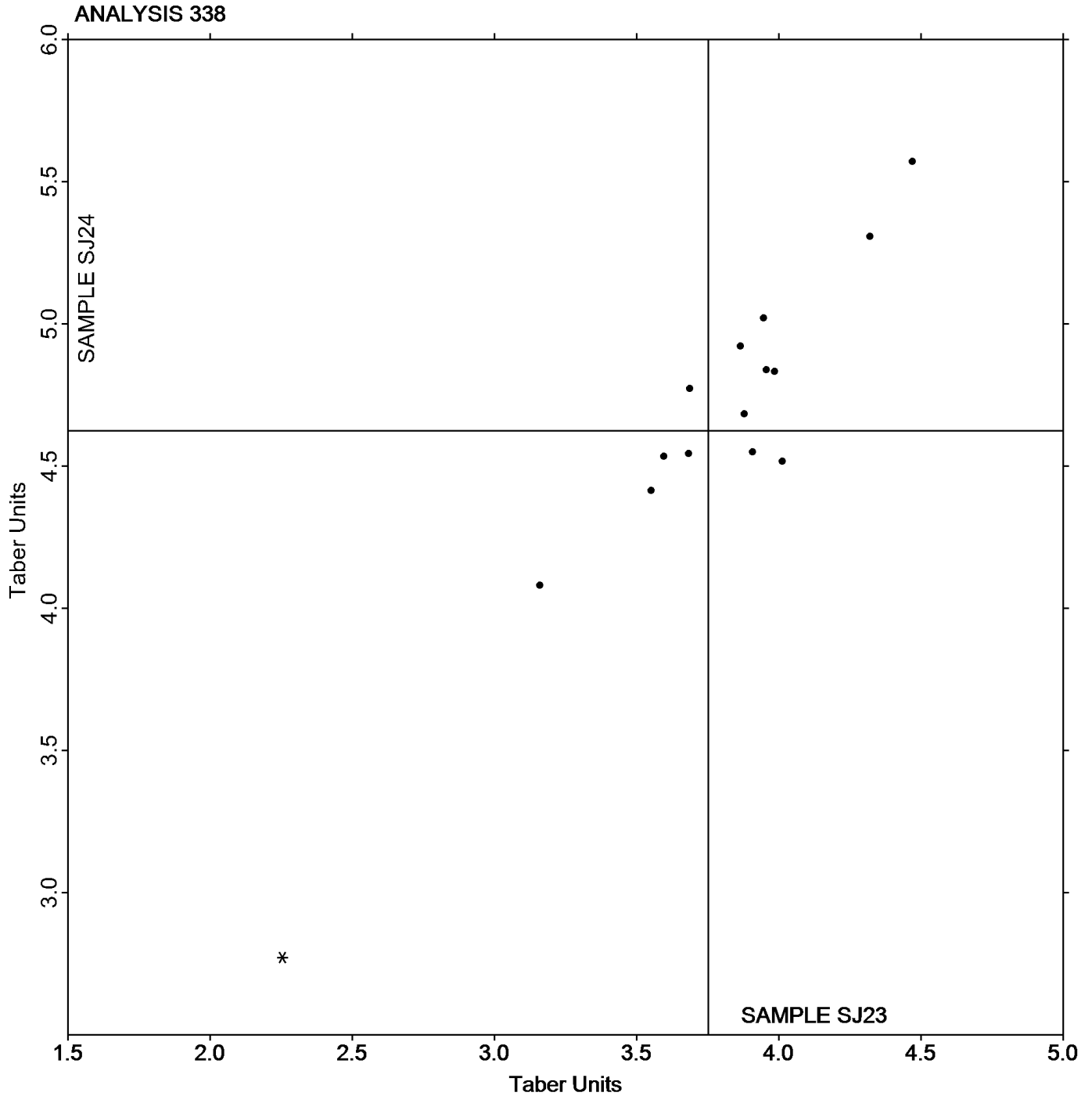
Comments on assigned Data Flags for Test #338

WF86EA (X) - Extreme data.

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

Grand Mean Sample **SJ23** = 3.7517 Taber Units

Grand Mean Sample **SJ24** = 4.6237 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 SQ23			Sample SQ24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3C6DMX		32.49	-0.96	-0.49	17.19	-1.23	-1.18
778WNZ		34.70	1.25	0.64	19.40	0.98	0.94
7DQZV4	*	32.46	-0.99	-0.51	20.56	2.14	2.06
CGCVYW		34.98	1.53	0.79	18.24	-0.18	-0.17
CW4T2R		28.73	-4.72	-2.43	16.78	-1.64	-1.57
EUD9BE		33.31	-0.14	-0.07	18.17	-0.25	-0.24
F7Y6MW		34.99	1.54	0.79	19.60	1.18	1.14
FR2TER		34.94	1.49	0.77	18.50	0.08	0.08
GW3PBX		35.50	2.05	1.05	19.05	0.63	0.61
J98JKD		35.15	1.70	0.87	18.89	0.47	0.45
JEZQ4L		30.27	-3.18	-1.64	17.34	-1.08	-1.04
KBUK47		34.16	0.71	0.37	18.40	-0.02	-0.02
QF6LMQ		33.65	0.20	0.10	18.75	0.33	0.32
X8BP3B		34.30	0.85	0.44	18.40	-0.02	-0.02
Y87R86		32.12	-1.33	-0.68	17.00	-1.42	-1.36

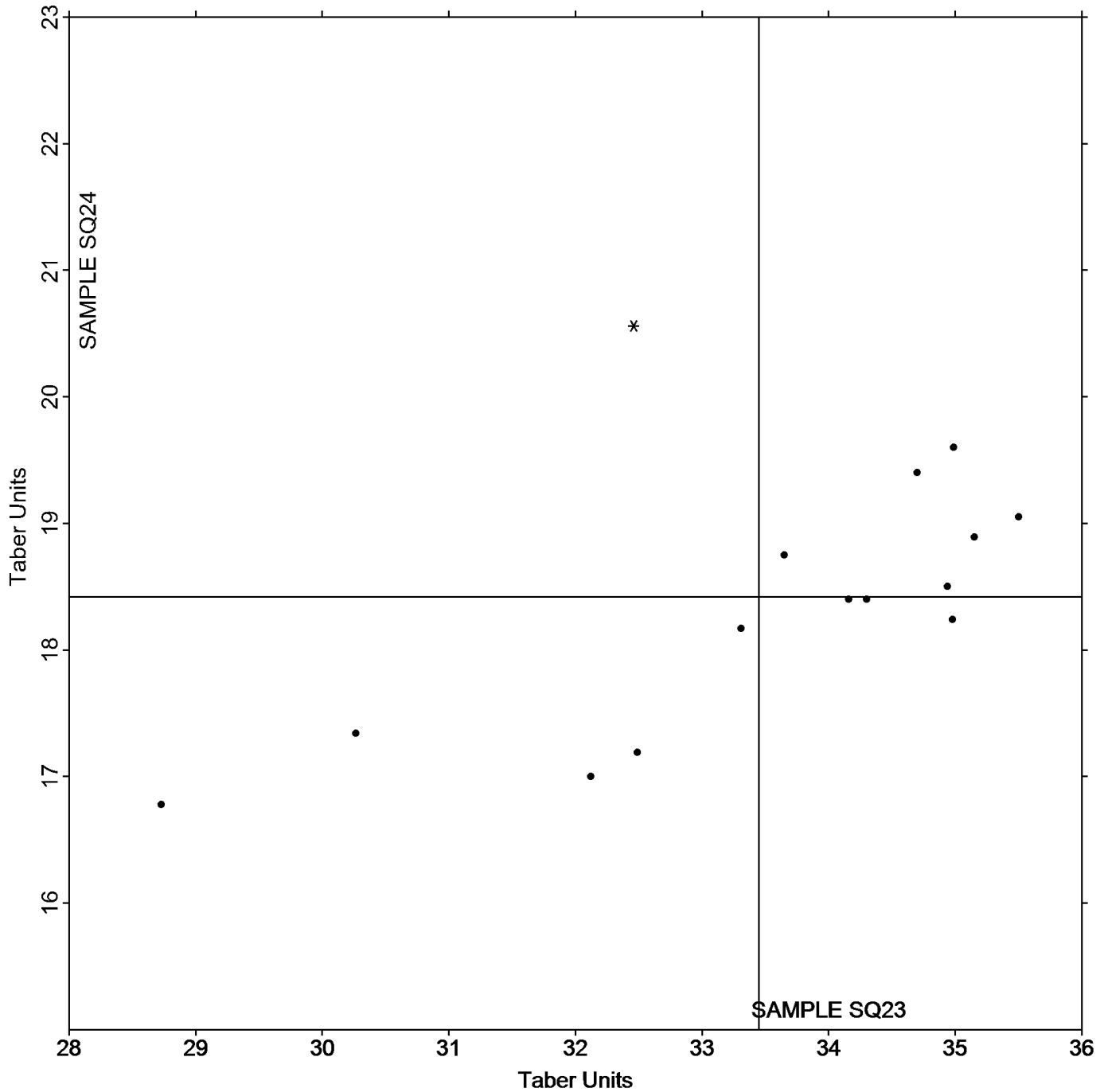
		Summary Statistics	
	Sample SQ23		Sample SQ24
Grand Means	33.450 Taber Units		18.418 Taber Units
SD Btwn Labs	1.945 Taber Units		1.040 Taber Units
Statistics based on 15 of 15 reporting participants			

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

Grand Mean Sample **SQ23** = 33.450 Taber Units

Grand Mean Sample **SQ24** = 18.418 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 ST23			Sample ST24		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
38VY6Y		292.0	4.7	0.41	247.7	3.9	0.40
44AWBY		283.6	-3.7	-0.32	238.8	-5.0	-0.51
4NYTAD		275.6	-11.7	-1.01	230.6	-13.3	-1.36
6F3DZZ		289.0	1.7	0.15	244.2	0.4	0.04
CGCVYW		287.0	-0.3	-0.03	245.4	1.6	0.16
DCACCP		301.9	14.6	1.27	246.3	2.5	0.25
DMBWEG		274.6	-12.7	-1.10	231.0	-12.8	-1.32
HH2CFX		288.1	0.8	0.07	244.3	0.5	0.05
HH4ZWC		274.1	-13.2	-1.15	232.3	-11.6	-1.18
HW87AV	X	123.7	-163.6	-14.22	126.2	-117.7	-12.06
JZ3C7D		312.0	24.7	2.15	263.1	19.3	1.97
KAKFQH		272.2	-15.1	-1.31	236.8	-7.0	-0.72
KXQY2G		300.0	12.7	1.10	255.0	11.2	1.14
QF6LMQ		283.8	-3.6	-0.31	248.5	4.7	0.48
RLTQX7		285.0	-2.3	-0.20	246.0	2.2	0.22
T88CU7		299.9	12.6	1.09	258.5	14.7	1.50
TKX9V6		278.0	-9.3	-0.81	233.0	-10.8	-1.11

Summary Statistics		
	Sample ST23	Sample ST24
Grand Means	287.30 Taber Units	243.85 Taber Units
SD Btwn Labs	11.51 Taber Units	9.75 Taber Units
Statistics based on 16 of 17 reporting participants		

Comments on assigned Data Flags for Test #340

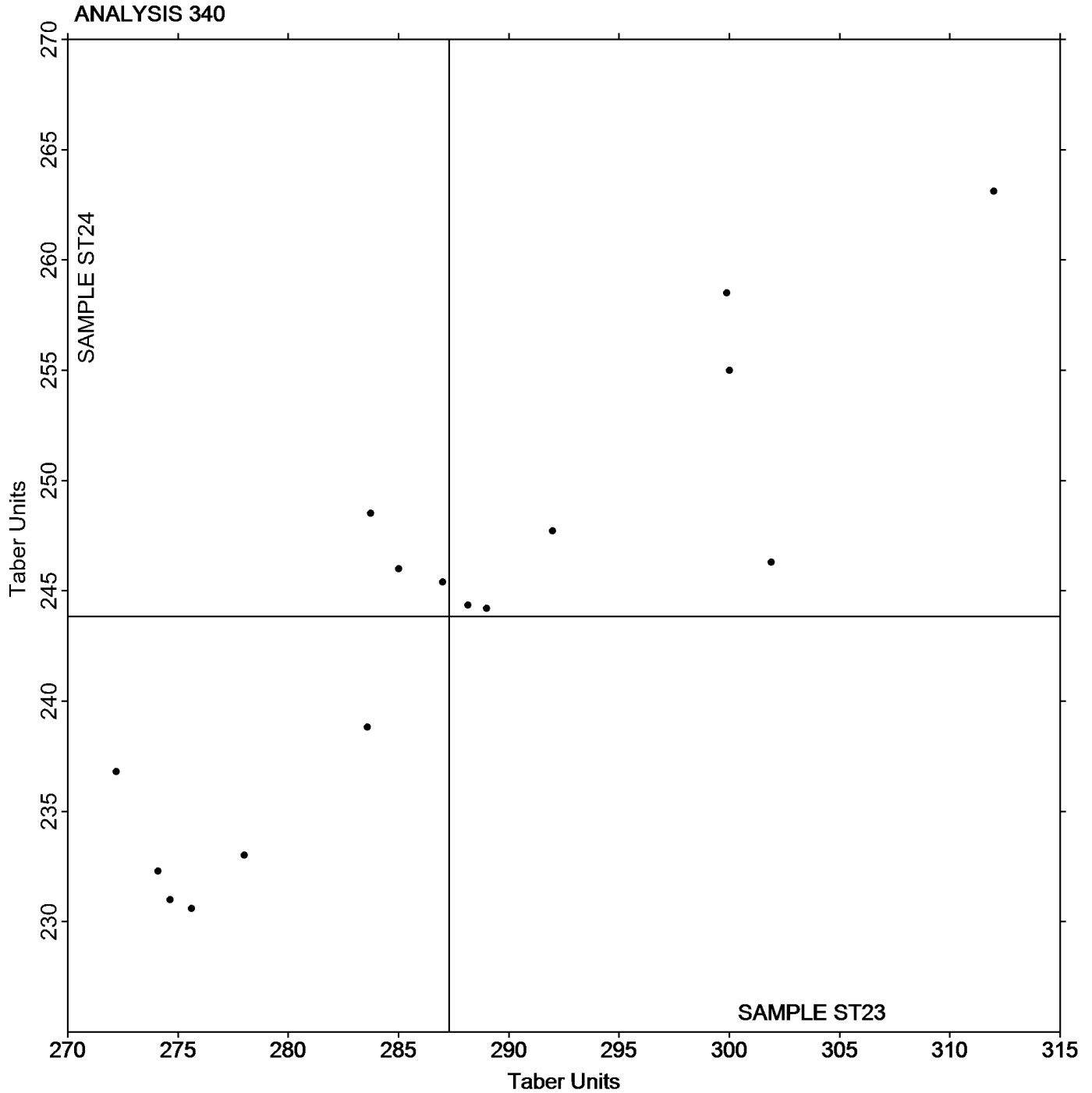
HW87AV (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program Analysis 340

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

Grand Mean Sample **ST23** = 287.30 Taber Units

Grand Mean Sample **ST24** = 243.85 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 SM23			Sample SM24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
778WNZ		58.22	4.20	0.61	58.48	5.20	0.74	TA
77BGEP		47.82	-6.20	-0.91	47.50	-5.78	-0.82	DT
8V9J4U		50.27	-3.75	-0.55	48.07	-5.22	-0.74	LW
92PCTY		50.58	-3.44	-0.50	50.54	-2.74	-0.39	LW
9GG9UU		53.18	-0.84	-0.12	51.52	-1.76	-0.25	XX
CGCVYW		60.36	6.34	0.93	60.64	7.36	1.04	LW
DZXAQQ		65.92	11.90	1.74	64.18	10.90	1.54	TL
EUD9BE		64.66	10.64	1.56	63.22	9.94	1.41	TA
F7Y6MW		51.02	-3.00	-0.44	49.01	-4.27	-0.60	TZ
FR2TER		45.02	-9.00	-1.31	44.69	-8.59	-1.22	TZ
HH4ZWC		46.44	-7.57	-1.11	48.73	-4.55	-0.64	LX
HW87AV		53.92	-0.10	-0.01	47.72	-5.56	-0.79	CA
J98JKD		63.18	9.16	1.34	62.74	9.46	1.34	LW
JEZQ4L		43.31	-10.71	-1.57	40.68	-12.60	-1.78	LW
TKX9V6		49.04	-4.98	-0.73	49.46	-3.82	-0.54	LW
ZDNKWA		53.24	-0.78	-0.11	53.26	-0.02	0.00	CD
ZKNYJW		55.40	1.38	0.20	59.00	5.72	0.81	TA
ZYABV7		60.72	6.70	0.98	59.62	6.34	0.90	TA

Summary Statistics		
	Sample SM23	Sample SM24
Grand Means	54.016 psi	53.281 psi
SD Btwn Labs	6.843 psi	7.069 psi
Statistics based on 18 of 18 reporting participants		

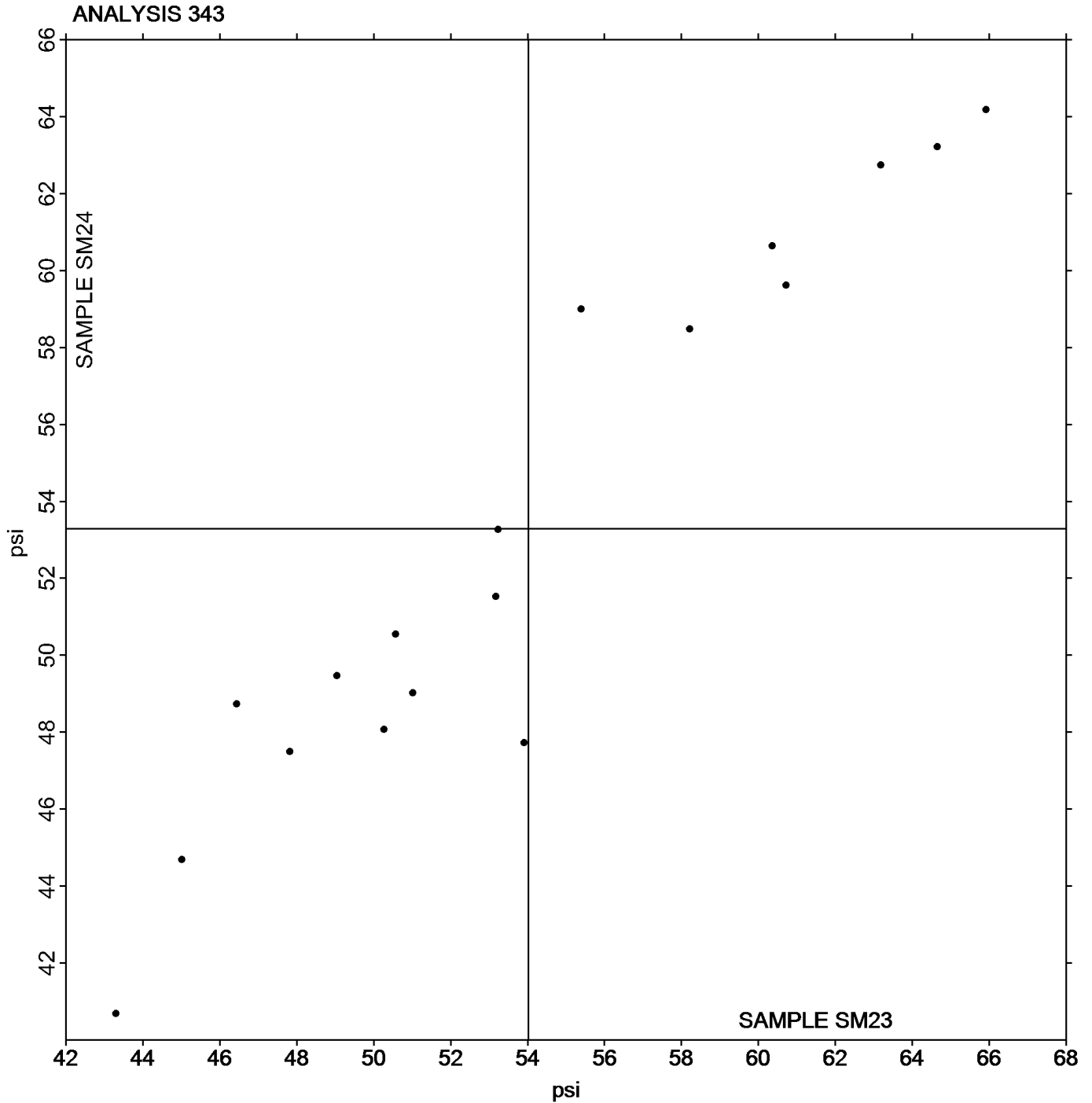
Instrument Code List

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

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

Grand Mean Sample **SM23** = 54.016 psi

Grand Mean Sample **SM24** = 53.281 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 SZ23			Sample SZ24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4NYTAD		34.00	-0.06	-0.04	40.00	0.75	0.33	CA
4ZBHQU		34.00	-0.06	-0.03	41.93	2.68	1.17	TA
6F3DZZ		34.60	0.54	0.31	40.20	0.95	0.41	CA
8BH8EA		33.58	-0.48	-0.28	38.84	-0.41	-0.18	LW
AAZXE8		33.56	-0.50	-0.29	37.70	-1.55	-0.67	LW
BZ84JM		33.86	-0.20	-0.12	37.08	-2.17	-0.94	TL
C9UHYD		33.12	-0.94	-0.55	39.42	0.17	0.07	TL
DCACCP		37.60	3.54	2.07	40.20	0.95	0.41	CA
DN8CPT		37.05	2.99	1.75	41.77	2.52	1.10	PG
JZ3C7D	X	30.18	-3.88	-2.27	25.08	-14.17	-6.16	TL
KAKFQH		34.60	0.54	0.31	40.60	1.35	0.59	CA
LEACQT		31.16	-2.90	-1.70	33.92	-5.33	-2.31	LW
NUZWJL		34.88	0.82	0.48	41.94	2.69	1.17	XX
RLBH9B		32.26	-1.80	-1.06	39.48	0.23	0.10	CA
T88CU7		32.60	-1.46	-0.86	36.40	-2.85	-1.24	TZ

Sample SZ23		Summary Statistics	Sample SZ24	
Grand Means	34.062 psi		39.248 psi	
SD Btwn Labs	1.708 psi		2.302 psi	
Statistics based on 14 of 15 reporting participants				

Comments on assigned Data Flags for Test #345

JZ3C7D (X) - Extreme data for Sample SZ24.

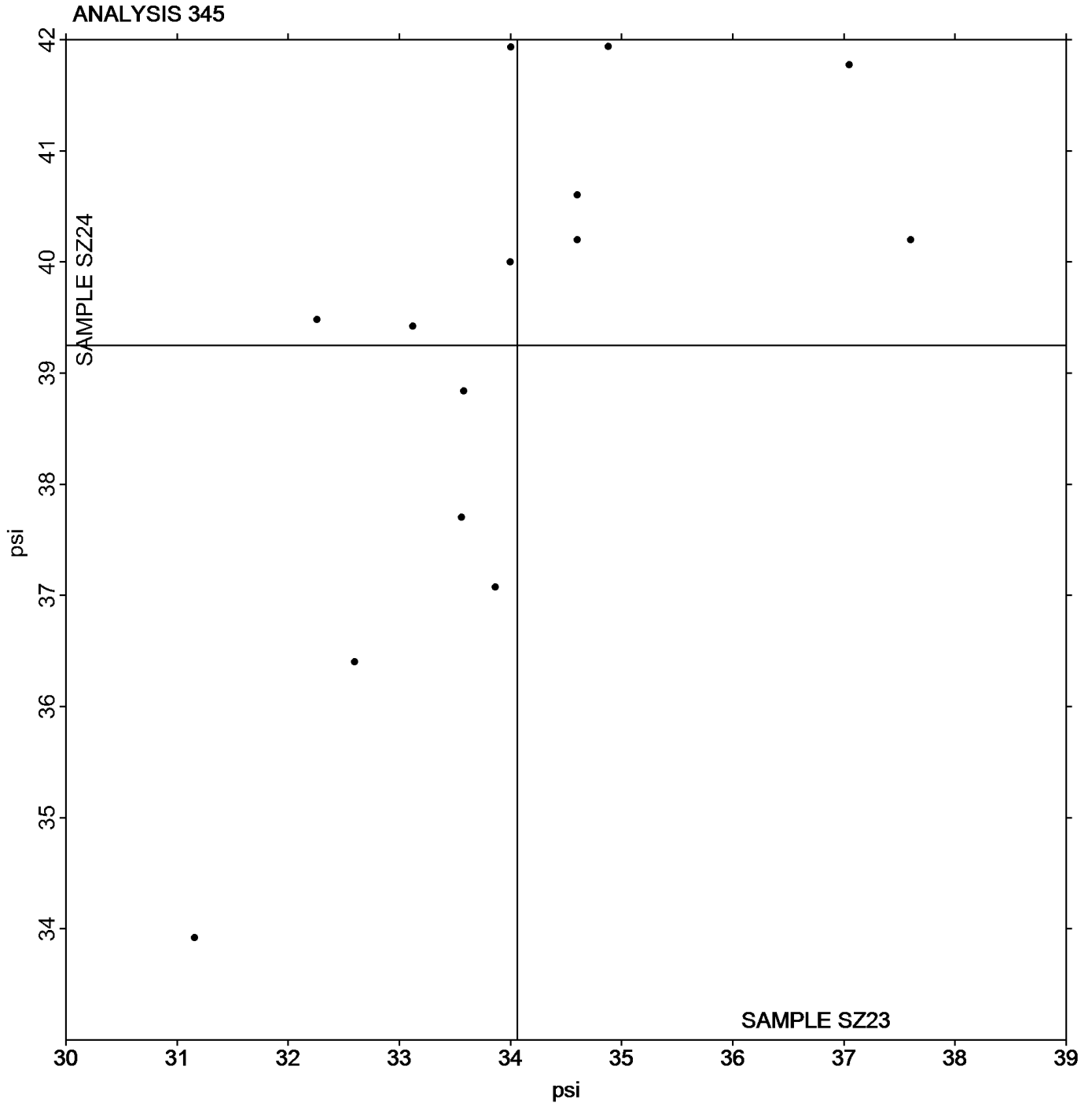
Instrument Code List

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

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

Grand Mean Sample **SZ23** = 34.062 psi

Grand Mean Sample **SZ24** = 39.248 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 SN23			Sample SN24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3NJCH7		73.00	-1.04	-0.17	70.80	-2.95	-0.49	HY
4NYTAD		76.40	2.36	0.39	76.80	3.05	0.50	HZ
778WNZ	*	92.40	18.36	3.02	88.80	15.05	2.48	HY
C466WP		73.00	-1.04	-0.17	74.80	1.05	0.17	HZ
CGCVYW		70.80	-3.24	-0.53	71.60	-2.15	-0.36	HY
DR7QCH		73.56	-0.48	-0.08	70.36	-3.39	-0.56	HY
EUD9BE		75.38	1.34	0.22	75.80	2.05	0.34	HZ
F7Y6MW		75.80	1.76	0.29	72.80	-0.95	-0.16	HY
FR2TER		65.00	-9.04	-1.49	65.00	-8.75	-1.44	HY
J98JKD		81.80	7.76	1.28	83.00	9.25	1.53	XX
KBUK47		75.00	0.96	0.16	75.00	1.25	0.21	HZ
LAFHTR		68.80	-5.24	-0.86	67.80	-5.95	-0.98	XX
LEDY87		72.00	-2.04	-0.34	72.20	-1.55	-0.26	HY
PEYKNM		64.60	-9.44	-1.55	65.20	-8.55	-1.41	HY
QG4R76		75.56	1.52	0.25	74.96	1.21	0.20	HZ
QUQ2QP		66.80	-7.24	-1.19	67.80	-5.95	-0.98	HY
TKX9V6		74.00	-0.04	-0.01	71.00	-2.75	-0.45	HZ
U2GLKG		75.36	1.32	0.22	75.12	1.37	0.23	KR
YUKEVV		71.20	-2.84	-0.47	71.20	-2.55	-0.42	HY
ZDNKWA		73.40	-0.64	-0.11	73.20	-0.55	-0.09	HY
ZYABV7	*	81.00	6.96	1.15	85.60	11.85	1.95	HY

		Summary Statistics			
		Sample SN23		Sample SN24	
Grand Means		74.041	1000th ft-lbs	73.754	1000th ft-lbs
SD Btwn Labs		6.072	1000th ft-lbs	6.062	1000th ft-lbs
Statistics based on 21 of 21 reporting participants					

Instrument Code List

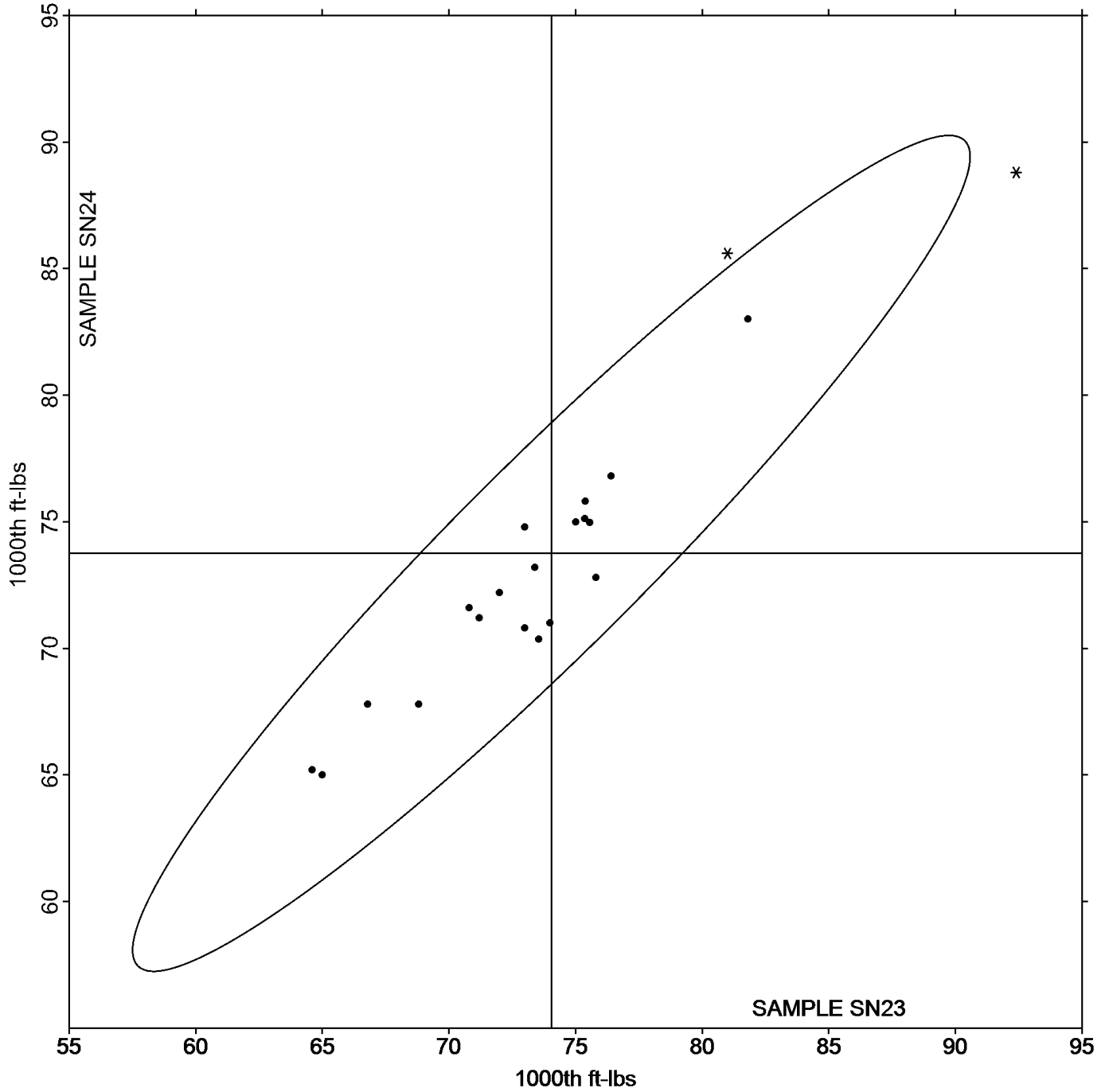
- | | |
|--|---|
| (HY) - Huygen Digitized Scott Internal Bond Tester | (HZ) - Huygen Internal Bond Tester with AccuPress |
| (KR) - Kumagai Riki Kogyo Internal Bond Tester | (XX) - Instrument make/model not specified by lab |

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

Grand Mean Sample **SN23** = 74.041 1000th ft-lbs

Grand Mean Sample **SN24** = 73.754 1000th ft-lbs

ANALYSIS 348



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

WebCode	Data Flag	Sample SP23			Sample SP24			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2MWC2X		88.40	24.45	1.79	87.20	23.83	1.90	SC
84Y2H3		68.81	4.86	0.36	71.00	7.62	0.61	XX
8BH8EA		78.00	14.05	1.03	73.00	9.63	0.77	XX
BZ84JM		64.00	0.05	0.00	67.80	4.43	0.35	TM
CNCAMJ		64.20	0.26	0.02	57.81	-5.57	-0.44	TM
DN8CPT		65.60	1.65	0.12	60.60	-2.77	-0.22	TM
HH4ZWC		47.68	-16.27	-1.19	51.77	-11.60	-0.93	TM
QF6LMQ		58.62	-5.33	-0.39	59.56	-3.81	-0.30	XX
RX7QUY		34.96	-28.99	-2.12	36.50	-26.88	-2.15	SC
UB2RK7		60.89	-3.06	-0.22	61.86	-1.51	-0.12	TM
XC4UVE		62.80	-1.15	-0.08	61.60	-1.77	-0.14	TM
YV8V8R		73.40	9.45	0.69	71.80	8.43	0.67	SC

		Summary Statistics			
		Sample SP23		Sample SP24	
Grand Means		63.946	1000th ft-lbs	63.374	1000th ft-lbs
SD Btwn Labs		13.669	1000th ft-lbs	12.521	1000th ft-lbs
Statistics based on 12 of 12 reporting participants					

Instrument Code List

(SC) - Scott Internal Bond Tester (Manual)

(TM) - TMI Monitor/Internal Bond Tester

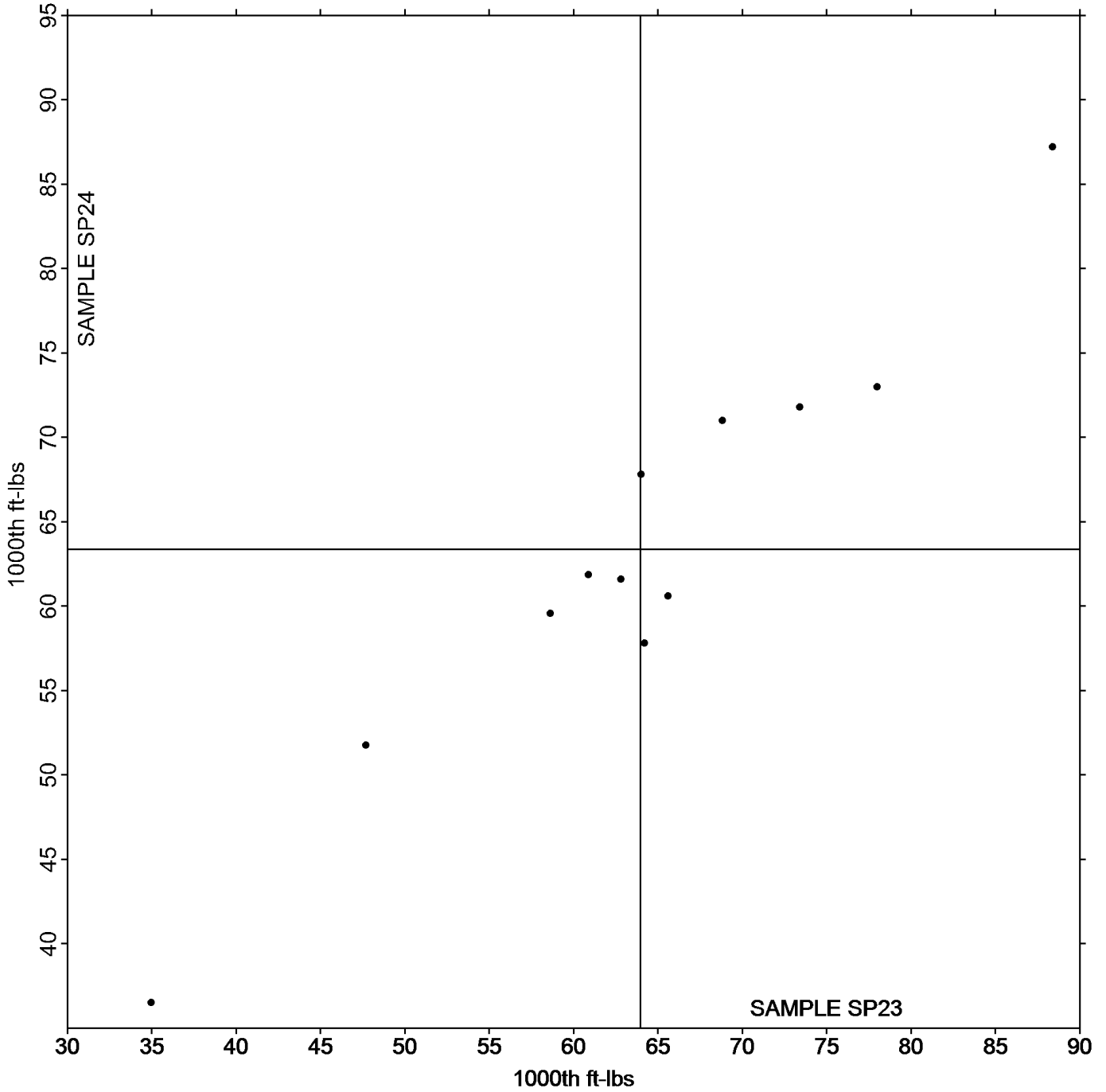
(XX) - Instrument make/model not specified by lab

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

Grand Mean Sample **SP23** = 63.946 1000th ft-lbs

Grand Mean Sample **SP24** = 63.374 1000th ft-lbs

ANALYSIS 349



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