

Paper & Paperboard Interlaboratory Testing Program

Summary Report #271S - July 2014

[Introduction to the Paper & Paperboard Interlaboratory Program](#)

[Explanation of Tables and Definitions of Terms](#)

[Instrument Manufacturer Contacts](#)

Analysis	Analysis Name
305	Bursting Strength - Printing Papers
310	Bursting Strength - Packaging Papers
311	Tearing Strength - Newsprint
312	Tearing Strength - Printing Papers
314	Tearing Strength - Packaging Papers
320	Tensile Breaking Strength - Newsprint
321	Tensile Energy Absorption - Newsprint
322	Elongation to Break - Newsprint
325	Tensile Breaking Strength - Printing Papers
327	Tensile Energy Absorption - Printing Papers
328	Elongation to Break - Printing Papers
330	Tensile Breaking Strength - Packaging Papers
331	Tensile Energy Absorption - Packaging Papers
332	Elongation to Break - Packaging Papers
334	Folding Endurance (MIT) - Double Folds
336	Bending Resistance, Gurley Type
338	Bending Resistance, Taber Type - 0 to 10 Units
339	Bending Resistance, Taber Type - 10 to 100 Taber Units
340	Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
343	Z-Direction Tensile
345	Z-Direction Tensile, Recycled Paperboard
348	Internal Bond Strength - Modified Scott Mechanics
349	Internal Bond Strength - Scott Bond Models

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

Emmerson Apparatus

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

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

FAX#: (207) 774-5304

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

WebCode	Data Flag	Sample SA09			Sample SA10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3ZXB JV		29.08	-0.20	-0.07	21.03	-1.26	-0.57
7DE6MK		27.60	-1.68	-0.60	20.40	-1.89	-0.86
9N46RJ		28.12	-1.16	-0.41	21.83	-0.46	-0.21
9QTEZZ		29.40	0.12	0.04	22.00	-0.29	-0.13
ADZCYJ		31.20	1.92	0.68	23.40	1.11	0.51
AV6JBZ		29.81	0.53	0.19	22.95	0.66	0.30
BFPZW6	*	28.80	-0.48	-0.17	24.70	2.41	1.10
BRZBLF		30.46	1.18	0.42	23.25	0.96	0.44
CMYRV2		27.35	-1.93	-0.68	20.45	-1.84	-0.84
DQVV2E		30.15	0.87	0.31	23.95	1.66	0.76
DYBBUN		30.74	1.46	0.52	23.60	1.31	0.60
EGNC4G		29.98	0.70	0.25	24.11	1.82	0.83
EJDLBW	*	36.89	7.61	2.70	27.45	5.17	2.35
FPVCBW		30.26	0.98	0.35	22.58	0.29	0.13
G9Q4WV		25.25	-4.03	-1.43	19.25	-3.04	-1.38
GGL3M4		35.67	6.39	2.27	26.08	3.79	1.73
GWD62M		26.38	-2.90	-1.03	20.10	-2.19	-1.00
JTLPNW		25.26	-4.02	-1.42	19.68	-2.61	-1.19
K77NUP		28.97	-0.31	-0.11	22.52	0.24	0.11
KMRACU		32.20	2.92	1.04	25.07	2.78	1.27
LZFT9C		25.21	-4.07	-1.44	18.89	-3.40	-1.55
NMLWJJ		32.20	2.92	1.04	24.10	1.81	0.83
PGER7P		29.67	0.40	0.14	23.50	1.21	0.55
PZ7VMQ		30.55	1.27	0.45	22.67	0.39	0.18
RDJ64C		26.95	-2.33	-0.83	20.54	-1.75	-0.80
T8WKWQ		28.25	-1.03	-0.36	19.77	-2.52	-1.15
UBPYZQ		25.65	-3.63	-1.29	20.20	-2.09	-0.95
XZC9NQ		27.75	-1.53	-0.54	20.00	-2.29	-1.04

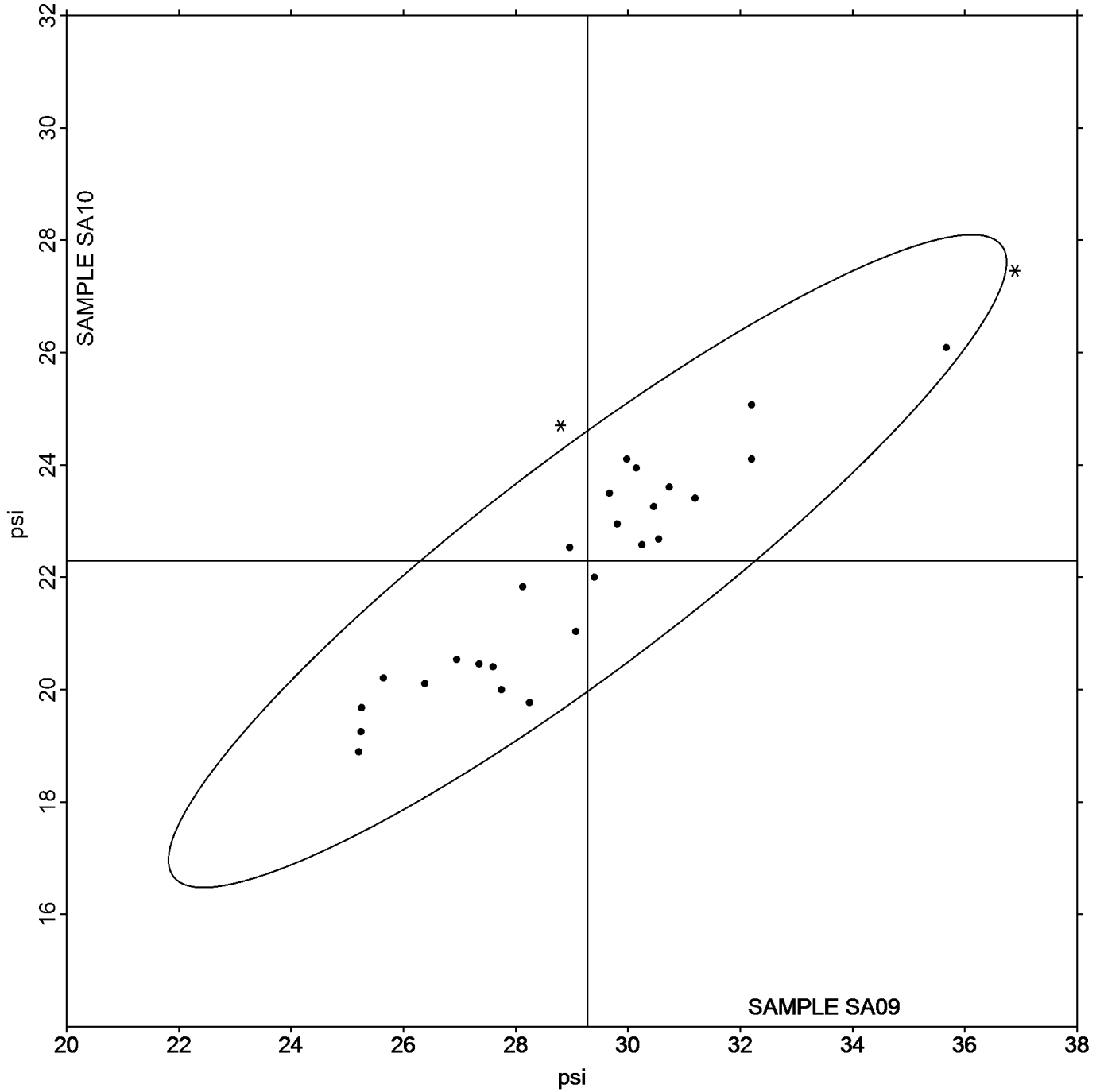
		Summary Statistics	
	Sample SA09		Sample SA10
Grand Means	29.279 psi		22.288 psi
SD Btwn Labs	2.822 psi		2.196 psi
Statistics based on 28 of 28 reporting participants			

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

Grand Mean Sample SA09 = 29.279 psi

Grand Mean Sample SA10 = 22.288 psi

ANALYSIS 305



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

WebCode	Data Flag	Sample SB09			Sample SB10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2LM8LG		65.80	-0.30	-0.09	46.30	-2.29	-0.69
2P76B7		65.39	-0.71	-0.20	46.06	-2.54	-0.76
3ZXBJV		68.19	2.08	0.59	52.08	3.48	1.04
6MMMGC		69.22	3.12	0.88	47.55	-1.05	-0.31
78PRLW		66.70	0.60	0.17	49.20	0.61	0.18
7M36VG		66.00	-0.10	-0.03	45.51	-3.08	-0.92
9K8GBC		61.49	-4.61	-1.30	46.62	-1.98	-0.59
AD4WLL		67.30	1.20	0.34	45.20	-3.39	-1.01
AZGPQ7		63.10	-3.00	-0.85	44.80	-3.79	-1.13
BRZBLF		68.86	2.76	0.78	51.63	3.04	0.91
C9F4L4		66.86	0.76	0.21	48.95	0.36	0.11
CLR8AM		63.12	-2.98	-0.84	48.66	0.07	0.02
EKMQPK		71.35	5.25	1.48	48.90	0.31	0.09
EZY8X9		65.33	-0.78	-0.22	50.30	1.71	0.51
F7KGGC		67.78	1.67	0.47	48.56	-0.04	-0.01
FHXK7A		68.60	2.50	0.71	48.69	0.10	0.03
G68886		62.03	-4.07	-1.15	45.03	-3.56	-1.06
GTRFHA		70.20	4.10	1.16	54.80	6.21	1.85
HKDT97		61.90	-4.20	-1.19	48.44	-0.15	-0.05
KRM2KR		66.26	0.16	0.04	51.36	2.77	0.83
PENLND	X	64.06	-2.04	-0.58	60.54	11.95	3.57
PGER7P		67.46	1.35	0.38	51.75	3.16	0.94
PXHMFB		63.09	-3.01	-0.85	47.10	-1.49	-0.45
Q4H4QF		67.00	0.90	0.25	47.40	-1.19	-0.36
QFDEYM		58.60	-7.50	-2.12	40.00	-8.59	-2.57
U8PTHE		61.73	-4.37	-1.24	46.70	-1.90	-0.57
VKCE6L		60.95	-5.15	-1.46	46.70	-1.89	-0.57
VQVMMQ		70.32	4.22	1.19	54.05	5.46	1.63
X4U93K		73.87	7.77	2.20	55.20	6.60	1.97
ZWPBAY		68.50	2.40	0.68	51.70	3.11	0.93

		Summary Statistics	
	Sample SB09		Sample SB10
Grand Means	66.104 psi		48.595 psi
SD Btwn Labs	3.533 psi		3.346 psi
Statistics based on 29 of 30 reporting participants			

Comments on assigned Data Flags for Test #310

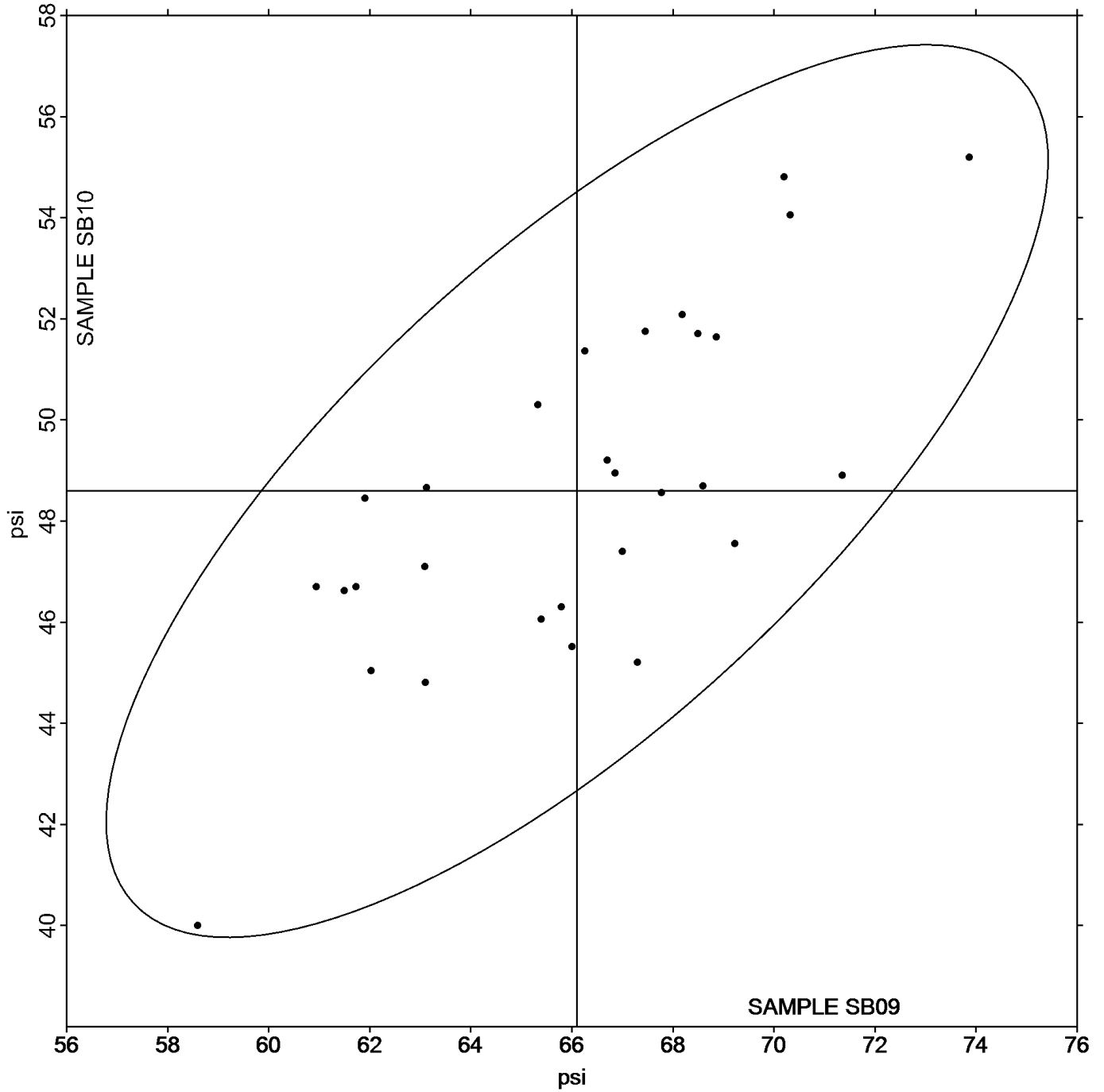
PENLND (X) - Inconsistent in testing between samples.

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

Grand Mean Sample **SB09** = 66.104 psi

Grand Mean Sample **SB10** = 48.595 psi

ANALYSIS 310



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

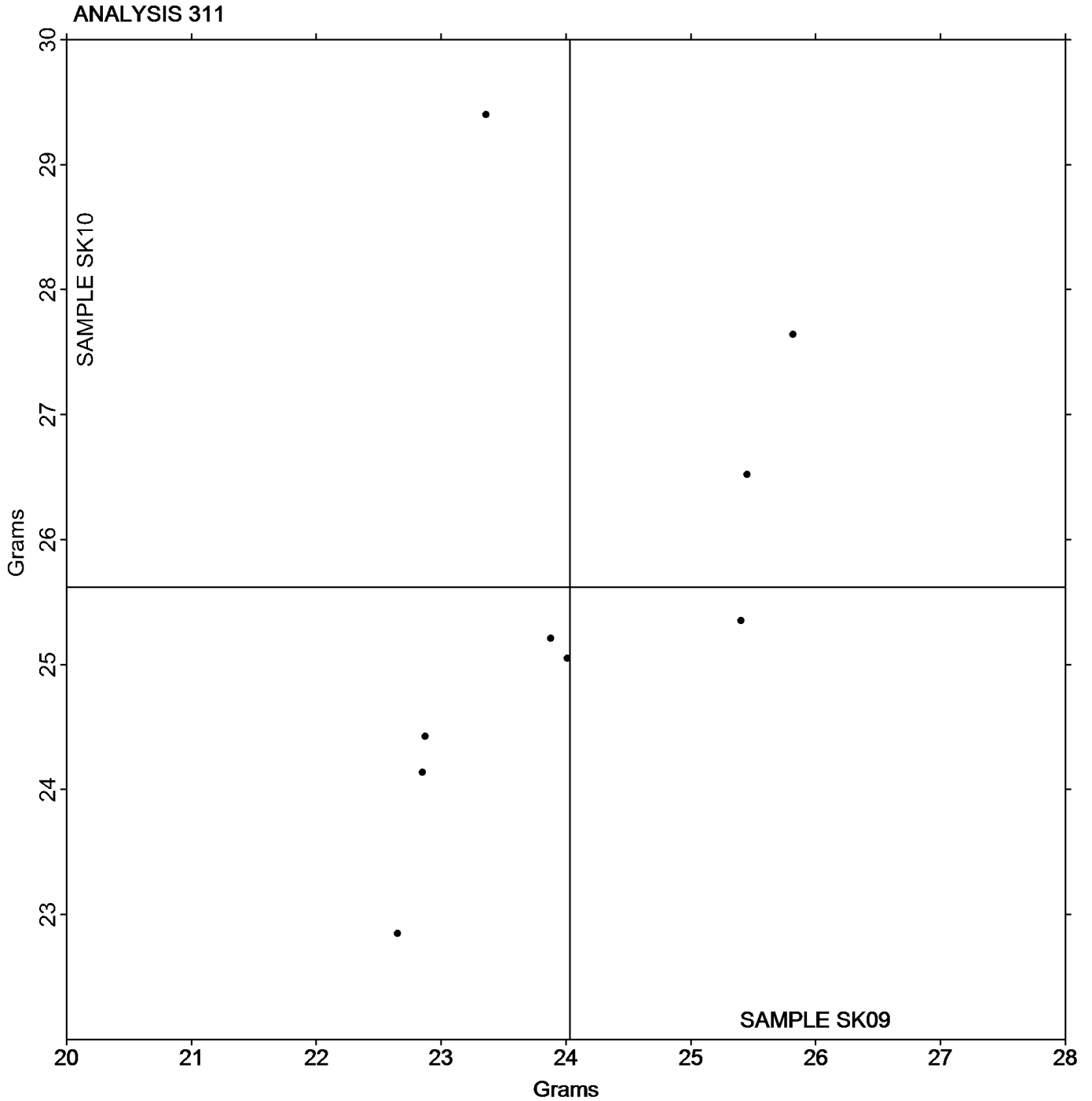
WebCode	Data Flag	Sample SK09			Sample SK10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
7M36VG		25.82	1.79	1.45	27.64	2.02	1.03
BRZBLF		22.85	-1.18	-0.96	24.14	-1.48	-0.75
CYR8K3		23.36	-0.67	-0.54	29.40	3.78	1.92
D22HCZ		25.40	1.37	1.11	25.35	-0.27	-0.14
DCYF2K		22.87	-1.16	-0.94	24.42	-1.20	-0.61
DYBBUN		24.01	-0.02	-0.02	25.05	-0.57	-0.29
EAM3V3		25.45	1.42	1.15	26.52	0.90	0.46
K77NUP		22.65	-1.38	-1.12	22.85	-2.77	-1.41
ZMMTWB		23.88	-0.15	-0.12	25.21	-0.41	-0.21

		Summary Statistics			
		Sample SK09		Sample SK10	
Grand Means		24.033 Grams		25.620 Grams	
SD Btwn Labs		1.235 Grams		1.970 Grams	
Statistics based on 9 of 9 reporting participants					

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

Grand Mean Sample **SK09** = 24.033 Grams

Grand Mean Sample **SK10** = 25.620 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 SC09			Sample SC10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2P76B7		48.60	-0.09	-0.04	60.18	0.93	0.30
2VRF2G		51.20	2.51	1.10	60.20	0.94	0.31
32UQVR		50.04	1.35	0.59	59.72	0.46	0.15
34JZ49		50.14	1.45	0.63	61.86	2.60	0.86
3G9UF2		48.16	-0.53	-0.23	60.37	1.12	0.37
3ZXB JV		49.20	0.51	0.22	60.00	0.74	0.24
68WGB4		51.92	3.23	1.41	61.38	2.12	0.70
6MMMGC		45.95	-2.74	-1.20	58.32	-0.94	-0.31
6UMYFU	*	43.60	-5.09	-2.23	51.20	-8.06	-2.65
8GBD6Z		46.22	-2.47	-1.08	59.90	0.64	0.21
9N46RJ		49.34	0.65	0.28	59.47	0.21	0.07
9QTEZZ		48.46	-0.23	-0.10	59.44	0.18	0.06
A4V6GX		44.00	-4.69	-2.05	52.20	-7.06	-2.32
ADZCYJ		46.10	-2.59	-1.13	56.00	-3.26	-1.07
AZGPQ7		50.84	2.15	0.94	64.55	5.29	1.74
BFPZW6		45.50	-3.19	-1.40	55.54	-3.72	-1.22
BRZBLF		47.36	-1.34	-0.59	57.87	-1.39	-0.46
C9F4L4		47.80	-0.89	-0.39	55.71	-3.55	-1.17
CLR8AM		49.29	0.60	0.26	56.74	-2.52	-0.83
CTTEW3		47.06	-1.63	-0.71	57.80	-1.46	-0.48
DQVV2E		48.76	0.07	0.03	58.73	-0.53	-0.17
EGNC4G		47.96	-0.74	-0.32	57.89	-1.37	-0.45
EJDLBW	X	55.55	6.85	3.00	56.41	-2.85	-0.94
EZY8X9		51.74	3.05	1.33	62.98	3.72	1.22
F7KGKC		48.11	-0.58	-0.26	56.52	-2.74	-0.90
FLCEM8		46.85	-1.85	-0.81	55.13	-4.13	-1.36
FPVCBW		48.95	0.26	0.11	61.04	1.78	0.59
G68886		50.29	1.60	0.70	63.41	4.15	1.36
GGY2FR		51.18	2.49	1.09	62.60	3.34	1.10
GNGA24		49.58	0.89	0.39	59.86	0.60	0.20
GWD62M		49.88	1.19	0.52	62.99	3.74	1.23
JTLPNW		51.65	2.96	1.29	65.21	5.95	1.96
KJ9DN6		44.63	-4.06	-1.78	55.38	-3.88	-1.27
KMRACU	X	53.60	4.91	2.15	54.44	-4.82	-1.58
LZFT9C		47.10	-1.59	-0.70	58.30	-0.96	-0.31
NJMHWT	X	51.12	2.43	1.06	62.48	3.22	1.06
NMLWJJ		52.00	3.31	1.45	62.89	3.63	1.19
PENLND		45.56	-3.13	-1.37	56.80	-2.46	-0.81
PGER7P		46.45	-2.25	-0.98	55.64	-3.62	-1.19
PZ7VMQ		52.02	3.33	1.46	62.89	3.63	1.19
QK89WN		51.60	2.91	1.27	59.60	0.34	0.11
QLGFYG		46.60	-2.09	-0.92	59.00	-0.26	-0.08
RDJ64C		50.99	2.30	1.01	62.08	2.82	0.93

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

WebCode	Data Flag	Sample SC09			Sample SC10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
T283HE		48.60	-0.09	-0.04	58.22	-1.04	-0.34
T73R28	X	55.81	7.12	3.11	52.32	-6.94	-2.28
T8WKWQ		52.72	4.03	1.76	61.58	2.32	0.76
THRQPN		46.40	-2.29	-1.00	55.80	-3.46	-1.14
U8PTHE		48.14	-0.55	-0.24	57.12	-2.14	-0.70
UVYWH3	X	49.52	0.83	0.36	49.88	-9.38	-3.08
VB6HGH		47.04	-1.65	-0.72	59.48	0.22	0.07
VKCE6L		50.57	1.88	0.82	63.72	4.46	1.47
XWDRC		49.64	0.95	0.41	59.18	-0.08	-0.03
XZC9NQ		50.36	1.67	0.73	60.48	1.22	0.40
ZFY726		49.82	1.13	0.49	60.60	1.34	0.44
ZWPBAY	X	47.00	-1.69	-0.74	57.60	-1.66	-0.54
ZZ93K2	X	47.66	-1.03	-0.45	51.95	-7.31	-2.40

		Summary Statistics	
	Sample SC09		Sample SC10
Grand Means	48.693 Grams		59.256 Grams
SD Btwn Labs	2.286 Grams		3.043 Grams
Statistics based on 49 of 56 reporting participants			

Comments on assigned Data Flags for Test #312

EJDLBW (X) - Data for Sample SC09 are high.

KMRACU (X) - Inconsistent in testing between samples.

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

T73R28 (X) - Data for Sample SC09 are high. Inconsistent in testing within the determinations for both samples.

UVYWH3 (X) - Data for Sample SC10 are low. Inconsistent in testing within determinations for Sample SC09.

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

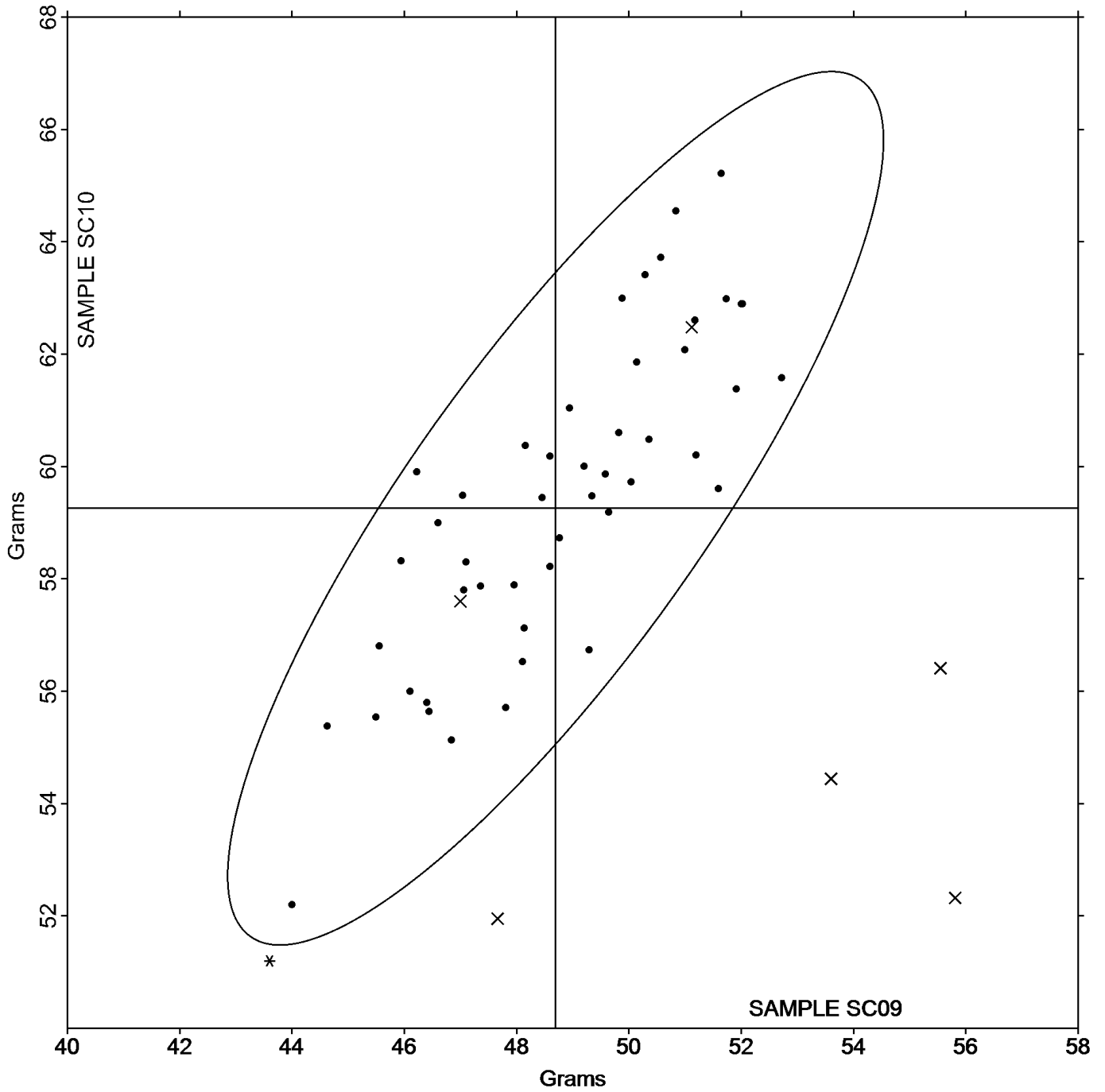
ZZ93K2 (X) - Inconsistent in testing between samples and within the determinations for Sample SC10.

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

Grand Mean Sample **SC09** = 48.693 Grams

Grand Mean Sample **SC10** = 59.256 Grams

ANALYSIS 312



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

WebCode	Data Flag	Sample SD09			Sample SD10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2WL78V	X	139.6	-8.4	-0.92	174.0	-10.8	-0.95
3BHJ4H		152.0	4.0	0.44	186.2	1.4	0.12
4LCFHP		152.3	4.3	0.47	202.7	17.9	1.59
6F4EWL		148.4	0.3	0.04	190.7	5.9	0.53
78PRLW		138.4	-9.7	-1.06	171.7	-13.1	-1.16
79JHRB		139.6	-8.4	-0.92	163.6	-21.2	-1.88
7M36VG		146.2	-1.9	-0.20	192.2	7.4	0.66
82WAH6		148.4	0.3	0.04	187.4	2.6	0.23
9K8GBC		156.4	8.4	0.92	192.5	7.7	0.68
9QTEZZ		145.1	-2.9	-0.32	178.5	-6.3	-0.55
A37VAH		146.0	-2.0	-0.22	178.7	-6.1	-0.54
AD4WLL		144.7	-3.3	-0.36	180.3	-4.5	-0.40
AZXN64		139.8	-8.2	-0.90	177.5	-7.3	-0.65
BRZBLF		148.4	0.4	0.05	185.5	0.7	0.06
CJ3ZQB		135.1	-12.9	-1.41	167.6	-17.1	-1.52
CMYRV2		141.2	-6.8	-0.75	165.2	-19.6	-1.73
CP74EN		161.0	12.9	1.42	184.2	-0.6	-0.06
CW9V77		150.0	2.0	0.22	188.8	4.0	0.36
DCYF2K		139.0	-9.0	-0.99	174.7	-10.1	-0.89
DDVWEH		147.1	-0.9	-0.10	189.0	4.2	0.37
E8K3V7		150.2	2.2	0.24	182.0	-2.7	-0.24
EKMQPK		152.2	4.2	0.46	196.2	11.4	1.01
G9Q4WV		137.5	-10.5	-1.15	175.5	-9.3	-0.82
GGL3M4		138.8	-9.2	-1.01	178.8	-6.0	-0.53
HKDT97	*	176.4	28.4	3.11	218.6	33.8	2.99
J8LLNA		166.3	18.3	2.01	201.7	17.0	1.50
KRM2KR		141.8	-6.2	-0.68	184.2	-0.6	-0.05
LPGXAG		163.6	15.5	1.70	197.5	12.7	1.13
MVK4MX		151.4	3.4	0.38	199.3	14.5	1.28
PXHMFB		143.6	-4.4	-0.48	188.6	3.8	0.34
Q4H4QF		135.2	-12.8	-1.40	181.6	-3.2	-0.28
QFDEYM		146.0	-2.0	-0.22	180.3	-4.5	-0.40
RA6BLU		149.0	1.0	0.11	175.4	-9.4	-0.83
UBPYZQ		152.4	4.4	0.48	191.2	6.4	0.57
VQVMMQ		138.0	-10.0	-1.10	173.7	-11.1	-0.98
WGN8FH		147.7	-0.3	-0.03	180.8	-4.0	-0.36
WMR9GC		159.3	11.3	1.24	189.9	5.1	0.45
ZWPBAY	X	136.0	-12.0	-1.32	177.6	-7.2	-0.64

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

	Sample SD09	Summary Statistics	Sample SD10
Grand Means	148.01 Grams		184.79 Grams
SD Btwn Labs	9.13 Grams		11.30 Grams
Statistics based on 36 of 38 reporting participants			

Comments on assigned Data Flags for Test #314

2WL78V (X) - Data appear to be off by a factor of .25; data converted by CTS (x4).

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

Analysis Notes:

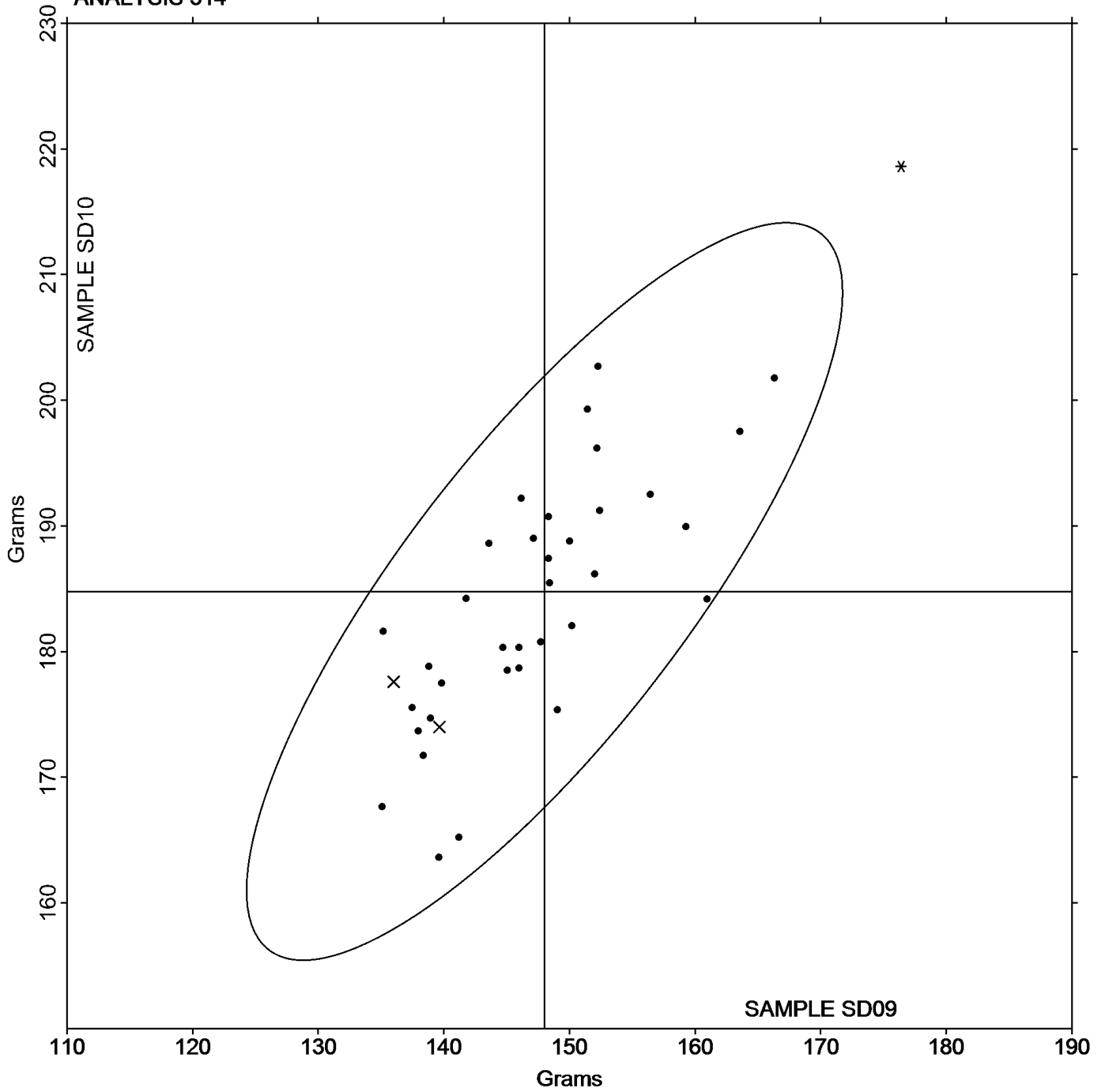
CP74EN - Data appear to be reported as gf, not mN as indicated on datasheet. Units corrected by CTS.

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

Grand Mean Sample **SD09** = 148.01 Grams

Grand Mean Sample **SD10** = 184.79 Grams

ANALYSIS 314



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

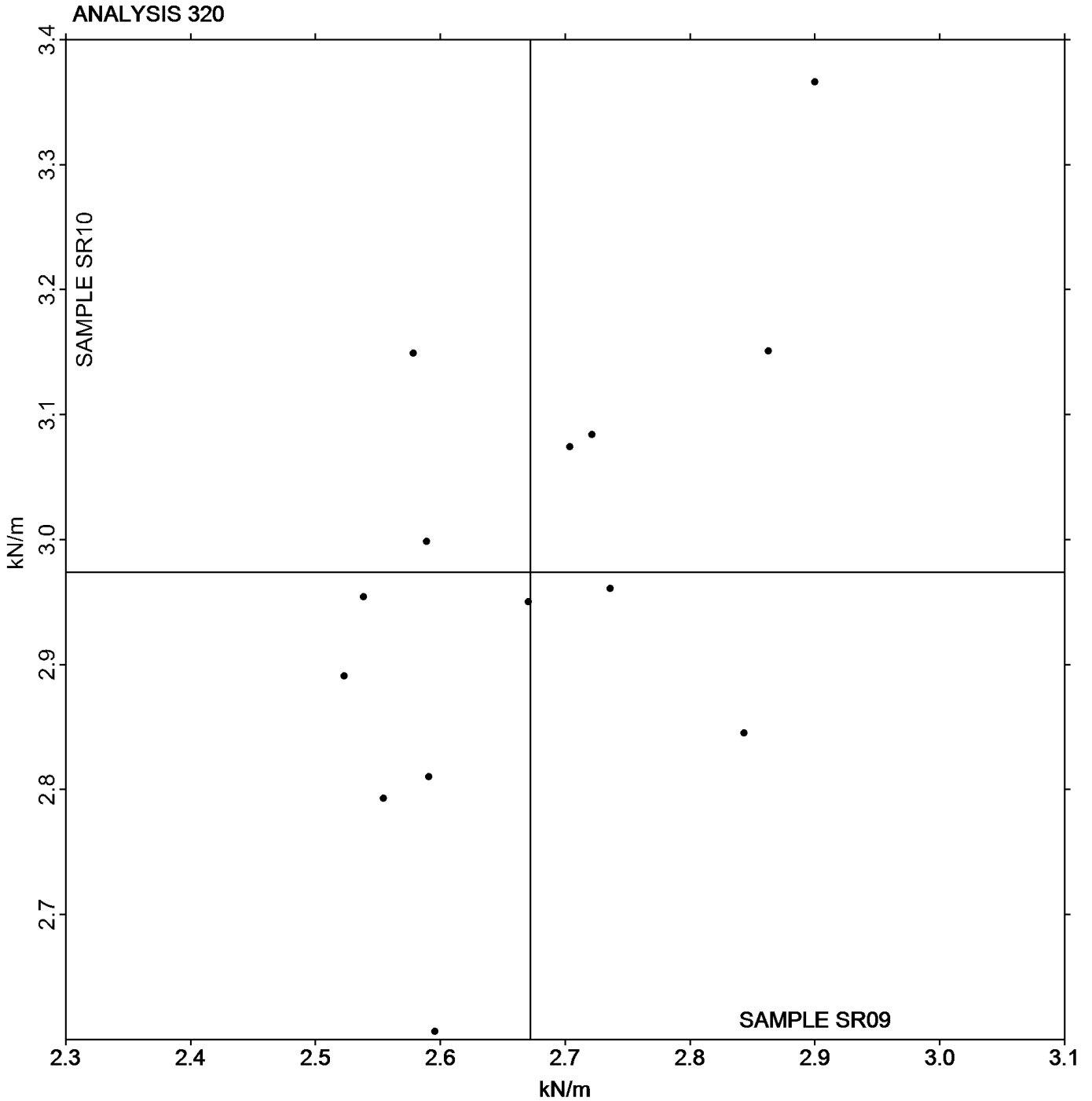
WebCode	Data Flag	Sample SR09			Sample SR10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
7M36VG		2.900	0.228	1.81	3.366	0.392	2.09
87RY4H		2.863	0.191	1.51	3.151	0.177	0.94
ADZCYJ		2.721	0.049	0.39	3.084	0.110	0.59
CYR8K3		2.596	-0.076	-0.60	2.606	-0.367	-1.96
D22HCZ		2.843	0.171	1.36	2.845	-0.129	-0.69
DCYF2K		2.704	0.032	0.25	3.074	0.100	0.53
DYBBUN		2.578	-0.093	-0.74	3.149	0.175	0.93
GTRFHA		2.539	-0.133	-1.06	2.954	-0.019	-0.10
K77NUP		2.589	-0.083	-0.66	2.998	0.025	0.13
PGER7P		2.523	-0.149	-1.18	2.891	-0.083	-0.44
TZE8XQ		2.670	-0.002	-0.01	2.950	-0.024	-0.13
XBVHDJ		2.591	-0.081	-0.64	2.810	-0.164	-0.87
ZFY726		2.554	-0.118	-0.93	2.793	-0.181	-0.97
ZMMTWB		2.736	0.064	0.51	2.961	-0.013	-0.07

		Summary Statistics			
		Sample SR09		Sample SR10	
Grand Means		2.6720 kN/m		2.9738 kN/m	
SD Btwn Labs		0.1263 kN/m		0.1877 kN/m	
Statistics based on 14 of 14 reporting participants					

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

Grand Mean Sample **SR09** = 2.6720 kN/m

Grand Mean Sample **SR10** = 2.9738 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 SR09			Sample SR10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
7M36VG	X	14.74	-1.85	-0.81	19.56	-4.27	-1.21
87RY4H		20.19	3.60	1.59	27.70	3.87	1.10
CYR8K3		15.23	-1.35	-0.59	16.13	-7.70	-2.19
DCYF2K		16.57	-0.02	-0.01	24.50	0.68	0.19
DYBBUN		15.58	-1.00	-0.44	27.42	3.60	1.02
GTRFHA		13.05	-3.54	-1.56	22.10	-1.73	-0.49
K77NUP		17.45	0.87	0.38	26.79	2.96	0.84
PGER7P		14.50	-2.09	-0.92	22.19	-1.64	-0.47
TZE8XQ		15.99	-0.60	-0.26	23.86	0.04	0.01
XBVHDJ		18.77	2.18	0.96	26.24	2.41	0.69
ZFY726		15.19	-1.39	-0.61	20.07	-3.75	-1.07
ZMMTWB		19.92	3.33	1.47	25.08	1.25	0.36

Summary Statistics	
Sample SR09	Sample SR10
Grand Means	16.585 Joules/sq m
SD Btwn Labs	2.272 Joules/sq m
	23.825 Joules/sq m
	3.516 Joules/sq m
Statistics based on 11 of 12 reporting participants	

Comments on assigned Data Flags for Test #321

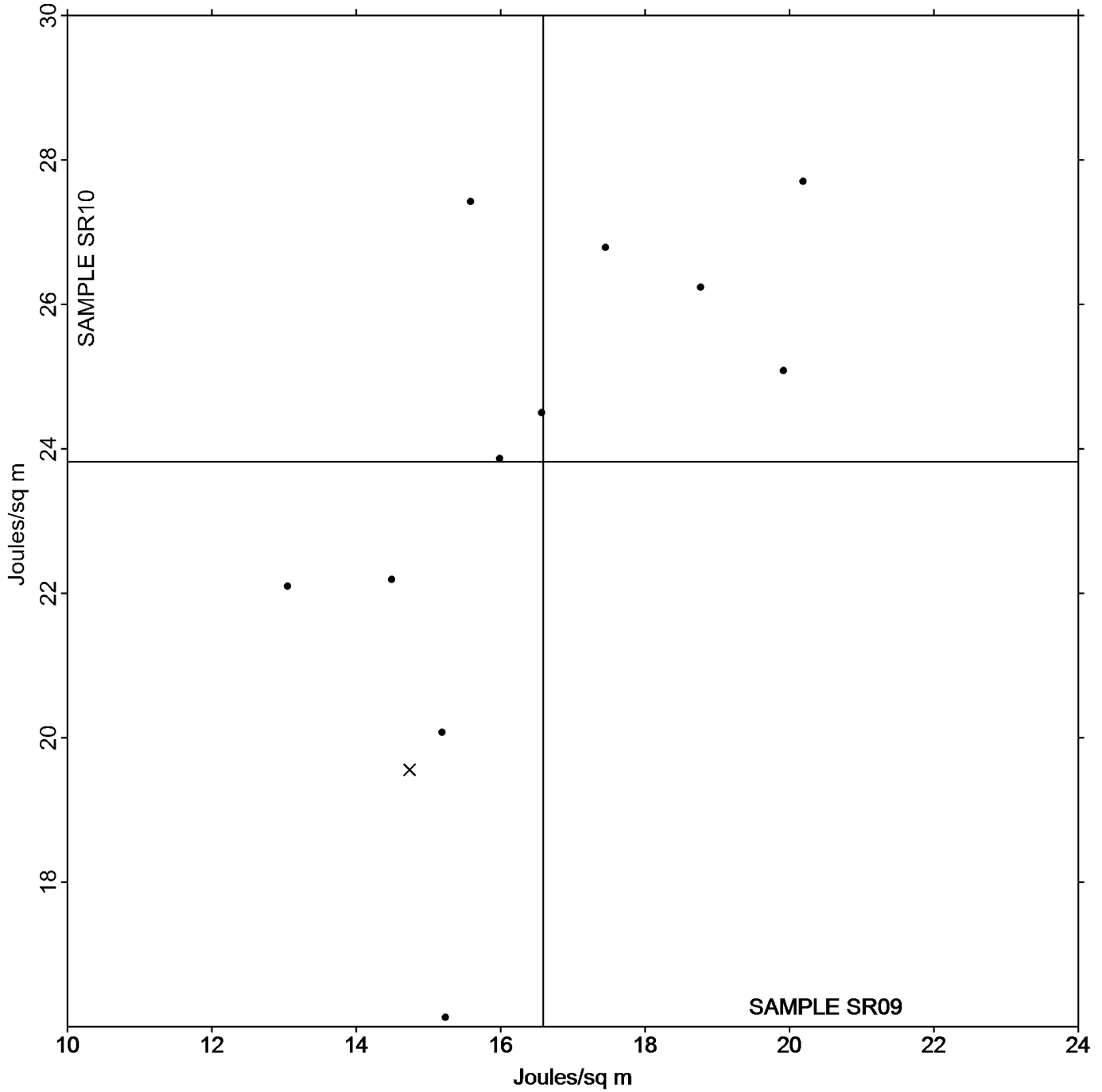
7M36VG (X) - Data appear to be off by a factor of .01; data converted by CTS (x100).

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

Grand Mean Sample **SR09** = 16.585 Joules/sq m

Grand Mean Sample **SR10** = 23.825 Joules/sq m

ANALYSIS 321



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

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

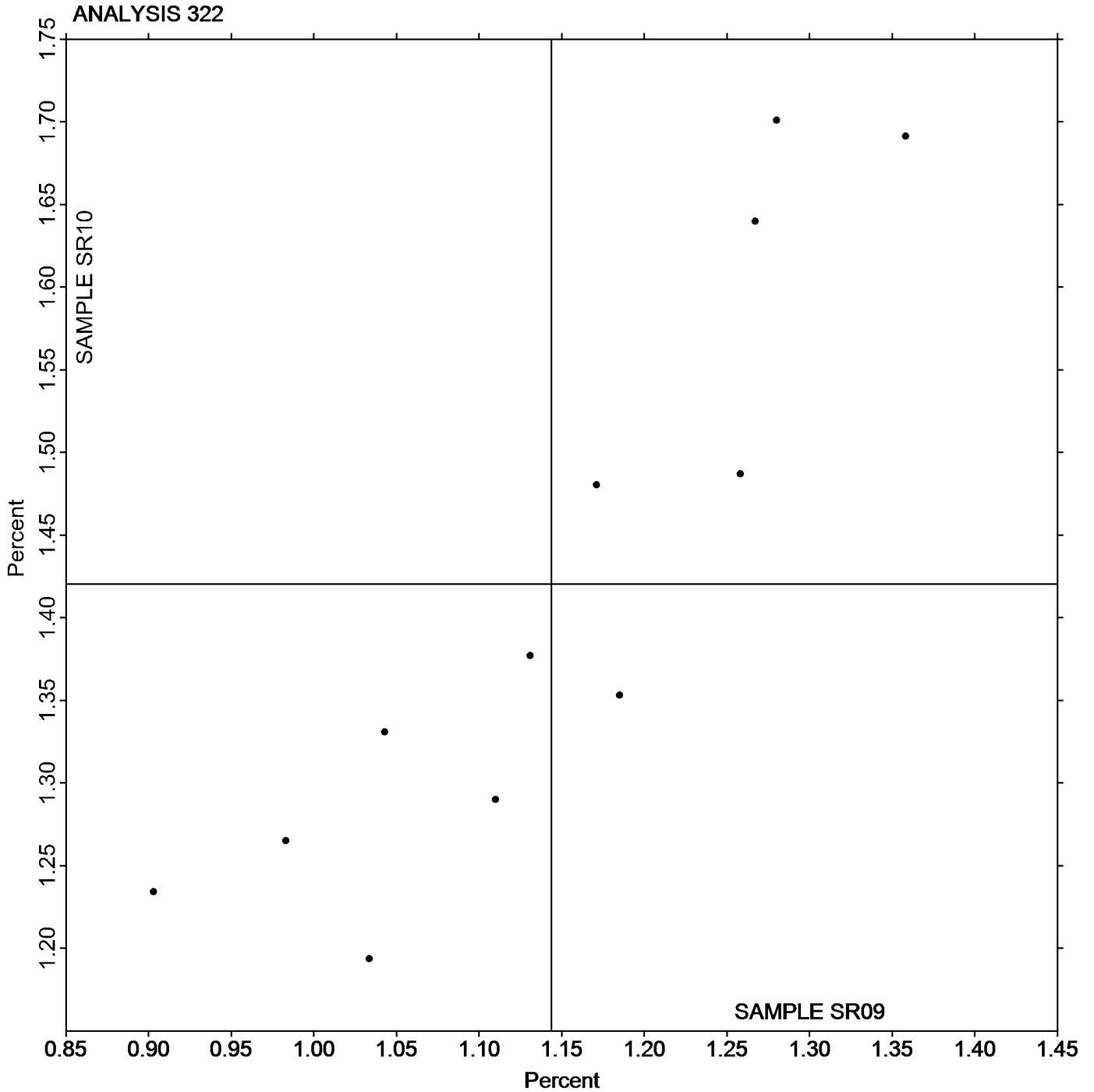
WebCode	Data Flag	Sample SR09			Sample SR10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
7M36VG		1.258	0.114	0.84	1.487	0.067	0.37
87RY4H		1.131	-0.013	-0.09	1.377	-0.043	-0.24
ADZCYJ		1.110	-0.034	-0.25	1.290	-0.130	-0.73
DCYF2K		1.043	-0.101	-0.74	1.331	-0.089	-0.50
DYBBUN		1.267	0.123	0.91	1.640	0.220	1.23
GTRFHA		0.903	-0.240	-1.77	1.234	-0.186	-1.04
K77NUP		1.358	0.215	1.58	1.691	0.271	1.52
PGER7P		0.983	-0.161	-1.18	1.265	-0.155	-0.87
TZE8XQ		1.171	0.028	0.20	1.480	0.060	0.34
XBVHDJ		1.280	0.136	1.01	1.701	0.281	1.57
ZFY726		1.034	-0.110	-0.81	1.194	-0.227	-1.27
ZMMTWB		1.185	0.041	0.31	1.353	-0.067	-0.38

		Summary Statistics			
		Sample SR09		Sample SR10	
Grand Means		1.1436	Percent	1.4203	Percent
SD Btwn Labs		0.1357	Percent	0.1784	Percent
Statistics based on 12 of 12 reporting participants					

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

Grand Mean Sample **SR09** = 1.1436 Percent

Grand Mean Sample **SR10** = 1.4203 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 SF09			Sample SF10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2VRF2G		4.693	-0.039	-0.15	4.879	-0.171	-0.60	LH
32UQVR		4.623	-0.108	-0.42	5.110	0.060	0.21	LH
34JZ49	*	4.357	-0.375	-1.47	4.373	-0.677	-2.38	IM
39U7JE		4.779	0.048	0.19	5.299	0.249	0.88	TP
3G9UF2		4.443	-0.288	-1.13	4.788	-0.262	-0.92	SP
3ZXB JV		4.653	-0.078	-0.31	4.995	-0.055	-0.19	DL
66894M		4.822	0.091	0.35	5.166	0.116	0.41	LH
68WGB4		4.498	-0.234	-0.91	4.784	-0.266	-0.93	LA
6MMMGC		4.448	-0.283	-1.11	4.919	-0.131	-0.46	XX
6QKZ42		5.008	0.277	1.08	5.360	0.310	1.09	LI
8GBD6Z	X	4.612	-0.119	-0.47	5.484	0.434	1.53	TJ
9N46RJ		4.706	-0.025	-0.10	5.007	-0.043	-0.15	LI
BFPZW6		4.935	0.204	0.80	5.333	0.283	0.99	TO
BRZBLF		4.869	0.138	0.54	5.235	0.185	0.65	LH
C9F4L4		4.822	0.091	0.36	4.921	-0.129	-0.45	XX
CLR8AM		4.869	0.137	0.54	5.113	0.063	0.22	LH
CTTEW3	*	5.286	0.554	2.17	5.863	0.813	2.86	MR
DQVV2E		4.882	0.151	0.59	5.262	0.212	0.75	LH
EGNC4G		4.483	-0.248	-0.97	4.770	-0.280	-0.98	LH
EJDLBW		4.544	-0.187	-0.73	4.825	-0.224	-0.79	LA
EZY8X9		4.547	-0.184	-0.72	4.787	-0.263	-0.92	LI
FHXK7A		4.609	-0.123	-0.48	4.850	-0.199	-0.70	TB
FPVCBW		4.751	0.019	0.07	5.187	0.137	0.48	LH
G68886		5.006	0.275	1.07	5.256	0.206	0.72	LI
GGY2FR		4.641	-0.090	-0.35	4.987	-0.062	-0.22	LH
GNGA24		4.596	-0.136	-0.53	4.883	-0.166	-0.58	BU
GWD62M		5.042	0.310	1.21	5.050	0.001	0.00	LX
JQFG2X		4.748	0.016	0.06	4.981	-0.069	-0.24	IN
JTLPNW		4.362	-0.370	-1.45	4.613	-0.437	-1.53	IM
KJ9DN6		5.218	0.487	1.91	5.494	0.445	1.56	LH
KMRACU	*	4.895	0.163	0.64	5.595	0.545	1.92	TJ
KRM2KR		4.559	-0.173	-0.68	5.018	-0.032	-0.11	IM
LFT39F		5.155	0.424	1.66	5.469	0.419	1.47	TJ
MPB2GW		4.768	0.037	0.14	5.245	0.195	0.68	XX
NJMHWT		4.459	-0.273	-1.07	4.749	-0.300	-1.06	TI
NMLWJJ		4.912	0.181	0.71	5.031	-0.019	-0.07	LH
PGER7P		4.531	-0.200	-0.78	4.992	-0.058	-0.20	LH
PZ7VMQ		4.132	-0.599	-2.34	4.603	-0.447	-1.57	LH
QK89WN		4.655	-0.077	-0.30	5.047	-0.003	-0.01	TC
QLGFYG		4.947	0.215	0.84	5.384	0.334	1.17	TO
RDJ64C		4.797	0.066	0.26	4.966	-0.083	-0.29	LH
RPVBEE		4.747	0.016	0.06	5.065	0.015	0.05	TB
T283HE		4.983	0.252	0.98	5.168	0.118	0.42	LE

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

WebCode	Data Flag	Sample SF09			Sample SF10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
T8WKWQ		4.630	-0.101	-0.40	4.936	-0.113	-0.40	TB
U6ZJAY		4.187	-0.544	-2.13	4.634	-0.416	-1.46	RE
U8PTHE		5.071	0.340	1.33	5.156	0.106	0.37	TA
UVYWH3		4.655	-0.077	-0.30	4.864	-0.186	-0.65	TF
V8MH4M		4.797	0.065	0.26	5.170	0.120	0.42	LA
VB6HGH		4.651	-0.080	-0.31	5.125	0.075	0.26	LF
VKCE6L		4.300	-0.432	-1.69	4.588	-0.462	-1.62	TP
XWDRC		5.143	0.412	1.61	5.624	0.574	2.02	TB
XZC9NQ		4.970	0.239	0.93	5.108	0.059	0.21	TO
YUNMEJ	X	3.226	-1.505	-5.89	3.422	-1.628	-5.72	TB
ZZ93K2		4.852	0.120	0.47	4.963	-0.087	-0.30	TP

Sample SF09		Summary Statistics	Sample SF10	
Grand Means	4.7315 kN/m		5.0498 kN/m	
SD Btwn Labs	0.2556 kN/m		0.2846 kN/m	
Statistics based on 52 of 54 reporting participants				

Comments on assigned Data Flags for Test #325

- 8GBD6Z (X) - Inconsistent in testing between samples.
- YUNMEJ (X) - Systematic error (data for both samples are low).

Instrument Code List

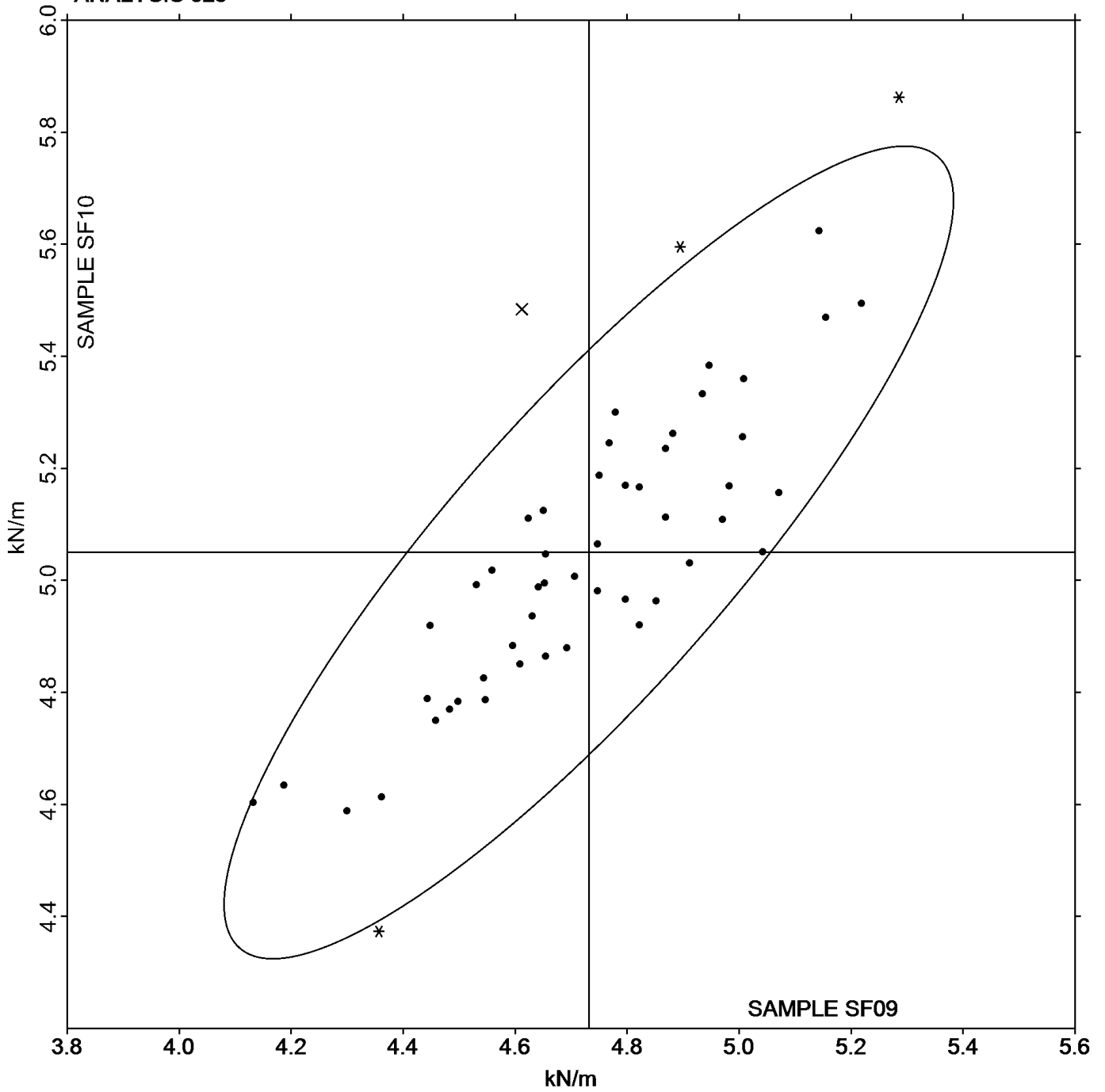
- | | |
|---|--|
| (BU) - Buchel | (DL) - EMIC DL500 Universal Testing Machines |
| (IM) - Instron 5500 Series | (IN) - Instron 3340 series |
| (LA) - L & W Tensile - Autoline 300 | (LE) - L & W Tensile Tester 066 |
| (LF) - L & W Tensile/Fracture Toughness Tester SE 064 | (LH) - L & W Alwetron TH1 (Horizontal) SE 060/065F |
| (LI) - L & W Tensile Tester SE 062 | (LX) - L & W (model not specified) |
| (MR) - MTS Alliance RT series | (RE) - Regmed |
| (SP) - Schopper Type Tensile Tester (TMI) | (TA) - Testometric AX |
| (TB) - Thwing-Albert EJA/1000 | (TC) - Thwing-Albert Electro-Hydraulic, Model 30LT |
| (TF) - Thwing-Albert EJA Vantage-1 | (TI) - Thwing-Albert QC II |
| (TJ) - Thwing-Albert QC II-XS | (TO) - Thwing-Albert QC-1000 |
| (TP) - TMI Monitor/Tensile 100 (84-21-01) | (XX) - Instrument make/model not specified by lab |

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

Grand Mean Sample **SF09** = 4.7315 kN/m

Grand Mean Sample **SF10** = 5.0498 kN/m

ANALYSIS 325



TAPPI-CTS Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

WebCode	Data Flag	Sample SF09			Sample SF10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
32UQVR		64.62	-2.08	-0.27	61.41	-0.10	-0.01	LH
34JZ49	*	68.02	1.33	0.17	52.58	-8.93	-1.32	IM
3ZXBJV		70.29	3.60	0.47	65.89	4.39	0.65	DL
66894M		69.26	2.56	0.33	61.46	-0.05	-0.01	LH
68WGB4		76.00	9.31	1.20	66.53	5.02	0.74	LA
6MMMGC		60.89	-5.80	-0.75	57.27	-4.24	-0.63	XX
6QKZ42		65.00	-1.69	-0.22	59.76	-1.75	-0.26	LI
9N46RJ		66.76	0.06	0.01	60.38	-1.13	-0.17	LI
BFPZW6		80.56	13.87	1.79	77.06	15.55	2.30	TO
BRZBLF		62.92	-3.77	-0.49	58.09	-3.42	-0.51	LH
C9F4L4		64.55	-2.14	-0.28	57.22	-4.29	-0.64	XX
CLR8AM		73.73	7.04	0.91	66.99	5.48	0.81	LH
CTTEW3		56.92	-9.77	-1.27	59.02	-2.49	-0.37	MR
DQVV2E		63.13	-3.56	-0.46	55.86	-5.65	-0.84	LH
EGNC4G		64.29	-2.40	-0.31	56.79	-4.72	-0.70	LH
EJDLBW		55.27	-11.42	-1.48	50.42	-11.09	-1.64	LA
EZY8X9		62.37	-4.32	-0.56	56.03	-5.48	-0.81	LI
FHXX7A	X	82.68	15.99	2.07	70.24	8.73	1.29	TB
FPVCBW		66.58	-0.11	-0.01	61.40	-0.11	-0.02	LH
G68886		72.95	6.26	0.81	65.63	4.12	0.61	LI
GGY2FR		62.45	-4.24	-0.55	55.52	-5.99	-0.89	LH
GNGA24		71.09	4.39	0.57	63.38	1.87	0.28	BU
GWD62M		70.59	3.90	0.50	63.09	1.58	0.23	LX
JTLPNW		71.43	4.74	0.61	65.37	3.86	0.57	IM
KJ9DN6		78.45	11.76	1.52	69.27	7.76	1.15	LH
KRM2KR		65.70	-0.99	-0.13	65.88	4.37	0.65	IM
LFT39F	X	69.53	2.83	0.37	60.77	-0.74	-0.11	TJ
NJMHWT		69.76	3.07	0.40	61.44	-0.07	-0.01	TI
NMLWJJ		65.83	-0.86	-0.11	58.76	-2.75	-0.41	LH
PGER7P		56.84	-9.85	-1.27	59.69	-1.82	-0.27	LH
PZ7VMQ		55.19	-11.50	-1.49	59.10	-2.41	-0.36	LH
QLGFYG		61.33	-5.36	-0.69	60.29	-1.22	-0.18	TO
RDJ64C		74.47	7.78	1.01	66.92	5.41	0.80	LH
RPVBEE		69.62	2.93	0.38	62.84	1.33	0.20	TB
T8WKWQ		71.85	5.16	0.67	66.11	4.60	0.68	TB
VB6HGH		57.95	-8.74	-1.13	58.99	-2.52	-0.37	LW
VKCE6L	*	45.40	-21.29	-2.76	40.89	-20.62	-3.05	TP
XWDRC		71.25	4.56	0.59	73.40	11.89	1.76	TB
YUNMEJ		84.27	17.58	2.27	75.12	13.61	2.01	TB

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

	Summary Statistics	
	Sample SF09	Sample SF10
Grand Means	66.691 Joules/sq m	61.509 Joules/sq m
SD Btwn Labs	7.727 Joules/sq m	6.756 Joules/sq m
Statistics based on 37 of 39 reporting participants		

Comments on assigned Data Flags for Test #327

FHXX7A (X) - Data appear to be off by a factor of 10; data converted by CTS (x.1).

LFT39F (X) - Data appear to be off by a factor of 10; data converted by CTS (x.1).

Analysis Notes:

CTTEW3 - Data appear to be reported as inch-lb/sq inch, not J/sq m as indicated on datasheet. Units corrected by CTS.

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

Instrument Code List

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

TAPPI-CTS Interlaboratory Testing Program

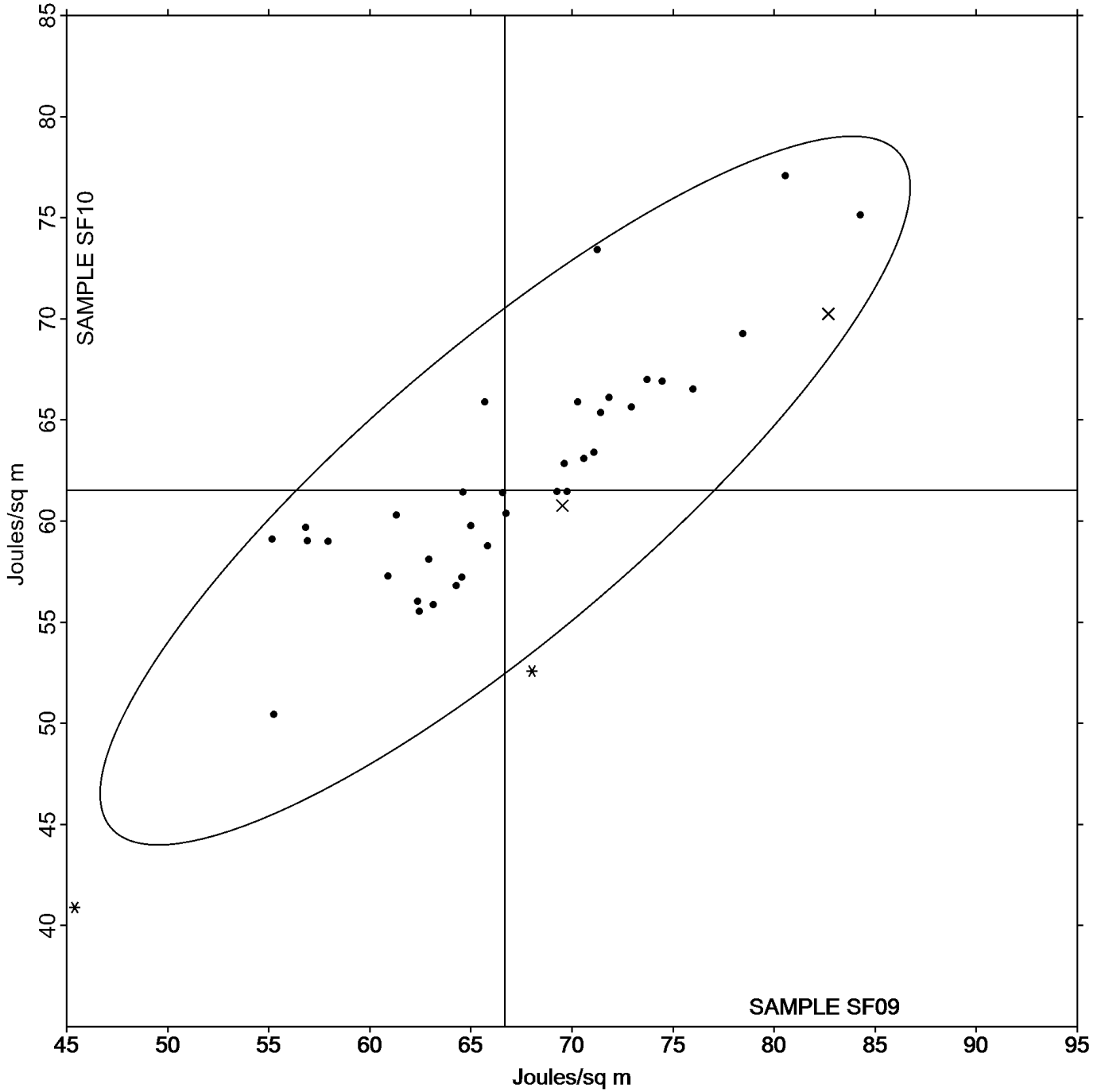
Analysis 327

Tensile Energy Absorption - Printing Papers

Grand Mean Sample **SF09** = 66.691 Joules/sq m

Grand Mean Sample **SF10** = 61.509 Joules/sq m

ANALYSIS 327



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

WebCode	Data Flag	Sample SF09			Sample SF10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
32UQVR		2.039	-0.073	-0.37	1.784	-0.043	-0.29	LH
34JZ49		2.534	0.422	2.14	2.008	0.181	1.21	XX
66894M		2.146	0.034	0.17	1.795	-0.032	-0.21	LH
68WGB4		1.964	-0.148	-0.75	1.655	-0.172	-1.15	LA
6MMMGC		1.976	-0.136	-0.69	1.739	-0.088	-0.59	XX
6QKZ42		1.928	-0.184	-0.94	1.685	-0.142	-0.95	LI
8GBD6Z	X	2.660	0.548	2.79	1.850	0.023	0.16	TJ
9N46RJ		2.109	-0.003	-0.02	1.797	-0.030	-0.20	LI
BFPZW6	X	2.757	0.645	3.28	2.477	0.650	4.35	TO
BRZBLF		1.923	-0.189	-0.96	1.674	-0.153	-1.02	LH
C9F4L4		2.196	0.084	0.43	1.744	-0.083	-0.55	XX
CLR8AM		2.225	0.113	0.57	1.929	0.102	0.68	LH
CTTEW3		1.728	-0.384	-1.95	1.641	-0.186	-1.24	MR
DQVV2E		1.800	-0.312	-1.59	1.487	-0.340	-2.27	LH
EGNC4G		2.146	0.034	0.17	1.798	-0.029	-0.19	XX
EJDLBW		2.160	0.048	0.24	1.866	0.039	0.26	LA
EZY8X9		2.029	-0.083	-0.42	1.743	-0.084	-0.56	LI
FHXK7A		2.249	0.137	0.70	1.850	0.023	0.16	TB
FPVCBW		2.037	-0.075	-0.38	1.770	-0.057	-0.38	LH
G68886		2.153	0.041	0.21	1.851	0.024	0.16	LI
GGY2FR		1.947	-0.165	-0.84	1.601	-0.226	-1.51	LH
GNGA24		2.333	0.221	1.12	1.995	0.168	1.13	BU
GWD62M		2.114	0.002	0.01	1.870	0.043	0.29	LX
JQFG2X		2.475	0.363	1.85	2.045	0.218	1.46	IN
JTLPNW		2.444	0.332	1.69	2.112	0.286	1.91	IM
KJ9DN6		2.217	0.105	0.53	1.886	0.059	0.40	LH
KRM2KR		2.146	0.034	0.17	1.948	0.121	0.81	IM
LFT39F		1.768	-0.344	-1.75	1.470	-0.357	-2.39	TJ
NJMHWT		2.284	0.172	0.87	1.904	0.077	0.52	TI
NMLWJJ		1.998	-0.114	-0.58	1.748	-0.079	-0.53	LH
PGER7P		1.889	-0.223	-1.14	1.805	-0.022	-0.15	LH
PZ7VMQ		1.993	-0.119	-0.61	1.914	0.087	0.58	LH
QLGFYG		1.835	-0.277	-1.41	1.669	-0.158	-1.06	TG
RDJ64C		2.275	0.163	0.83	1.972	0.145	0.97	LH
RPVBEE		2.180	0.068	0.35	1.882	0.056	0.37	TB
T8WKWQ		2.354	0.242	1.23	2.059	0.232	1.56	TB
U6ZJAY		2.246	0.133	0.68	2.032	0.205	1.37	RE
UVYWH3		2.380	0.268	1.36	1.920	0.093	0.62	TF
VB6HGH		1.886	-0.226	-1.15	1.785	-0.042	-0.28	LX
VKCE6L		2.203	0.091	0.46	1.852	0.025	0.17	TP
XWDRC		2.067	-0.045	-0.23	1.960	0.133	0.89	TB
XZC9NQ	X	3.227	1.115	5.67	2.854	1.027	6.87	TO
YUNMEJ	X	62.923	60.811	309.39	55.087	53.260	356.45	TB

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

	Summary Statistics	
	Sample SF09	Sample SF10
Grand Means	2.1122 Percent	1.8268 Percent
SD Btwn Labs	0.1966 Percent	0.1494 Percent
Statistics based on 39 of 43 reporting participants		

Comments on assigned Data Flags for Test #328

- 8GBD6Z (X) - Inconsistent in testing between samples.
- BFPZW6 (X) - Data for both samples are high. Inconsistent within the determinations for Sample SF10.
- XZC9NQ (X) - Extreme data.
- YUNMEJ (X) - Extreme data.

Instrument Code List

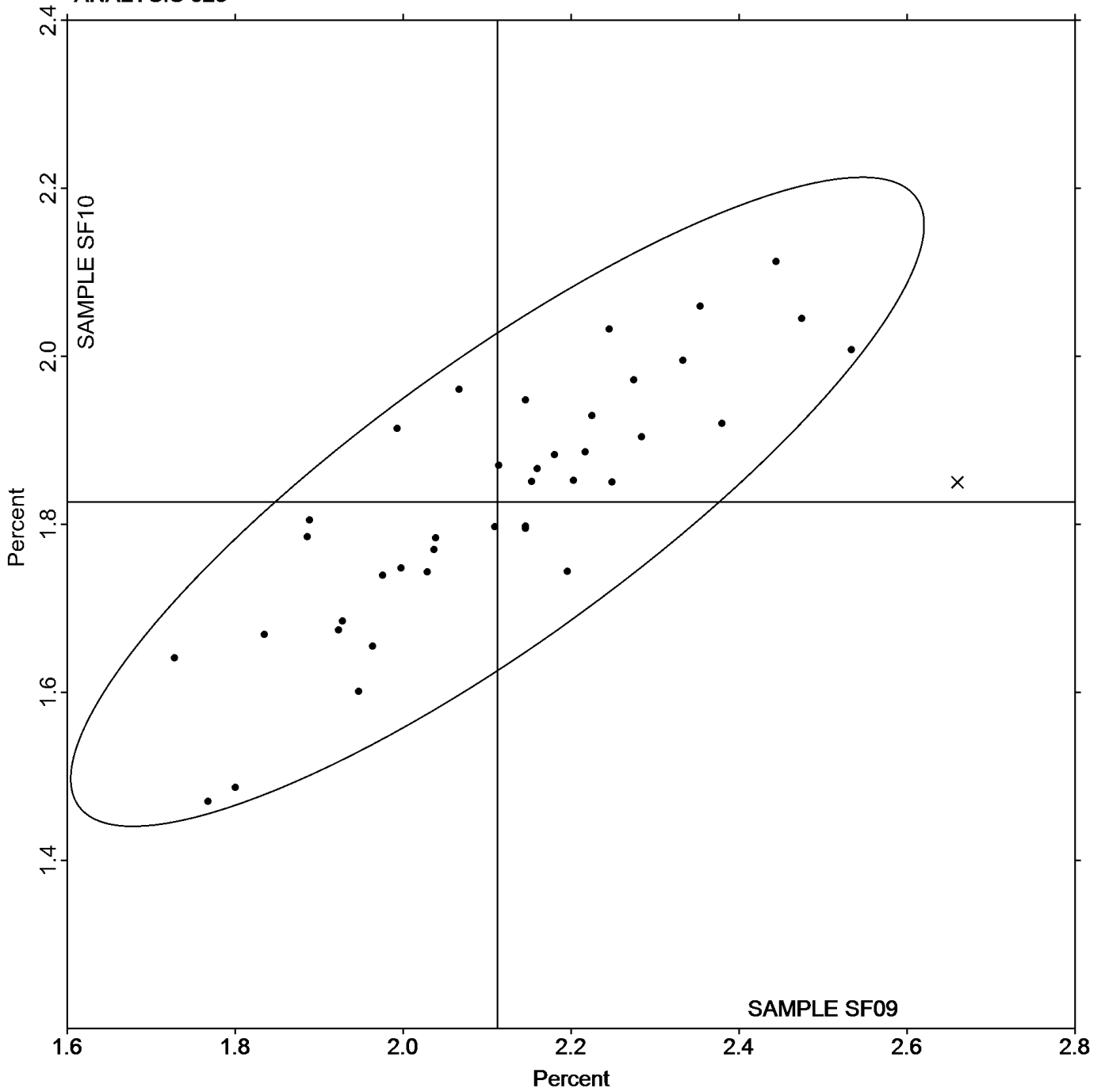
- | | |
|--|---|
| (BU) - Buchel
(IN) - Instron 3340 Series
(LH) - L & W Alwetron TH1 (Horizontal) SE 060
(LX) - L & W (model not specified)
(RE) - Regmed
(TF) - Thwing-Albert EJA Vantage-1
(TI) - Thwing-Albert QC II
(TO) - Thwing-Albert QC-1000
(XX) - Instrument make/model not specified by lab | (IM) - Instron 5500
(LA) - L & W Tensile - Autoline 300
(LI) - L & W Tensile Tester SE 062
(MR) - MTS Alliance RT series
(TB) - Thwing-Albert EJA/1000
(TG) - Thwing-Albert QC
(TJ) - Thwing-Albert QC II-XS
(TP) - TMI Monitor/Tensile 100 (84-21-01) |
|--|---|

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

Grand Mean Sample **SF09** = 2.1122 Percent

Grand Mean Sample **SF10** = 1.8268 Percent

ANALYSIS 328



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

WebCode	Data Flag	Sample SE09			Sample SE10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2P76B7		11.68	0.03	0.04	9.052	0.338	0.68	LE
3BHJ4H		10.78	-0.87	-1.28	7.911	-0.803	-1.60	TK
4LCFHP		11.44	-0.21	-0.31	8.689	-0.025	-0.05	TP
6F4EWL		12.38	0.73	1.07	9.202	0.488	0.98	TO
76ZJEG		11.82	0.16	0.24	8.681	-0.033	-0.07	TA
78PRLW		10.59	-1.06	-1.56	8.195	-0.519	-1.04	IK
79JHRB		11.92	0.27	0.39	8.961	0.247	0.49	LW
7M36VG		12.21	0.56	0.82	9.469	0.755	1.51	LA
82WAH6		11.02	-0.63	-0.92	8.730	0.016	0.03	XX
8MW974		11.12	-0.53	-0.78	8.481	-0.233	-0.47	LW
9QTEZZ		11.55	-0.10	-0.14	8.377	-0.337	-0.67	TB
A37VAH		11.23	-0.42	-0.61	8.707	-0.007	-0.01	IF
AZXN64		13.30	1.65	2.42	9.743	1.029	2.06	TP
BHDEG9		11.18	-0.47	-0.69	8.047	-0.667	-1.33	IM
BRZBLF		12.07	0.41	0.61	9.015	0.301	0.60	LH
CJ3ZQB		13.13	1.48	2.16	9.737	1.023	2.04	LA
CMYRV2		12.50	0.85	1.25	8.730	0.016	0.03	TK
CW9V77		10.25	-1.40	-2.05	7.938	-0.776	-1.55	SA
DDVWEH		12.57	0.92	1.35	9.655	0.941	1.88	LA
DWL3M9		11.63	-0.02	-0.03	8.933	0.219	0.44	TH
E3NG7N		11.17	-0.48	-0.70	8.710	-0.004	-0.01	LE
E8K3V7		11.71	0.06	0.09	8.396	-0.318	-0.64	TO
G9Q4WV		11.12	-0.53	-0.78	8.548	-0.166	-0.33	TO
GGL3M4		13.14	1.49	2.18	9.355	0.641	1.28	TH
HKDT97		11.28	-0.37	-0.54	8.670	-0.044	-0.09	TP
J8LLNA		11.34	-0.31	-0.45	8.573	-0.141	-0.28	ID
L32HRN		11.14	-0.51	-0.75	8.546	-0.168	-0.34	LA
LZCAK9		12.26	0.61	0.89	9.177	0.463	0.92	TO
MVK4MX		10.92	-0.73	-1.07	7.898	-0.816	-1.63	LW
PENLND		11.84	0.19	0.27	8.564	-0.150	-0.30	IK
Q4H4QF		11.63	-0.02	-0.03	8.982	0.268	0.54	LX
QFDEYM		11.21	-0.44	-0.65	7.846	-0.868	-1.74	TK
QZY73Q		11.72	0.07	0.11	9.072	0.358	0.71	TB
RA6BLU		12.17	0.51	0.75	9.010	0.296	0.59	TH
UBPYZQ		11.90	0.25	0.37	8.840	0.126	0.25	TH
VKCE6L		11.30	-0.36	-0.52	8.220	-0.493	-0.99	TO
VQVMMQ		12.03	0.38	0.55	9.030	0.316	0.63	LH
WGN8FH		11.32	-0.33	-0.48	8.505	-0.209	-0.42	TB
WMR9GC		10.92	-0.74	-1.08	8.095	-0.619	-1.24	LH
ZWPBAY		11.56	-0.09	-0.14	8.267	-0.447	-0.89	IF

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

	Sample SE09	Summary Statistics	Sample SE10
Grand Means	11.651 kN/m		8.7139 kN/m
SD Btwn Labs	0.684 kN/m		0.5003 kN/m
Statistics based on 40 of 40 reporting participants			

Analysis Notes:

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

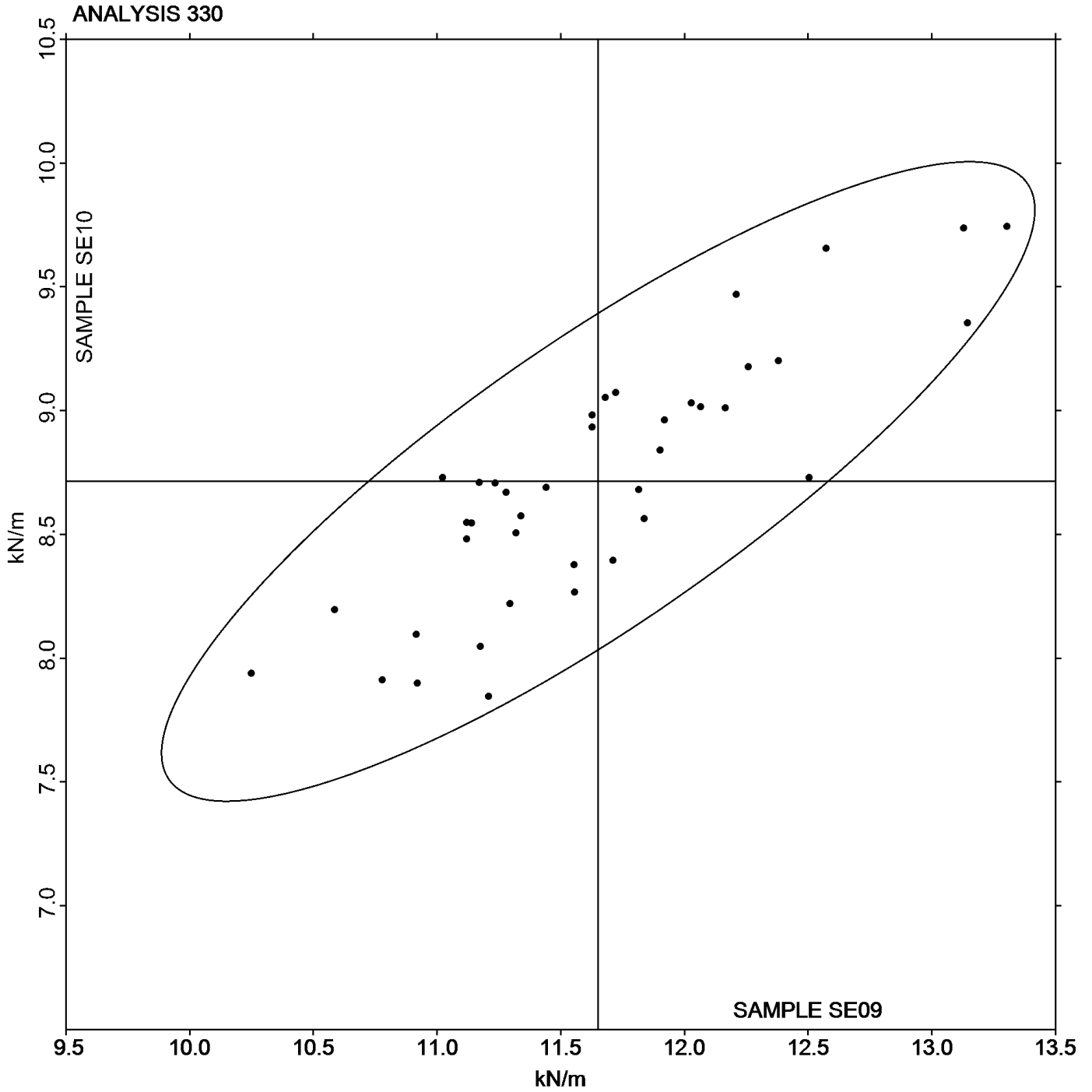
Instrument Code List

(ID) - Instron 4201	(IF) - Instron 3340 Series
(IK) - Instron 4400 Series	(IM) - Instron 5500 Series
(LA) - L & W Autoline	(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)
(XX) - Instrument make/model not specified by lab	

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

Grand Mean Sample **SE09** = 11.651 kN/m

Grand Mean Sample **SE10** = 8.7139 kN/m



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

WebCode	Data Flag	Sample SE09			Sample SE10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3BHJ4H		175.5	-21.3	-0.80	68.65	-9.03	-0.81	TK
6F4EWL		253.6	56.7	2.12	99.03	21.36	1.92	TO
78PRLW		203.3	6.4	0.24	91.94	14.26	1.28	IK
79JHRB		195.4	-1.4	-0.05	72.46	-5.22	-0.47	LW
7M36VG	X	1.5	-195.4	-7.30	0.61	-77.07	-6.91	LA
82WAH6		184.4	-12.4	-0.46	75.19	-2.49	-0.22	XX
AZXN64		129.1	-67.8	-2.53	53.65	-24.03	-2.16	TP
BHDEG9		183.6	-13.3	-0.50	69.68	-8.00	-0.72	IM
BRZBLF		196.4	-0.5	-0.02	79.80	2.12	0.19	LH
CJ3ZQB		218.4	21.5	0.80	82.86	5.19	0.47	LA
CW9V77		161.8	-35.0	-1.31	70.29	-7.39	-0.66	SA
DDVWEH		212.9	16.0	0.60	89.15	11.47	1.03	LA
DWL3M9		202.5	5.7	0.21	87.08	9.40	0.84	TH
E3NG7N	X	196.0	-0.9	-0.03	83.20	5.52	0.50	LE
E8K3V7		210.7	13.8	0.52	69.70	-7.98	-0.72	TO
G9Q4WV		134.1	-62.8	-2.35	55.51	-22.17	-1.99	TO
GGL3M4		240.9	44.1	1.64	87.30	9.62	0.86	TH
HKDT97		198.4	1.5	0.06	86.70	9.02	0.81	TP
L32HRN		210.7	13.9	0.52	83.03	5.35	0.48	LA
LZCAK9		204.8	7.9	0.29	83.04	5.36	0.48	XX
MVK4MX		179.7	-17.2	-0.64	64.51	-13.17	-1.18	LW
PENLND		200.2	3.4	0.13	73.98	-3.70	-0.33	TH
Q4H4QF		200.1	3.2	0.12	76.91	-0.77	-0.07	LX
QZY73Q		216.0	19.1	0.71	94.71	17.04	1.53	TB
RA6BLU		206.8	9.9	0.37	77.35	-0.33	-0.03	TH
UBPYZQ		236.5	39.6	1.48	96.03	18.35	1.65	TH
VKCE6L		204.5	7.6	0.28	75.45	-2.23	-0.20	TO
VQVMMQ		200.8	3.9	0.15	75.74	-1.94	-0.17	LH
WGN8FH		178.8	-18.1	-0.67	69.22	-8.46	-0.76	TB
WMR9GC		178.1	-18.7	-0.70	69.89	-7.79	-0.70	LH
ZWPBAY		191.2	-5.7	-0.21	73.83	-3.84	-0.34	IN

Sample SE09		Summary Statistics	Sample SE10	
Grand Means	196.87 Joules/sq m		77.679 Joules/sq m	
SD Btw Labs	26.78 Joules/sq m		11.147 Joules/sq m	
Statistics based on 29 of 31 reporting participants				

Comments on assigned Data Flags for Test #331

7M36VG (X) - Extreme data.

E3NG7N (X) - Data appears to be transposed between Analysis #331 and Analysis #332. Data switched by CTS.

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

Analysis Notes:

G9Q4WV - Data appear to be reported as kg-m/sq m, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

HKDT97 - Data appear to be reported as J/sq m, not kg-m/sq m as indicated on datasheet. Units corrected by CTS.

Instrument Code List

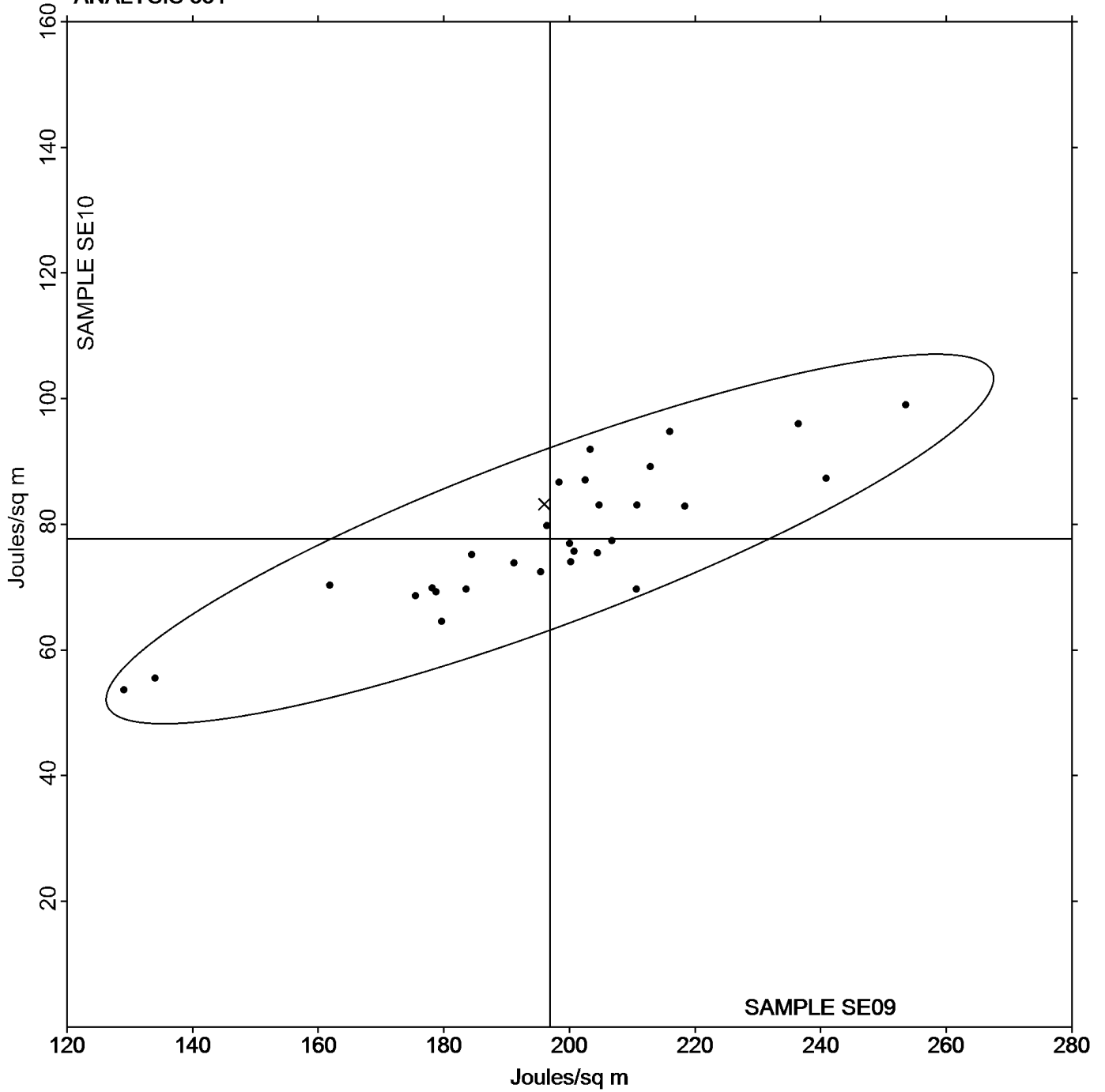
(IK) - Instron 4400 Series	(IM) - Instron 5500 Series
(IN) - Instron 3360 Series	(LA) - L & W Autoline
(LE) - L & W Tensile Tester 066	(LH) - L & W Alwetron TH1 (Horizontal) SE 060
(LW) - L & W Tensile Tester SE062	(LX) - L & W (model not specified)
(SA) - Shimadzu Autograph AG 2000 A	(TB) - Thwing-Albert 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 **SE09** = 196.87 Joules/sq m

Grand Mean Sample **SE10** = 77.679 Joules/sq m

ANALYSIS 331



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

WebCode	Data Flag	Sample SE09			Sample SE10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3BHJ4H		2.440	-0.175	-0.64	1.377	-0.129	-0.59	TK
6F4EWL		3.100	0.485	1.77	1.781	0.274	1.25	TO
78PRLW		3.203	0.588	2.14	2.056	0.550	2.51	IK
79JHRB		2.416	-0.199	-0.73	1.291	-0.216	-0.98	LW
7M36VG		2.427	-0.188	-0.69	1.512	0.005	0.03	LA
82WAH6		2.451	-0.164	-0.60	1.340	-0.167	-0.76	XX
8MW974		2.382	-0.233	-0.85	1.353	-0.154	-0.70	LW
9QTEZZ		2.356	-0.259	-0.94	1.379	-0.128	-0.58	TB
AZXN64		2.977	0.362	1.32	1.780	0.273	1.25	TP
BHDEG9		2.738	0.123	0.45	1.676	0.169	0.77	IM
BRZBLF		2.378	-0.237	-0.86	1.375	-0.132	-0.60	LH
CJ3ZQB		2.392	-0.223	-0.81	1.304	-0.203	-0.92	LA
CW9V77		2.298	-0.317	-1.16	1.423	-0.084	-0.38	SA
DDVWEH		2.393	-0.222	-0.81	1.368	-0.139	-0.63	LA
DWL3M9		2.812	0.197	0.72	1.734	0.227	1.04	TH
E3NG7N	X	2.560	-0.055	-0.20	1.480	-0.027	-0.12	LE
E8K3V7		2.604	-0.011	-0.04	1.306	-0.201	-0.92	TO
G9Q4WV		3.005	0.390	1.42	1.868	0.361	1.65	TO
GGL3M4		2.810	0.195	0.71	1.559	0.052	0.24	TH
HKDT97		3.240	0.625	2.28	2.000	0.493	2.25	TP
J8LLNA		2.463	-0.152	-0.55	1.406	-0.101	-0.46	ID
L32HRN		2.362	-0.253	-0.92	1.279	-0.228	-1.04	LA
LZCAK9		2.640	0.025	0.09	1.590	0.083	0.38	XX
MVK4MX		2.403	-0.212	-0.77	1.270	-0.237	-1.08	LW
PENLND		2.736	0.121	0.44	1.620	0.113	0.52	IX
Q4H4QF		2.475	-0.140	-0.51	1.321	-0.186	-0.85	LX
QZY73Q		2.790	0.175	0.64	1.670	0.163	0.75	TB
RA6BLU		2.635	0.020	0.07	1.508	0.001	0.01	TH
UBPYZQ		3.027	0.412	1.50	1.733	0.226	1.03	TH
VKCE6L		2.687	0.072	0.26	1.467	-0.040	-0.18	TO
VQVMMQ		2.435	-0.180	-0.66	1.334	-0.173	-0.79	XX
WGN8FH		2.331	-0.284	-1.04	1.279	-0.228	-1.04	TB
WMR9GC		2.386	-0.229	-0.83	1.338	-0.169	-0.77	LH
ZWPBAY		2.501	-0.114	-0.42	1.418	-0.089	-0.40	IN

Sample SE09		Summary Statistics	Sample SE10	
Grand Means	2.6149 Percent		1.5065	Percent
SD Btw Labs	0.2743 Percent		0.2190	Percent
Statistics based on 33 of 34 reporting participants				

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

Comments on assigned Data Flags for Test #332

E3NG7N (X) - Data appears to be transposed between Analysis #332 and Analysis #331. Data switched by CTS.

Instrument Code List

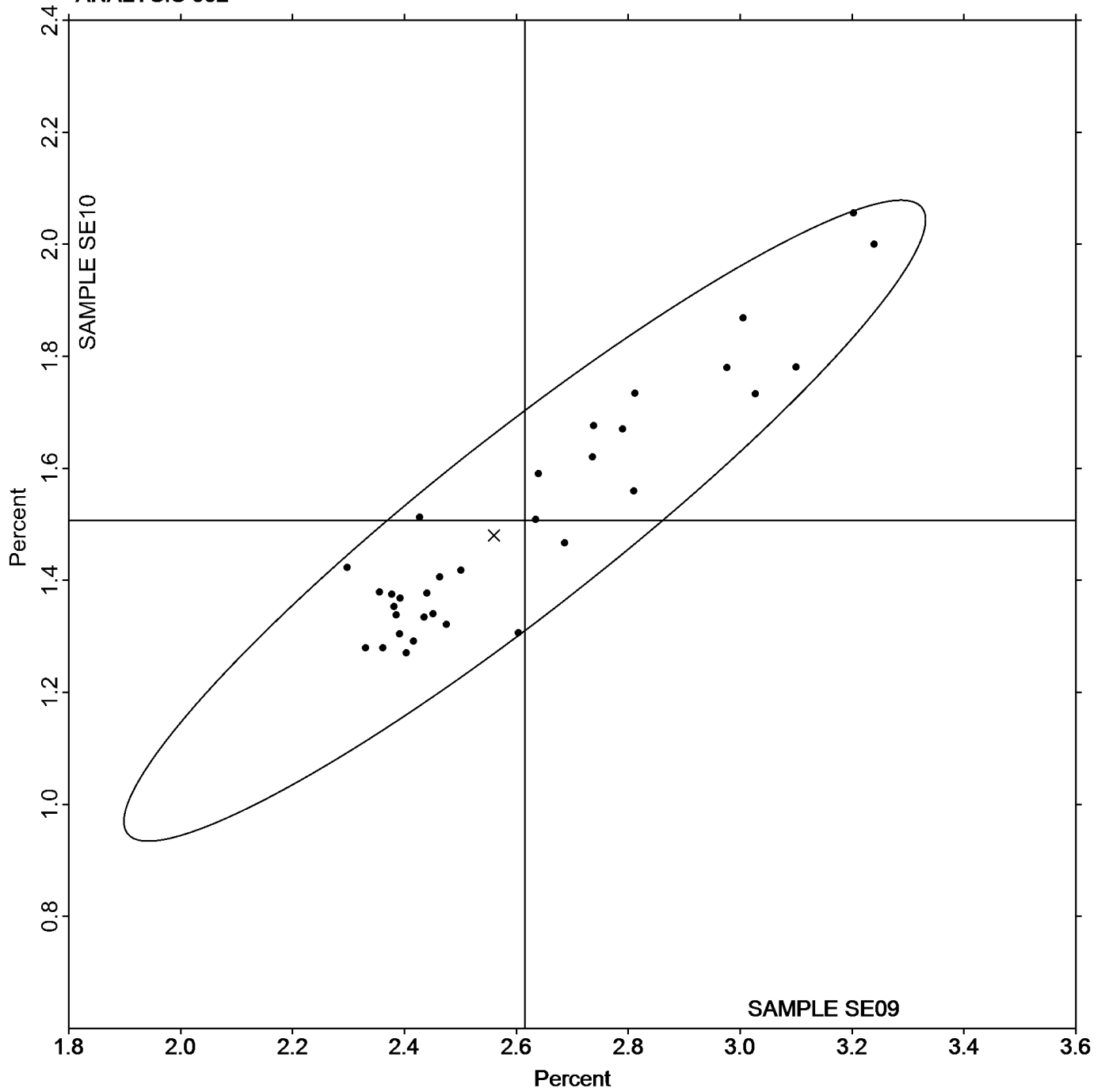
(ID) - Instron 4201	(IK) - Instron 4400 Series
(IM) - Instron 5500 Series	(IN) - Instron 3360 Series
(IX) - Instron (model not specified)	(LA) - L & W Autoline 300
(LE) - L & W Tensile Tester 066	(LH) - L & W Alwetron TH1 (Horizontal) SE 060
(LW) - L & W Tensile Tester SE062	(LX) - L & W (model not specified)
(SA) - Shimadzu Autograph AG 2000 A	(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 **SE09** = 2.6149 Percent

Grand Mean Sample **SE10** = 1.5065 Percent

ANALYSIS 332



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

WebCode	Data Flag	Sample SG09			Sample SG10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
34JZ49		306.7	22.4	0.22	257.4	-5.9	-0.09	MT
4LCFHP		172.4	-111.9	-1.09	164.7	-98.6	-1.49	MT
6QKZ42		336.6	52.3	0.51	326.4	63.1	0.95	MT
7DE6MK		259.5	-24.8	-0.24	246.4	-16.9	-0.25	MT
8GBD6Z		329.9	45.6	0.44	412.4	149.1	2.25	MT
8MW974	X	51.3	-233.0	-2.27	42.7	-220.6	-3.32	MT
9QTEZZ		128.1	-156.2	-1.52	177.5	-85.8	-1.29	XX
AA2VNB		412.1	127.8	1.24	330.0	66.7	1.01	MT
CMYRV2		221.8	-62.5	-0.61	241.8	-21.5	-0.32	MT
DDVWEH		241.9	-42.4	-0.41	203.4	-59.9	-0.90	XX
EJDLBW		316.4	32.1	0.31	253.4	-9.9	-0.15	MT
GNGA24		307.7	23.4	0.23	235.3	-28.0	-0.42	MT
JTLPNW		427.6	143.3	1.39	232.7	-30.6	-0.46	MT
KMRACU		186.7	-97.6	-0.95	205.1	-58.2	-0.88	XX
NUKJD4		467.1	182.8	1.78	310.1	46.8	0.71	XX
T283HE		315.6	31.3	0.30	343.6	80.3	1.21	MT
UVYWH3		118.4	-165.9	-1.61	272.2	8.9	0.13	MT

		Summary Statistics	
	Sample SG09		Sample SG10
Grand Means	284.28 Double Folds		263.28 Double Folds
SD Btwn Labs	102.78 Double Folds		66.35 Double Folds
Statistics based on 16 of 17 reporting participants			

Comments on assigned Data Flags for Test #334

8MW974 (X) - Data for Sample SG10 are low.

Instrument Code List

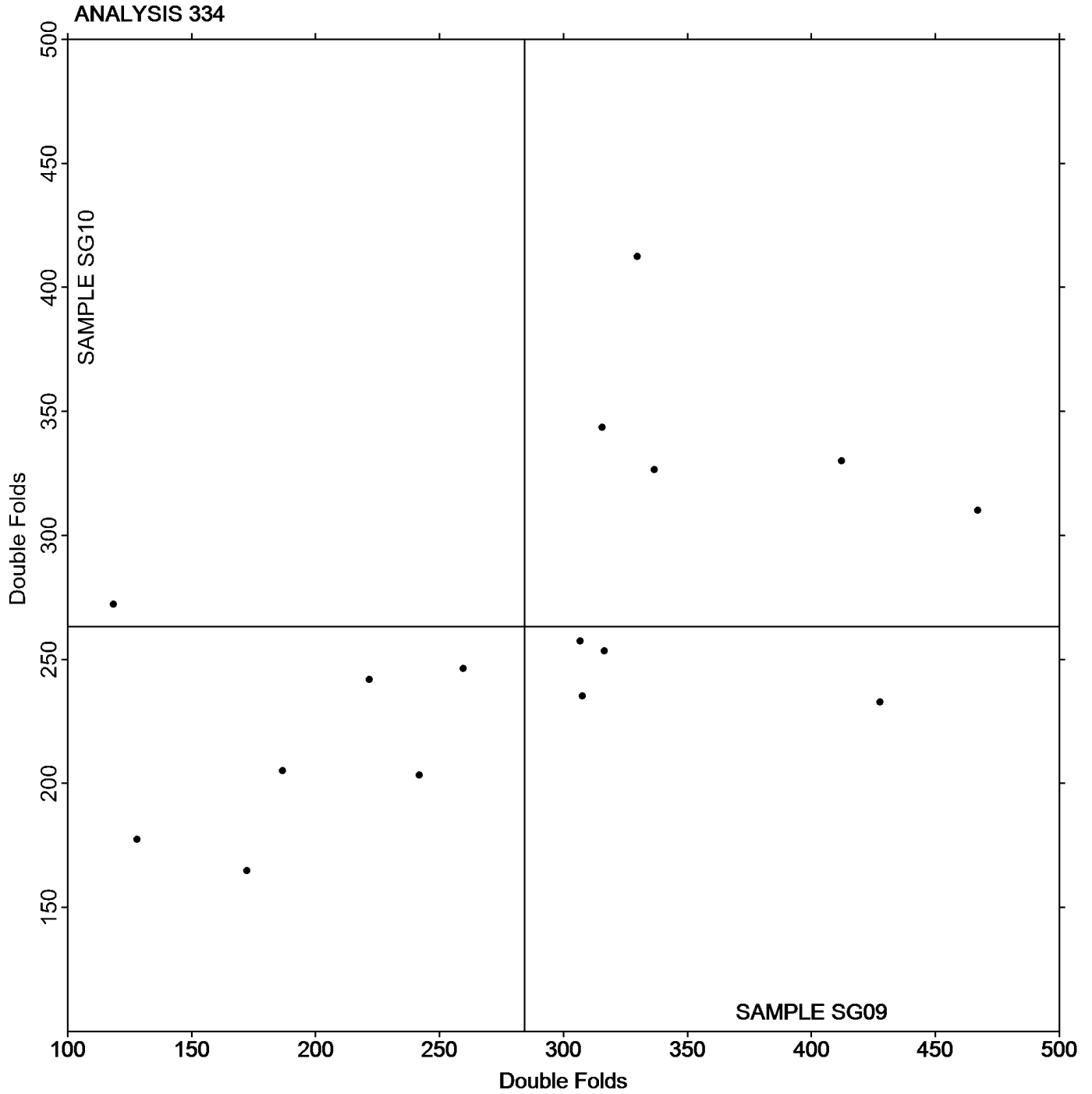
(MT) - MIT - Tinius Olsen

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

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

Grand Mean Sample **SG09** = 284.28 Double Folds

Grand Mean Sample **SG10** = 263.28 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 SH09			Sample SH10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2VRF2G		147.6	17.4	1.19	247.5	32.5	1.75
8GBD6Z		121.9	-8.3	-0.57	197.8	-17.2	-0.93
9QTEZZ		140.5	10.2	0.70	219.2	4.2	0.22
BFPZW6		119.0	-11.2	-0.77	201.8	-13.2	-0.71
CTTEW3		114.1	-16.1	-1.10	191.6	-23.4	-1.26
EAM3V3		136.9	6.7	0.46	207.6	-7.4	-0.40
EJDLBW		120.1	-10.1	-0.69	210.7	-4.3	-0.23
EKMQPK		127.8	-2.4	-0.16	220.7	5.7	0.31
FLCEM8		135.0	4.8	0.33	231.1	16.1	0.87
FPVCBW		123.0	-7.2	-0.49	206.9	-8.1	-0.44
G9Q4WV		150.8	20.5	1.40	260.5	45.5	2.45
GNGA24		137.9	7.7	0.52	234.7	19.7	1.06
JTLPNW		117.9	-12.3	-0.84	201.4	-13.6	-0.73
NJMHWT	X	74.1	-56.1	-3.83	115.9	-99.1	-5.33
PENLND	*	166.5	36.3	2.48	226.4	11.4	0.62
PZ7VMQ		121.7	-8.6	-0.58	201.6	-13.4	-0.72
QK89WN		124.9	-5.3	-0.36	208.1	-6.9	-0.37
RPVBEE		110.3	-19.9	-1.36	199.6	-15.4	-0.83
T73R28		141.8	11.6	0.79	222.7	7.7	0.41
THRQPN		116.5	-13.7	-0.94	195.2	-19.8	-1.07

		Summary Statistics	
	Sample SH09		Sample SH10
Grand Means	130.21 Gurley Units		214.99 Gurley Units
SD Btwn Labs	14.64 Gurley Units		18.58 Gurley Units
Statistics based on 19 of 20 reporting participants			

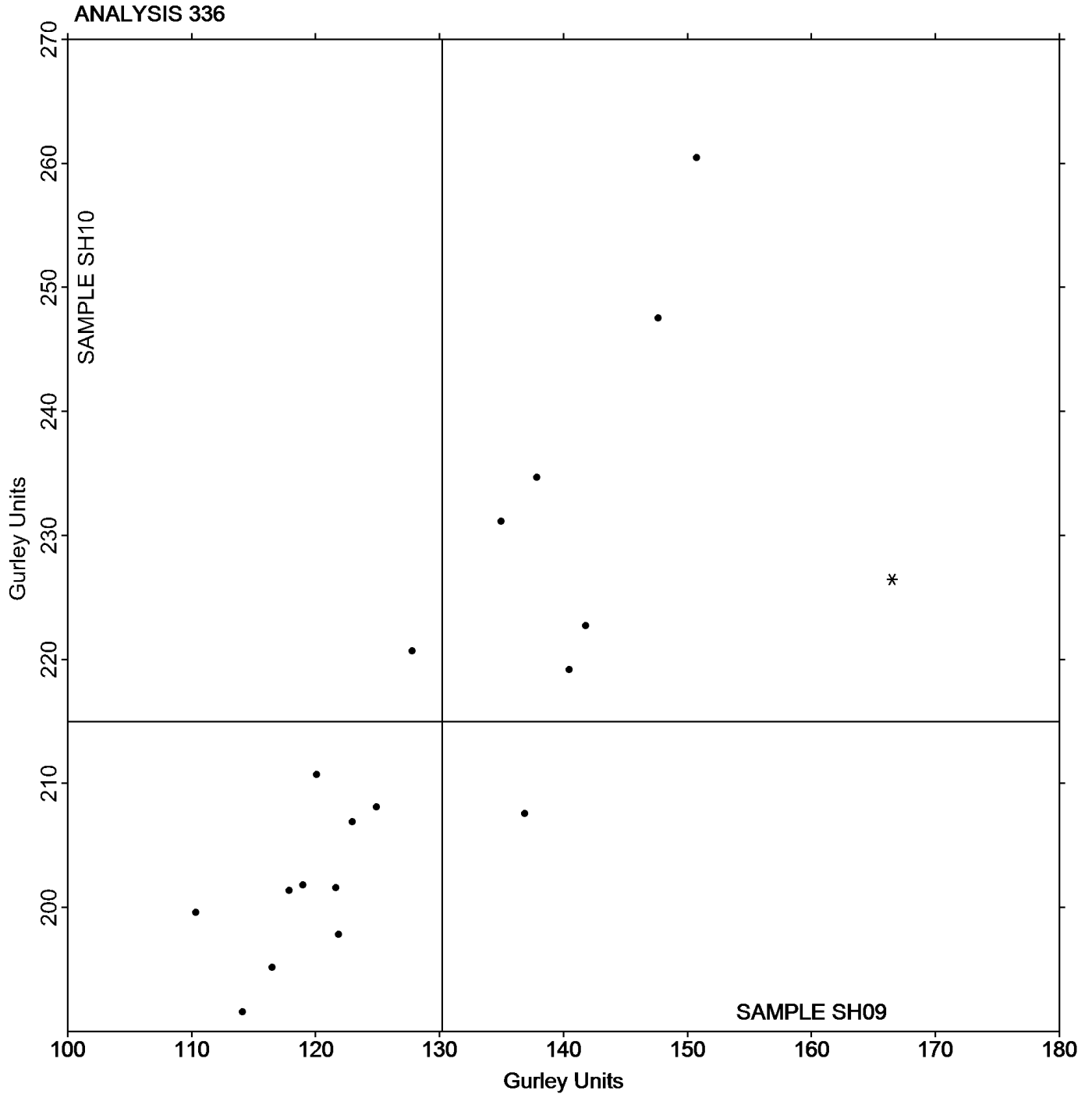
Comments on assigned Data Flags for Test #336

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

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

Grand Mean Sample **SH09** = 130.21 Gurley Units

Grand Mean Sample **SH10** = 214.99 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 SJ09			Sample SJ10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
39U7JE		1.885	-0.048	-0.15	4.449	0.145	0.21
68WGB4		1.751	-0.182	-0.59	4.458	0.154	0.23
6UMYFU		1.991	0.058	0.19	4.683	0.379	0.56
79JHRB		1.670	-0.263	-0.85	3.440	-0.864	-1.27
AA2VNB		1.855	-0.078	-0.25	4.479	0.175	0.26
CTTEW3		1.448	-0.485	-1.56	3.623	-0.681	-1.00
FPVCBW		2.247	0.314	1.02	4.578	0.274	0.40
JTLPNW		1.745	-0.188	-0.61	4.428	0.124	0.18
KMRACU	*	2.665	0.732	2.36	2.831	-1.473	-2.17
LFT39F		1.955	0.022	0.07	4.547	0.243	0.36
MPB2GW		1.740	-0.193	-0.62	4.296	-0.008	-0.01
PENLND	X	0.189	-1.743	-5.63	0.439	-3.864	-5.70
T8WKWQ		1.932	-0.001	0.00	4.517	0.213	0.31
ZWPBAY		2.240	0.307	0.99	5.620	1.316	1.94

		Summary Statistics	
	Sample SJ09		Sample SJ10
Grand Means	1.9326 Taber Units		4.3036 Taber Units
SD Btwn Labs	0.3097 Taber Units		0.6785 Taber Units
Statistics based on 13 of 14 reporting participants			

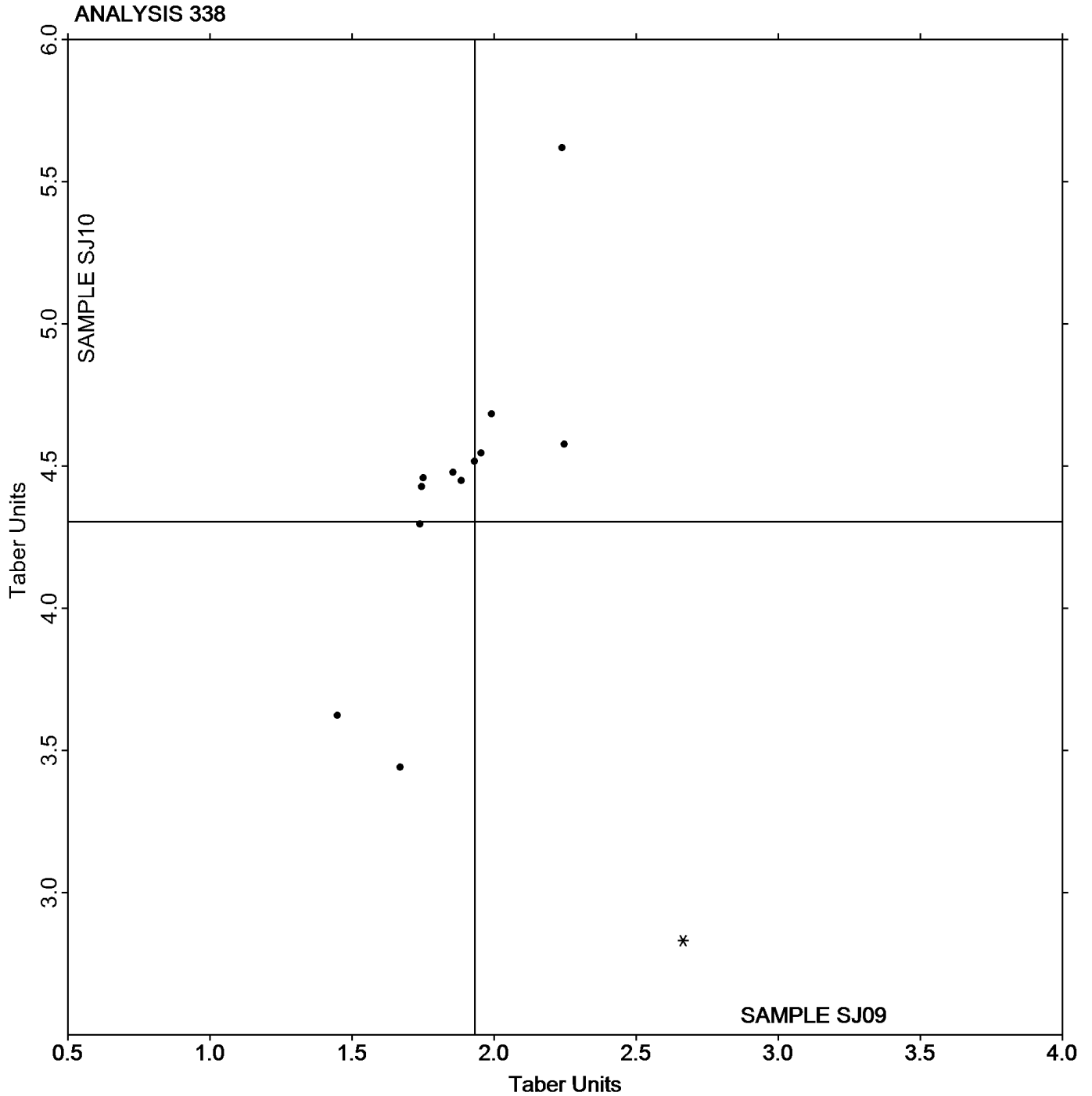
Comments on assigned Data Flags for Test #338

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

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

Grand Mean Sample **SJ09** = 1.9326 Taber Units

Grand Mean Sample **SJ10** = 4.3036 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 SQ09			Sample SQ10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3ZXBJV		35.54	-0.77	-0.42	21.36	-1.29	-1.26
79JHRB		34.85	-1.46	-0.79	22.05	-0.60	-0.59
8MW974		36.75	0.44	0.24	23.29	0.64	0.63
DDVWEH		38.30	1.99	1.08	22.80	0.15	0.15
E3NG7N		35.63	-0.68	-0.37	22.26	-0.39	-0.38
EKMQPK		33.79	-2.52	-1.37	20.67	-1.98	-1.94
GNGA24		36.27	-0.04	-0.02	23.11	0.46	0.45
JTLPNW		35.83	-0.48	-0.26	21.76	-0.89	-0.87
K77NUP		38.88	2.57	1.40	24.28	1.63	1.61
KRM2KR		38.00	1.69	0.92	23.50	0.85	0.84
L32HRN		33.00	-3.31	-1.80	22.58	-0.07	-0.07
QLGFYG		36.40	0.09	0.05	22.90	0.25	0.25
QZY73Q		38.82	2.51	1.36	23.85	1.20	1.18
ZZ93K2	X	42.95	6.64	3.61	26.96	4.31	4.24

		Summary Statistics	
	Sample SQ09		Sample SQ10
Grand Means	36.312 Taber Units		22.647 Taber Units
SD Btwn Labs	1.840 Taber Units		1.017 Taber Units
Statistics based on 13 of 14 reporting participants			

Comments on assigned Data Flags for Test #339

ZZ93K2 (X) - Data for both samples are high.

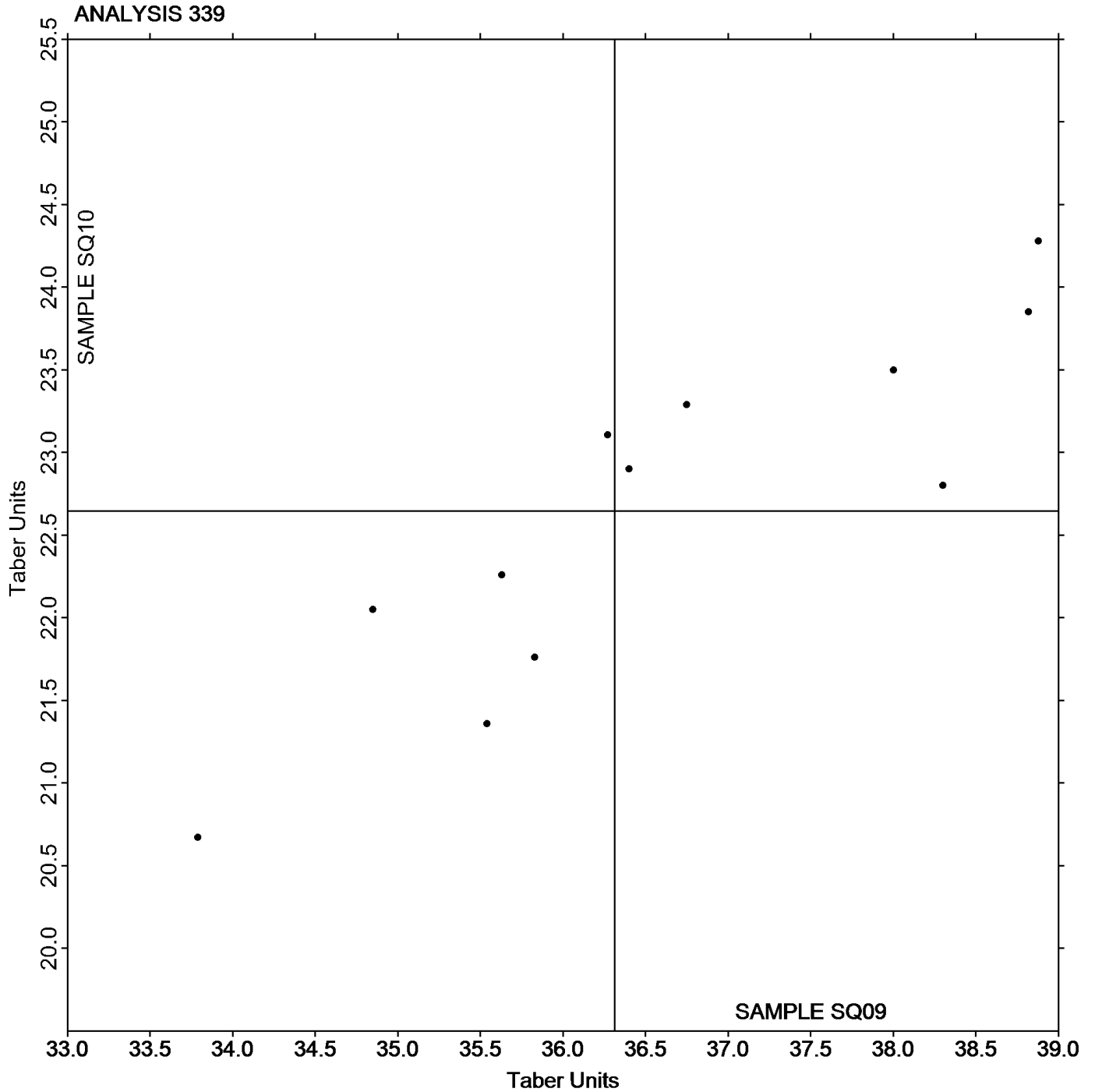
Analysis Notes:

QZY73Q - 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 **SQ09** = 36.312 Taber Units

Grand Mean Sample **SQ10** = 22.647 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 ST09			Sample ST10		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2WL78V		260.3	16.7	1.76	248.8	8.5	1.17
76ZJEG		243.3	-0.3	-0.03	243.0	2.7	0.37
79JHRB		259.3	15.7	1.65	232.0	-8.3	-1.14
A37VAH		242.2	-1.4	-0.14	238.9	-1.4	-0.19
AD4WLL		247.0	3.4	0.36	243.0	2.7	0.37
ADYJZB	X	118.6	-125.0	-13.14	89.9	-150.4	-20.64
CP74EN		238.6	-5.0	-0.52	247.8	7.5	1.03
CW9V77		238.3	-5.2	-0.55	233.8	-6.5	-0.89
DCYF2K		246.0	2.4	0.25	250.3	10.0	1.37
DWL3M9		229.4	-14.2	-1.49	230.9	-9.4	-1.29
HKDT97		230.7	-12.9	-1.36	235.9	-4.4	-0.61
J8LLNA	X	276.3	32.7	3.43	344.3	103.9	14.27
PWMYYZ		247.8	4.2	0.44	231.9	-8.4	-1.15
XCP9JY		240.1	-3.5	-0.37	247.3	7.0	0.96

Summary Statistics		
	Sample ST09	Sample ST10
Grand Means	243.58 Taber Units	240.30 Taber Units
SD Btwn Labs	9.51 Taber Units	7.28 Taber Units
Statistics based on 12 of 14 reporting participants		

Comments on assigned Data Flags for Test #340

ADYJZB (X) - Extreme data.

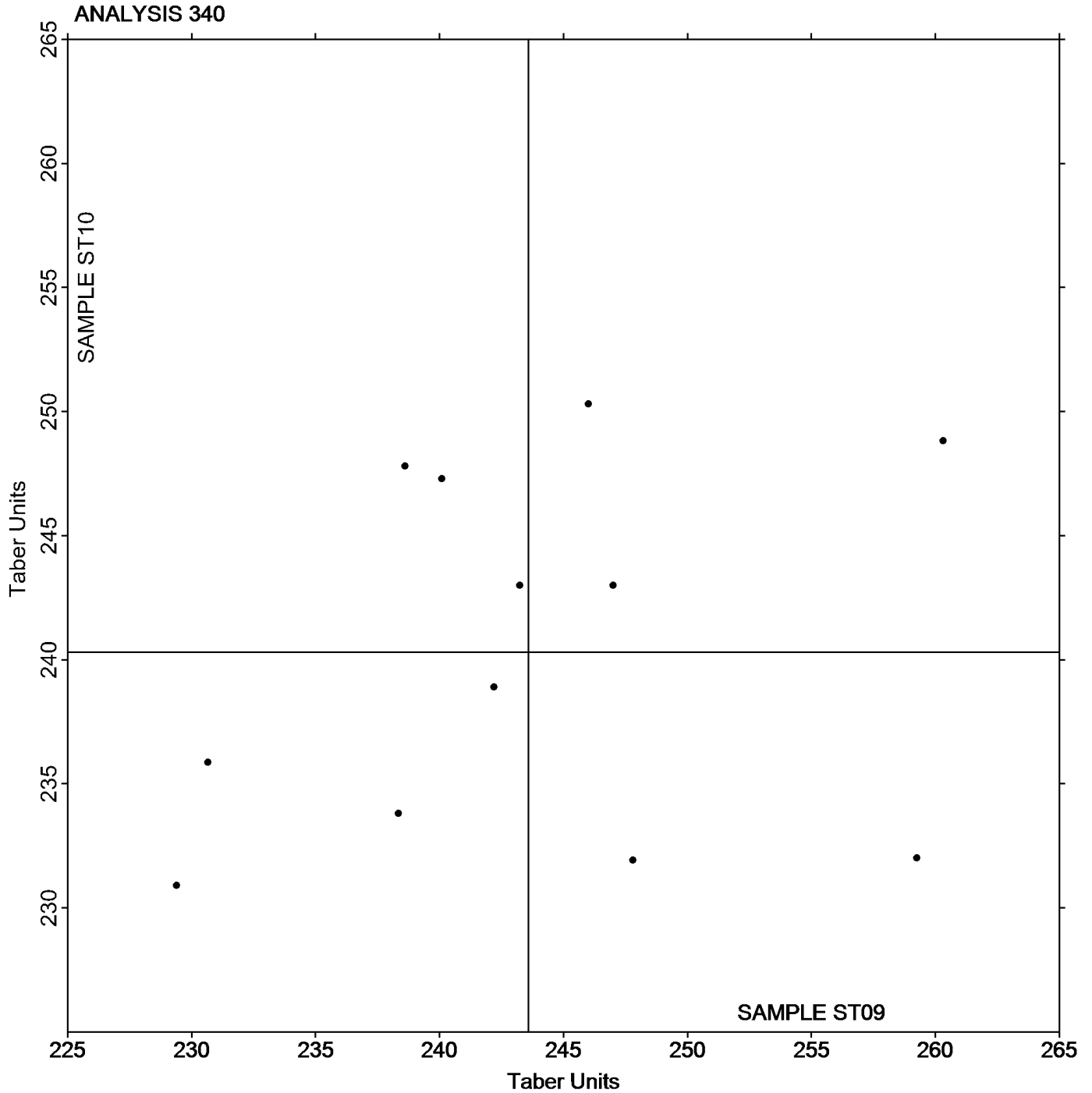
J8LLNA (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program Analysis 340

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

Grand Mean Sample **ST09** = 243.58 Taber Units

Grand Mean Sample **ST10** = 240.30 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 SM09			Sample SM10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
8MW974		85.72	5.01	0.47	89.84	5.04	0.47	LW
9N46RJ		69.36	-11.35	-1.07	72.72	-12.07	-1.12	LW
A4V6GX		78.70	-2.01	-0.19	90.62	5.82	0.54	XX
ADYJZB		92.04	11.33	1.07	100.68	15.88	1.48	CA
DDVWEH		81.56	0.85	0.08	92.44	7.64	0.71	LW
DWL3M9		67.82	-12.89	-1.22	76.34	-8.46	-0.79	LW
E3NG7N		81.56	0.85	0.08	86.62	1.82	0.17	TA
FHXK7A		66.56	-14.15	-1.33	68.76	-16.04	-1.49	CD
JTLPNW		72.33	-8.38	-0.79	73.33	-11.47	-1.07	TZ
K77NUP		72.17	-8.54	-0.81	74.33	-10.47	-0.98	TZ
LPGXAG		86.64	5.93	0.56	93.22	8.42	0.78	TA
LZCAK9		82.60	1.89	0.18	84.80	0.00	0.00	TA
PENLND	*	107.08	26.37	2.49	97.98	13.18	1.23	TL
QZY73Q		90.40	9.69	0.91	94.98	10.18	0.95	TA
UAVBFB		83.52	2.81	0.27	87.20	2.40	0.22	DT
YUNMEJ		85.31	4.60	0.43	91.71	6.91	0.64	TA
ZZ93K2		68.69	-12.02	-1.13	65.99	-18.81	-1.75	XX

		Summary Statistics	
	Sample SM09		Sample SM10
Grand Means	80.709 psi		84.797 psi
SD Btwn Labs	10.604 psi		10.738 psi
Statistics based on 17 of 17 reporting participants			

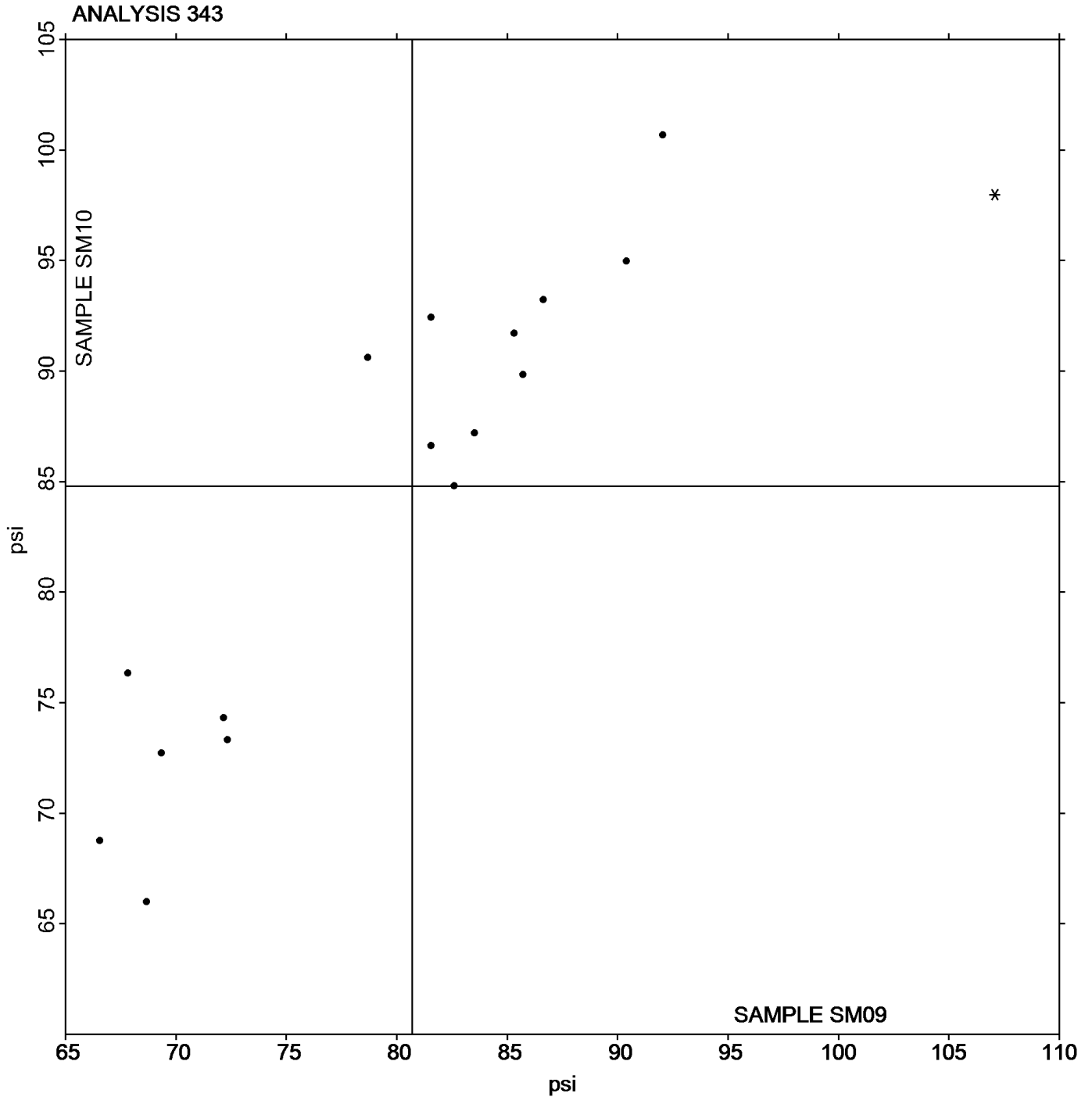
Instrument Code List

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

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

Grand Mean Sample **SM09** = 80.709 psi

Grand Mean Sample **SM10** = 84.797 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 SZ09			Sample SZ10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
222H9H		38.90	1.02	0.43	44.22	2.84	1.33	DP
78PRLW		42.14	4.26	1.77	44.06	2.68	1.25	PG
A37VAH		35.76	-2.12	-0.88	40.94	-0.44	-0.21	TZ
AD4WLL		38.20	0.32	0.13	40.60	-0.78	-0.37	CA
AXUQUB		37.88	0.00	0.00	40.82	-0.56	-0.26	XX
CJ3ZQB		39.53	1.65	0.69	44.05	2.67	1.25	XX
CP74EN		35.54	-2.34	-0.97	39.40	-1.98	-0.93	TL
DCYF2K		38.68	0.80	0.33	40.32	-1.06	-0.50	CA
GNGA24		36.24	-1.64	-0.68	43.28	1.90	0.89	CA
HKDT97		33.13	-4.75	-1.97	37.80	-3.58	-1.68	LW
KD6CNC		38.06	0.18	0.08	38.72	-2.66	-1.25	TL
PWMYYZ		37.06	-0.82	-0.34	40.96	-0.42	-0.20	TL
VFGPJ8		35.56	-2.32	-0.96	41.82	0.44	0.21	TL
X4U93K		41.46	3.58	1.49	39.54	-1.84	-0.86	LW
XCP9JY		40.00	2.12	0.88	44.20	2.82	1.32	CA

Summary Statistics		
	Sample SZ09	Sample SZ10
Grand Means	37.876 psi	41.382 psi
SD Btwn Labs	2.410 psi	2.134 psi
Statistics based on 15 of 15 reporting participants		

Instrument Code List

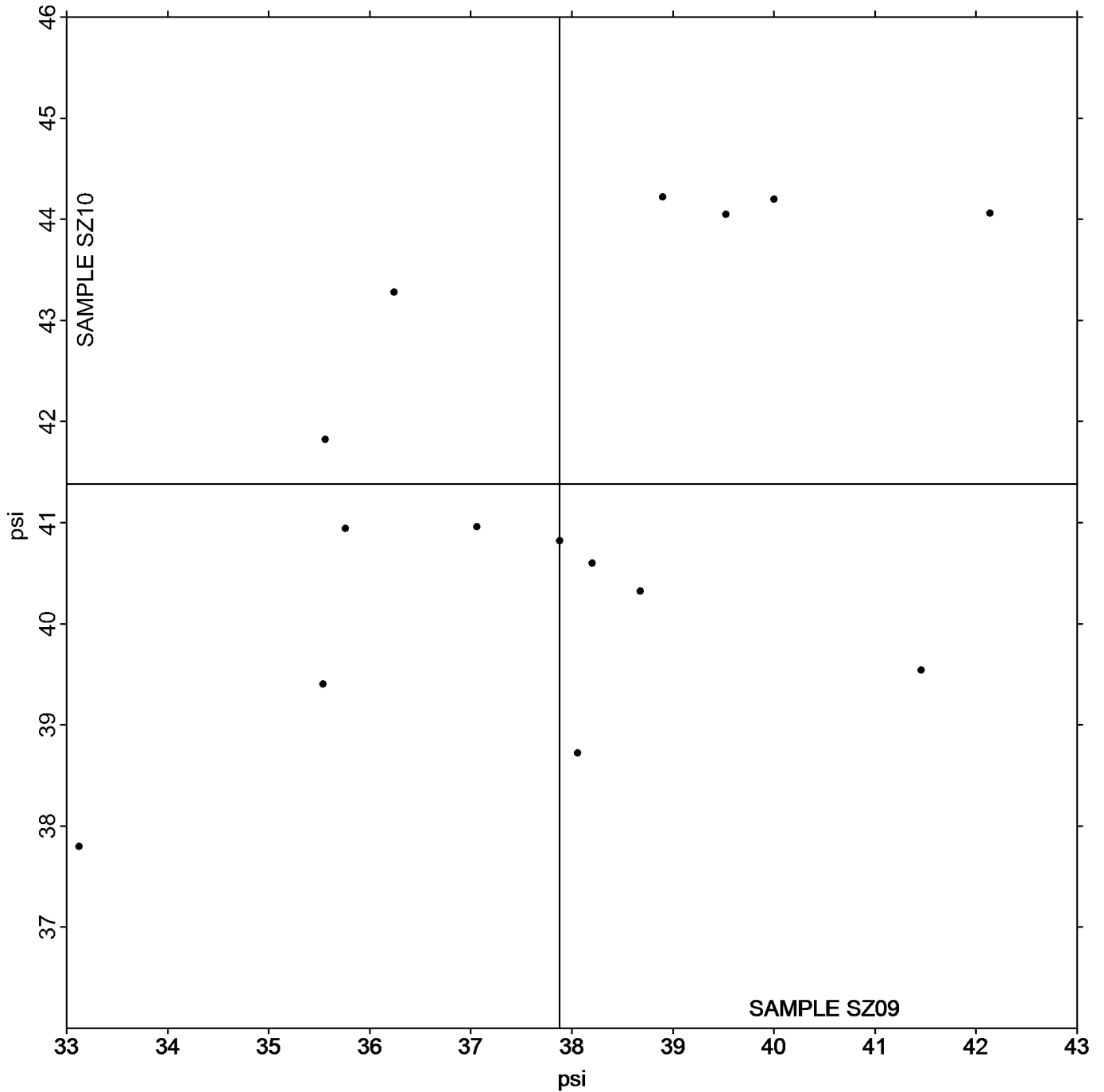
- | | |
|---|--|
| (CA) - CSI CS-163
(LW) - L & W ZD Tensile Tester
(TL) - TMI Lab Master
(XX) - Instrument make/model not specified by lab | (DP) - Dek-Tron XP Series
(PG) - Perkins Model A Mullen Tester
(TZ) - TMI Monitor/ZDT Tester |
|---|--|

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

Grand Mean Sample **SZ09** = 37.876 psi

Grand Mean Sample **SZ10** = 41.382 psi

ANALYSIS 345



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

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

WebCode	Data Flag	Sample SN09			Sample SN10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
32UQVR		136.0	4.4	0.43	113.5	5.6	0.65	HY
6F4EWL		136.4	4.8	0.47	109.8	1.9	0.22	HZ
8GBD6Z		123.8	-7.8	-0.75	99.4	-8.5	-0.97	HY
8MW974		133.0	1.4	0.14	103.4	-4.5	-0.51	HY
AV6JBZ	*	120.7	-10.9	-1.06	127.4	19.6	2.24	HY
BFPZW6		130.8	-0.8	-0.07	106.4	-1.5	-0.17	HY
DDVWEH		149.8	18.2	1.77	119.0	11.1	1.28	XX
DWL3M9		117.6	-14.0	-1.35	99.4	-8.5	-0.97	HZ
E3NG7N		144.0	12.4	1.21	119.4	11.5	1.32	HY
E8K3V7		125.4	-6.2	-0.60	102.0	-5.9	-0.67	HY
FPVCBW		123.1	-8.4	-0.82	101.1	-6.7	-0.77	KR
GNGA24		135.6	4.0	0.39	117.0	9.1	1.05	XX
JTLPNW		134.4	2.8	0.27	98.8	-9.1	-1.04	HY
K77NUP		118.0	-13.6	-1.32	100.8	-7.1	-0.81	HY
KJ9DN6		127.3	-4.3	-0.42	100.9	-7.0	-0.80	HZ
LPGXAG		132.2	0.6	0.06	115.2	7.3	0.84	HY
QZY73Q		129.4	-2.2	-0.21	104.6	-3.3	-0.37	HZ
RPVBEE		120.8	-10.7	-1.04	102.7	-5.2	-0.59	HY
XWDRC		136.2	4.6	0.45	98.8	-9.1	-1.04	HY
XZC9NQ		156.8	25.2	2.45	117.4	9.5	1.09	HY

Sample SN09		Summary Statistics	Sample SN10	
Grand Means	131.57 1000th ft-lbs		107.85 1000th ft-lbs	
SD Btw Labs	10.31 1000th ft-lbs		8.74 1000th ft-lbs	
Statistics based on 20 of 20 reporting participants				

Instrument Code List

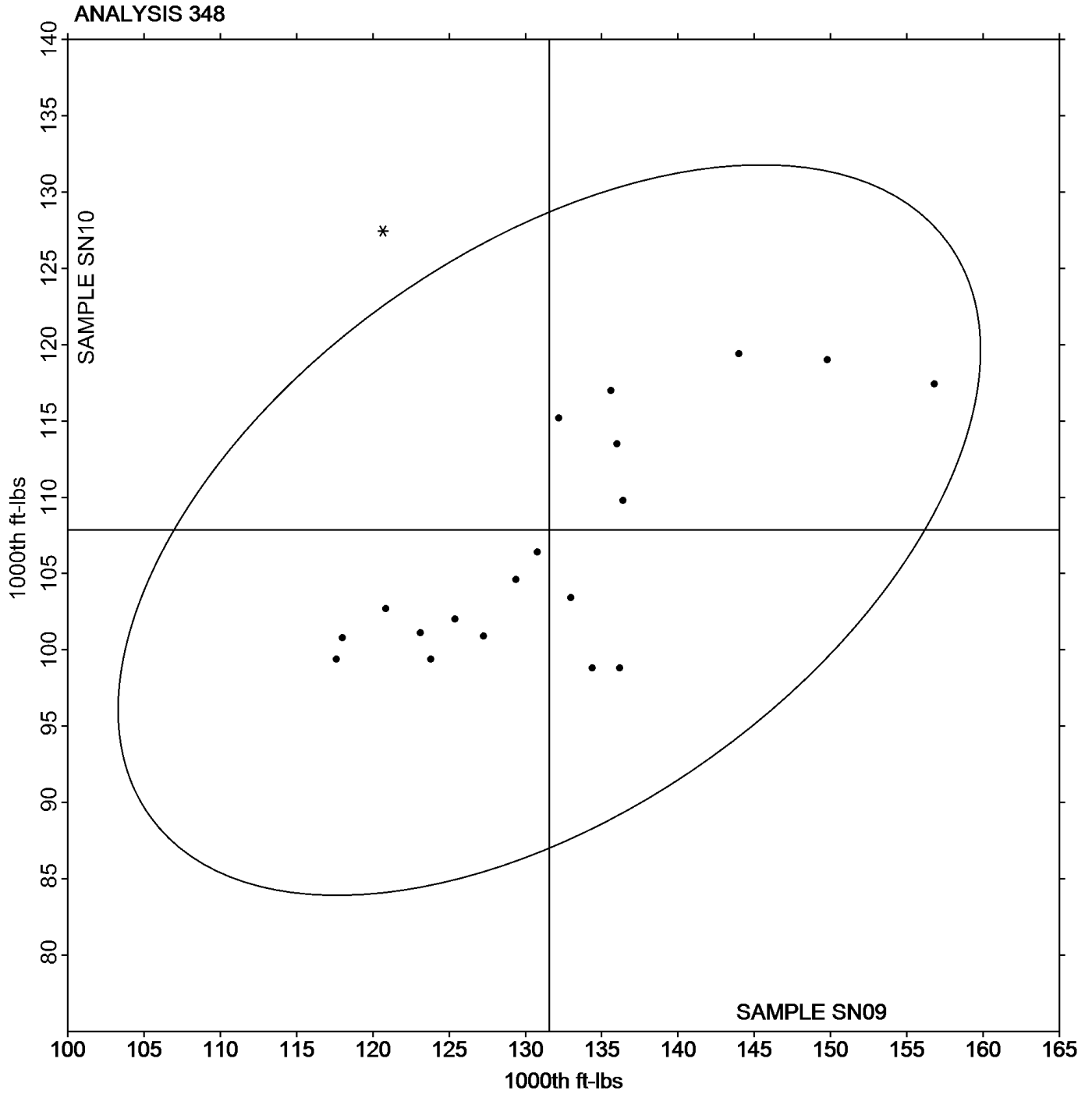
(HY) - Huygen Digitized Scott Internal Bond Tester
 (KR) - Kumagai Riki Kogyo Internal Bond Tester

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

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

Grand Mean Sample **SN09** = 131.57 1000th ft-lbs

Grand Mean Sample **SN10** = 107.85 1000th ft-lbs



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

WebCode	Data Flag	Sample SP09			Sample SP10			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
27VBKL		115.4	9.8	0.61	79.00	4.53	0.38	SC
3ZXBJV		113.8	8.2	0.51	65.60	-8.87	-0.74	TM
78PRLW		116.0	10.4	0.64	81.00	6.53	0.55	TM
79JHRB		106.7	1.0	0.07	77.10	2.63	0.22	SC
BRZBLF		97.8	-7.9	-0.49	69.00	-5.48	-0.46	TM
HKDT97		89.7	-15.9	-0.99	55.29	-19.18	-1.61	TM
KD6CNB		92.0	-13.6	-0.85	57.60	-16.87	-1.41	XX
KMRACU		112.6	7.0	0.43	77.20	2.73	0.23	TM
PGER7P		96.8	-8.8	-0.55	73.09	-1.38	-0.12	XX
Q4H4QF		108.0	2.4	0.15	72.40	-2.07	-0.17	SC
T4DKJV		140.4	34.8	2.16	96.40	21.93	1.84	XX
X4U93K		78.4	-27.2	-1.69	90.00	15.53	1.30	XX

Summary Statistics				
	Sample SP09		Sample SP10	
Grand Means	105.63	1000th ft-lbs	74.473	1000th ft-lbs
SD Btwn Labs	16.11	1000th ft-lbs	11.935	1000th ft-lbs
Statistics based on 12 of 12 reporting participants				

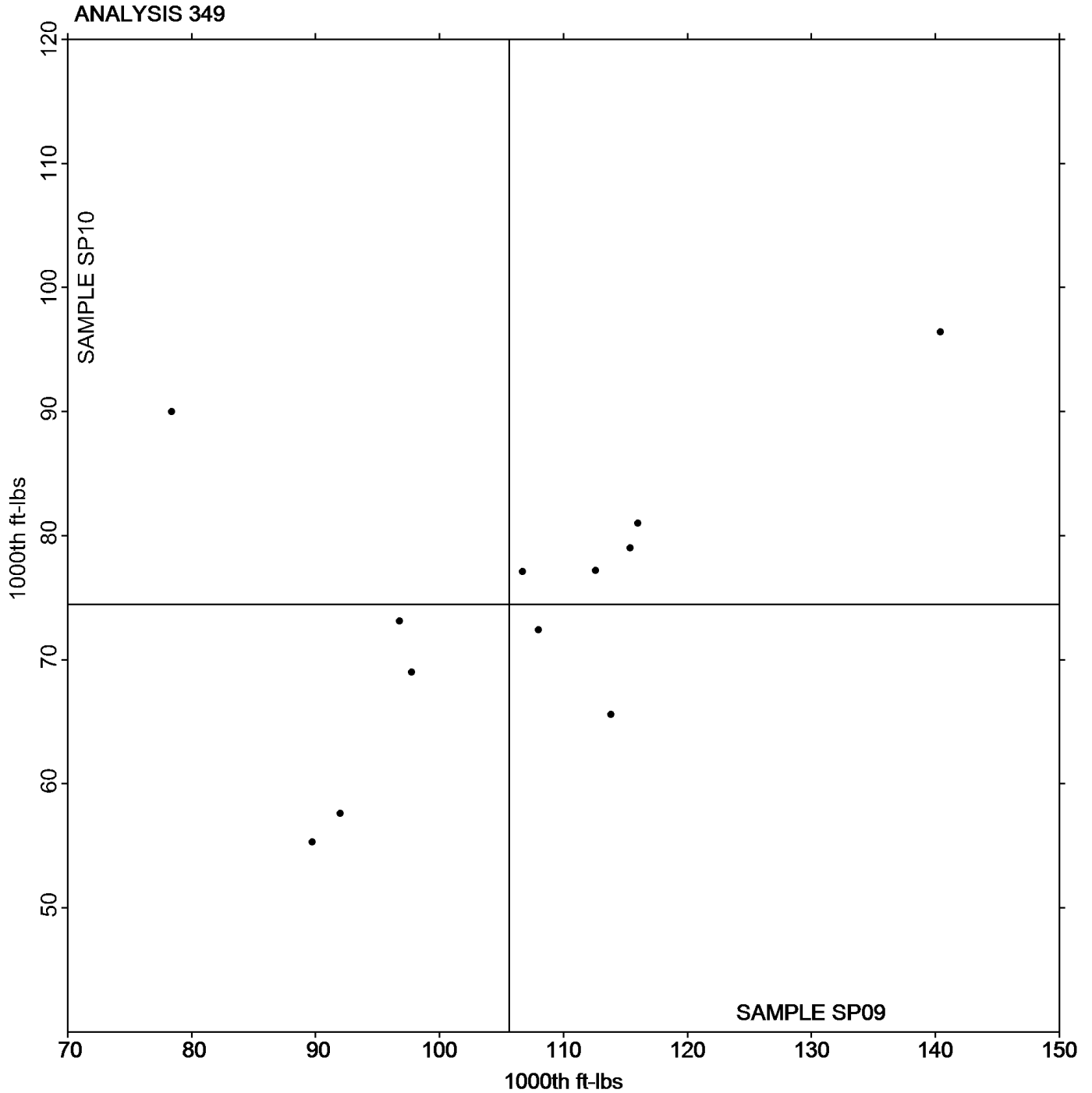
Instrument Code List

- (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 **SP09** = 105.63 1000th ft-lbs

Grand Mean Sample **SP10** = 74.473 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.