Collaborative Testing Services, Inc.

Paper & Paperboard Interlaboratory Testing Program

Summary Report #268S - January 2014

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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:

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

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

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.

Instrument Manufacturer Contacts

If your results have been flagged with an "X" and you suspect that the problem is with your instrument (and not your testing procedure), CTS urges you to contact the appropriate instrument manufacturer. CTS has asked manufacturers to supply a contact person who is familiar with the Paper, Paperboard & Corrugated Fiberboard Interlaboratory Program. The listed service contact should be able to work with you on evaluating your results and determining possible causes of the problem.

Technidyne Corp., Hagerty Div.
George Hagerty
287 Dix Ave. P.O. Box 4741
Queensbury, NY 12804
Phone: (518) 793-2834
FAX #: (518) 792-1796

Technidyne Corporation
Jeff Hobbs / Mike Lankins
100 Quality Avenue
New Albany, IN 47150-2272 USA
Phone: (812) 948-2884
FAX #: (812) 945-6847

Thwing Albert Instrument Co.
Raymond McCart, Service Contact
David Zarrilli, Sales Contact
10960 Dutton Road
Philadelphia, PA 19154
Phone: (215) 637-0100
FAX #: (215) 632-8370

Testing Machines Inc.
Michael Foran, Technical Support Engineer
2910 Expressway Drive South
Islandia, NY 11722
Phone: (631) 439-5400
FAX #: (631) 439-5420

Huygen Corporation
Richard Wade
P.O. Box 316
Waconda, IL 60084
Phone: (815) 455-2200
FAX #: (815) 455-2300

Gurley Precision Instruments
Martin Gordinier, Product Manager
P.O. Box 88
Troy, NY 12181-0088
Phone: (800) 759-1844
FAX #: (518) 274-0336

Lorentzen & Wettre USA Inc.
Bill Crai, Technical Manager
1055 Windward Ridge Pkwy
Suite 160
Alpharetta, GA 30005
Phone: (770) 442-8015
FAX #: (770) 442-6792

Valmet Inc.
Eeva Nettamo, Product Mgr Paper Testing
3100 Medlock Bridge Road - Suite 260
Norcross, GA 30071
Phone: (404) 448-0849
FAX #: (404) 242-8386

Custom Scientific Instruments
DEK-TRON Scientific
Segundo Vargas, Chief Design Engineer
244 East Third Street

Plainfield, NJ 07060
Phone: (908) 668-1777
FAX #: (908) 668-4794

Emmerson Apparatus
170 Anderson Street
Portland, ME 04101
Phone: (207) 774-5254

FAX#: (207) 774-5304

TAPPI-CTS Interlaboratory Testing Program

Analysis 305

Bursting Strength - Printing Papers

WebCode	Data Flag	Sample SA03 Lab Mean	Sample SA03 Diff from Grand Mean	Sample SA03 CPV	Sample SA04 Lab Mean	Sample SA04 Diff from Grand Mean	Sample SA04 CPV
22PPTR		23.40	3.97	2.00	31.90	3.31	1.66
3M7D6N		20.63	1.20	0.61	28.06	-0.53	-0.27
6JK8LJ		16.25	-3.18	-1.60	27.20	-1.39	-0.70
83BG3Y		19.40	-0.03	-0.02	27.30	-1.29	-0.65
8N6ECB		17.00	-2.43	-1.22	28.70	0.11	0.05
9EKJWV		19.82	0.39	0.20	30.16	1.57	0.79
9JAKW2		20.25	0.82	0.41	30.50	1.91	0.95
ARCGVN		20.13	0.70	0.35	28.83	0.23	0.12
CLGDRB		21.96	2.53	1.27	32.31	3.71	1.86
FQMC87		19.22	-0.21	-0.11	27.40	-1.20	-0.60
HDY6CG		21.93	2.50	1.26	30.91	2.32	1.16
HL9EV4		17.78	-1.65	-0.83	26.35	-2.24	-1.12
HNNHDL		19.07	-0.36	-0.18	26.90	-1.69	-0.85
LDH8HE		16.79	-2.64	-1.33	26.83	-1.76	-0.88
NA9KED		22.42	2.99	1.51	30.57	1.98	0.99
P882MK		17.20	-2.23	-1.12	25.80	-2.79	-1.40
QPXWZ7		17.50	-1.93	-0.97	26.20	-2.39	-1.20
VKCDJL		20.29	0.86	0.43	29.82	1.23	0.62
WZEGBQ		19.91	0.48	0.24	30.11	1.52	0.76
YRRYNK		17.65	-1.78	-0.90	28.45	-0.14	-0.07
ZWKVRP		19.42	-0.01	0.00	26.18	-2.42	-1.21

Summary Statistics

	Sample SA03	Sample SA04
Grand Means	19.430 psi	28.595 psi
SD Btwn Labs	1.985 psi	1.996 psi

Statistics based on 21 of 21 reporting participants

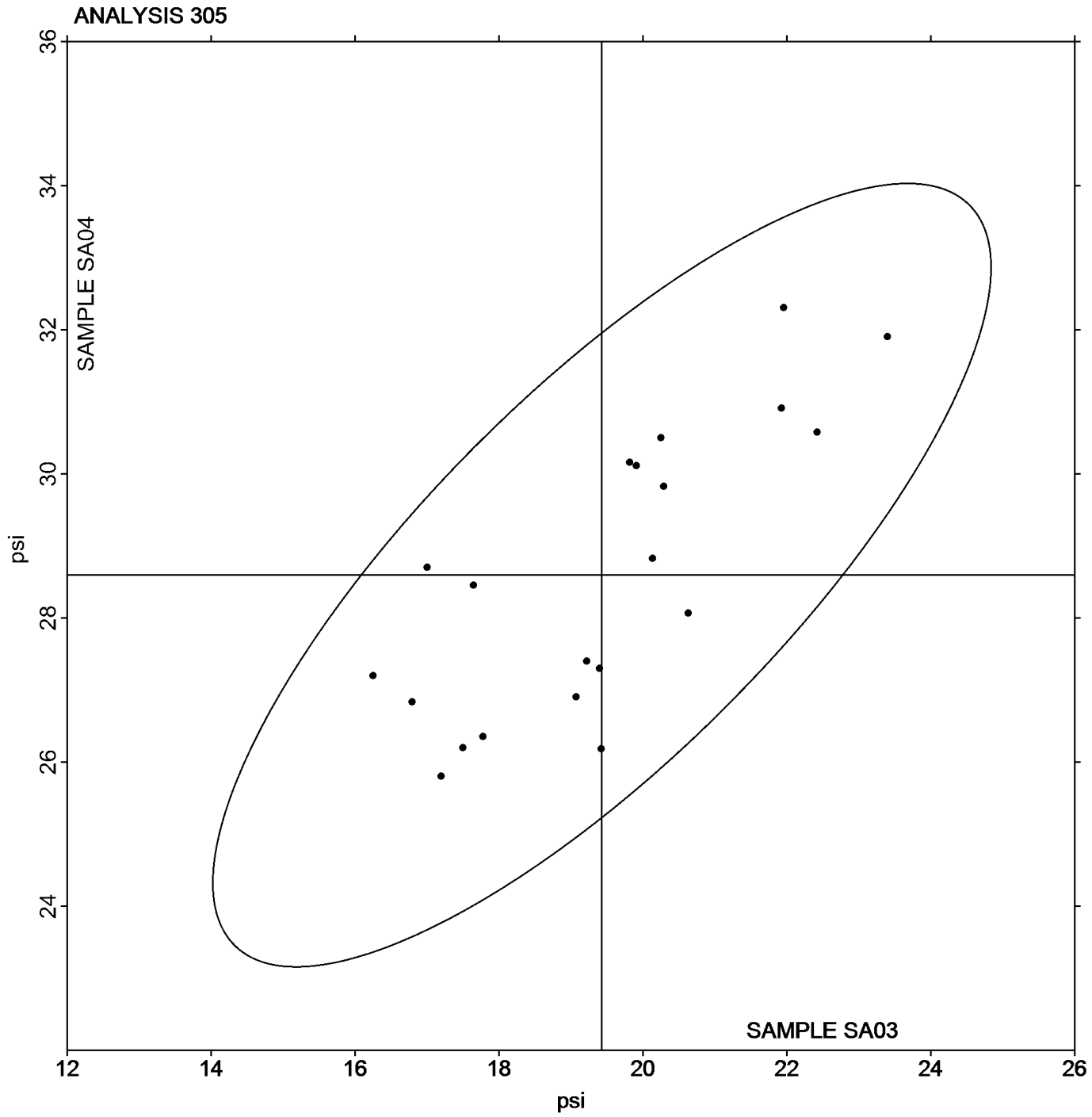
TAPPI-CTS Interlaboratory Testing Program

Analysis 305

Bursting Strength - Printing Papers

Grand Mean Sample **SA03** = 19.430 psi

Grand Mean Sample **SA04** = 28.595 psi



TAPPI-CTS Interlaboratory Testing Program

Analysis 310

Bursting Strength - Packaging Papers

WebCode	Data Flag	Sample SB03 Lab Mean	Sample SB03 Diff from Grand Mean	Sample SB03 CPV	Sample SB04 Lab Mean	Sample SB04 Diff from Grand Mean	Sample SB04 CPV
2FFVDU		77.44	4.51	1.10	47.99	3.67	1.03
44HFY4		72.70	-0.23	-0.06	45.80	1.48	0.42
687C4Y		75.87	2.94	0.72	44.63	0.31	0.09
92G43D		67.52	-5.41	-1.32	40.75	-3.57	-1.00
9EKJWV		67.05	-5.89	-1.43	43.52	-0.79	-0.22
9GKXYR		66.31	-6.62	-1.61	40.32	-4.00	-1.12
9ZGCKB		74.00	1.07	0.26	43.70	-0.62	-0.17
ABBCV8		64.27	-8.66	-2.11	41.13	-3.19	-0.90
D43JCU		75.50	2.57	0.63	44.25	-0.07	-0.02
D4V6CR		78.76	5.82	1.42	48.84	4.52	1.27
G7GGVT		75.81	2.88	0.70	46.22	1.91	0.54
H3BAX9		76.80	3.87	0.94	43.00	-1.32	-0.37
KV3G4P		72.10	-0.83	-0.20	48.20	3.88	1.09
NA9KED		72.16	-0.77	-0.19	43.21	-1.11	-0.31
NZ8AVQ		77.20	4.27	1.04	45.20	0.88	0.25
PBFPMF		75.89	2.96	0.72	45.33	1.01	0.29
PG2ZXQ		72.09	-0.84	-0.20	39.67	-4.64	-1.31
U7QBTA		71.48	-1.45	-0.35	43.25	-1.06	-0.30
UFE68Q		80.42	7.49	1.82	41.82	-2.50	-0.70
UWMDP	X	78.68	5.75	1.40	67.86	23.54	6.63
V86DH2		72.70	-0.23	-0.06	49.00	4.68	1.32
W2QA2X	*	75.41	2.48	0.60	55.33	11.02	3.10
WL2YPG		68.83	-4.10	-1.00	43.21	-1.10	-0.31
WU87PP		71.10	-1.83	-0.45	40.65	-3.67	-1.03
WWYZQZ		69.18	-3.75	-0.91	41.52	-2.79	-0.79
YEM69P		72.70	-0.23	-0.06	41.35	-2.97	-0.83

Summary Statistics

	Sample SB03	Sample SB04
Grand Means	72.931 psi	44.316 psi
SD Btwn Labs	4.104 psi	3.554 psi

Statistics based on 25 of 26 reporting participants

Comments on assigned Data Flags for Test #310

UWMDPM (X) - Extreme data for Sample SB04.

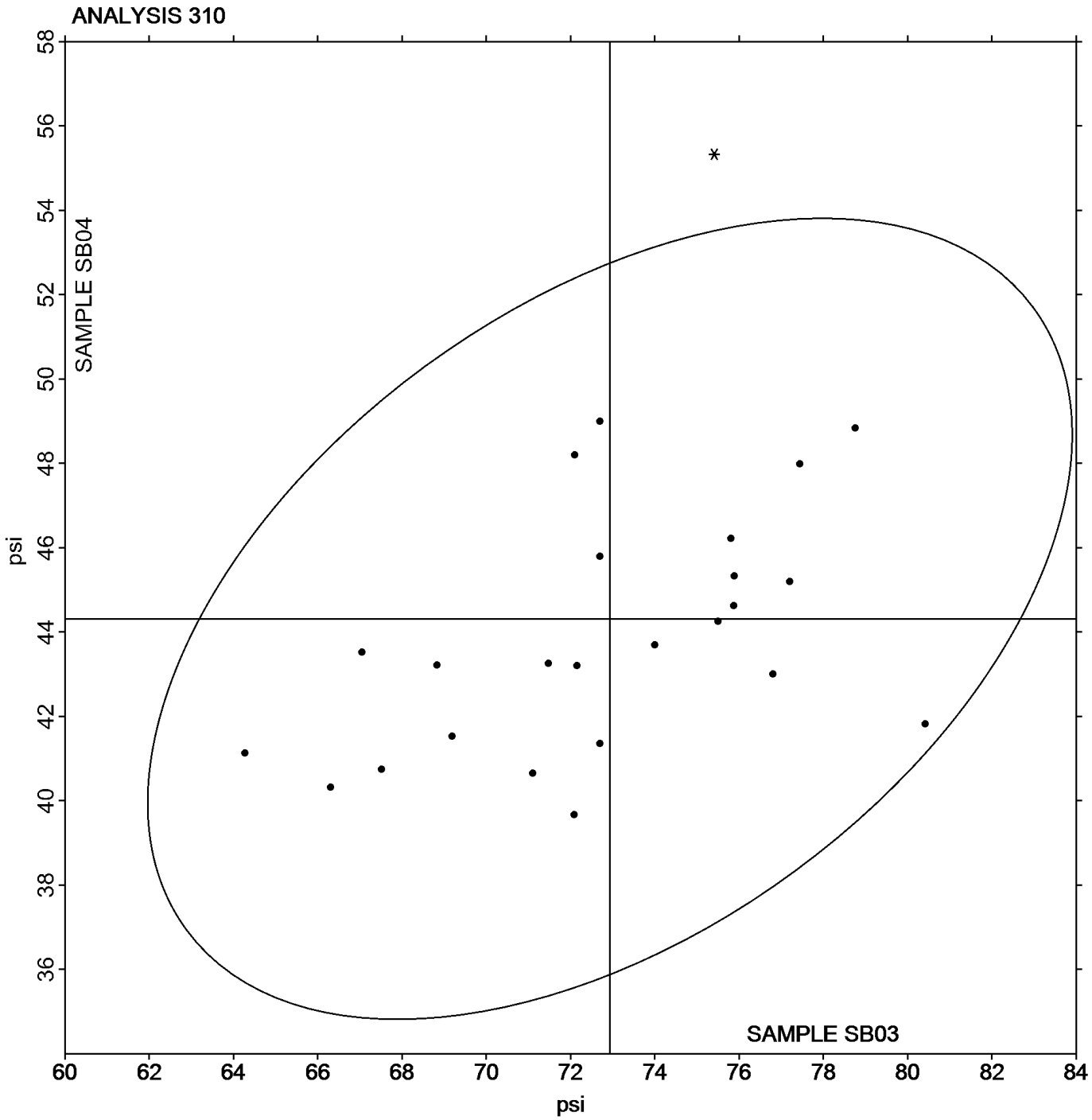
TAPPI-CTS Interlaboratory Testing Program

Analysis 310

Bursting Strength - Packaging Papers

Grand Mean Sample **SB03** = 72.931 psi

Grand Mean Sample **SB04** = 44.316 psi



TAPPI-CTS Interlaboratory Testing Program

Analysis 311

Tearing Strength - Newsprint

WebCode	Data Flag	Sample SK03 Lab Mean	Sample SK03 Diff from Grand Mean	Sample SK03 CPV	Sample SK04 Lab Mean	Sample SK04 Diff from Grand Mean	Sample SK04 CPV
8LXU9N	X	31.41	11.24	7.82	30.96	12.63	7.64
8LY3FU		20.70	0.54	0.37	18.70	0.37	0.22
EJ77TE	X	31.87	11.70	8.14	30.96	12.63	7.64
HDY6CG		21.38	1.21	0.84	19.95	1.62	0.98
P4UAX4		17.92	-2.25	-1.56	15.64	-2.69	-1.63
VKCDJL		19.60	-0.57	-0.39	18.10	-0.23	-0.14
WDAKN		21.23	1.06	0.74	19.27	0.94	0.57

Summary Statistics

	Sample SK03	Sample SK04
Grand Means	20.167 Grams	18.332 Grams
SD Btwn Labs	1.437 Grams	1.653 Grams

Statistics based on 5 of 7 reporting participants

Comments on assigned Data Flags for Test #311

8LXU9N (X) - Extreme data.

EJ77TE (X) - Extreme data.

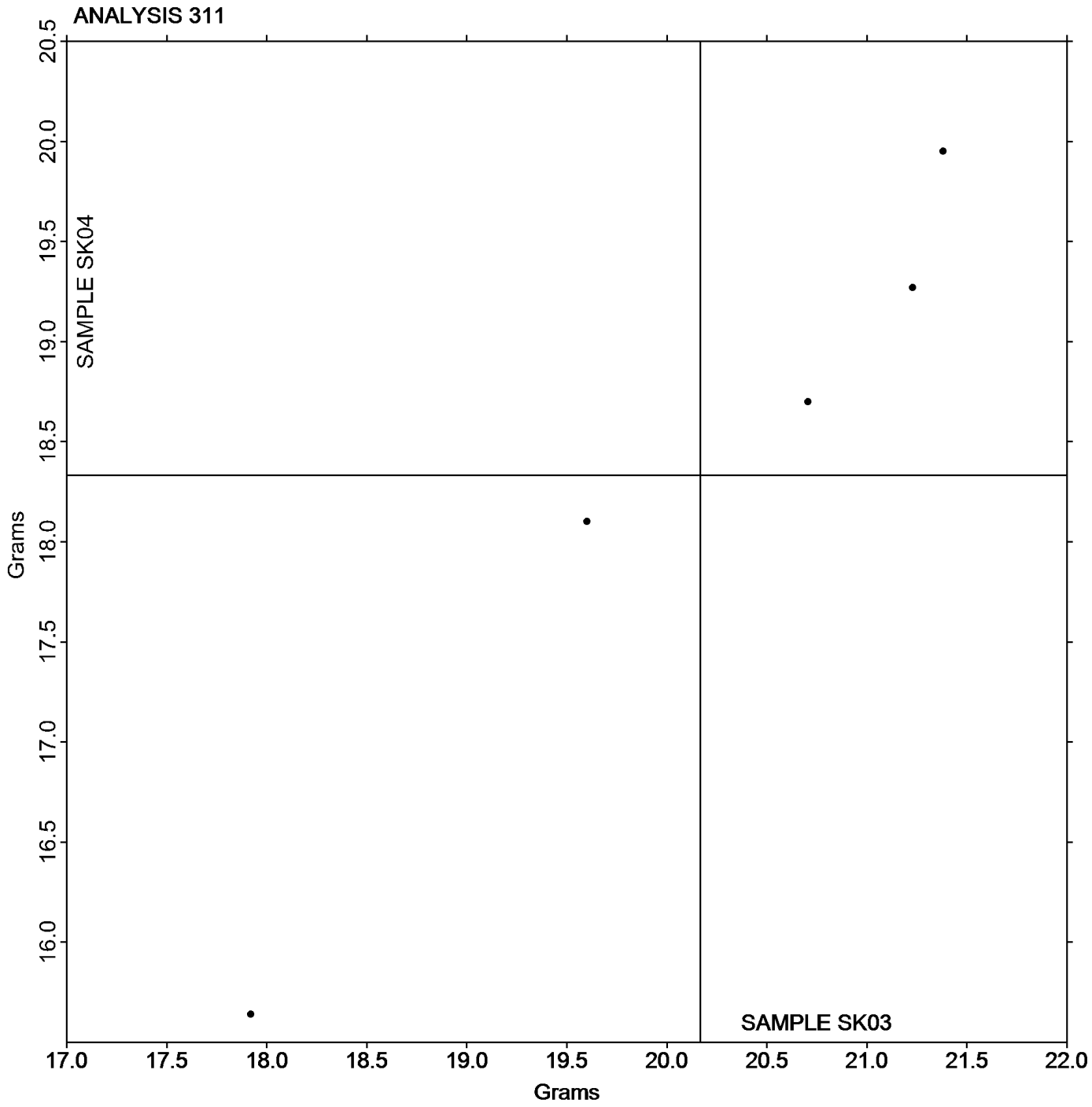
TAPPI-CTS Interlaboratory Testing Program

Analysis 311

Tearing Strength - Newsprint

Grand Mean Sample **SK03** = 20.167 Grams

Grand Mean Sample **SK04** = 18.332 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 SC03 Lab Mean	Sample SC03 Diff from Grand Mean	Sample SC03 CPV	Sample SC04 Lab Mean	Sample SC04 Diff from Grand Mean	Sample SC04 CPV
22PPTR		57.28	0.86	0.20	50.88	1.68	0.41
2EWQGU		52.32	-4.10	-0.93	46.31	-2.89	-0.71
2WGTGC		58.25	1.83	0.42	52.19	2.99	0.73
3M7D6N		59.23	2.81	0.64	51.35	2.15	0.52
687C4Y		53.55	-2.87	-0.65	45.89	-3.31	-0.81
7QYUBM		59.66	3.24	0.74	53.54	4.34	1.06
83BG3Y		53.90	-2.52	-0.57	44.40	-4.80	-1.17
8FYQHC	X	52.00	-4.42	-1.00	56.40	7.20	1.76
92G43D		57.12	0.70	0.16	48.76	-0.44	-0.11
96KUNH		54.90	-1.52	-0.35	48.84	-0.36	-0.09
9EKJWV		58.40	1.98	0.45	50.80	1.60	0.39
9GKXYR		60.77	4.35	0.99	52.94	3.74	0.91
9JAKW2		64.14	7.72	1.75	56.69	7.49	1.83
9QCD23		50.50	-5.92	-1.34	45.30	-3.90	-0.95
9R68KY		55.54	-0.88	-0.20	49.20	0.00	0.00
AEVZ7E		57.58	1.16	0.26	49.38	0.18	0.04
ARCGVN		61.66	5.24	1.19	52.88	3.68	0.90
BAEWXN		56.72	0.30	0.07	50.22	1.02	0.25
CJDFRF		58.40	1.98	0.45	53.70	4.50	1.10
CLGDRB		58.28	1.86	0.42	50.71	1.51	0.37
CXCKUL		52.60	-3.82	-0.87	46.00	-3.20	-0.78
E2BW34		57.76	1.34	0.30	49.36	0.16	0.04
FQMC87		61.24	4.82	1.09	51.88	2.68	0.65
G7GGVT		54.68	-1.74	-0.40	48.97	-0.23	-0.06
G9L3R7	X	57.20	0.78	0.18	55.20	6.00	1.46
HCBLPA	*	44.64	-11.78	-2.67	38.51	-10.69	-2.61
HCWBGP		52.40	-4.02	-0.91	47.00	-2.20	-0.54
HL9EV4		58.29	1.87	0.42	50.75	1.55	0.38
HNNHDL		58.52	2.10	0.48	53.16	3.96	0.97
HPAF4D		58.88	2.46	0.56	52.50	3.30	0.81
HRBPK9		59.50	3.08	0.70	49.85	0.65	0.16
JY3WVE		50.35	-6.07	-1.38	45.67	-3.53	-0.86
KV3G4P	X	69.40	12.98	2.95	56.80	7.60	1.86
LDH8HE		55.80	-0.62	-0.14	49.30	0.10	0.02
LLFRTM	X	41.44	-14.98	-3.40	39.36	-9.84	-2.40
NA9KED		55.12	-1.30	-0.30	46.92	-2.28	-0.56
NZ4W4N		49.20	-7.22	-1.64	43.60	-5.60	-1.37
P882MK		54.58	-1.84	-0.42	46.82	-2.38	-0.58
P9R9D8	*	63.69	7.27	1.65	59.04	9.84	2.40
PHJFG7		56.50	0.08	0.02	49.38	0.18	0.04
PMUK6Z		57.80	1.38	0.31	50.00	0.80	0.20
QPXWZ7		49.80	-6.62	-1.50	44.40	-4.80	-1.17
QRFEFJ	X	54.96	-1.46	-0.33	48.78	-0.42	-0.10

TAPPI-CTS Interlaboratory Testing Program

Analysis 312

Tearing Strength - Printing Papers

WebCode	Data Flag	Sample SC03 Lab Mean	Sample SC03 Diff from Grand Mean	Sample SC03 CPV	Sample SC04 Lab Mean	Sample SC04 Diff from Grand Mean	Sample SC04 CPV
U7QBTA		47.42	-9.00	-2.04	42.06	-7.14	-1.74
UWMDP		52.47	-3.95	-0.90	44.68	-4.52	-1.10
VEK9BP		49.58	-6.84	-1.55	42.74	-6.46	-1.58
WF83P6		65.38	8.96	2.04	57.75	8.55	2.09
WL2YPG		57.20	0.78	0.18	48.79	-0.41	-0.10
WU87PP		55.19	-1.23	-0.28	47.61	-1.59	-0.39
WWYZQZ		61.51	5.09	1.16	51.74	2.54	0.62
WZEGBQ		59.74	3.32	0.75	51.13	1.93	0.47
XECZCE	*	58.30	1.88	0.43	47.30	-1.90	-0.46
YEM69P		54.98	-1.44	-0.33	46.81	-2.39	-0.58
YXGFZB		63.92	7.50	1.70	56.73	7.53	1.84
ZWKVRP		55.76	-0.66	-0.15	45.59	-3.61	-0.88
ZXN8ZF	X	79.20	22.78	5.17	51.20	2.00	0.49

Summary Statistics

	Sample SC03	Sample SC04
Grand Means	56.420 Grams	49.200 Grams
SD Btwn Labs	4.404 Grams	4.097 Grams

Statistics based on 50 of 56 reporting participants

Comments on assigned Data Flags for Test #312

8FYQHC (X) - Inconsistent in testing between samples.

G9L3R7 (X) - Inconsistent in testing between samples and within the determinations for Sample SC03.

KV3G4P (X) - Inconsistent in testing between samples, data for Sample SC03 are high. Inconsistent within the determinations for Sample SC03.

LLFRTM (X) - Inconsistent in testing between samples, data for Sample SC03 are low. Inconsistent in testing within the determinations for both samples.

ZXN8ZF (X) - Inconsistent in testing between samples, data for Sample SC03 are high. Inconsistent in testing within the determinations for both samples.

Analysis Notes:

G7GGVT - Data appear to be reported as mN, not gf as indicated on datasheet. Units corrected by CTS.

QRFEFJ - Data appear to be off by a factor of 8; data converted by CTS (x.125).

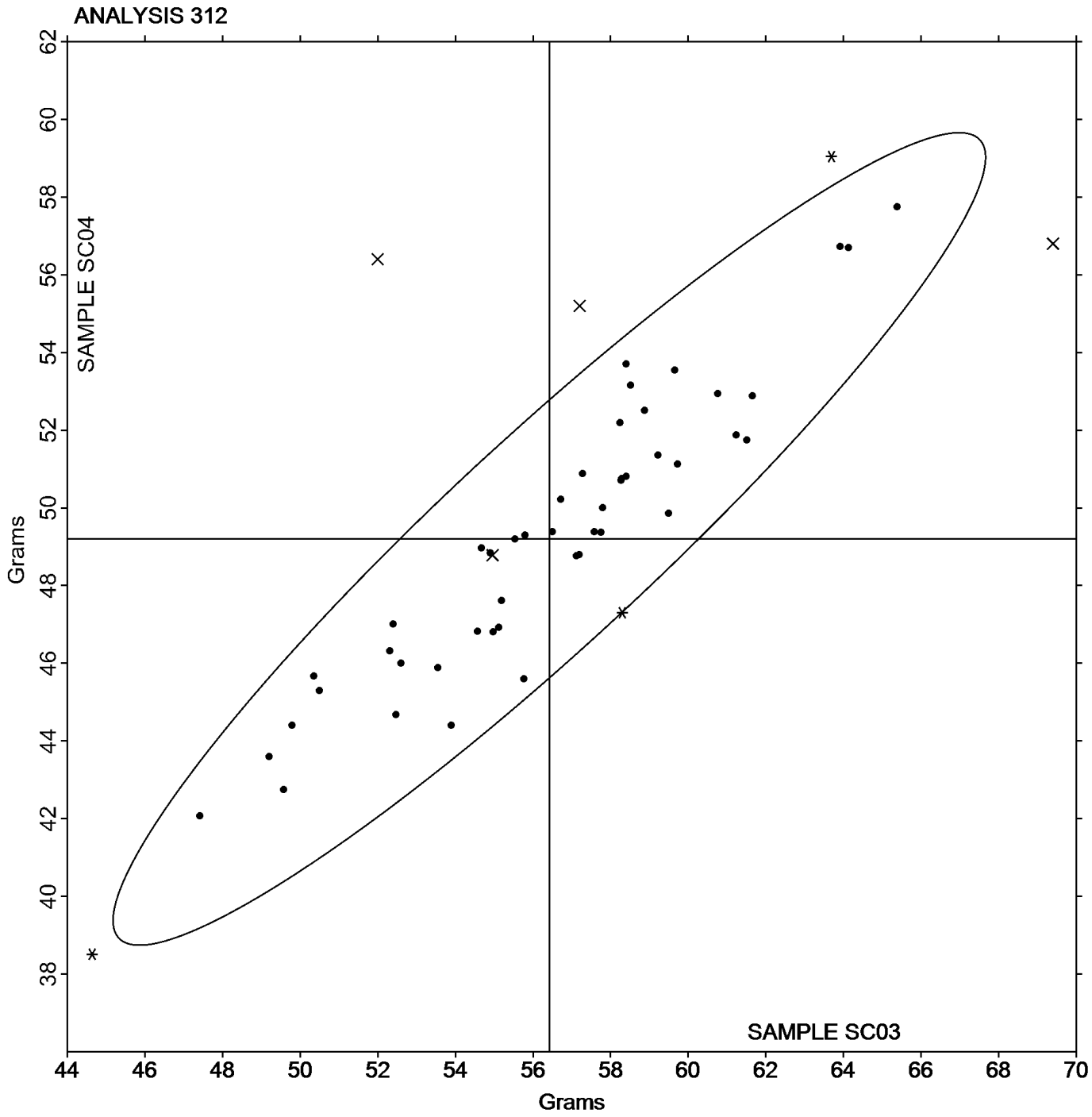
TAPPI-CTS Interlaboratory Testing Program

Analysis 312

Tearing Strength - Printing Papers

Grand Mean Sample **SC03** = 56.420 Grams

Grand Mean Sample **SC04** = 49.200 Grams



TAPPI-CTS Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

WebCode	Data Flag	Sample SD03 Lab Mean	Sample SD03 Diff from Grand Mean	Sample SD03 CPV	Sample SD04 Lab Mean	Sample SD04 Diff from Grand Mean	Sample SD04 CPV
29VQKU	X	162.8	5.1	0.39	163.4	7.3	0.53
2FFVDU		162.2	4.5	0.34	161.4	5.2	0.38
2JWBQT		155.3	-2.4	-0.18	157.4	1.2	0.09
2LD86X		146.4	-11.3	-0.85	143.6	-12.6	-0.92
44HFY4		150.4	-7.3	-0.55	152.0	-4.2	-0.31
468TDF		170.4	12.7	0.96	176.6	20.5	1.49
63BLZ9		166.0	8.3	0.62	156.0	-0.2	-0.02
6JK8LJ		165.6	7.9	0.59	161.2	5.0	0.37
78GJZZ		145.6	-12.2	-0.91	150.3	-5.9	-0.43
8BZQ9Z		172.3	14.6	1.10	165.3	9.1	0.66
8LY3FU		150.7	-7.0	-0.52	147.9	-8.3	-0.60
9EE7BK		179.4	21.7	1.63	184.8	28.6	2.09
9ZGCKB		146.3	-11.4	-0.86	145.6	-10.6	-0.77
9ZY7HZ		160.4	2.7	0.20	161.6	5.4	0.39
ABBCV8		149.2	-8.5	-0.64	149.2	-7.0	-0.51
AHR8B2		171.5	13.8	1.04	171.3	15.1	1.10
D43JCU		162.0	4.3	0.32	162.0	5.8	0.42
DCBNWR		160.9	3.2	0.24	159.2	3.0	0.22
EN2DCW		161.9	4.1	0.31	161.1	4.9	0.36
ERM4Q8		151.8	-5.9	-0.44	149.9	-6.3	-0.46
ETUY4C		163.0	5.3	0.40	157.4	1.2	0.09
H3BAX9		130.4	-27.3	-2.06	125.6	-30.6	-2.23
K76YJY		163.9	6.2	0.47	161.7	5.5	0.40
KV3G4P		132.0	-25.7	-1.94	130.4	-25.8	-1.88
KVGJEN		134.8	-22.9	-1.72	133.7	-22.5	-1.64
KZGCQE		177.2	19.4	1.46	174.1	17.9	1.31
MX2QTN		160.3	2.6	0.20	157.0	0.8	0.06
P882MK		150.5	-7.2	-0.54	148.2	-8.0	-0.58
PG2ZXQ		169.2	11.5	0.87	163.1	6.9	0.50
QLU679		158.5	0.8	0.06	151.8	-4.3	-0.32
RXLM37		162.8	5.0	0.38	158.8	2.6	0.19
TCNPKL		155.1	-2.6	-0.19	159.2	3.1	0.22
UFE68Q		128.6	-29.1	-2.19	129.3	-26.9	-1.96
V86DH2		147.2	-10.5	-0.79	141.2	-15.0	-1.09
VE37V3		162.9	5.2	0.39	163.8	7.6	0.56
W2QA2X		180.3	22.6	1.70	179.7	23.5	1.72
YRRYNK		172.6	14.9	1.12	171.3	15.1	1.10

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

Summary Statistics

	Sample SD03	Sample SD04
Grand Means	157.71 Grams	156.19 Grams
SD Btwn Labs	13.28 Grams	13.70 Grams

Statistics based on 36 of 37 reporting participants

Analysis Notes:

29VQKU - Data appear to be off by a factor of .25; data converted by CTS (x4).

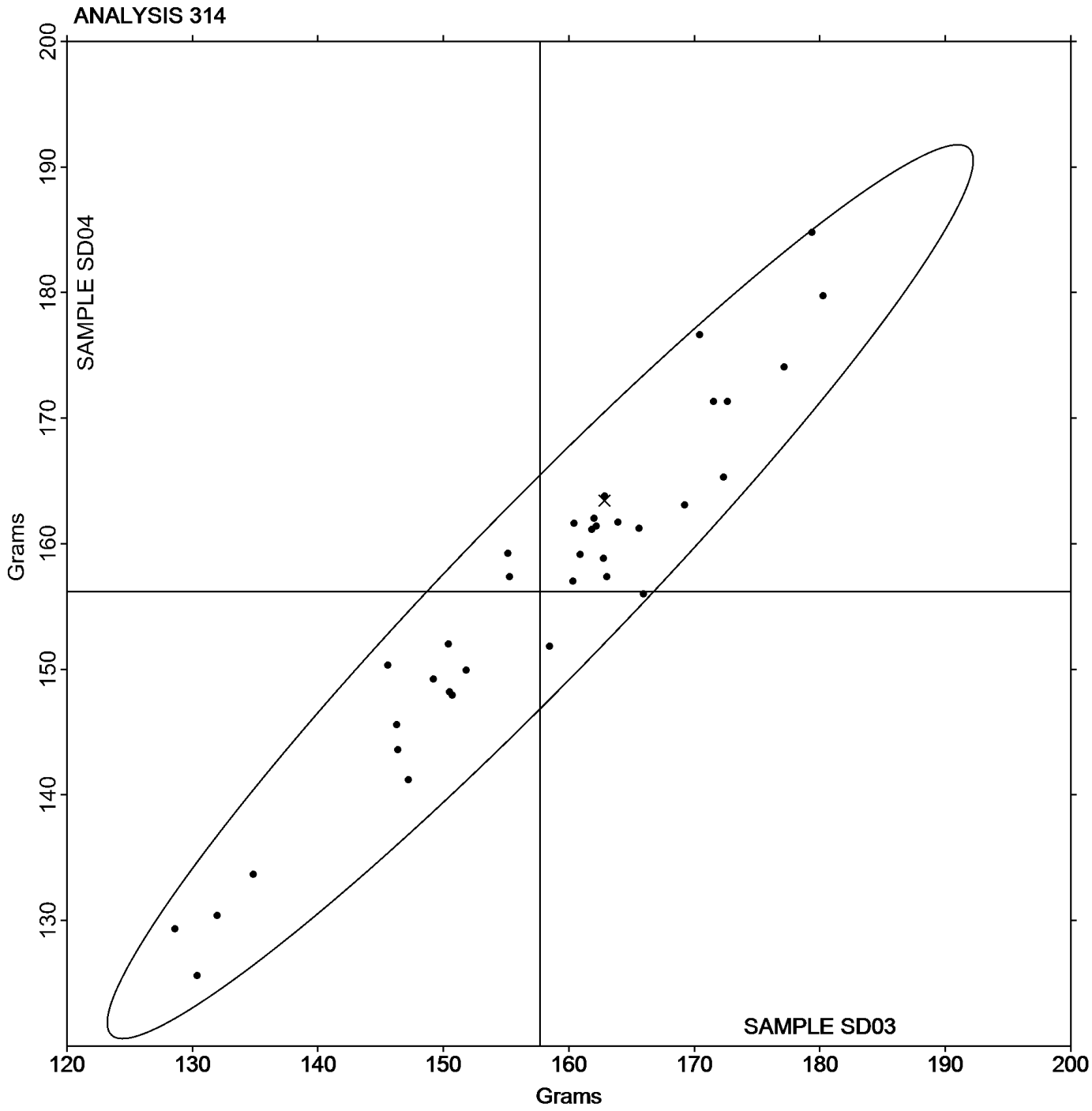
TAPPI-CTS Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

Grand Mean Sample **SD03** = 157.71 Grams

Grand Mean Sample **SD04** = 156.19 Grams



TAPPI-CTS Interlaboratory Testing Program

Analysis 320

Tensile Breaking Strength - Newsprint

WebCode	Data Flag	Sample SR03 Lab Mean	Sample SR03 Diff from Grand Mean	Sample SR03 CPV	Sample SR04 Lab Mean	Sample SR04 Diff from Grand Mean	Sample SR04 CPV
7QYUBM		2.773	0.041	0.24	2.887	-0.004	-0.02
83BG3Y		2.763	0.031	0.18	3.210	0.319	1.55
8LXU9N		2.599	-0.133	-0.77	2.792	-0.099	-0.48
8LY3FU		2.904	0.172	1.00	3.139	0.248	1.20
EJ77TE		2.819	0.087	0.51	2.937	0.046	0.22
G2Z9DV		3.048	0.316	1.83	3.085	0.194	0.94
HDY6CG		2.658	-0.074	-0.43	2.891	0.000	0.00
NA9KED		2.650	-0.082	-0.47	2.744	-0.147	-0.71
NZ8AVQ		2.809	0.077	0.44	2.940	0.049	0.24
P4UAX4		2.349	-0.383	-2.22	2.512	-0.379	-1.84
VKCDJL		2.658	-0.074	-0.43	2.606	-0.285	-1.39
WDAKN		2.753	0.021	0.12	2.949	0.058	0.28

Summary Statistics

	Sample SR03	Sample SR04
Grand Means	2.7319 kN/m	2.8910 kN/m
SD Btwn Labs	0.1728 kN/m	0.2056 kN/m

Statistics based on 12 of 12 reporting participants

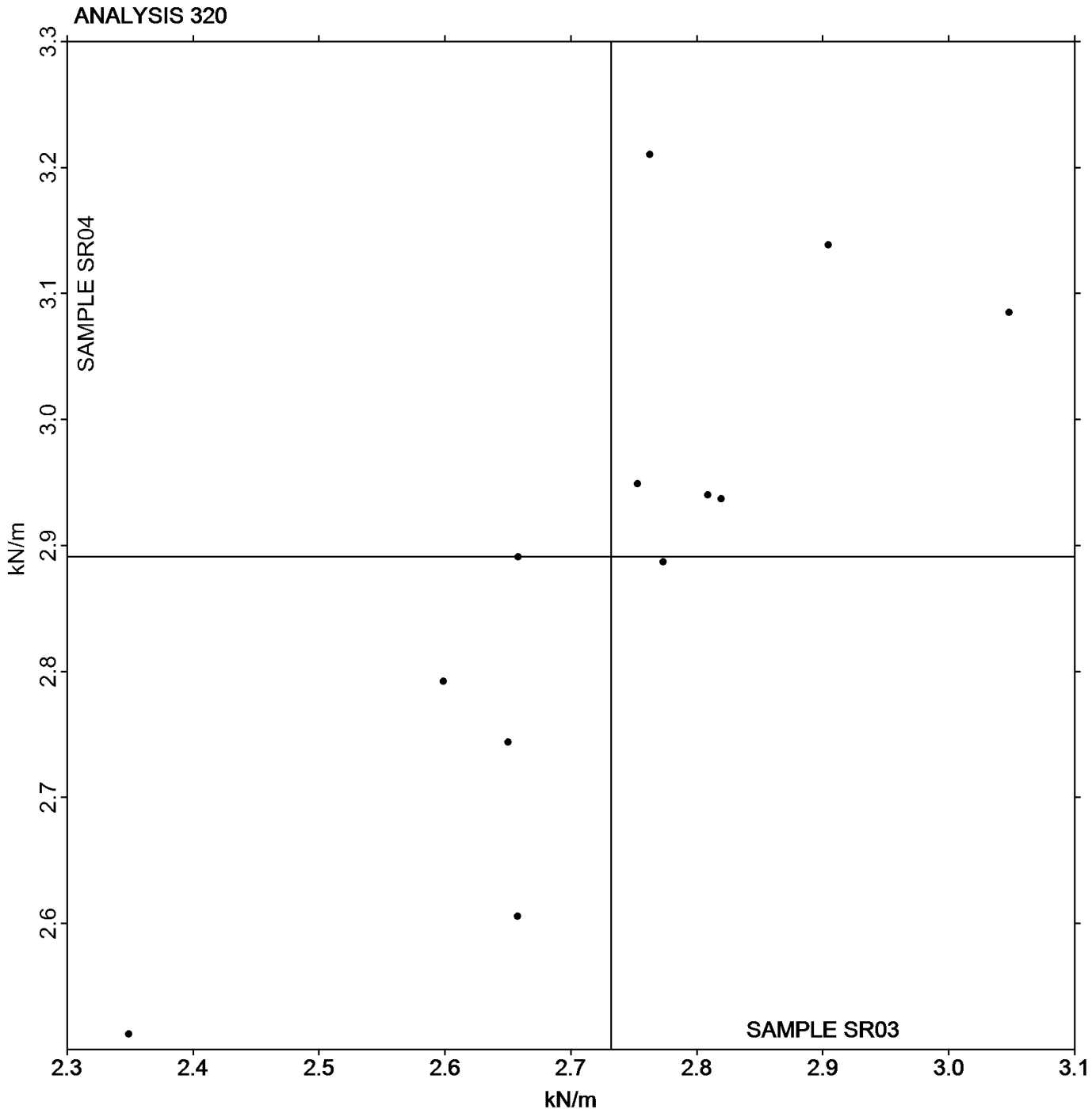
TAPPI-CTS Interlaboratory Testing Program

Analysis 320

Tensile Breaking Strength - Newsprint

Grand Mean Sample **SR03** = 2.7319 kN/m

Grand Mean Sample **SR04** = 2.8910 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 SR03 Lab Mean	Sample SR03 Diff from Grand Mean	Sample SR03 CPV	Sample SR04 Lab Mean	Sample SR04 Diff from Grand Mean	Sample SR04 CPV
7QYUBM		17.60	1.32	0.64	19.00	0.68	0.30
83BG3Y		15.60	-0.68	-0.33	21.67	3.35	1.47
8LXU9N		14.28	-2.00	-0.97	17.80	-0.53	-0.23
8LY3FU		17.78	1.50	0.73	21.11	2.79	1.22
EJ77TE		17.53	1.25	0.61	19.60	1.28	0.56
G2Z9DV		19.46	3.18	1.54	18.13	-0.19	-0.08
HDY6CG		15.63	-0.65	-0.32	18.69	0.37	0.16
NA9KED		14.17	-2.11	-1.02	16.65	-1.68	-0.74
NZ8AVQ		12.43	-3.85	-1.87	13.59	-4.73	-2.08
VKCDJL		17.85	1.57	0.76	16.18	-2.14	-0.94
WDAKN		16.77	0.49	0.24	19.14	0.82	0.36

Summary Statistics

	Sample SR03	Sample SR04
Grand Means	16.283 Joules/sq m	18.323 Joules/sq m
SD Btwn Labs	2.062 Joules/sq m	2.280 Joules/sq m

Statistics based on 11 of 11 reporting participants

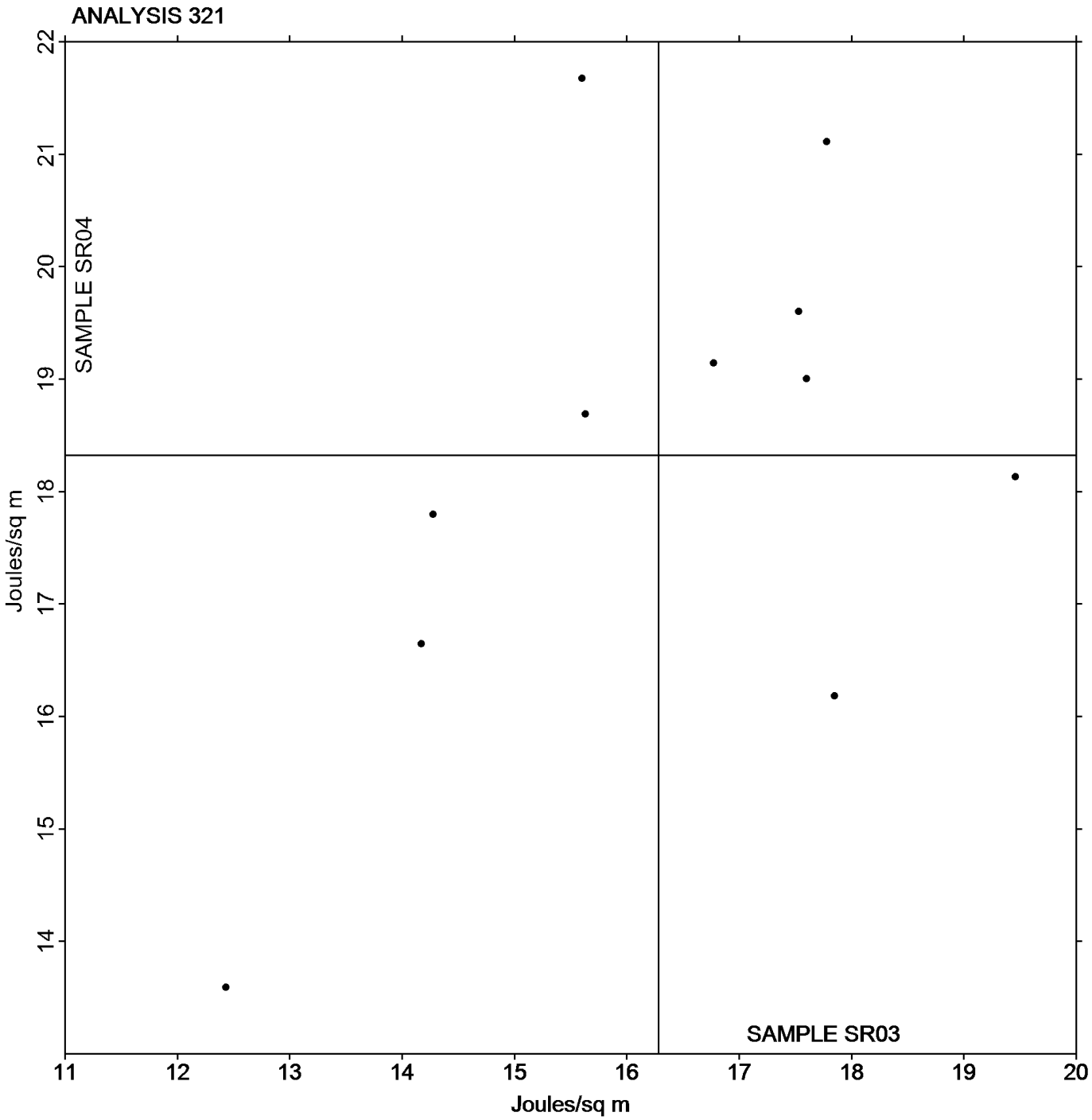
TAPPI-CTS Interlaboratory Testing Program

Analysis 321

Tensile Energy Absorption - Newsprint

Grand Mean Sample **SR03** = 16.283 Joules/sq m

Grand Mean Sample **SR04** = 18.323 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 SR03 Lab Mean	Sample SR03 Diff from Grand Mean	Sample SR03 CPV	Sample SR04 Lab Mean	Sample SR04 Diff from Grand Mean	Sample SR04 CPV
7QYUBM		1.085	0.028	0.18	1.119	-0.010	-0.06
83BG3Y		1.119	0.061	0.41	1.348	0.219	1.29
8LY3FU		1.039	-0.019	-0.12	1.120	-0.009	-0.05
EJ77TE		1.000	-0.058	-0.38	1.070	-0.059	-0.35
G2Z9DV		1.030	-0.028	-0.18	0.990	-0.139	-0.82
HDY6CG		1.186	0.128	0.85	1.319	0.190	1.12
NA9KED		0.925	-0.133	-0.88	1.040	-0.089	-0.52
NZ8AVQ		0.803	-0.254	-1.69	0.836	-0.293	-1.73
VKCDJL		1.367	0.309	2.05	1.365	0.237	1.39
WDAKN		1.022	-0.036	-0.24	1.080	-0.049	-0.29

Summary Statistics

	Sample SR03	Sample SR04
Grand Means	1.0577 Percent	1.1287 Percent
SD Btwn Labs	0.1508 Percent	0.1698 Percent

Statistics based on 10 of 10 reporting participants

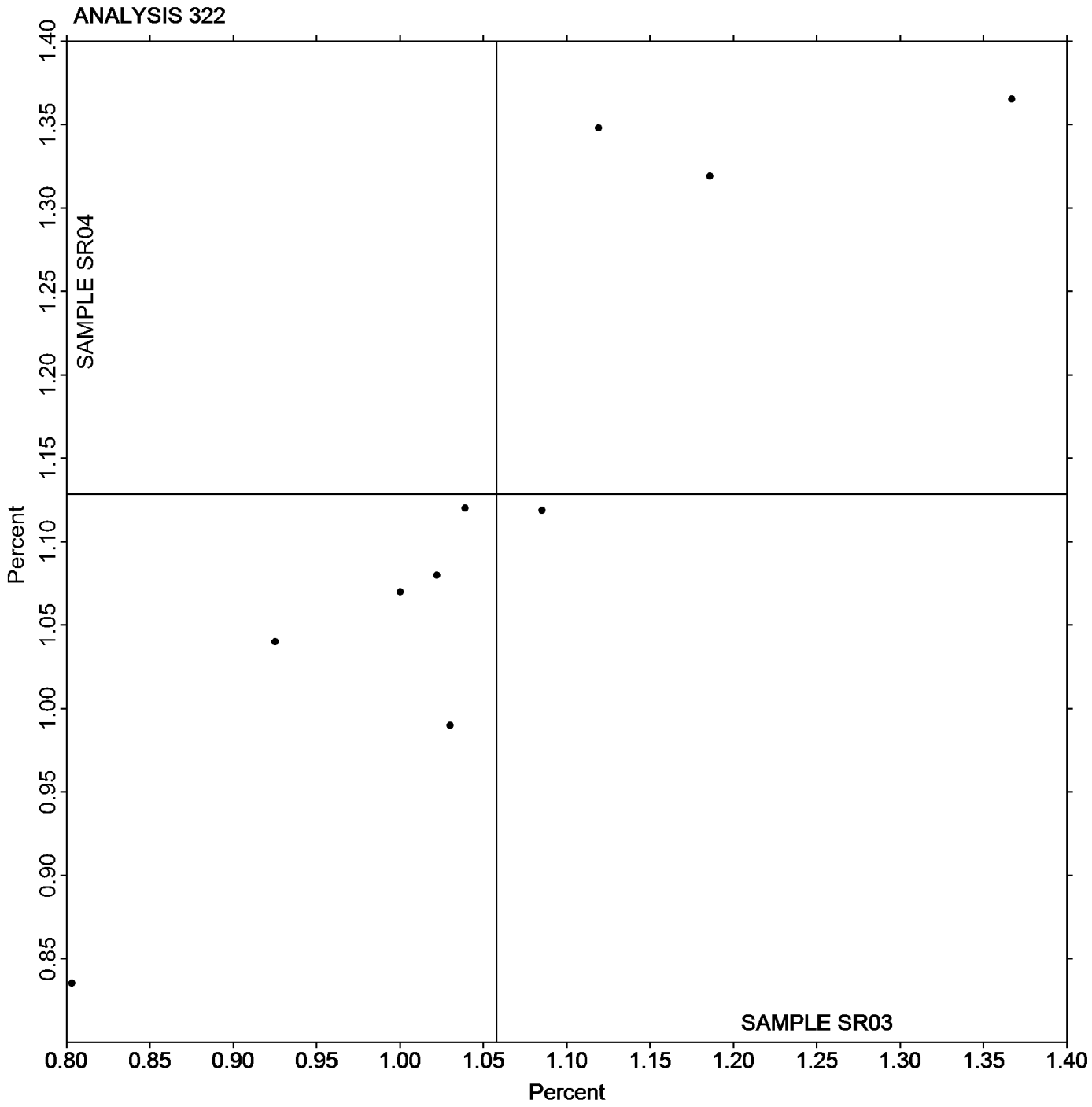
TAPPI-CTS Interlaboratory Testing Program

Analysis 322

Elongation to Break - Newsprint

Grand Mean Sample **SR03** = 1.0577 Percent

Grand Mean Sample **SR04** = 1.1287 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 SF03 Lab Mean	Sample SF03 Diff from Grand Mean	Sample SF03 CPV	Sample SF04 Lab Mean	Sample SF04 Diff from Grand Mean	Sample SF04 CPV	Instr Code
22PPTR		3.933	0.042	0.16	4.812	-0.003	-0.01	LH
2EWQGU		3.694	-0.197	-0.75	4.727	-0.088	-0.29	TC
2WGTGC		3.622	-0.268	-1.03	4.749	-0.066	-0.22	TP
3M7D6N		4.093	0.202	0.77	4.990	0.175	0.57	LH
687C4Y		3.820	-0.071	-0.27	4.779	-0.036	-0.12	XX
6GYYHX	X	3.000	-0.890	-3.40	3.896	-0.919	-3.01	RE
8FYQHC		4.315	0.424	1.62	5.182	0.367	1.20	LH
8MUPVJ		3.898	0.008	0.03	5.009	0.194	0.63	LA
92G43D		3.766	-0.124	-0.48	4.573	-0.242	-0.79	TA
96KUNH		3.752	-0.139	-0.53	4.819	0.004	0.01	LE
9EKJWV		3.694	-0.197	-0.75	4.660	-0.155	-0.51	DL
9GKXYR		3.643	-0.248	-0.95	4.508	-0.307	-1.01	LI
9JAKW2		4.019	0.128	0.49	4.823	0.008	0.03	TJ
9QCD23		4.258	0.367	1.40	5.083	0.268	0.88	TO
9R68KY		4.352	0.461	1.76	5.278	0.463	1.52	TO
ABBCV8		3.878	-0.013	-0.05	4.649	-0.166	-0.55	IM
AEVZ7E		3.550	-0.341	-1.30	4.372	-0.443	-1.45	SP
ARCGVN		3.354	-0.537	-2.05	4.325	-0.490	-1.61	ID
BAEWXN		3.772	-0.118	-0.45	4.720	-0.095	-0.31	TF
CB9TAN		3.966	0.075	0.29	5.232	0.417	1.37	TJ
CJDFRF		4.046	0.155	0.59	4.959	0.144	0.47	MR
CLGDRB		3.682	-0.209	-0.80	4.631	-0.184	-0.60	IM
CZ8JCD		4.387	0.496	1.90	5.418	0.603	1.98	XX
E2BW34		4.070	0.179	0.68	4.782	-0.033	-0.11	LH
FQMC87		3.955	0.065	0.25	5.115	0.300	0.98	LH
G9L3R7		3.780	-0.110	-0.42	4.620	-0.195	-0.64	LA
HCBLPA	X	4.274	0.383	1.47	5.883	1.068	3.50	TJ
HCWBGP		3.877	-0.014	-0.05	4.648	-0.167	-0.55	TB
HL9EV4		3.747	-0.144	-0.55	4.646	-0.169	-0.55	LI
HNNHDL		3.703	-0.187	-0.72	4.645	-0.170	-0.56	TB
HPAF4D		3.673	-0.217	-0.83	4.540	-0.275	-0.90	IM
HRBPK9		3.776	-0.115	-0.44	4.772	-0.043	-0.14	LI
JY3WVE		3.979	0.088	0.34	4.632	-0.183	-0.60	TI
NA9KED		3.646	-0.245	-0.94	4.648	-0.167	-0.55	LH
NKYBWK		3.898	0.007	0.03	4.886	0.071	0.23	TB
PBFPMF		3.717	-0.174	-0.67	4.424	-0.391	-1.28	TB
PHJFG7		4.309	0.418	1.60	5.204	0.389	1.28	TB
PMUK6Z		3.961	0.071	0.27	4.662	-0.153	-0.50	LH
QPXWZ7		4.187	0.296	1.13	4.943	0.128	0.42	IM
QRFEFJ		3.786	-0.104	-0.40	4.748	-0.067	-0.22	BU
U7QBTA		3.735	-0.156	-0.60	4.346	-0.469	-1.54	XX
VEK9BP		4.413	0.522	2.00	5.392	0.577	1.89	LH
VZCZBY	*	3.992	0.101	0.39	5.315	0.500	1.64	TB

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

WebCode	Data Flag	Sample SF03 Lab Mean	Sample SF03 Diff from Grand Mean	Sample SF03 CPV	Sample SF04 Lab Mean	Sample SF04 Diff from Grand Mean	Sample SF04 CPV	Instr Code
WF83P6	*	3.157	-0.734	-2.81	4.124	-0.691	-2.27	IK
WU87PP		4.046	0.155	0.59	4.779	-0.036	-0.12	TP
WWYZQZ		3.974	0.083	0.32	4.819	0.004	0.01	LI
WZEGBQ		3.699	-0.192	-0.73	4.729	-0.086	-0.28	LH
XECZCE		4.354	0.463	1.77	5.487	0.672	2.20	LA
YAEZFP		3.806	-0.085	-0.33	4.728	-0.087	-0.28	TP
YXGFZB		3.849	-0.041	-0.16	4.687	-0.128	-0.42	TN
ZWKVRP		4.062	0.171	0.65	5.318	0.503	1.65	LX

Summary Statistics

	Sample SF03	Sample SF04
Grand Means	3.8907 kN/m	4.8150 kN/m
SD Btwn Labs	0.2615 kN/m	0.3051 kN/m

Statistics based on 49 of 51 reporting participants

Comments on assigned Data Flags for Test #325

6GYYHX (X) - Systematic error (data for both samples are low).

HCBLPA (X) - Inconsistent in testing between samples, data for Sample SF04 are high.

Instrument Code List

(BU) - Buchel
(DL) - EMIC DL500 Universal Testing Machines
(ID) - Instron 4201/4202
(IK) - Instron 4400 Series
(IM) - Instron 5500 Series
(LA) - L & W Tensile - Autoline 300
(LE) - L & W Tensile Tester 066
(LH) - L & W Alwetron TH1 (Horizontal) SE 060/065F
(LI) - L & W Tensile Tester SE 062
(LX) - L & W (model not specified)
(MR) - MTS Alliance RT series
(RE) - Regmed
(SP) - Schopper Type Tensile Tester (TMI)
(TA) - Testometric AX
(TB) - Thwing-Albert EJA/1000
(TC) - Thwing-Albert Electro-Hydraulic, Model 30LT
(TF) - Thwing-Albert EJA Vantage-1
(TI) - Thwing-Albert QC II
(TJ) - Thwing-Albert QC II-XS
(TN) - Testometric M100-1CT
(TO) - Thwing-Albert QC-1000
(TP) - TMI Monitor/Tensile 100 (84-21-01)
(XX) - Instrument make/model not specified by lab

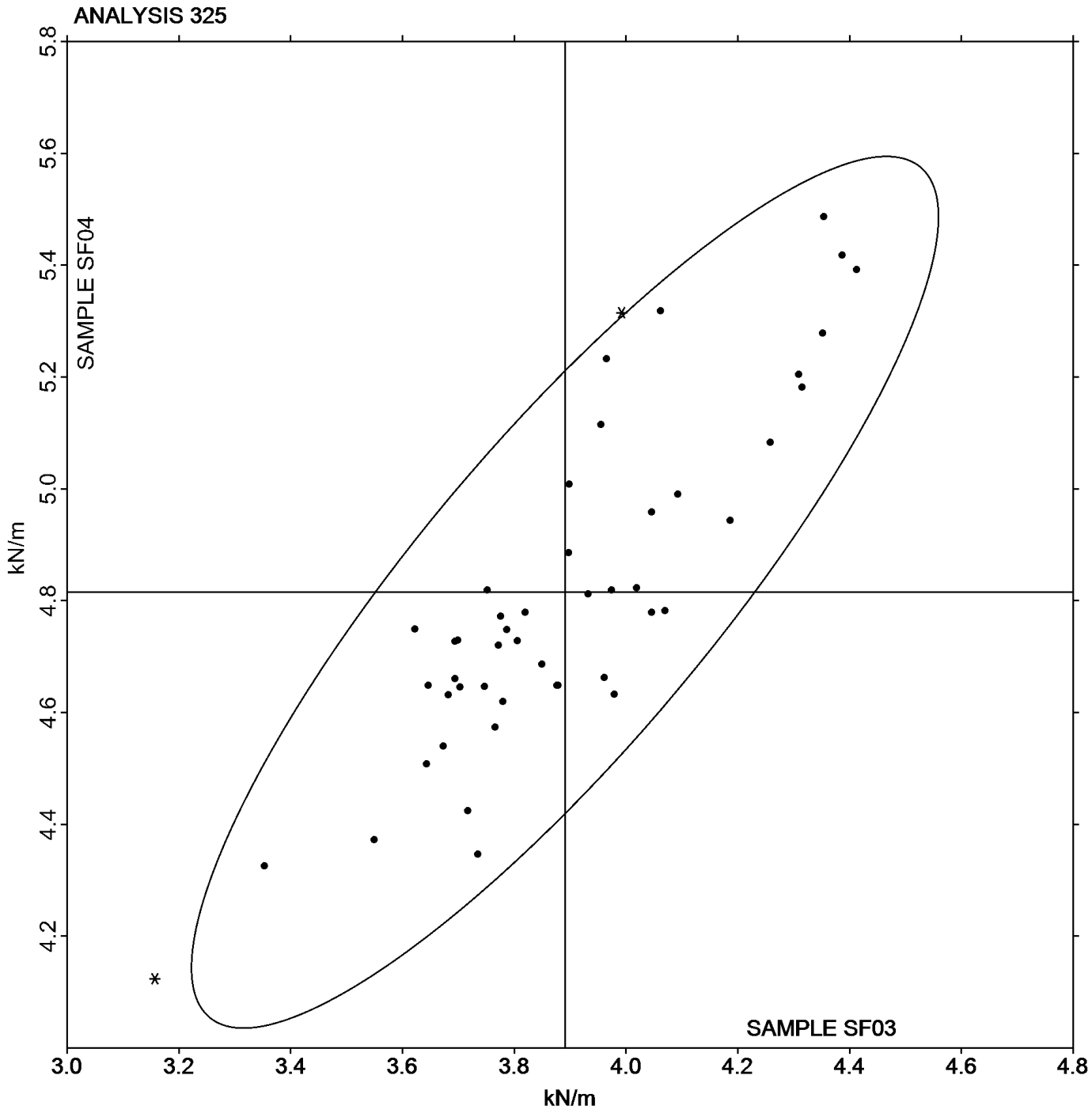
TAPPI-CTS Interlaboratory Testing Program

Analysis 325

Tensile Breaking Strength - Printing Papers

Grand Mean Sample **SF03** = 3.8907 kN/m

Grand Mean Sample **SF04** = 4.8150 kN/m



TAPPI-CTS Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

WebCode	Data Flag	Sample SF03 Lab Mean	Sample SF03 Diff from Grand Mean	Sample SF03 CPV	Sample SF04 Lab Mean	Sample SF04 Diff from Grand Mean	Sample SF04 CPV	Instr Code
22PPTR		33.30	-0.18	-0.05	65.53	-0.37	-0.04	LH
3M7D6N		35.67	2.18	0.59	71.85	5.96	0.71	LH
687C4Y		34.98	1.49	0.40	66.94	1.04	0.12	XX
6GYYHX		30.63	-2.86	-0.77	63.72	-2.18	-0.26	RE
9EKJWV		35.02	1.53	0.41	73.04	7.14	0.86	DL
9GKXYR		32.02	-1.47	-0.39	64.03	-1.86	-0.22	LI
9QCD23		34.41	0.93	0.25	65.61	-0.28	-0.03	TO
ABBCV8		34.35	0.87	0.23	72.59	6.69	0.80	IM
ARCGVN		28.32	-5.17	-1.39	65.37	-0.52	-0.06	ID
CB9TAN		30.75	-2.74	-0.74	53.69	-12.21	-1.46	TJ
CJDFRF		32.92	-0.56	-0.15	63.05	-2.85	-0.34	MR
CLGDRB		35.88	2.39	0.64	74.23	8.33	1.00	IM
E2BW34		32.82	-0.67	-0.18	60.11	-5.78	-0.69	LH
FQMC87		37.39	3.90	1.05	74.77	8.87	1.06	LH
G9L3R7		26.58	-6.91	-1.86	50.47	-15.43	-1.85	LA
HL9EV4		34.61	1.12	0.30	65.79	-0.11	-0.01	LI
HNNHDL		34.25	0.77	0.21	70.63	4.73	0.57	TB
HPAF4D		35.17	1.68	0.45	68.20	2.31	0.28	IM
HRBPK9		30.70	-2.79	-0.75	65.99	0.09	0.01	LI
JY3WVE		33.71	0.22	0.06	56.62	-9.27	-1.11	TI
NA9KED		29.91	-3.58	-0.96	62.91	-2.99	-0.36	LH
NKYBWK		33.55	0.06	0.02	66.86	0.96	0.12	TB
PBFPMF		36.73	3.24	0.87	67.20	1.31	0.16	TB
PHJFG7		39.54	6.05	1.63	73.07	7.18	0.86	TB
PMUK6Z		31.87	-1.62	-0.43	60.75	-5.15	-0.62	LH
QPXWZ7		37.97	4.49	1.21	67.16	1.26	0.15	IM
QRFEFJ	X	59.74	26.25	7.06	118.73	52.83	6.33	BU
U7QBTA	*	31.34	-2.14	-0.58	47.45	-18.45	-2.21	XX
VEK9BP	X	19.99	-13.49	-3.63	28.25	-37.64	-4.51	LH
VZCZBY		28.92	-4.57	-1.23	69.70	3.80	0.46	TB
WU87PP		26.41	-7.07	-1.90	46.72	-19.18	-2.30	TP
WWYZQZ		35.18	1.69	0.45	67.85	1.96	0.23	LI
WZEGBQ		32.15	-1.34	-0.36	68.83	2.93	0.35	LH
XECZCE	X	39.39	5.90	1.59	75.49	9.59	1.15	LA
YXGFZB	*	45.40	11.91	3.20	87.35	21.45	2.57	TN
ZWKVRP		32.65	-0.84	-0.23	76.53	10.64	1.27	LX

Summary Statistics

	Sample SF03	Sample SF04
Grand Means	33.488 Joules/sq m	65.897 Joules/sq m
SD Btwn Labs	3.721 Joules/sq m	8.350 Joules/sq m

Statistics based on 33 of 36 reporting participants

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

Comments on assigned Data Flags for Test #327

QRFEFJ (X) - Extreme data.

VEK9BP (X) - Data for both samples are low.

Analysis Notes:

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

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

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

XECZCE - Data appears to be transposed between Analysis #327 and Analysis #328. Data switched by CTS.

Instrument Code List

(BU) - Buchel

(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

(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

(TN) - Testometric M100-1CT

(TO) - Thwing-Albert QC-1000

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

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

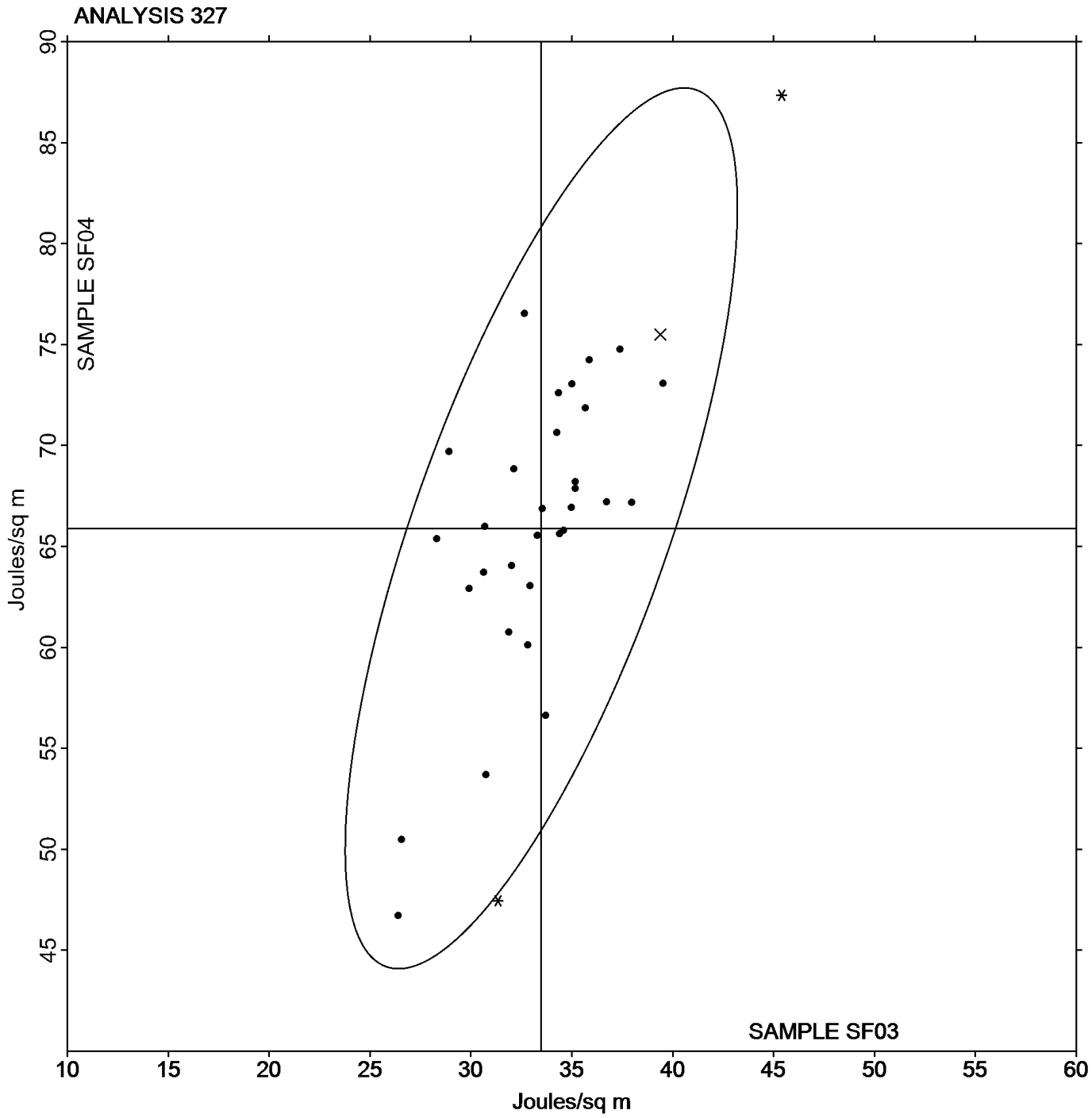
TAPPI-CTS Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

Grand Mean Sample **SF03** = 33.488 Joules/sq m

Grand Mean Sample **SF04** = 65.897 Joules/sq m



TAPPI-CTS Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

WebCode	Data Flag	Sample SF03 Lab Mean	Sample SF03 Diff from Grand Mean	Sample SF03 CPV	Sample SF04 Lab Mean	Sample SF04 Diff from Grand Mean	Sample SF04 CPV	Instr Code
22PPTR		1.307	-0.096	-0.71	2.010	-0.124	-0.51	LH
3M7D6N		1.353	-0.050	-0.37	2.124	-0.010	-0.04	LH
687C4Y		1.457	0.054	0.40	2.085	-0.049	-0.20	XX
6GYYHX		1.593	0.191	1.41	2.534	0.401	1.66	RE
9EKJWV		1.597	0.194	1.44	2.451	0.317	1.32	DL
9GKXYR		1.336	-0.067	-0.49	2.089	-0.045	-0.19	LI
9QCD23		1.214	-0.189	-1.40	1.853	-0.281	-1.16	TG
9R68KY		1.573	0.170	1.26	2.300	0.166	0.69	TO
ABBCV8		1.409	0.006	0.05	2.326	0.192	0.80	IM
ARCGVN		1.292	-0.111	-0.82	2.219	0.085	0.35	ID
BAEWXN		1.640	0.237	1.76	2.380	0.246	1.02	TF
CB9TAN	*	1.249	-0.154	-1.14	1.592	-0.542	-2.25	TJ
CJDFRF		1.299	-0.104	-0.77	1.940	-0.194	-0.80	MR
CLGDRB		1.512	0.109	0.81	2.397	0.264	1.09	IM
E2BW34		1.198	-0.205	-1.52	1.815	-0.319	-1.32	LH
FQMC87		1.424	0.021	0.16	2.157	0.023	0.10	LH
G9L3R7		1.338	-0.065	-0.48	1.988	-0.146	-0.60	LA
HCBLPA	X	1.473	0.070	0.52	1.614	-0.520	-2.16	TJ
HCWBGP		1.490	0.087	0.65	2.220	0.086	0.36	TF
HL9EV4		1.409	0.006	0.05	2.106	-0.028	-0.11	LI
HNNHDL		1.485	0.082	0.61	2.328	0.194	0.81	TB
HRBPK9		1.259	-0.144	-1.07	2.063	-0.071	-0.29	LI
JY3WVE		1.353	-0.050	-0.37	1.854	-0.280	-1.16	TI
NA9KED		1.270	-0.133	-0.98	2.013	-0.121	-0.50	LH
NKYBWK		1.355	-0.048	-0.36	2.052	-0.082	-0.34	TB
PBFPMF		1.557	0.154	1.14	2.309	0.175	0.73	TB
PHJFG7		1.417	0.014	0.10	2.089	-0.045	-0.19	TB
PMUK6Z		1.264	-0.139	-1.03	1.931	-0.203	-0.84	LH
QPXWZ7		1.480	0.077	0.57	2.080	-0.054	-0.22	IM
QRFEFJ		1.515	0.112	0.83	2.290	0.156	0.65	BU
U7QBTA	*	1.273	-0.130	-0.96	1.601	-0.533	-2.21	XX
VEK9BP	X	2.659	1.257	9.31	4.824	2.690	11.16	LH
VZCZBY	X	32.000	30.597	226.65	52.188	50.054	207.66	TB
WF83P6		1.455	0.052	0.39	2.429	0.295	1.23	IK
WU87PP		1.408	0.005	0.04	2.033	-0.101	-0.42	TP
WWYZQZ		1.352	-0.051	-0.38	2.135	0.001	0.01	LI
WZEGBQ		1.314	-0.089	-0.66	2.125	-0.009	-0.04	LH
XECZCE	X	1.246	-0.157	-1.16	1.964	-0.170	-0.70	LA
YXGFZB	*	1.790	0.387	2.87	2.754	0.620	2.57	TN
ZWKVRP		1.264	-0.139	-1.03	2.140	0.006	0.03	LX

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

Summary Statistics

	Sample SF03	Sample SF04
Grand Means	1.4028 Percent	2.1337 Percent
SD Btwn Labs	0.1350 Percent	0.2410 Percent

Statistics based on 36 of 40 reporting participants

Comments on assigned Data Flags for Test #328

HCBLPA (X) - Inconsistent in testing between samples.

VEK9BP (X) - Extreme data.

VZCZBY (X) - Extreme data.

Analysis Notes:

XECZCE - Data appears to be transposed between Analysis #328 and Analysis #327. Data switched by CTS.

Instrument Code List

(BU) - Buchel
(DL) - EMIC DL500 Universal Testing Machines
(ID) - Instron 4201
(IK) - Instron 4400 Series
(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
(TN) - Testometric M100-1CT
(TO) - Thwing-Albert QC-1000
(TP) - TMI Monitor/Tensile 100 (84-21-01)
(XX) - Instrument make/model not specified by lab

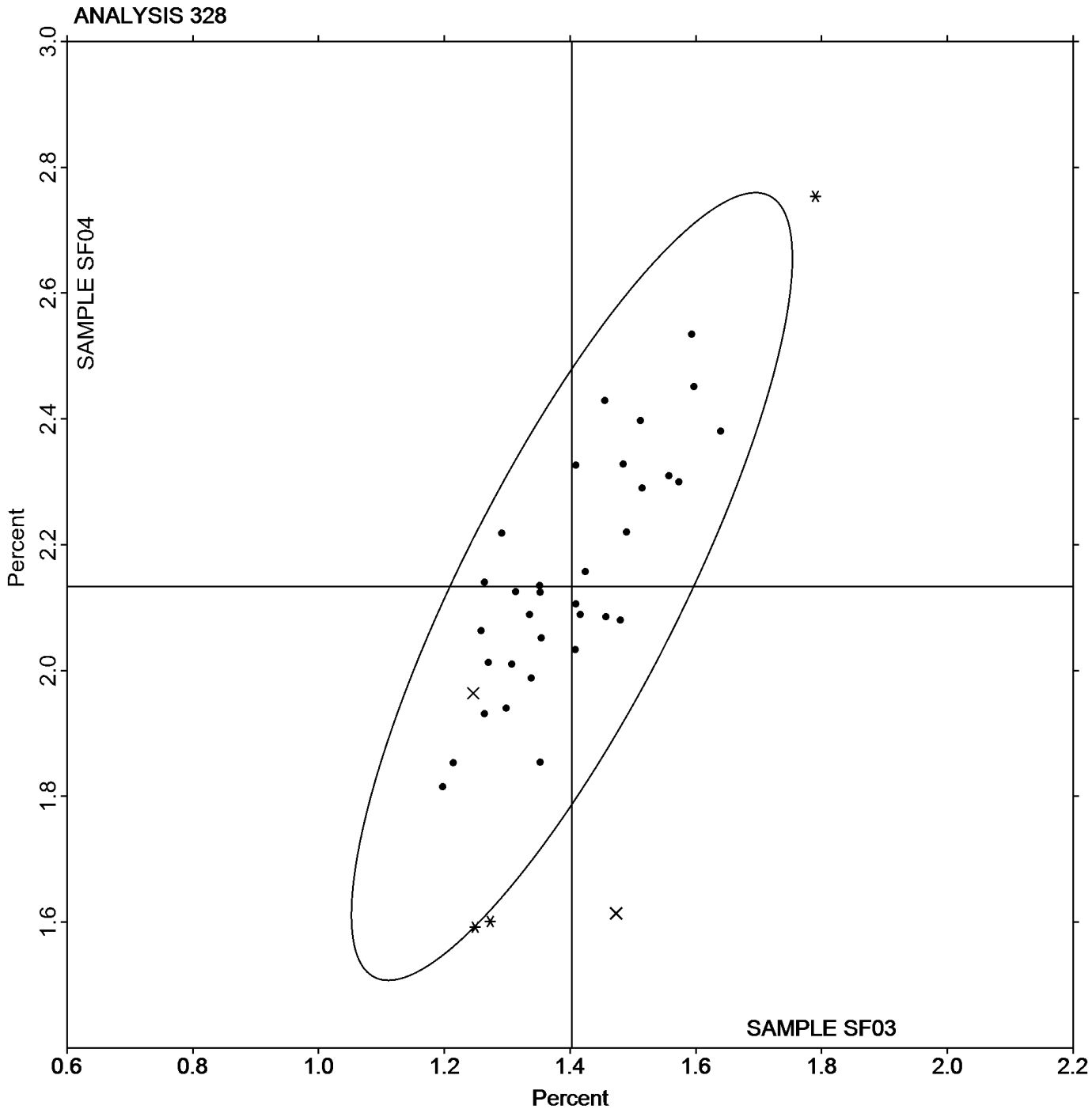
TAPPI-CTS Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

Grand Mean Sample **SF03** = 1.4028 Percent

Grand Mean Sample **SF04** = 2.1337 Percent



TAPPI-CTS Interlaboratory Testing Program

Analysis 330

Tensile Breaking Strength - Packaging Papers

WebCode	Data Flag	Sample SE03 Lab Mean	Sample SE03 Diff from Grand Mean	Sample SE03 CPV	Sample SE04 Lab Mean	Sample SE04 Diff from Grand Mean	Sample SE04 CPV	Instr Code
2FFVDU		12.50	1.39	1.76	12.59	1.50	1.92	TH
2GPVFG	X	10.87	-0.24	-0.31	11.02	-0.06	-0.08	LE
2JWBQT		11.17	0.06	0.08	11.28	0.20	0.25	IF
2LD86X		11.43	0.32	0.40	11.06	-0.02	-0.03	LW
44HFY4		10.73	-0.38	-0.48	10.85	-0.23	-0.30	TE
468TDF		11.68	0.57	0.72	11.70	0.62	0.79	TO
4X34JN		10.98	-0.13	-0.16	11.07	-0.02	-0.02	TH
63BLZ9		10.09	-1.02	-1.29	10.11	-0.97	-1.24	XX
6JK8LJ		11.67	0.56	0.71	11.68	0.60	0.76	TK
78GJZZ		11.36	0.25	0.32	11.48	0.40	0.51	TO
8BZQ9Z		10.72	-0.39	-0.49	10.61	-0.47	-0.60	TH
8HHM3W		12.71	1.60	2.02	12.75	1.66	2.12	TA
9EE7BK		11.74	0.63	0.80	11.74	0.66	0.84	TH
9ZGCKB		11.15	0.04	0.05	11.22	0.14	0.17	IK
9ZY7HZ		10.93	-0.18	-0.23	11.03	-0.06	-0.07	SP
AHR8B2		10.30	-0.81	-1.02	10.31	-0.77	-0.98	LW
BJWKJA		12.12	1.01	1.28	12.20	1.12	1.43	TX
DCBNWR		9.33	-1.79	-2.26	9.18	-1.90	-2.42	SA
DQBRYW		10.24	-0.87	-1.11	10.25	-0.83	-1.06	IM
EGZ9AE		10.55	-0.56	-0.71	10.77	-0.31	-0.40	TB
ERM4Q8		11.64	0.53	0.66	11.32	0.23	0.30	LH
ETUY4C		12.12	1.01	1.28	11.90	0.82	1.04	TP
H3BAX9	X	12.22	1.11	1.40	12.72	1.64	2.09	IK
HV9APR		10.98	-0.13	-0.17	10.91	-0.17	-0.22	TO
JRXAF8		9.97	-1.15	-1.45	9.75	-1.34	-1.70	LA
KV3G4P		11.27	0.16	0.20	11.35	0.26	0.34	IF
KVGJEN		10.12	-0.99	-1.25	10.08	-1.01	-1.28	TK
KZGCQE		10.54	-0.57	-0.72	10.52	-0.57	-0.72	TP
LGQBK4		10.15	-0.96	-1.21	10.21	-0.87	-1.11	LW
MX2QTN		12.19	1.08	1.37	12.18	1.10	1.40	LA
P882MK		10.74	-0.37	-0.47	10.66	-0.42	-0.54	TB
PG2ZXQ		10.75	-0.36	-0.45	10.77	-0.31	-0.40	LH
QLU679		12.39	1.28	1.62	12.19	1.11	1.41	LA
UFE68Q	*	11.86	0.75	0.95	11.43	0.35	0.44	TK
UWMDP		10.89	-0.23	-0.29	10.94	-0.14	-0.18	IK
VE37V3		10.55	-0.57	-0.72	10.61	-0.47	-0.60	ID
WL2YPG		10.60	-0.51	-0.65	10.60	-0.48	-0.62	LH
WU87PP		11.65	0.54	0.68	11.58	0.49	0.63	TO
YRRYNK		11.29	0.18	0.23	11.19	0.11	0.14	TO

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

Summary Statistics

	Sample SE03	Sample SE04
Grand Means	11.112 kN/m	11.082 kN/m
SD Btwn Labs	0.790 kN/m	0.784 kN/m

Statistics based on 37 of 39 reporting participants

Comments on assigned Data Flags for Test #330

H3BAX9 (X) - Inconsistent in testing between samples.

Analysis Notes:

2GPVFG - Data appears to be transposed between Analysis #330 and Analysis #331. Data switched by CTS.

Instrument Code List

(ID) - Instron 4201
(IF) - Instron 3340 Series
(IK) - Instron 4400 Series
(IM) - Instron 5500 Series
(LA) - L & W Autoline
(LE) - L & W Tensile Tester 066
(LH) - L & W Alwetron TH1 (Horizontal) SE 060
(LW) - L & W Tensile Tester SE062
(SA) - Shimadzu Autograph AG 2000 A
(SP) - Schopper Type Tensile Tester (TMI)
(TA) - Thwing-Albert Tensile Tester
(TB) - Thwing-Albert EJA/1000
(TE) - Thwing-Albert Intelect II
(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

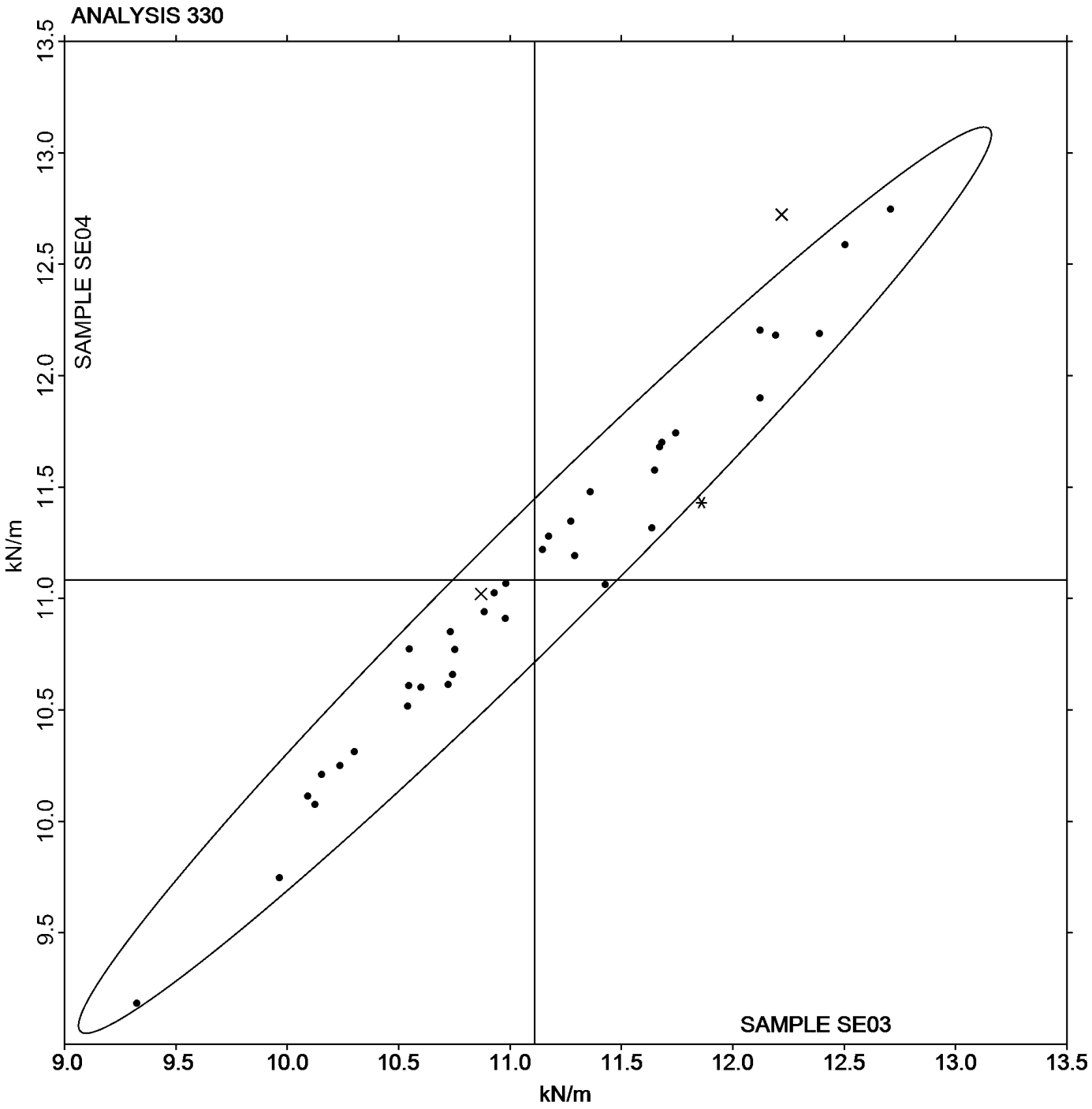
TAPPI-CTS Interlaboratory Testing Program

Analysis 330

Tensile Breaking Strength - Packaging Papers

Grand Mean Sample **SE03** = 11.112 kN/m

Grand Mean Sample **SE04** = 11.082 kN/m



TAPPI-CTS Interlaboratory Testing Program

Analysis 331

Tensile Energy Absorption - Packaging Papers

WebCode	Data Flag	Sample SE03 Lab Mean	Sample SE03 Diff from Grand Mean	Sample SE03 CPV	Sample SE04 Lab Mean	Sample SE04 Diff from Grand Mean	Sample SE04 CPV	Instr Code
2FFVDU		219.0	27.3	1.06	222.7	30.2	1.00	TH
2GPVFG	X	186.5	-5.2	-0.20	196.5	4.0	0.13	LE
2LD86X		184.3	-7.4	-0.29	177.6	-14.9	-0.49	LW
44HFY4		180.1	-11.6	-0.45	184.6	-7.9	-0.26	LW
468TDF		228.0	36.3	1.40	232.9	40.5	1.34	TO
4X34JN		188.5	-3.2	-0.12	185.3	-7.1	-0.24	TH
63BLZ9		174.5	-17.2	-0.67	179.2	-13.3	-0.44	XX
78GJZZ		202.4	10.8	0.42	210.7	18.2	0.60	TO
8BZQ9Z		194.4	2.7	0.10	190.1	-2.3	-0.08	TH
9EE7BK		227.3	35.6	1.38	226.1	33.6	1.11	TH
9ZGCKB		208.8	17.1	0.66	210.6	18.1	0.60	IK
AHR8B2		178.3	-13.4	-0.52	180.6	-11.9	-0.39	LW
BJWKJA		220.7	29.0	1.12	223.7	31.2	1.03	XX
DCBNWR		148.1	-43.6	-1.69	139.9	-52.6	-1.74	SA
DQBRYW		181.5	-10.2	-0.39	182.7	-9.8	-0.32	IM
EGZ9AE		194.8	3.1	0.12	207.4	14.9	0.49	TB
ERM4Q8		173.1	-18.6	-0.72	154.9	-37.5	-1.24	LH
ETUY4C	*	120.7	-71.0	-2.75	119.6	-72.9	-2.41	TP
H3BAX9	*	173.5	-18.2	-0.70	199.2	6.7	0.22	XX
HV9APR		196.3	4.6	0.18	189.4	-3.0	-0.10	XX
JRXAF8		177.8	-13.9	-0.54	170.2	-22.3	-0.74	LA
KV3G4P		244.1	52.4	2.03	263.7	71.3	2.35	IN
KVGJEN		189.7	-2.0	-0.08	192.6	0.1	0.00	TK
MX2QTN		195.8	4.1	0.16	196.9	4.4	0.15	LA
PG2ZXQ		190.7	-0.9	-0.04	187.1	-5.4	-0.18	LH
QLU679		165.1	-26.6	-1.03	150.3	-42.1	-1.39	LA
WU87PP		203.3	11.6	0.45	205.9	13.5	0.44	TO
YRRYNK		215.0	23.3	0.90	212.6	20.2	0.67	TO

Summary Statistics

	Sample SE03	Sample SE04
Grand Means	191.69 Joules/sq m	192.46 Joules/sq m
SD Btwn Labs	25.84 Joules/sq m	30.27 Joules/sq m

Statistics based on 27 of 28 reporting participants

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

Analysis Notes:

2GPVFG - Data appears to be transposed between Analysis #331 and Analysis #332. Data switched by CTS.

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

EGZ9AE - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

KV3G4P - Data appear to be reported as J/sq m, not kg-m/sq m as indicated on datasheet. Units corrected by CTS.

YRRYNK - 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

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

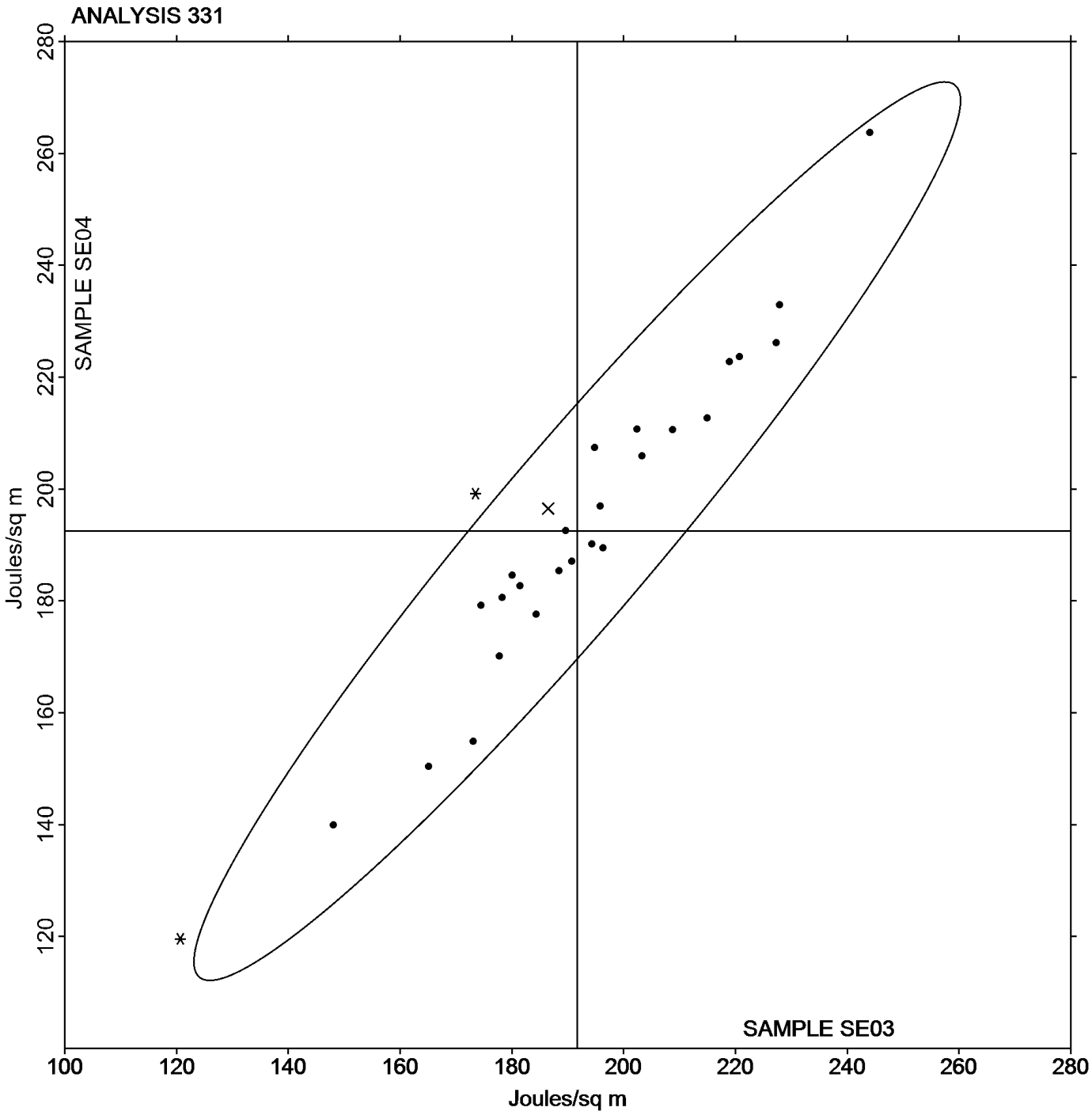
TAPPI-CTS Interlaboratory Testing Program

Analysis 331

Tensile Energy Absorption - Packaging Papers

Grand Mean Sample **SE03** = 191.69 Joules/sq m

Grand Mean Sample **SE04** = 192.46 Joules/sq m



TAPPI-CTS Interlaboratory Testing Program

Analysis 332

Elongation to Break - Packaging Papers

WebCode	Data Flag	Sample SE03 Lab Mean	Sample SE03 Diff from Grand Mean	Sample SE03 CPV	Sample SE04 Lab Mean	Sample SE04 Diff from Grand Mean	Sample SE04 CPV	Instr Code
2FFVDU		2.681	0.090	0.31	2.720	0.110	0.36	TH
2GPVFG	X	2.494	-0.097	-0.34	2.577	-0.033	-0.11	LE
2LD86X		2.346	-0.245	-0.86	2.341	-0.269	-0.89	LW
44HFY4		2.422	-0.169	-0.59	2.450	-0.160	-0.53	LW
468TDF		2.923	0.332	1.16	3.018	0.408	1.35	TO
4X34JN		2.718	0.127	0.44	2.650	0.040	0.13	TH
63BLZ9		2.515	-0.076	-0.27	2.567	-0.043	-0.14	XX
78GJZZ		2.650	0.059	0.21	2.724	0.114	0.38	TO
8BZQ9Z		2.762	0.171	0.60	2.739	0.129	0.43	TH
9EE7BK		2.911	0.320	1.12	2.934	0.324	1.07	TH
9ZGCKB		2.928	0.337	1.18	2.941	0.331	1.10	IK
AHR8B2		2.515	-0.076	-0.27	2.544	-0.066	-0.22	LW
BJWKJA		2.794	0.203	0.71	2.776	0.166	0.55	XX
DCBNWR		2.373	-0.218	-0.76	2.280	-0.330	-1.10	SA
DQBRYW		2.838	0.247	0.86	2.852	0.242	0.80	IM
EGZ9AE		2.770	0.179	0.63	2.880	0.270	0.89	TB
ERM4Q8		2.166	-0.425	-1.48	2.010	-0.600	-1.99	LH
ETUY4C		3.129	0.538	1.88	3.131	0.521	1.73	TP
H3BAX9	*	2.100	-0.491	-1.72	2.337	-0.273	-0.91	XX
HV9APR		2.710	0.119	0.42	2.650	0.040	0.13	XX
JRXAF8		2.184	-0.407	-1.42	2.130	-0.480	-1.59	LA
KV3G4P		2.317	-0.274	-0.96	2.473	-0.137	-0.46	IN
KVGJEN		2.747	0.156	0.54	2.786	0.176	0.58	TK
LGQBK4		2.454	-0.137	-0.48	2.480	-0.130	-0.43	LW
MX2QTN		2.285	-0.306	-1.07	2.298	-0.312	-1.04	LA
P882MK		2.472	-0.119	-0.42	2.573	-0.037	-0.12	TB
PG2ZXQ		2.580	-0.011	-0.04	2.530	-0.080	-0.27	XX
QLU679		2.130	-0.461	-1.61	1.993	-0.617	-2.05	LA
VE37V3		2.493	-0.098	-0.34	2.652	0.042	0.14	XX
WU87PP		2.618	0.027	0.09	2.654	0.044	0.14	TO
YRRYNK		3.200	0.609	2.13	3.196	0.586	1.94	TO

Summary Statistics

	Sample SE03	Sample SE04
Grand Means	2.5910 Percent	2.6103 Percent
SD Btwn Labs	0.2862 Percent	0.3014 Percent

Statistics based on 30 of 31 reporting participants

Analysis Notes:

2GPVFG - Data appears to be transposed between Analysis #332 and Analysis #330. Data switched by CTS.

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

Instrument Code List

(IK) - Instron 4400 Series

(IM) - Instron 5500 Series

(IN) - Instron 3360 Series

(LA) - L & W Autoline 300

(LE) - L & W Tensile Tester 066

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

(LW) - L & W Tensile Tester SE062

(SA) - Shimadzu Autograph AG 2000 A

(TB) - Thwing-Albert EJA/1000

(TH) - Thwing-Albert QC-3A

(TK) - Thwing-Albert Model 37-4

(TO) - Thwing-Albert QC-1000

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

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

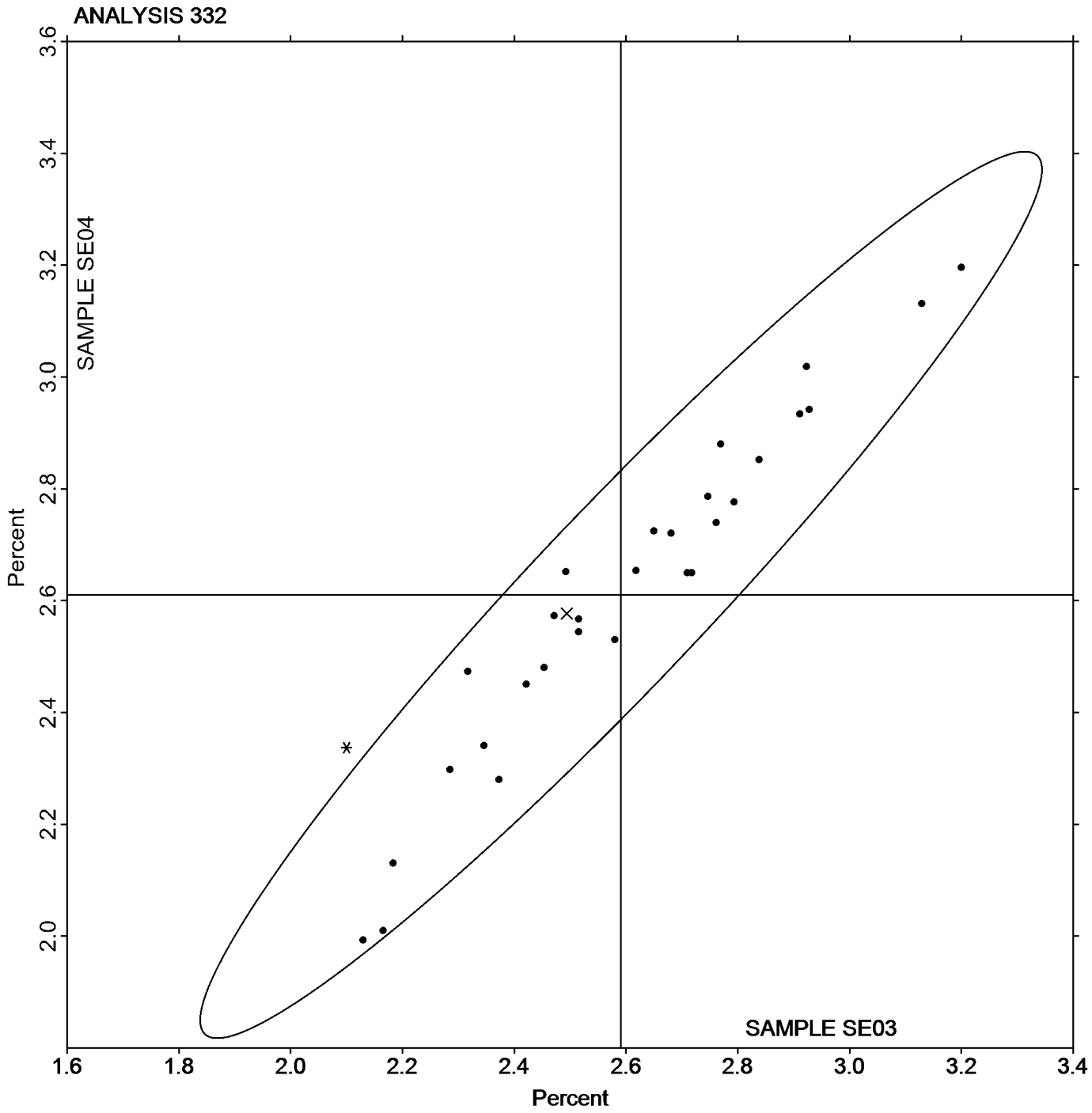
TAPPI-CTS Interlaboratory Testing Program

Analysis 332

Elongation to Break - Packaging Papers

Grand Mean Sample **SE03** = 2.5910 Percent

Grand Mean Sample **SE04** = 2.6103 Percent



TAPPI-CTS Interlaboratory Testing Program

Analysis 334

Folding Endurance (MIT) - Double Folds

WebCode	Data Flag	Sample SG03 Lab Mean	Sample SG03 Diff from Grand Mean	Sample SG03 CPV	Sample SG04 Lab Mean	Sample SG04 Diff from Grand Mean	Sample SG04 CPV	Instr Code
6JK8LJ		180.3	-70.9	-0.95	210.0	-24.5	-0.45	MT
8N6ECB		240.2	-11.0	-0.15	188.8	-45.7	-0.85	MT
96KUNH		362.9	111.7	1.49	293.1	58.6	1.08	MT
9JAKW2		155.2	-96.0	-1.28	190.5	-44.0	-0.81	XX
ARCGVN		259.3	8.1	0.11	232.7	-1.8	-0.03	MT
BAEWXN		166.0	-85.2	-1.14	235.2	0.7	0.01	MT
CLGDRB		263.0	11.8	0.16	282.6	48.1	0.89	MT
G9L3R7		330.9	79.7	1.07	286.3	51.8	0.96	MT
HCBLPA		374.8	123.6	1.65	261.0	26.5	0.49	MT
HPAF4D		268.3	17.1	0.23	332.6	98.1	1.81	MT
HRBPK9		345.4	94.2	1.26	203.1	-31.4	-0.58	MT
JN7GXA		229.3	-21.9	-0.29	168.9	-65.6	-1.21	XX
KZGCQE		138.9	-112.3	-1.50	149.0	-85.5	-1.58	MT
LGQBK4		257.6	6.4	0.09	298.3	63.8	1.18	MT
MX2QTN		168.1	-83.1	-1.11	176.0	-58.5	-1.08	XX
P882MK		226.4	-24.8	-0.33	179.1	-55.4	-1.02	XX
QRFEFJ		215.2	-36.0	-0.48	243.8	9.3	0.17	MT
WZYA22		340.1	88.9	1.19	290.7	56.2	1.04	MT

Summary Statistics

	Sample SG03	Sample SG04
Grand Means	251.22 Double Folds	234.54 Double Folds
SD Btwn Labs	74.74 Double Folds	54.12 Double Folds

Statistics based on 18 of 18 reporting participants

Instrument Code List

(MT) - MIT - Tinius Olsen

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

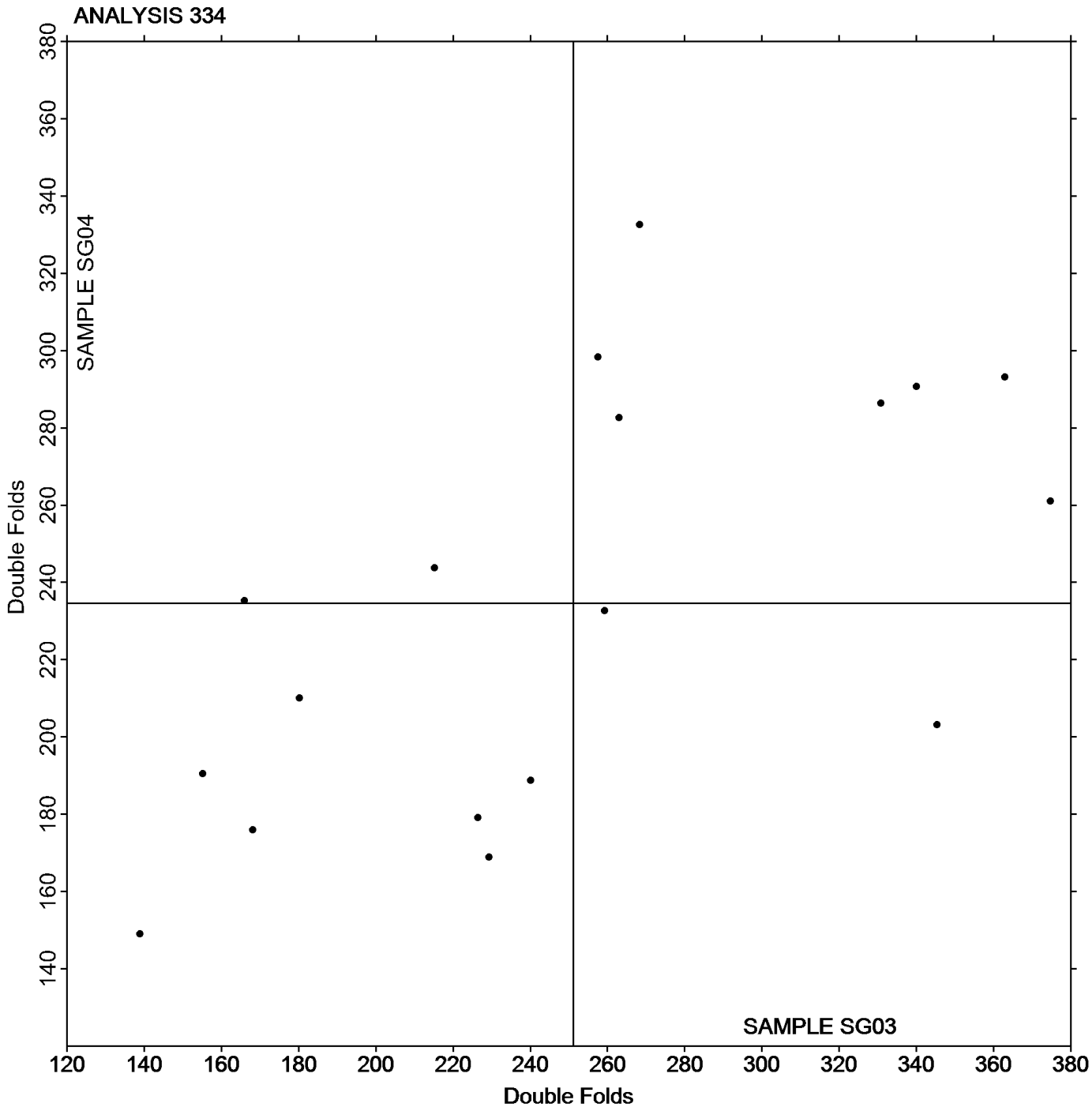
TAPPI-CTS Interlaboratory Testing Program

Analysis 334

Folding Endurance (MIT) - Double Folds

Grand Mean Sample **SG03** = 251.22 Double Folds

Grand Mean Sample **SG04** = 234.54 Double Folds



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

TAPPI-CTS Interlaboratory Testing Program

Analysis 336

Bending Resistance, Gurley Type

WebCode	Data Flag	Sample SH03 Lab Mean	Sample SH03 Diff from Grand Mean	Sample SH03 CPV	Sample SH04 Lab Mean	Sample SH04 Diff from Grand Mean	Sample SH04 CPV
2EWQGU		221.8	-1.7	-0.14	126.5	-5.0	-0.44
3M7D6N		225.6	2.0	0.17	136.3	4.8	0.42
8FYQHC		223.2	-0.3	-0.03	145.4	13.9	1.22
CJDFRF		200.7	-22.8	-1.90	125.8	-5.7	-0.50
CLGDRB		219.8	-3.7	-0.31	122.8	-8.7	-0.76
CXCKUL		217.4	-6.1	-0.51	123.4	-8.0	-0.70
D43JCU		235.8	12.2	1.02	138.5	7.0	0.62
G9L3R7		217.1	-6.4	-0.53	119.2	-12.3	-1.07
HCBLPA		212.4	-11.1	-0.92	123.9	-7.6	-0.66
HNNHDL		216.9	-6.6	-0.55	124.5	-7.0	-0.61
JY3WVE		228.5	5.0	0.41	121.4	-10.0	-0.88
LLFRTM		226.7	3.1	0.26	145.9	14.4	1.26
NKYBWK		225.1	1.6	0.13	112.2	-19.3	-1.68
P4UAX4		219.1	-4.4	-0.37	135.1	3.6	0.32
P882MK		203.6	-19.9	-1.66	121.3	-10.1	-0.89
QPXWZ7		226.9	3.4	0.28	137.6	6.2	0.54
QRFEFJ		236.4	12.9	1.08	142.1	10.6	0.93
UWMDP		232.0	8.5	0.71	159.8	28.4	2.48
WF83P6		224.9	1.4	0.12	132.3	0.8	0.07
YRRYNK	*	256.5	33.0	2.75	135.5	4.0	0.35

Summary Statistics

	Sample SH03	Sample SH04
Grand Means	223.52 Gurley Units	131.48 Gurley Units
SD Btwn Labs	11.99 Gurley Units	11.44 Gurley Units

Statistics based on 20 of 20 reporting participants

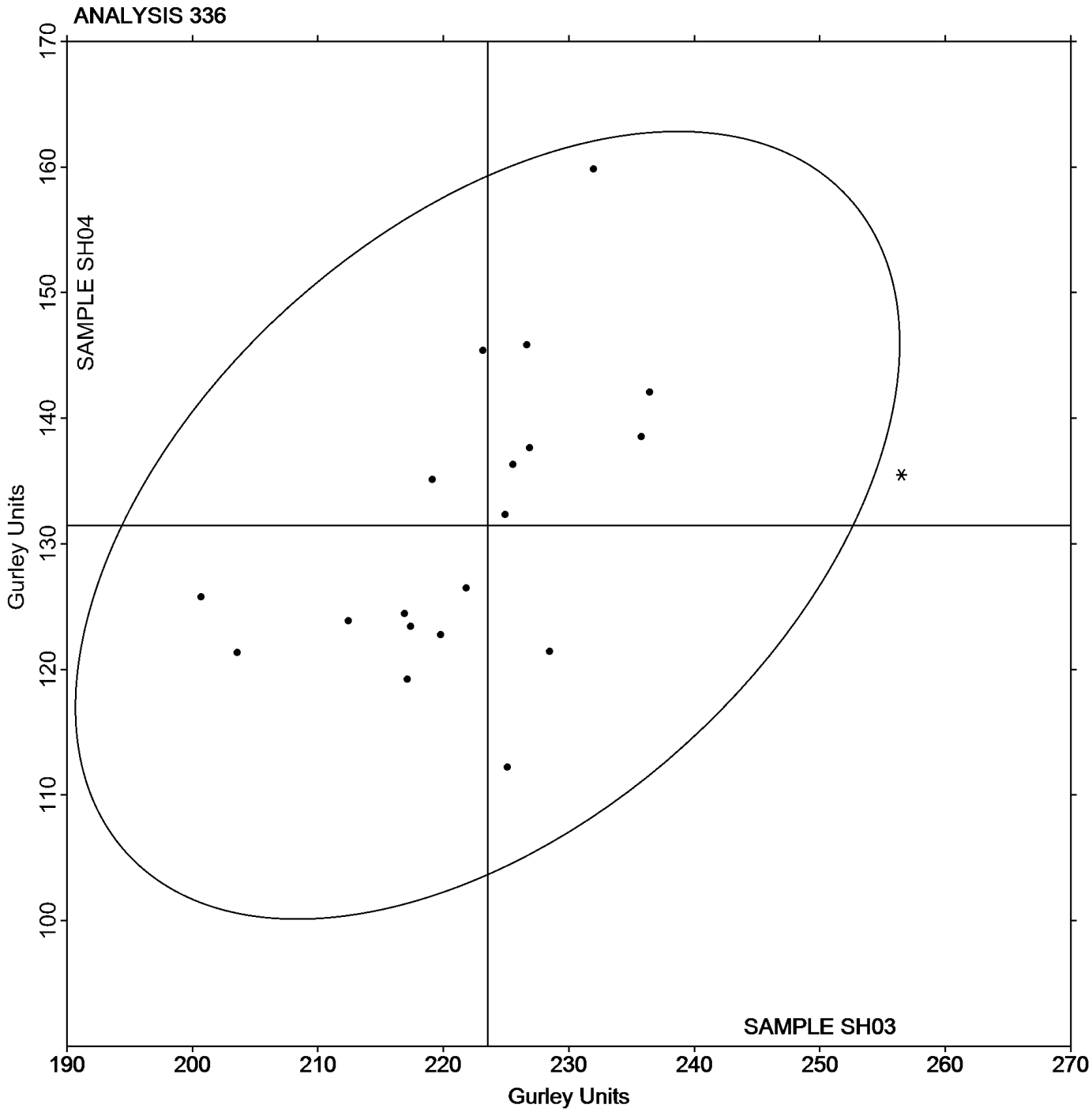
TAPPI-CTS Interlaboratory Testing Program

Analysis 336

Bending Resistance, Gurley Type

Grand Mean Sample **SH03** = 223.52 Gurley Units

Grand Mean Sample **SH04** = 131.48 Gurley Units



TAPPI-CTS Interlaboratory Testing Program

Analysis 338

Bending Resistance, Taber Type - 0 to 10 Units

WebCode	Data Flag	Sample SJ03 Lab Mean	Sample SJ03 Diff from Grand Mean	Sample SJ03 CPV	Sample SJ04 Lab Mean	Sample SJ04 Diff from Grand Mean	Sample SJ04 CPV
2LD86X		2.620	-0.441	-0.84	1.620	-0.413	-0.81
3M7D6N		3.359	0.298	0.57	2.090	0.057	0.11
9JAKW2	*	1.940	-1.121	-2.13	1.824	-0.209	-0.41
ARCGVN		3.052	-0.009	-0.02	1.995	-0.038	-0.07
CB9TAN		3.388	0.327	0.62	2.058	0.025	0.05
CJDFRF		2.428	-0.633	-1.21	1.399	-0.634	-1.24
CLGDRB	X	7.390	4.329	8.24	4.860	2.827	5.51
CZ8JCD		3.070	0.009	0.02	1.853	-0.180	-0.35
HNNHDL		3.179	0.118	0.22	1.955	-0.079	-0.15
KV3G4P		3.130	0.069	0.13	2.660	0.627	1.22
NZ4W4N		3.053	-0.008	-0.02	1.784	-0.249	-0.49
UWMDP		3.181	0.120	0.23	1.970	-0.063	-0.12
WZYA22		2.937	-0.124	-0.24	1.782	-0.251	-0.49
XECZCE		2.996	-0.065	-0.12	1.984	-0.049	-0.10
YAEZFP		3.203	0.142	0.27	1.915	-0.118	-0.23
YXGFZB	*	4.380	1.319	2.51	3.610	1.577	3.07

Summary Statistics

	Sample SJ03	Sample SJ04
Grand Means	3.0610 Taber Units	2.0333 Taber Units
SD Btwn Labs	0.5251 Taber Units	0.5131 Taber Units

Statistics based on 15 of 16 reporting participants

Comments on assigned Data Flags for Test #338

CLGDRB (X) - Extreme data.

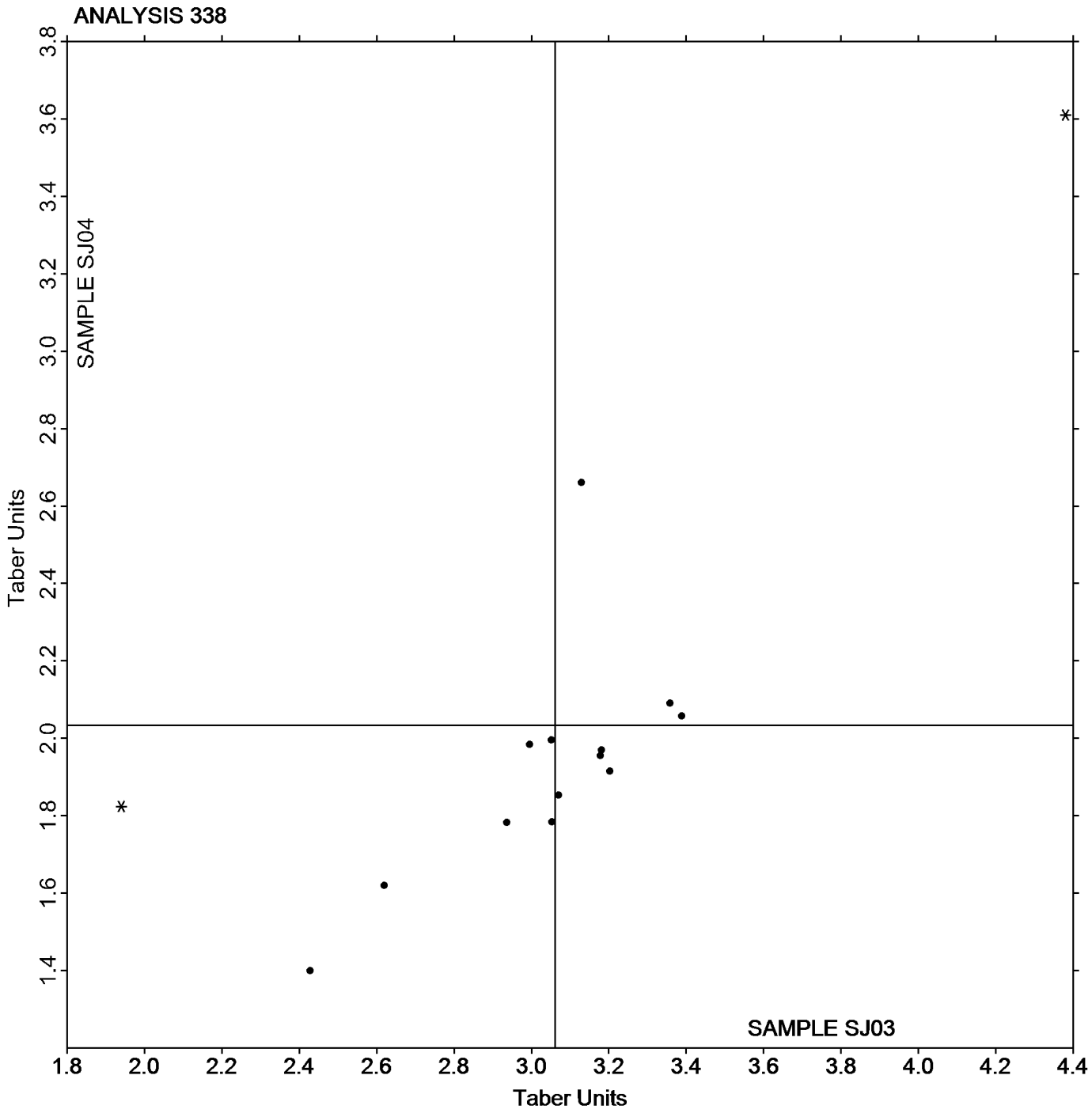
TAPPI-CTS Interlaboratory Testing Program

Analysis 338

Bending Resistance, Taber Type - 0 to 10 Units

Grand Mean Sample **SJ03** = 3.0610 Taber Units

Grand Mean Sample **SJ04** = 2.0333 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 SQ03 Lab Mean	Sample SQ03 Diff from Grand Mean	Sample SQ03 CPV	Sample SQ04 Lab Mean	Sample SQ04 Diff from Grand Mean	Sample SQ04 CPV
2GPVFG		34.04	-0.33	-0.18	34.30	0.23	0.11
2LD86X		31.55	-2.82	-1.53	31.85	-2.22	-1.11
2WGTGC		31.92	-2.45	-1.33	31.34	-2.73	-1.36
9EKJWV		32.35	-2.02	-1.10	31.49	-2.58	-1.29
9QCD23		36.25	1.88	1.02	36.30	2.23	1.12
ABBCV8		37.30	2.93	1.59	36.50	2.43	1.22
CLGDRB	X	45.96	11.59	6.28	45.51	11.44	5.72
D43JCU		35.26	0.89	0.48	34.67	0.60	0.30
EGZ9AE		35.92	1.55	0.84	36.63	2.56	1.28
JRXAF8		34.10	-0.27	-0.15	32.70	-1.37	-0.68
LGQBK4		34.34	-0.03	-0.02	33.81	-0.26	-0.13
QRFEFJ		35.08	0.71	0.38	35.17	1.10	0.55
VKCDJL	X	94.19	59.82	32.43	93.23	59.16	29.57

Summary Statistics

	Sample SQ03	Sample SQ04
Grand Means	34.374 Taber Units	34.069 Taber Units
SD Btwn Labs	1.844 Taber Units	2.001 Taber Units

Statistics based on 11 of 13 reporting participants

Comments on assigned Data Flags for Test #339

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

VKCDJL (X) - Extreme data.

Analysis Notes:

EGZ9AE - Data appear to be reported as g-cm, not mN-m as indicated on datasheet. Units corrected by CTS.

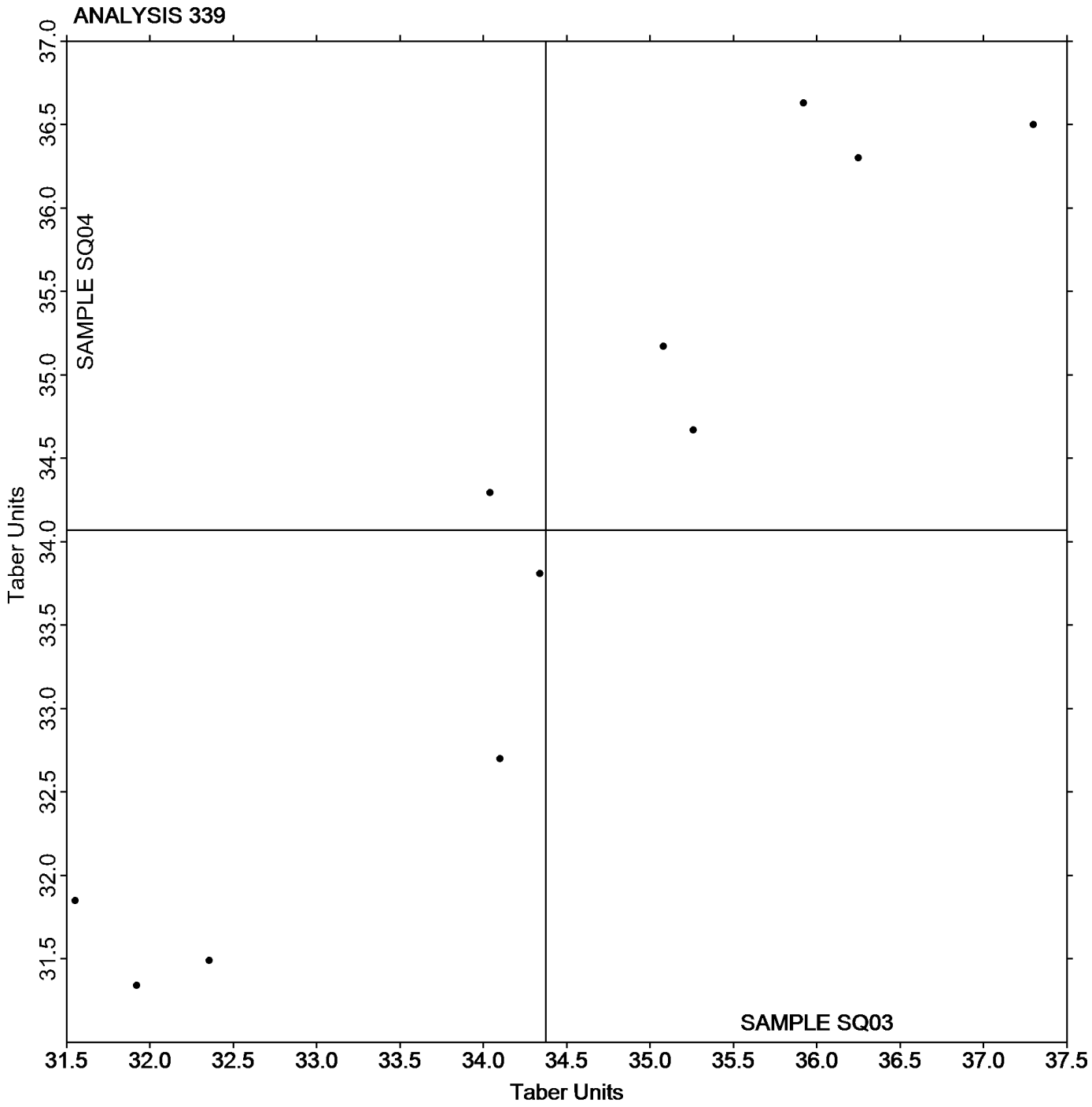
TAPPI-CTS Interlaboratory Testing Program

Analysis 339

Bending Resistance, Taber Type - 10 to 100 Taber Units

Grand Mean Sample **SQ03** = 34.374 Taber Units

Grand Mean Sample **SQ04** = 34.069 Taber Units



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

TAPPI-CTS Interlaboratory Testing Program

Analysis 340

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

WebCode	Data Flag	Sample ST03 Lab Mean	Sample ST03 Diff from Grand Mean	Sample ST03 CPV	Sample ST04 Lab Mean	Sample ST04 Diff from Grand Mean	Sample ST04 CPV
29VQKU		255.1	1.9	0.13	244.1	-3.6	-0.36
2JWBQT		242.8	-10.5	-0.73	238.8	-8.9	-0.90
2LD86X		236.8	-16.5	-1.16	232.0	-15.7	-1.58
4X34JN		269.6	16.3	1.15	252.3	4.6	0.47
8HHM3W		245.0	-8.3	-0.58	241.5	-6.2	-0.62
8LY3FU		249.3	-4.0	-0.28	249.4	1.7	0.17
DCBNWR		243.3	-9.9	-0.70	242.0	-5.7	-0.57
EN2DCW		240.3	-13.0	-0.91	238.9	-8.8	-0.89
LDYJ37		264.5	11.2	0.79	245.9	-1.8	-0.18
TCNPKL		252.5	-0.8	-0.05	259.3	11.6	1.17
UACCE4		242.5	-10.8	-0.76	248.4	0.7	0.07
UTJBDJ	X	88.4	-164.9	-11.57	105.8	-141.9	-14.31
V86DH2		265.0	11.7	0.82	260.6	12.9	1.30
VE37V3		285.8	32.5	2.28	266.8	19.1	1.92

Summary Statistics

	Sample ST03	Sample ST04
Grand Means	253.27 Taber Units	247.69 Taber Units
SD Btwn Labs	14.26 Taber Units	9.91 Taber Units

Statistics based on 13 of 14 reporting participants

Comments on assigned Data Flags for Test #340

UTJBDJ (X) - Extreme data.

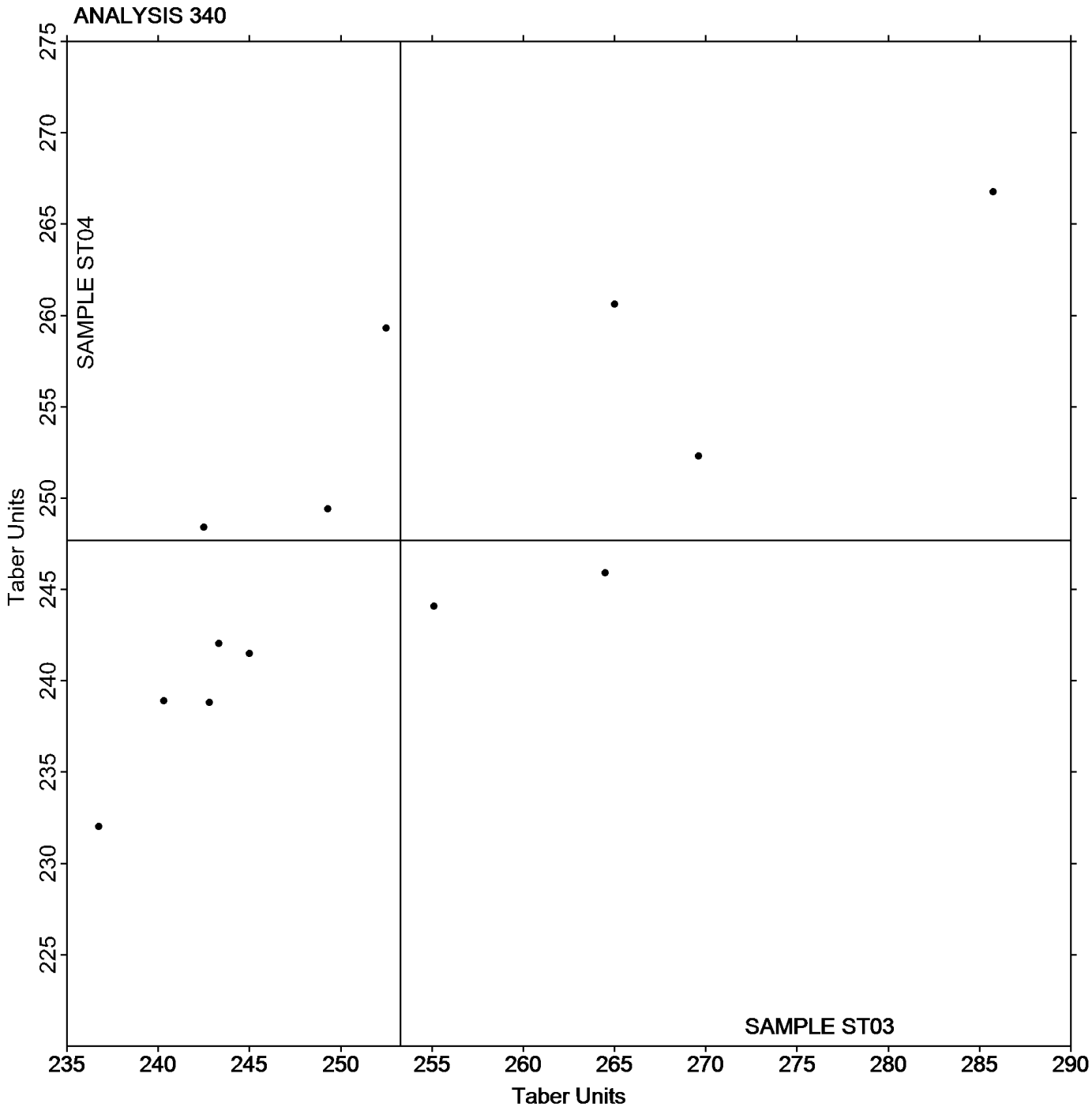
TAPPI-CTS Interlaboratory Testing Program

Analysis 340

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

Grand Mean Sample **ST03** = 253.27 Taber Units

Grand Mean Sample **ST04** = 247.69 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 SM03 Lab Mean	Sample SM03 Diff from Grand Mean	Sample SM03 CPV	Sample SM04 Lab Mean	Sample SM04 Diff from Grand Mean	Sample SM04 CPV	Instr Code
2GPVFG		68.62	-0.84	-0.11	88.92	-0.30	-0.02	TA
2WGTGC		62.27	-7.19	-0.91	88.89	-0.33	-0.03	XX
4X34JN		62.82	-6.64	-0.84	78.84	-10.38	-0.80	LW
ARCGVN		57.94	-11.52	-1.45	64.76	-24.46	-1.90	CD
CLGDRB		62.60	-6.86	-0.86	77.15	-12.07	-0.94	TZ
EGZ9AE		76.40	6.94	0.87	98.18	8.96	0.69	TA
HL9EV4		60.37	-9.09	-1.14	74.00	-15.22	-1.18	LW
HV9APR		69.60	0.14	0.02	85.60	-3.62	-0.28	TA
JFYMYB		72.96	3.50	0.44	88.64	-0.58	-0.05	DT
K76YJY		72.52	3.06	0.39	101.22	12.00	0.93	TA
LGQBK4		65.54	-3.92	-0.49	78.16	-11.06	-0.86	LW
MX2QTN		70.84	1.38	0.17	95.54	6.32	0.49	LW
PBFPMF		76.92	7.46	0.94	115.64	26.42	2.05	CD
UTJBDJ		78.92	9.46	1.19	99.04	9.82	0.76	CA
UWMDP	*	89.46	20.00	2.52	105.78	16.56	1.28	TL
VKCDJL		61.15	-8.31	-1.05	75.20	-14.02	-1.09	TZ
VZCZBY		72.86	3.41	0.43	97.50	8.28	0.64	TA
ZXN8ZF		68.46	-1.00	-0.13	92.92	3.70	0.29	XX

Summary Statistics

	Sample SM03	Sample SM04
Grand Means	69.458 psi	89.221 psi
SD Btwn Labs	7.944 psi	12.905 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
(TA) - Thwing-Albert Tensile Tester
(TL) - TMI Lab Master
(TZ) - TMI Monitor/ZDT Tester
(XX) - Instrument make/model not specified by lab

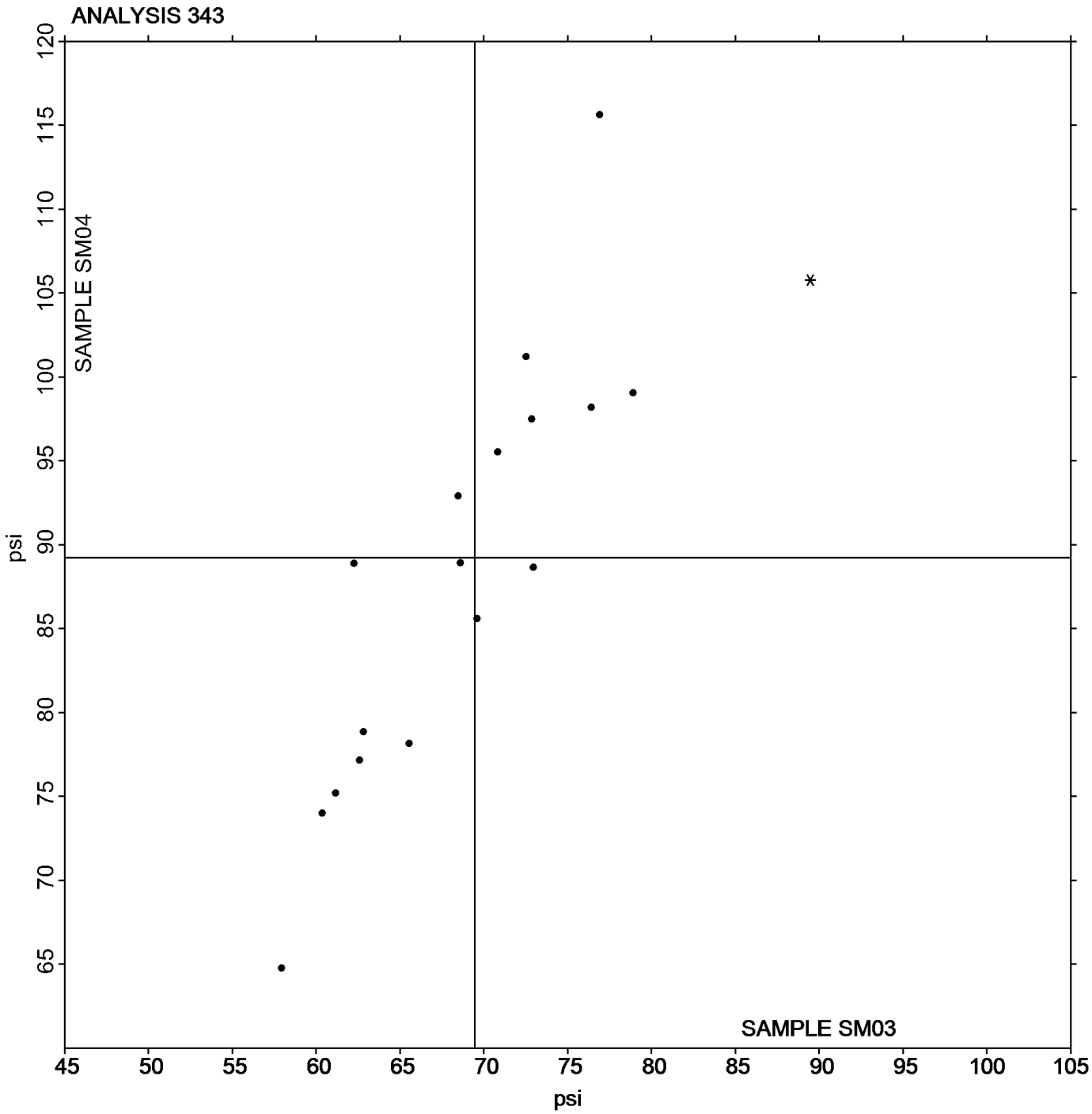
TAPPI-CTS Interlaboratory Testing Program

Analysis 343

Z-Direction Tensile

Grand Mean Sample **SM03** = 69.458 psi

Grand Mean Sample **SM04** = 89.221 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 SZ03 Lab Mean	Sample SZ03 Diff from Grand Mean	Sample SZ03 CPV	Sample SZ04 Lab Mean	Sample SZ04 Diff from Grand Mean	Sample SZ04 CPV	Instr Code
2JWBQT		40.80	-1.84	-0.58	36.08	-2.51	-0.98	TZ
3PUMGB		44.64	2.00	0.63	39.97	1.38	0.54	XX
8LY3FU		40.66	-1.98	-0.63	37.72	-0.87	-0.34	CA
9ZGCKB		46.50	3.86	1.22	42.88	4.29	1.68	PG
D4V6CR		40.88	-1.76	-0.56	36.26	-2.33	-0.91	LW
EN2DCW		36.68	-5.96	-1.89	34.16	-4.42	-1.73	TZ
FGNK2Z		48.56	5.92	1.88	41.60	3.01	1.18	TL
PLE3KL		40.00	-2.64	-0.84	37.60	-0.99	-0.39	DP
QLU679		44.50	1.86	0.59	38.11	-0.47	-0.19	XX
QRFEFJ		41.52	-1.12	-0.35	36.92	-1.67	-0.65	CA
TCNPKL		45.36	2.72	0.86	38.72	0.13	0.05	TL
UACCE4		42.40	-0.24	-0.08	42.00	3.41	1.34	CA
V86DH2		41.80	-0.84	-0.27	39.60	1.01	0.40	CA

Summary Statistics

	Sample SZ03	Sample SZ04
Grand Means	42.638 psi	38.586 psi
SD Btwn Labs	3.158 psi	2.551 psi

Statistics based on 13 of 13 reporting participants

Instrument Code List

(CA) - CSI CS-163

(DP) - Dek-Tron XP Series

(LW) - L & W ZD Tensile Tester

(PG) - Perkins Model A Mullen Tester

(TL) - TMI Lab Master

(TZ) - TMI Monitor/ZDT Tester

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

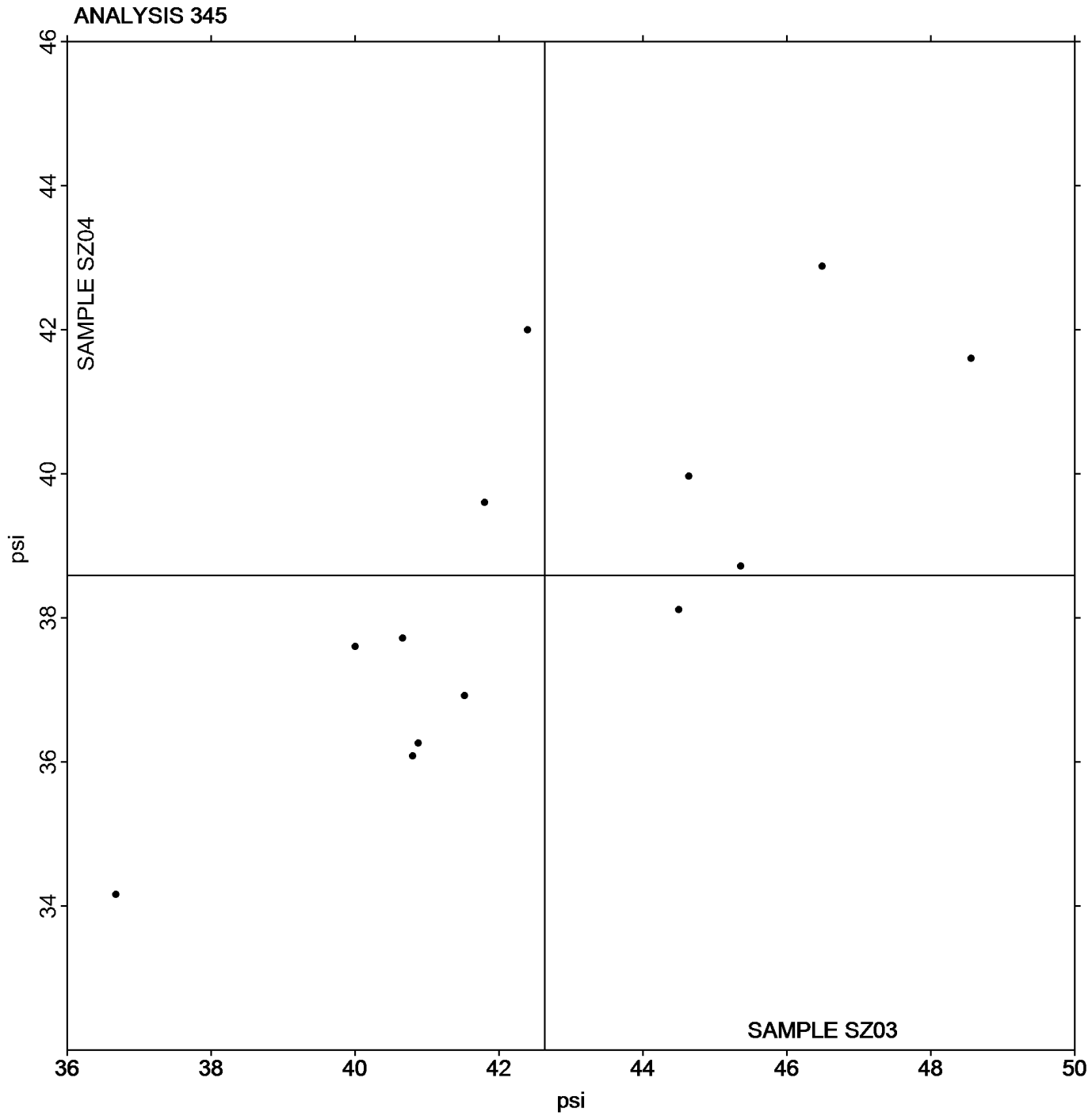
TAPPI-CTS Interlaboratory Testing Program

Analysis 345

Z-Direction Tensile, Recycled Paperboard

Grand Mean Sample **SZ03** = 42.638 psi

Grand Mean Sample **SZ04** = 38.586 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 SN03 Lab Mean	Sample SN03 Diff from Grand Mean	Sample SN03 CPV	Sample SN04 Lab Mean	Sample SN04 Diff from Grand Mean	Sample SN04 CPV	Instr Code
2GPVFG		116.8	8.0	1.37	99.20	5.41	0.90	HY
3M7D6N		103.6	-5.2	-0.88	88.08	-5.71	-0.95	KR
468TDF		112.8	4.0	0.69	92.60	-1.19	-0.20	HZ
4X34JN		103.8	-5.0	-0.85	81.00	-12.79	-2.13	HZ
6GYYHX		109.9	1.1	0.19	93.74	-0.05	-0.01	HY
78GJZZ		105.8	-3.0	-0.51	89.00	-4.79	-0.80	HY
9R68KY		115.0	6.2	1.06	99.00	5.21	0.87	HY
ARCGVN		103.8	-5.0	-0.85	92.00	-1.79	-0.30	HY
CLGDRB		115.4	6.6	1.13	95.80	2.01	0.33	HY
EGZ9AE		113.8	5.0	0.86	95.20	1.41	0.23	HZ
EN2DCW	X	132.9	24.1	4.12	120.68	26.89	4.47	HZ
HCBLPA		103.6	-5.2	-0.88	87.40	-6.39	-1.06	HY
K76YJY		119.2	10.4	1.78	108.60	14.81	2.46	HY
LGQBK4		107.8	-1.0	-0.17	97.00	3.21	0.53	HY
MX2QTN		116.0	7.2	1.23	99.20	5.41	0.90	XX
NKYBWK		102.7	-6.1	-1.04	90.16	-3.63	-0.60	HY
PHJFG7		102.2	-6.6	-1.12	88.60	-5.19	-0.86	HY
PMUK6Z		112.2	3.4	0.58	95.20	1.41	0.23	HY
QRFEFJ		111.6	2.8	0.48	100.20	6.41	1.07	XX
VEK9BP		100.0	-8.8	-1.51	89.24	-4.55	-0.76	HZ
VKCDJL		105.4	-3.4	-0.58	98.20	4.41	0.73	HY
YXGFZB		103.0	-5.8	-0.99	90.20	-3.59	-0.60	HY

Summary Statistics

	Sample SN03	Sample SN04
Grand Means	108.78 1000th ft-lbs	93.792 1000th ft-lbs
SD Btwn Labs	5.86 1000th ft-lbs	6.009 1000th ft-lbs

Statistics based on 21 of 22 reporting participants

Comments on assigned Data Flags for Test #348

EN2DCW (X) - Systematic error (data for both samples are high). Inconsistent within the determinations for Sample SN04.

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

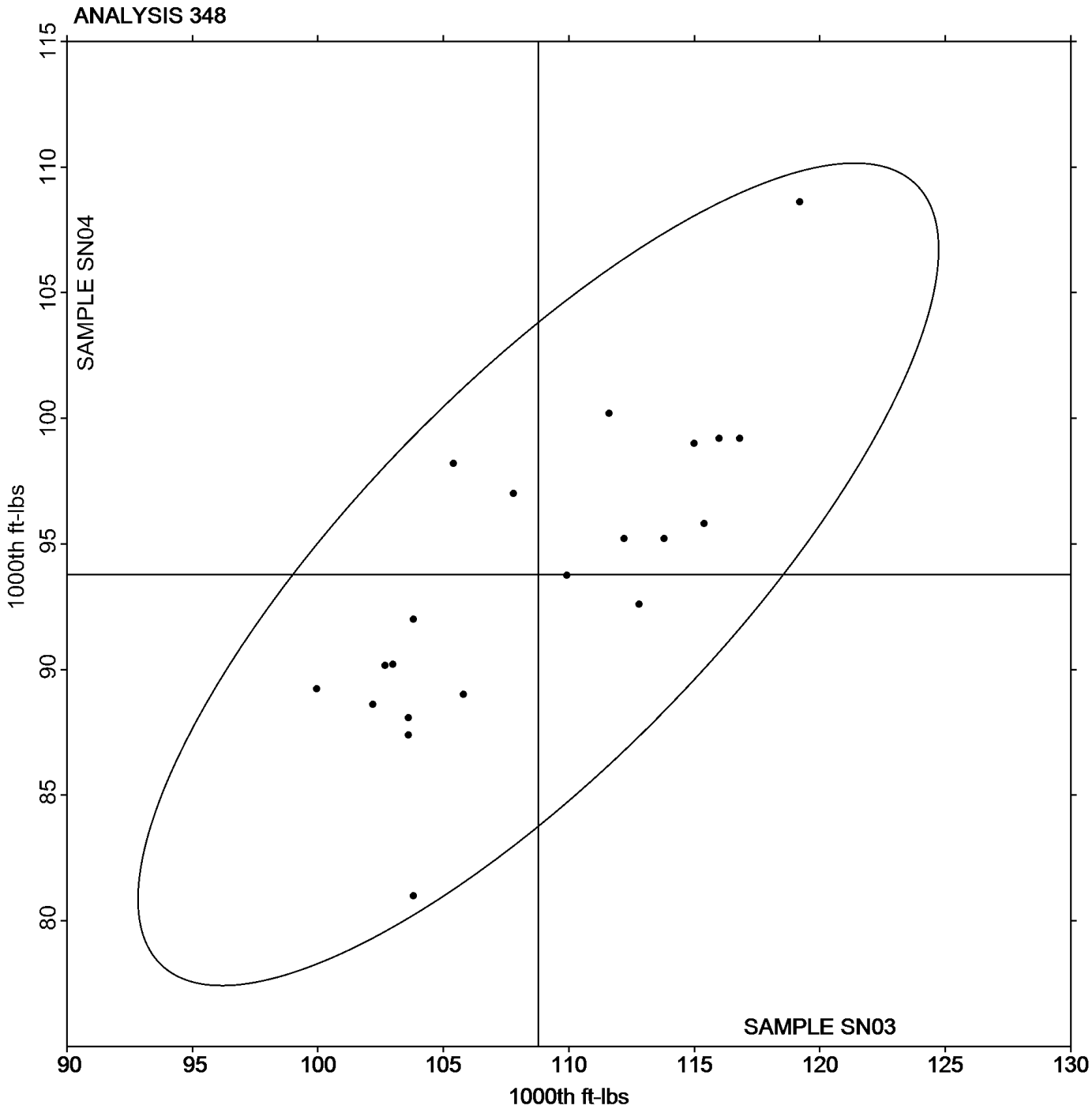
TAPPI-CTS Interlaboratory Testing Program

Analysis 348

Internal Bond Strength - Modified Scott Mechanics

Grand Mean Sample **SN03** = 108.78 1000th ft-lbs

Grand Mean Sample **SN04** = 93.792 1000th ft-lbs



TAPPI-CTS Interlaboratory Testing Program

Analysis 349

Internal Bond Strength - Scott Bond Models

WebCode	Data Flag	Sample SP03 Lab Mean	Sample SP03 Diff from Grand Mean	Sample SP03 CPV	Sample SP04 Lab Mean	Sample SP04 Diff from Grand Mean	Sample SP04 CPV	Instr Code
2LD86X		110.72	14.50	1.05	86.72	4.61	0.33	SC
44HFY4		78.20	-18.02	-1.31	67.94	-14.17	-1.03	SC
9C9N9H		118.20	21.98	1.59	110.00	27.89	2.02	SC
9EKJWV		87.18	-9.03	-0.66	70.40	-11.71	-0.85	TM
9JAKW2		97.60	1.38	0.10	87.20	5.09	0.37	TM
9ZGCKB		87.20	-9.02	-0.65	73.20	-8.91	-0.65	TM
D4V6CR		83.80	-12.42	-0.90	73.00	-9.11	-0.66	XX
NA9KED		93.55	-2.67	-0.19	75.95	-6.17	-0.45	XX
TNVP7D		109.50	13.28	0.96	94.60	12.49	0.91	XX

Summary Statistics

	Sample SP03	Sample SP04
Grand Means	96.217 1000th ft-lbs	82.111 1000th ft-lbs
SD Btwn Labs	13.787 1000th ft-lbs	13.781 1000th ft-lbs

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

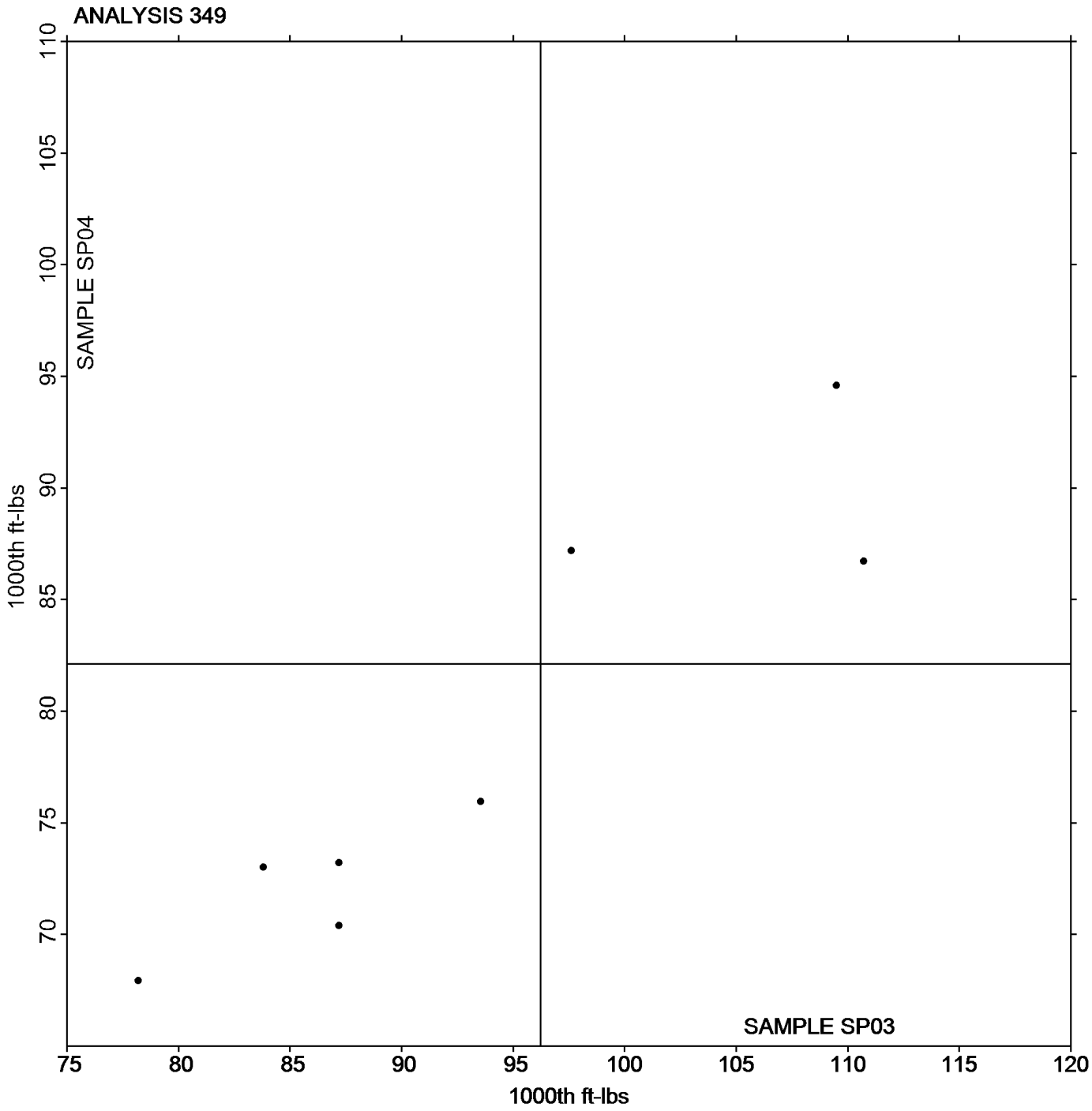
TAPPI-CTS Interlaboratory Testing Program

Analysis 349

Internal Bond Strength - Scott Bond Models

Grand Mean Sample **SP03** = 96.217 1000th ft-lbs

Grand Mean Sample **SP04** = 82.111 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.