

Paper & Paperboard Interlaboratory Testing Program

Summary Report #244S - January 2010

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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.

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

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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

Key for Web Summary Reports (Page 1 of 2)

WebCode	Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Paper Report published on the CTS web site. The WebCode for each analysis can be found in the Performance Analysis Report mailed to each participant. In addition, the WebCodes can be found on the data sheets.
Lab Mean	The average of the values obtained for each sample by the participant.
Grand Mean	The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.
Difference from Grand Mean	The difference of the LAB MEAN from the GRAND MEAN.
Between-Lab Standard Deviation	An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).
Comparative Performance Value	An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.
Inst Code	A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section), if instruments are tracked.
Data Flag	DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

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

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

Common Problems Highlighted in Footnotes

1. **Extreme data** - The laboratory's results for one or both samples are so inconsistent with those of the other participants that the lab mean(s) fall outside the plot. The participant is advised to immediately review his data and/or testing procedure.
2. **Systematic bias** - The laboratory's results are either consistently high or low for both samples when compared to the other participants (the plotted point falls near the top or bottom of the ellipse). This indicates that the participant is performing the test with a constant bias. Causes of systematic errors include improper calibration, the particular make/model of equipment or a modification to the testing procedure.
3. **Inconsistency in testing between samples/sample sets** - The laboratory's results indicate that there are differences in the way the two samples tested (the plotted point falls to the side of the ellipse). This type of error may be attributed to the analyst deviating from the procedure when testing one of the samples or a material interaction occurrence with the instrument or room conditions. The inconsistency is reflected in the CPVs for the two samples, such as a +1.5 CPV for sample A and a -2.2 CPV for sample B. CTS also will specify if the laboratory's data for one sample are high/low compared to the other participants. If this inconsistency is slight, the lab's plotted point will be an * that falls on the edge of the ellipse.
4. **Inconsistency in testing within a sample** - The laboratory's within-lab standard deviation for a specified sample is high when compared to the other participants, often causing the lab's plotted point to fall outside of the ellipse.

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

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 SA53			Sample SA54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
26PF8A		27.50	0.42	0.19	32.90	-1.28	-0.67
2VZNPX		24.70	-2.38	-1.06	32.00	-2.18	-1.14
3FXX8K		29.06	1.98	0.88	37.46	3.29	1.73
48RT98		26.99	-0.09	-0.04	33.94	-0.24	-0.12
73B8C7		30.90	3.82	1.70	35.22	1.04	0.55
7HEXVW		23.35	-3.73	-1.66	30.80	-3.38	-1.77
9MNURA		27.97	0.89	0.40	36.64	2.46	1.29
AGGL7Z		27.12	0.04	0.02	34.51	0.33	0.17
BHGGMF		28.05	0.97	0.43	34.65	0.47	0.25
BHP86Z		23.00	-4.08	-1.81	30.80	-3.38	-1.77
CFP2TT		28.16	1.08	0.48	35.79	1.61	0.85
EZBEXR		25.72	-1.37	-0.61	34.40	0.22	0.12
F36WWE		27.72	0.64	0.28	33.84	-0.34	-0.18
G6X49F		29.55	2.47	1.10	35.50	1.32	0.70
GCKCRT		31.80	4.72	2.10	37.60	3.42	1.80
HMEP8W		24.90	-2.18	-0.97	33.10	-1.08	-0.57
HXNCXW		26.36	-0.72	-0.32	34.80	0.62	0.33
JA8G6R		29.65	2.57	1.14	36.67	2.49	1.31
JXPZYE		29.55	2.47	1.10	34.65	0.47	0.25
KW74MZ		26.85	-0.23	-0.10	34.27	0.10	0.05
PG2PQR		28.40	1.32	0.59	34.00	-0.18	-0.09
PGN2X7		27.80	0.72	0.32	33.08	-1.09	-0.57
QEEDQE		27.00	-0.08	-0.04	36.10	1.92	1.01
QHACLB		26.48	-0.60	-0.27	33.00	-1.18	-0.62
T8XWR9		26.81	-0.27	-0.12	34.81	0.63	0.33
TLBP9T		26.15	-0.93	-0.41	33.35	-0.83	-0.43
U6K7YD		25.22	-1.86	-0.83	32.72	-1.46	-0.76
VF78VJ		29.49	2.41	1.07	35.26	1.08	0.57
W6ETCT		28.04	0.96	0.43	35.57	1.39	0.73
YANU2A		26.15	-0.93	-0.41	33.98	-0.20	-0.10
YHUFFW	*	21.00	-6.08	-2.70	28.90	-5.28	-2.77
YL32LG		27.60	0.52	0.23	36.20	2.02	1.06
YZNCED		28.34	1.26	0.56	34.67	0.49	0.26
Z6VBEB		23.60	-3.48	-1.55	31.80	-2.38	-1.25
ZHCPZB		26.83	-0.25	-0.11	33.20	-0.98	-0.51

Sample SA53**Summary Statistics****Sample SA54**

Grand Means 27.080 psi
SD Btwn Labs 2.250 psi

34.177 psi
1.903 psi

Statistics based on 35 of 35 reporting participants

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

Notes for Analysis 305

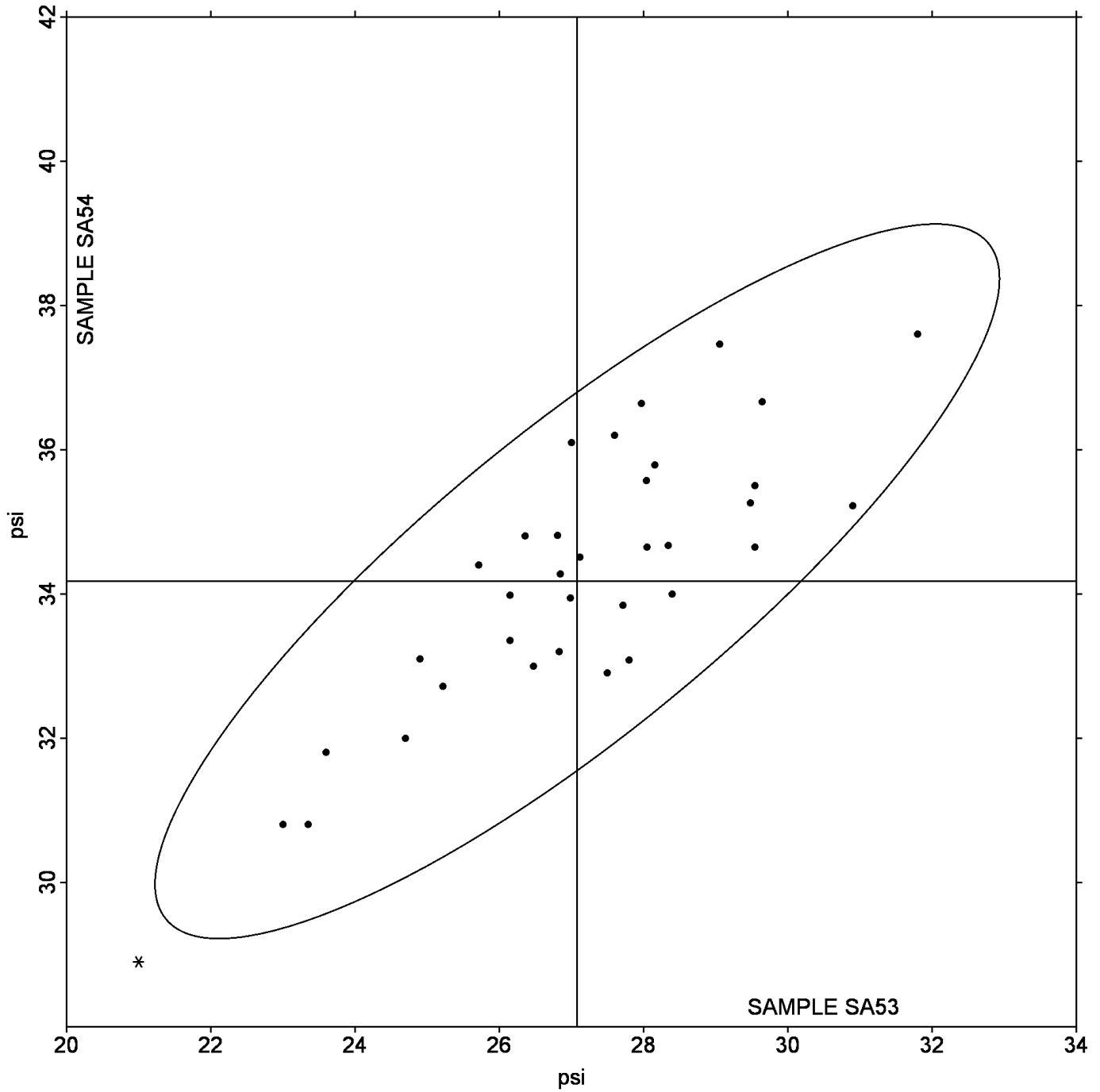
No Data Flags assigned for this analysis.

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

Grand Mean Sample SA53 = 27.080 psi

Grand Mean Sample SA54 = 34.177 psi

ANALYSIS 305



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

WebCode	Data Flag	Sample SB53			Sample SB54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3R3G6D		56.18	1.33	0.47	60.04	3.46	1.17
4LKQPJ		53.50	-1.35	-0.48	55.60	-0.98	-0.33
4YMLVH		60.10	5.24	1.86	61.54	4.96	1.68
6BKE9A		50.24	-4.61	-1.64	53.43	-3.15	-1.07
8M9ZRA		49.32	-5.53	-1.96	51.85	-4.73	-1.60
998NWB		57.62	2.77	0.98	58.32	1.74	0.59
CV99ZW		52.60	-2.25	-0.80	52.30	-4.28	-1.45
F83GXH		54.40	-0.45	-0.16	54.80	-1.78	-0.60
HX6DZY		56.50	1.65	0.59	58.45	1.87	0.63
KFPAHB		50.05	-4.80	-1.70	50.60	-5.98	-2.03
KVBLKX		59.60	4.75	1.69	59.40	2.82	0.95
PH7WRE		53.75	-1.10	-0.39	55.44	-1.14	-0.39
PWV8N3		52.36	-2.49	-0.88	52.65	-3.93	-1.33
QCG8VT		56.91	2.06	0.73	56.52	-0.06	-0.02
QHXU67		52.47	-2.38	-0.84	55.51	-1.07	-0.36
R2XX3T		56.49	1.64	0.58	56.86	0.27	0.09
RNT2JQ		55.19	0.34	0.12	60.41	3.82	1.29
T3CWXF		53.94	-0.91	-0.32	56.68	0.10	0.03
TTZ3MN		57.23	2.38	0.84	59.33	2.75	0.93
V49CUH		56.37	1.52	0.54	56.65	0.07	0.02
W3ZG8H		57.58	2.73	0.97	58.47	1.88	0.64
W9PT97	X	69.00	14.15	5.02	72.60	16.02	5.42
WFTVD7		51.63	-3.22	-1.14	52.34	-4.24	-1.43
WT2BLW		54.36	-0.49	-0.17	57.03	0.45	0.15
XJDKN3		53.69	-1.16	-0.41	56.80	0.22	0.07
XJMYVD		58.20	3.35	1.19	58.40	1.82	0.61
YR7JVW	*	54.30	-0.55	-0.20	61.00	4.42	1.49
ZEXNYH		56.37	1.52	0.54	57.35	0.76	0.26

		Summary Statistics	
	Sample SB53		Sample SB54
Grand Means	54.851 psi		56.584 psi
SD Btwn Labs	2.818 psi		2.954 psi
Statistics based on 27 of 28 reporting participants			

Comments on assigned Data Flags for Test #310

W9PT97 (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program

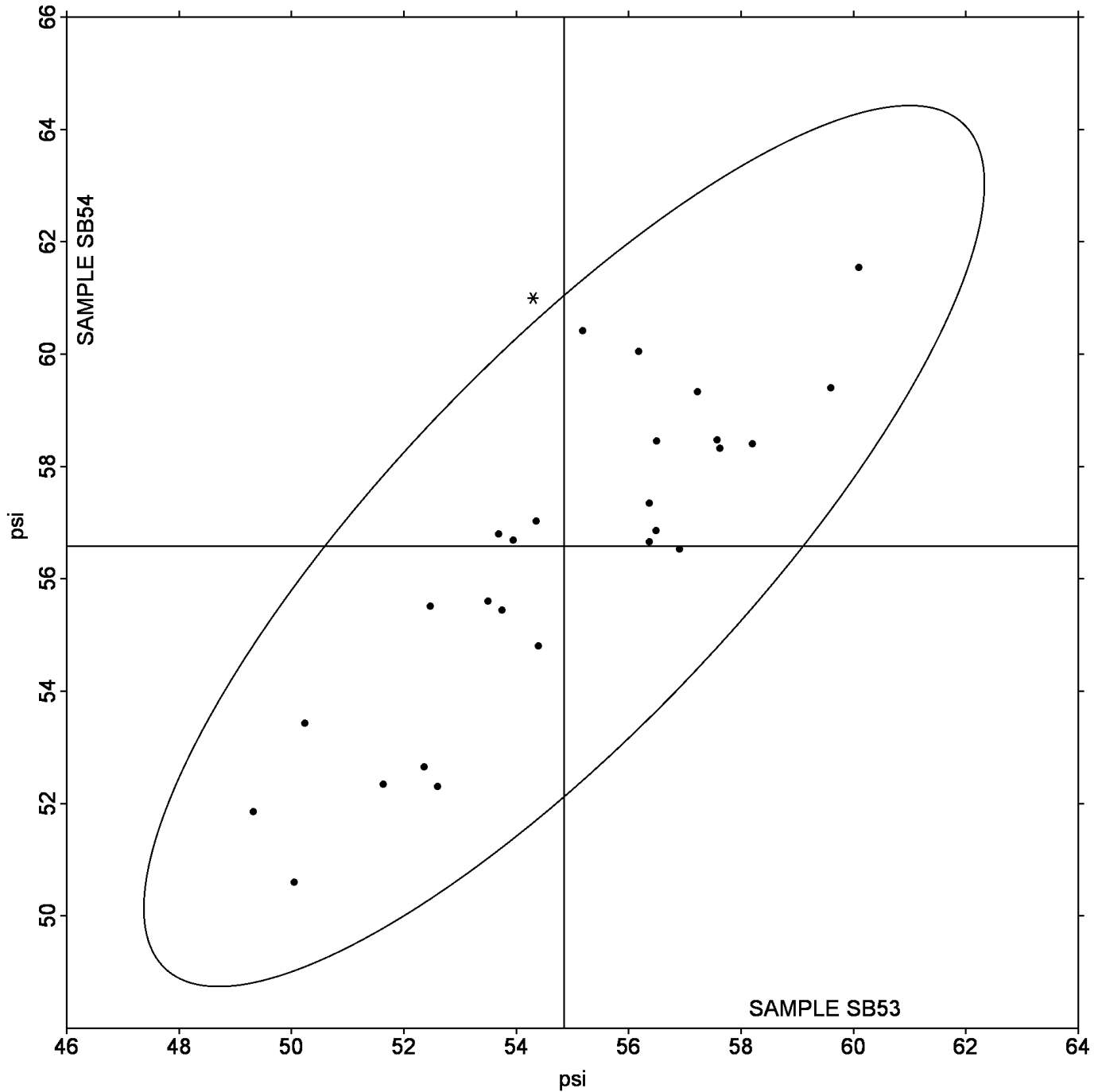
Analysis 310

Bursting Strength - Packaging Papers

Grand Mean Sample **SB53** = 54.851 psi

Grand Mean Sample **SB54** = 56.584 psi

ANALYSIS 310



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

WebCode	Data Flag	Sample SK53			Sample SK54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
36PQMD		19.84	-0.74	-0.38	19.45	-0.83	-0.41
37CREM		22.20	1.62	0.84	21.40	1.12	0.56
GJ8ZVB		19.56	-1.02	-0.53	19.22	-1.06	-0.53
GWZ2LP		18.90	-1.68	-0.87	17.75	-2.53	-1.26
JD9KYZ		18.74	-1.85	-0.96	18.87	-1.41	-0.70
JK7AGP		20.13	-0.45	-0.23	19.90	-0.37	-0.19
NJVMP6		23.30	2.72	1.41	22.30	2.02	1.00
PJ7BGD	X	30.02	9.44	4.89	21.34	1.06	0.53
XQXU67		22.78	2.20	1.14	22.95	2.67	1.33
YCL8UM		22.44	1.86	0.97	23.54	3.26	1.62
YUX26F		16.93	-3.65	-1.89	16.97	-3.31	-1.64
Z3FLH7		20.45	-0.13	-0.07	20.70	0.42	0.21
ZQRV3E		21.70	1.12	0.58	20.30	0.02	0.01

Summary Statistics	
Sample SK53	Sample SK54
Grand Means	20.581 Grams
SD Btwn Labs	1.929 Grams
	20.279 Grams
	2.012 Grams
Statistics based on 12 of 13 reporting participants	

Comments on assigned Data Flags for Test #311

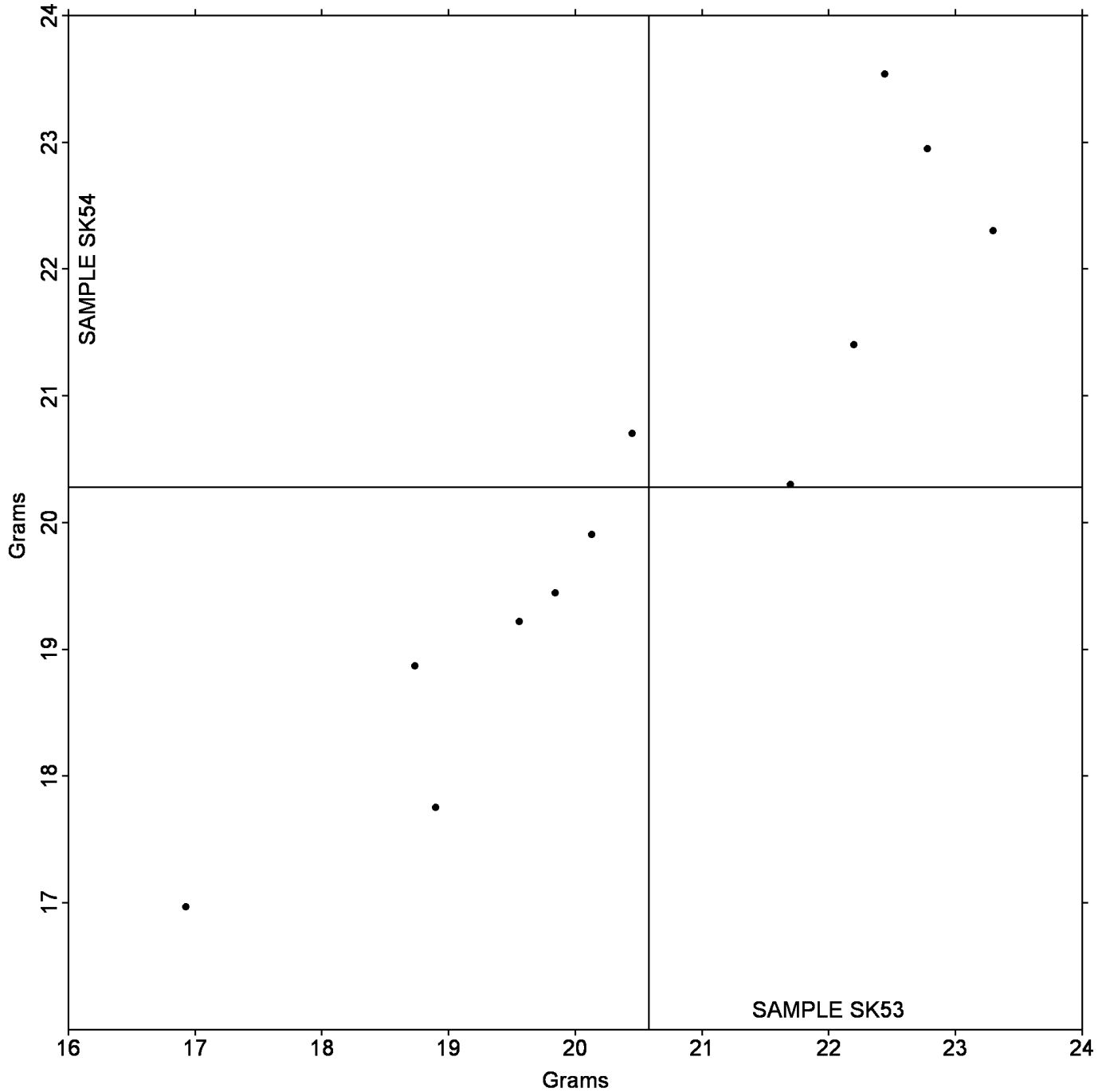
PJ7BGD (X) - Inconsistent in testing between samples, data for Sample SK53 are high and inconsistent within the replicate measurements for both samples.

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

Grand Mean Sample **SK53** = 20.581 Grams

Grand Mean Sample **SK54** = 20.279 Grams

ANALYSIS 311



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 SC53			Sample SC54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
262U3Q		53.40	3.06	0.84	60.80	2.98	0.67
32JW9A		51.30	0.96	0.26	60.51	2.69	0.60
33VELM		47.40	-2.94	-0.80	56.60	-1.22	-0.27
384TDJ		48.80	-1.54	-0.42	54.40	-3.42	-0.77
39DXD2		48.70	-1.64	-0.45	56.70	-1.12	-0.25
3RHQUF		50.38	0.05	0.01	57.47	-0.35	-0.08
3ZWHNC		47.70	-2.64	-0.72	54.04	-3.78	-0.85
4BZEFR		51.73	1.39	0.38	61.16	3.34	0.75
4HLWW3		47.38	-2.96	-0.81	56.14	-1.68	-0.38
632TRJ		51.17	0.83	0.23	59.04	1.22	0.27
67T7UG		51.56	1.22	0.33	58.92	1.10	0.25
68JCA8		49.82	-0.52	-0.14	56.65	-1.17	-0.26
6VBKQ8		53.98	3.64	1.00	62.22	4.40	0.99
7D64ZU		50.01	-0.33	-0.09	56.74	-1.08	-0.24
8ME964		51.28	0.94	0.26	59.29	1.47	0.33
8TUC8X		42.98	-7.36	-2.01	49.17	-8.65	-1.94
8ZVJVD		54.41	4.07	1.11	62.44	4.62	1.04
A83B8A		47.18	-3.16	-0.86	54.14	-3.68	-0.82
AGF8GY		55.18	4.84	1.32	63.60	5.78	1.30
BFCT76		52.41	2.07	0.57	61.25	3.43	0.77
CBBD8B		47.00	-3.34	-0.91	53.60	-4.22	-0.95
CMP287		49.60	-0.74	-0.20	60.00	2.18	0.49
EKNE9Z		55.26	4.92	1.35	59.71	1.89	0.42
F3YTUN		53.40	3.06	0.84	63.20	5.38	1.21
G2VNJJ		58.96	8.62	2.36	67.80	9.98	2.24
GLF6NR		45.11	-5.23	-1.43	52.97	-4.85	-1.09
GP9TNZ		51.89	1.55	0.42	62.55	4.73	1.06
H66MDJ		51.16	0.82	0.22	58.90	1.08	0.24
J6MPH4		53.33	2.99	0.82	57.70	-0.12	-0.03
J7HBBU	*	57.40	7.06	1.93	61.55	3.73	0.84
J8GBN2		55.01	4.68	1.28	63.31	5.50	1.23
JTHVM2		52.02	1.68	0.46	57.06	-0.76	-0.17
JYAGU9		48.52	-1.82	-0.50	53.48	-4.34	-0.97
KBBLWT		47.30	-3.04	-0.83	56.50	-1.32	-0.30
KLC7A8		52.56	2.22	0.61	61.86	4.04	0.91
KXAVKE		51.98	1.64	0.45	62.85	5.03	1.13
LEWHGQ		45.50	-4.84	-1.32	51.56	-6.26	-1.40
LLABBE	X	62.23	11.89	3.25	78.42	20.60	4.62
LPQYTK		43.13	-7.21	-1.97	48.45	-9.37	-2.10
LVLNTQ		49.61	-0.73	-0.20	57.35	-0.47	-0.11
MFVFPV		53.17	2.83	0.77	64.13	6.31	1.41
MMEW4R		49.00	-1.34	-0.37	56.70	-1.12	-0.25
MNRR74		45.80	-4.54	-1.24	52.80	-5.02	-1.12

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

WebCode	Data Flag	Sample SC53			Sample SC54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
MQMTKF		51.87	1.53	0.42	60.07	2.25	0.50
NKNYKR		43.60	-6.74	-1.84	50.71	-7.11	-1.59
Q9THUG		51.04	0.70	0.19	58.09	0.28	0.06
QRNTZ6		43.60	-6.74	-1.84	48.80	-9.02	-2.02
QVCQZM		48.42	-1.92	-0.53	56.57	-1.24	-0.28
R9YAZB		53.72	3.38	0.92	59.02	1.20	0.27
RC24Z2	X	88.10	37.76	10.32	52.74	-5.08	-1.14
T8UY3Y		50.12	-0.22	-0.06	58.93	1.11	0.25
T9J6JP		47.50	-2.84	-0.78	54.80	-3.02	-0.68
TU3PEL		53.46	3.12	0.85	58.86	1.04	0.23
UJAZHX	*	55.52	5.18	1.42	59.76	1.94	0.44
UN9R69		52.56	2.22	0.61	60.30	2.48	0.56
URE3EQ		47.32	-3.02	-0.83	53.84	-3.98	-0.89
V2NYD7		49.92	-0.42	-0.11	59.05	1.23	0.28
V7EACK		47.50	-2.84	-0.78	54.41	-3.41	-0.76
VE8L8D		55.61	5.27	1.44	62.85	5.03	1.13
VP4KRE		50.10	-0.24	-0.07	57.00	-0.82	-0.18
VUK39N		49.41	-0.93	-0.26	57.95	0.13	0.03
VVHTFA		47.72	-2.62	-0.72	52.20	-5.62	-1.26
W7C8DK		49.58	-0.76	-0.21	57.82	0.00	0.00
WHRC73		51.45	1.11	0.30	60.30	2.48	0.56
WYTMRE		50.50	0.16	0.04	61.63	3.81	0.85
XGFVMM		48.10	-2.24	-0.61	52.30	-5.52	-1.24
XNWP6Q		49.20	-1.14	-0.31	55.10	-2.72	-0.61
YD6C4R		54.25	3.91	1.07	62.40	4.58	1.03
YQNGYV		53.80	3.46	0.95	60.10	2.28	0.51
Z2TDQB		45.40	-4.94	-1.35	52.30	-5.52	-1.24
Z996XN	*	41.94	-8.40	-2.30	45.90	-11.92	-2.67
ZPE9KZ	*	58.48	8.14	2.23	69.85	12.03	2.70
ZWUDEF		48.90	-1.44	-0.39	58.83	1.01	0.23

	Sample SC53	Summary Statistics	Sample SC54
Grand Means	50.339 Grams		57.818 Grams
SD Btwn Labs	3.658 Grams		4.462 Grams
Statistics based on 71 of 73 reporting participants			

Comments on assigned Data Flags for Test #312

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

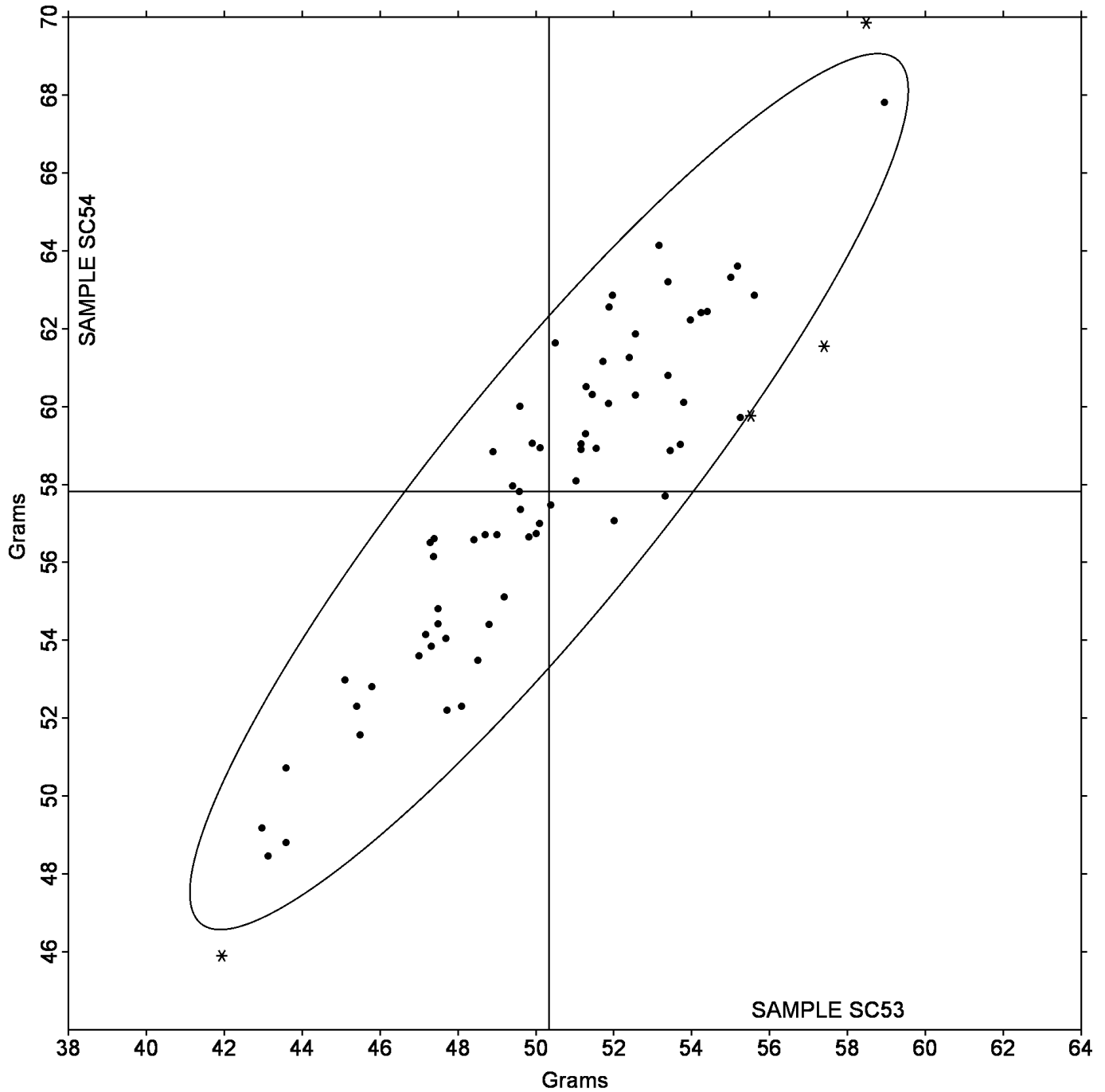
RC24Z2 (X) - Extreme data for Sample SC53.

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

Grand Mean Sample **SC53** = 50.339 Grams

Grand Mean Sample **SC54** = 57.818 Grams

ANALYSIS 312



TAPPI-CTS Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

WebCode	Data Flag	Sample SD53			Sample SD54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2UH3TV		202.0	3.9	0.37	166.8	-0.3	-0.03
2Y6QV8		196.3	-1.8	-0.17	165.3	-1.8	-0.22
3UMF9B		213.5	15.4	1.44	179.3	12.2	1.53
49TLJM		210.5	12.4	1.16	168.7	1.6	0.20
6KA37W		201.2	3.1	0.29	171.2	4.1	0.52
7AXUKH		196.3	-1.8	-0.17	164.4	-2.7	-0.33
8E429Z		183.2	-14.9	-1.40	160.9	-6.1	-0.77
8QFDTA	X	186.0	-12.0	-1.13	277.6	110.6	13.84
8XXRE2		185.8	-12.3	-1.15	152.4	-14.7	-1.84
A2M8G7		188.9	-9.2	-0.86	173.0	5.9	0.74
A4LYGK	X	83.9	-114.2	-10.71	70.6	-96.4	-12.07
AGLZJZ		200.9	2.8	0.27	170.3	3.2	0.40
C29MTK		177.7	-20.4	-1.91	162.3	-4.8	-0.60
CAGPU8		188.3	-9.8	-0.92	155.7	-11.4	-1.42
DPZGH7		205.4	7.3	0.69	175.2	8.1	1.02
E4YAV2	X	191.4	-6.7	-0.63	188.8	21.7	2.72
ETXLLV		200.8	2.7	0.25	156.8	-10.3	-1.28
FVENTM		201.2	3.2	0.30	164.0	-3.1	-0.38
GTVWQB		187.6	-10.5	-0.98	149.0	-18.1	-2.27
GU624Y		216.8	18.7	1.76	173.6	6.5	0.82
GVWWW		210.0	12.0	1.12	167.4	0.3	0.04
J3JXQQ		200.6	2.5	0.24	172.7	5.6	0.70
JPVV7D		190.8	-7.3	-0.68	168.0	0.9	0.12
JX8ZT4		219.6	21.5	2.02	177.6	10.5	1.32
L6PURY		183.6	-14.5	-1.36	157.9	-9.2	-1.15
NKBAGE		194.1	-4.0	-0.37	166.8	-0.3	-0.03
NZFECY		204.3	6.2	0.58	167.3	0.3	0.03
PYBEBX	X	39.9	-158.2	-14.83	41.6	-125.4	-15.70
RH7LBR		190.8	-7.3	-0.68	160.4	-6.7	-0.83
RUBY4L		191.9	-6.2	-0.58	158.4	-8.6	-1.08
TTRKNN		200.5	2.4	0.23	169.8	2.7	0.34
TWZHQ6		217.9	19.8	1.86	185.7	18.6	2.33
TXZR62		195.2	-2.9	-0.27	158.0	-9.1	-1.13
U8G7DM		205.2	7.1	0.66	176.2	9.1	1.14
WEV66J		199.9	1.8	0.17	173.3	6.2	0.78
WJR797		179.4	-18.7	-1.75	168.4	1.3	0.17
XVCVHJ		189.2	-8.8	-0.83	165.7	-1.3	-0.17
YJ7BZ4		201.3	3.2	0.30	169.1	2.0	0.25
YNDT7J		202.3	4.2	0.40	175.7	8.7	1.09
Z4T4X6	X	200.3	2.2	0.21	170.8	3.7	0.46
ZHFQ43	X	152.8	-45.3	-4.24	126.2	-40.9	-5.11

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

	Sample SD53	Summary Statistics	Sample SD54
Grand Means	198.08 Grams		167.06 Grams
SD Btwn Labs	10.66 Grams		7.99 Grams
Statistics based on 35 of 41 reporting participants			

Comments on assigned Data Flags for Test #314

8QFDTA (X) - Extreme data for Sample SD54.

A4LYGK (X) - Extreme data.

E4YAV2 (X) - Inconsistent in testing between samples, data for Sample SD54 are high.

PYBEBX (X) - Extreme data.

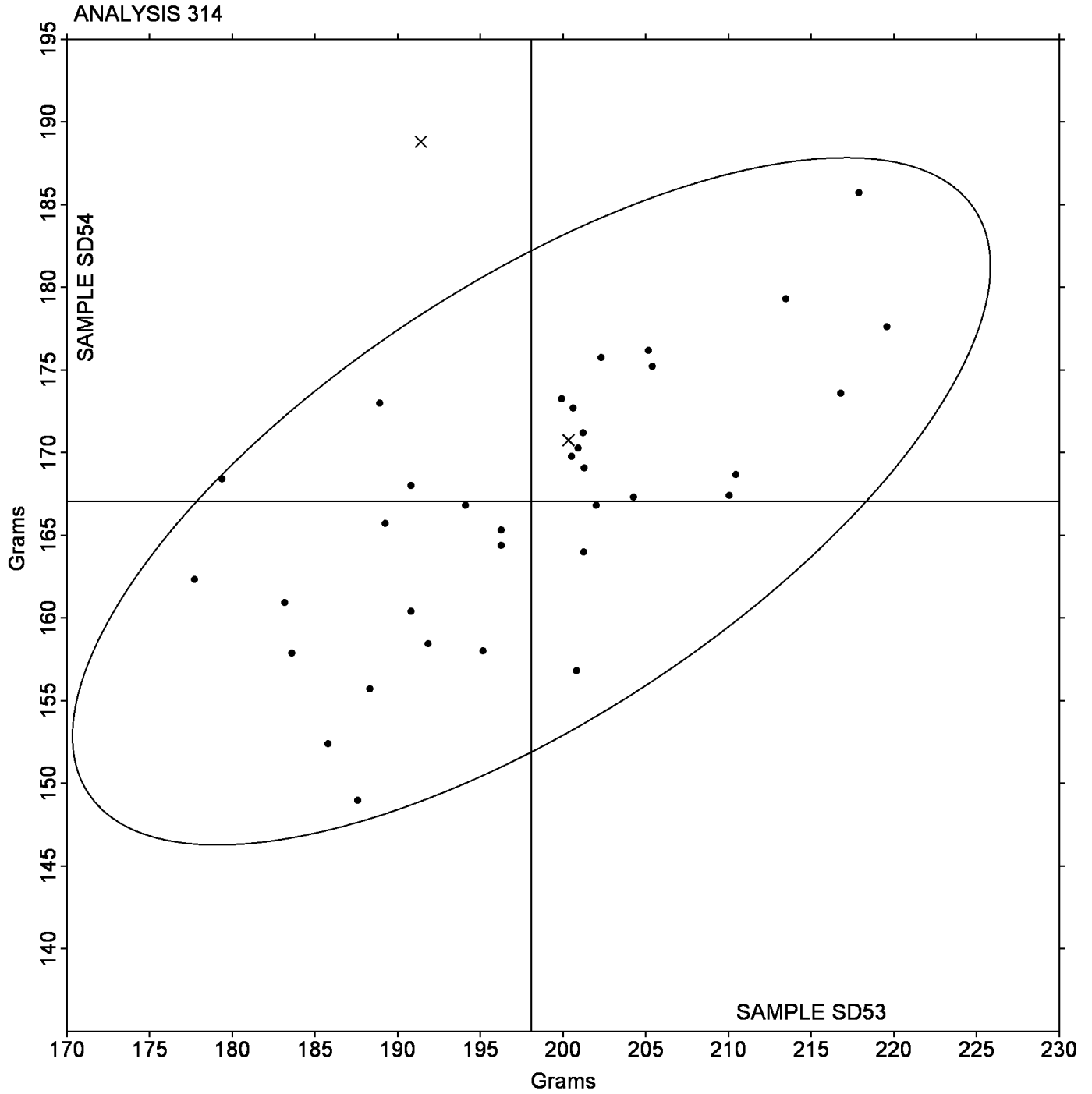
Z4T4X6 (X) - Data appear to be off by a factor of 1/4; data converted by CTS (x4).

ZHFQ43 (X) - Extreme data.

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

Grand Mean Sample **SD53** = 198.08 Grams

Grand Mean Sample **SD54** = 167.06 Grams



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

WebCode	Data Flag	Sample SR53			Sample SR54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
33MN43		1.949	-0.022	-0.14	1.950	-0.074	-0.37
6Y9AN7		1.893	-0.078	-0.50	1.912	-0.112	-0.57
79RY8C		1.924	-0.047	-0.30	1.928	-0.096	-0.48
8C67VX		1.898	-0.073	-0.46	1.954	-0.070	-0.35
9QHDEV		1.850	-0.121	-0.77	1.897	-0.127	-0.64
AFFCEW		2.014	0.043	0.27	2.345	0.321	1.62
CX7GN9	X	1.067	-0.904	-5.73	0.887	-1.137	-5.75
HCMBT7		1.959	-0.012	-0.08	1.975	-0.049	-0.25
HGDQZZ		2.236	0.265	1.68	2.348	0.324	1.64
J6BUAH	X	0.497	-1.474	-9.34	1.426	-0.598	-3.02
J9DVB2		1.770	-0.201	-1.27	1.818	-0.206	-1.04
MPNQFJ		2.267	0.296	1.87	2.286	0.262	1.32
NFVCU6		1.758	-0.213	-1.35	1.696	-0.328	-1.66
NYZWBE		1.839	-0.133	-0.84	1.904	-0.119	-0.60
QLGKEU		1.938	-0.033	-0.21	2.099	0.076	0.38
QUMBYR		2.110	0.139	0.88	1.999	-0.025	-0.13
T6KUMQ		2.162	0.191	1.21	2.247	0.223	1.13

		Summary Statistics	
	Sample SR53		Sample SR54
Grand Means	1.9712 kN/m		2.0239 kN/m
SD Btwn Labs	0.1579 kN/m		0.1979 kN/m
Statistics based on 15 of 17 reporting participants			

Comments on assigned Data Flags for Test #320

CX7GN9 (X) - Extreme data.

J6BUAH (X) - Extreme data.

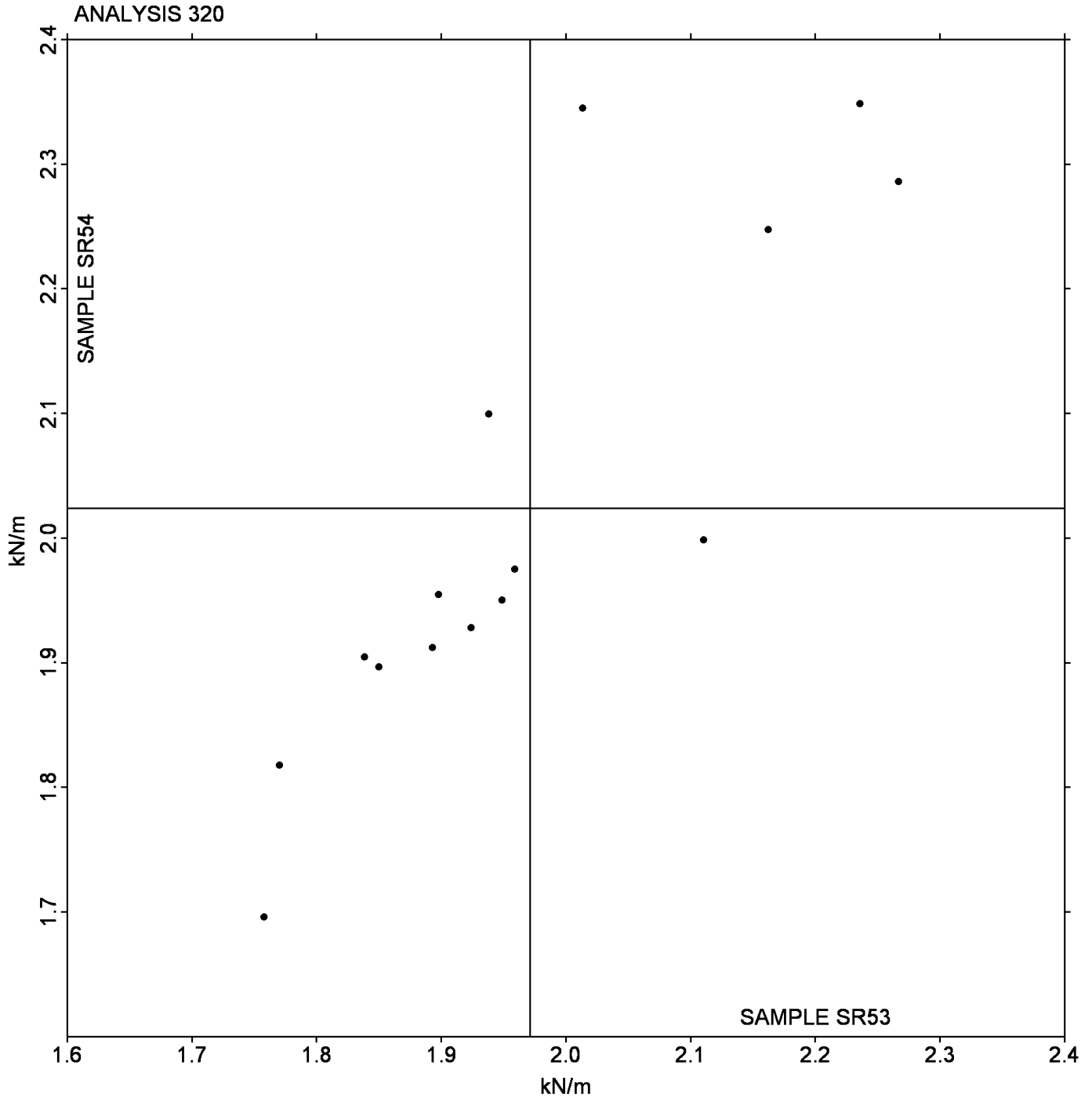
Analysis Notes:

AFFCEW - Data appear to be off by a factor of 10; data converted by CTS (/10).

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

Grand Mean Sample **SR53** = 1.9712 kN/m

Grand Mean Sample **SR54** = 2.0239 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 SR53			Sample SR54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
42DGQ8		9.91	-0.58	-0.36	10.20	-0.41	-0.24
4MV66K		12.55	2.06	1.26	12.51	1.90	1.12
7AULYC		11.62	1.13	0.69	13.04	2.43	1.44
9EHRT6		7.14	-3.35	-2.05	6.49	-4.11	-2.43
BMJYLA		9.54	-0.95	-0.58	8.94	-1.67	-0.99
CGK86X		10.49	0.00	0.00	10.98	0.38	0.22
H3H4CL		9.68	-0.81	-0.50	10.16	-0.45	-0.26
JPTNLR		10.33	-0.16	-0.10	10.60	-0.01	-0.01
NB2X4G		13.22	2.73	1.67	12.82	2.22	1.31
NZ4WVU		12.51	2.02	1.23	11.43	0.83	0.49
NZ99VW		9.25	-1.24	-0.76	11.17	0.56	0.33
PQMY4R		11.38	0.89	0.55	10.61	0.00	0.00
QV4J3E		10.19	-0.29	-0.18	9.48	-1.13	-0.67
X7PWH4		9.04	-1.45	-0.89	10.07	-0.54	-0.32

		Summary Statistics			
		Sample SR53		Sample SR54	
Grand Means		10.489	Joules/sq m	10.606	Joules/sq m
SD Btwn Labs		1.635	Joules/sq m	1.691	Joules/sq m
Statistics based on 14 of 14 reporting participants					

Notes for Analysis 321

No Data Flags assigned for this analysis.

Analysis Notes:

NZ4WVU - Data appear to be reported as J/sq m, not kg-m/sq m as indicated on datasheet. Unit changed by CTS.

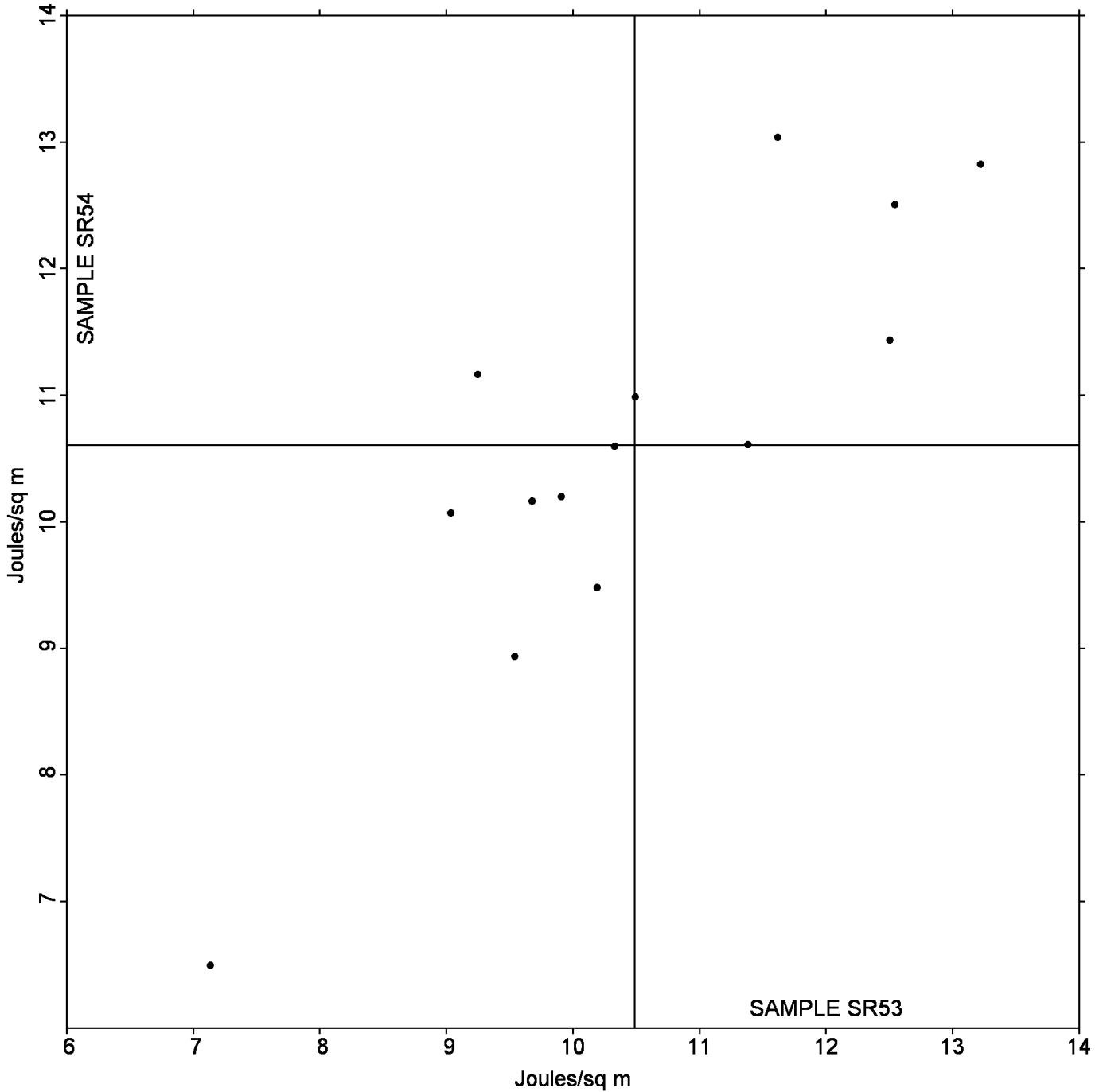
PQMY4R - Data appear to be reported as J/sq m, not kg-m/sq m as indicated on datasheet. Unit changed by CTS.

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

Grand Mean Sample **SR53** = 10.489 Joules/sq m

Grand Mean Sample **SR54** = 10.606 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 SR53			Sample SR54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3CUHZG		1.0900	0.1320	1.38	1.1300	0.1776	1.88
3TXZ7F		0.8970	-0.0610	-0.64	0.9220	-0.0304	-0.32
47EFAD		1.0320	0.0740	0.77	0.9750	0.0226	0.24
4KX6HF		0.8970	-0.0610	-0.64	0.8350	-0.1174	-1.24
F4KC3U		0.8680	-0.0900	-0.94	0.8750	-0.0774	-0.82
FMKMMV		0.9020	-0.0560	-0.58	0.8900	-0.0624	-0.66
GA4WP7		0.9050	-0.0530	-0.55	0.8980	-0.0544	-0.58
KR7XQG		0.8896	-0.0684	-0.71	0.9313	-0.0211	-0.22
MF8XAH		0.8769	-0.0812	-0.85	0.8238	-0.1286	-1.36
NKTC8N		1.0320	0.0740	0.77	1.0140	0.0616	0.65
QXH9YJ		0.9938	0.0358	0.37	0.9982	0.0458	0.48
RCUHA7		1.1140	0.1560	1.63	1.1140	0.1616	1.71
VGJKZF		0.8910	-0.0670	-0.70	0.9040	-0.0484	-0.51
W94BWK		1.1240	0.1660	1.73	1.0640	0.1116	1.18
ZPEUW2		0.8581	-0.0999	-1.04	0.9119	-0.0405	-0.43

		Summary Statistics			
		Sample SR53		Sample SR54	
Grand Means		0.95803	Percent	0.95242	Percent
SD Btwn Labs		0.09590	Percent	0.09451	Percent
Statistics based on 15 of 15 reporting participants					

Notes for Analysis 322

No Data Flags assigned for this analysis.

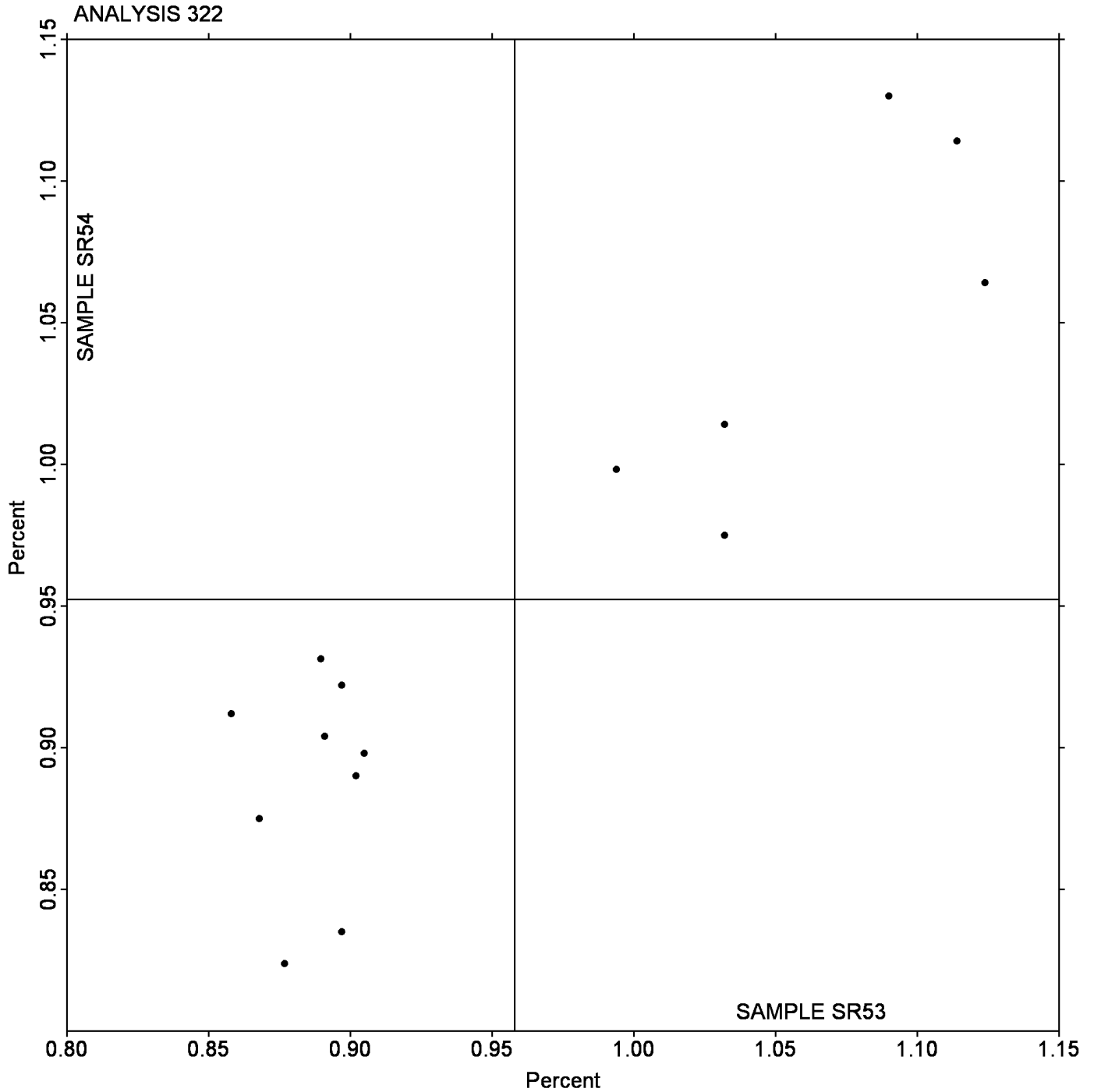
Analysis Notes:

KR7XQG - Data appear to be off by a factor of 100; data converted by CTS (/100).

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

Grand Mean Sample **SR53** = 0.95803 Percent

Grand Mean Sample **SR54** = 0.95242 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 SF53			Sample SF54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2B94N2	X	2.267	-2.613	-7.92	4.001	-1.707	-4.71	IN
37F32Y		5.100	0.220	0.67	5.912	0.203	0.56	LH
3A8NHU		4.953	0.073	0.22	5.668	-0.040	-0.11	LI
3GTG9L	X	4.604	-0.276	-0.84	5.382	-0.327	-0.90	TP
3HN4MB		5.026	0.146	0.44	6.135	0.427	1.18	LH
3K6RLN		5.056	0.176	0.53	6.124	0.416	1.15	TO
3VVQR8		4.581	-0.299	-0.91	5.518	-0.190	-0.52	LH
484QZ7		5.283	0.403	1.22	6.243	0.534	1.47	LX
4G37AC		4.517	-0.363	-1.10	5.461	-0.247	-0.68	TB
6797RH	X	4.727	-0.153	-0.46	4.510	-1.199	-3.31	TI
6XEXAE		4.985	0.105	0.32	5.811	0.103	0.28	XX
849MNV		5.458	0.578	1.75	6.187	0.479	1.32	LH
8WH6MR		4.865	-0.015	-0.04	5.597	-0.112	-0.31	LA
92WFU2		5.057	0.177	0.54	5.937	0.229	0.63	LH
9W76K4		4.349	-0.531	-1.61	5.263	-0.445	-1.23	SP
9ZY6ND		4.474	-0.406	-1.23	5.194	-0.514	-1.42	IK
BNYAK2		4.463	-0.417	-1.26	5.346	-0.362	-1.00	MN
BPTWYQ	*	4.788	-0.092	-0.28	5.905	0.197	0.54	LH
C33DWE		4.603	-0.277	-0.84	5.308	-0.400	-1.10	IM
D8PQTY		5.091	0.211	0.64	5.793	0.084	0.23	TO
DCNZ6L		4.306	-0.574	-1.74	5.112	-0.596	-1.64	LH
DNC67Q		5.145	0.265	0.80	5.904	0.195	0.54	TA
E2MWR4		5.062	0.182	0.55	5.786	0.077	0.21	TO
FFMX46		4.792	-0.088	-0.27	5.694	-0.014	-0.04	TB
FM7A8Y		5.208	0.328	1.00	6.167	0.458	1.26	TB
GUPHK2		4.897	0.017	0.05	5.596	-0.112	-0.31	XX
H8KJ33		5.150	0.270	0.82	5.950	0.242	0.67	LH
HQRTZE		4.925	0.045	0.14	5.679	-0.029	-0.08	TJ
HRR8PD		4.996	0.116	0.35	5.723	0.015	0.04	TB
HWGEZE		4.450	-0.430	-1.30	5.199	-0.510	-1.41	TX
J4QVG8		4.541	-0.339	-1.03	5.315	-0.393	-1.09	TO
J6BCC3		4.766	-0.114	-0.35	5.535	-0.173	-0.48	LH
JU8KPL		5.286	0.406	1.23	6.180	0.471	1.30	IX
K2LXY6		4.745	-0.135	-0.41	5.723	0.014	0.04	TB
KC4P9Z		4.843	-0.037	-0.11	5.510	-0.199	-0.55	TJ
KJR87A		5.318	0.438	1.33	6.221	0.513	1.42	IM
KUNEM2		4.943	0.063	0.19	5.609	-0.099	-0.27	TC
M3976C		5.678	0.798	2.42	6.487	0.778	2.15	IA
M8WDM		4.609	-0.271	-0.82	5.354	-0.354	-0.98	TF
MDYQ2N		5.019	0.139	0.42	5.792	0.084	0.23	LH
NQL7Q9	*	5.705	0.825	2.50	6.735	1.027	2.83	TJ
P7WE3W		4.821	-0.059	-0.18	5.779	0.070	0.19	DL
PAXTRR		4.755	-0.125	-0.38	5.648	-0.061	-0.17	LH

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

WebCode	Data Flag	Sample SF53			Sample SF54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
PQDPT9		4.598	-0.282	-0.85	5.462	-0.246	-0.68	LH
Q2LY8J		4.640	-0.240	-0.73	5.426	-0.282	-0.78	LH
QHXBLW		4.852	-0.028	-0.08	5.686	-0.022	-0.06	LI
R2DZ9M		5.329	0.449	1.36	6.178	0.470	1.30	LH
T3Q2EZ		5.311	0.431	1.31	6.300	0.592	1.63	LH
T6QZ6D		5.106	0.226	0.69	6.008	0.299	0.83	LX
TCL2B7		4.665	-0.215	-0.65	5.414	-0.294	-0.81	LH
U7LXY7	X	5.037	0.157	0.47	5.261	-0.448	-1.23	TP
U8LEQG		4.422	-0.458	-1.39	5.257	-0.451	-1.25	XX
UBALG6		4.775	-0.105	-0.32	5.362	-0.346	-0.96	LH
UCTMUJ		4.636	-0.244	-0.74	5.510	-0.198	-0.55	TB
UL7UUF		4.713	-0.167	-0.51	5.570	-0.138	-0.38	LH
UWHAE2		4.573	-0.307	-0.93	5.447	-0.262	-0.72	TI
V274XK		4.728	-0.152	-0.46	5.563	-0.146	-0.40	LH
V33PKJ		4.808	-0.072	-0.22	5.502	-0.207	-0.57	XX
VAGNZG		4.309	-0.571	-1.73	5.133	-0.575	-1.59	ID
VB7HD7		4.652	-0.228	-0.69	5.323	-0.386	-1.06	ID
VZCJ6T	*	5.693	0.813	2.46	6.444	0.736	2.03	TJ
WUFZZV		4.615	-0.265	-0.80	5.394	-0.314	-0.87	TO
X8LVQG		5.149	0.269	0.82	5.938	0.229	0.63	LH
Y2GD99		4.828	-0.052	-0.16	5.825	0.116	0.32	IM
YF2733		4.711	-0.169	-0.51	5.439	-0.269	-0.74	MR
YHN834		4.839	-0.041	-0.12	5.639	-0.069	-0.19	KA
YZ8ZAF	X	4.343	-0.537	-1.63	5.830	0.122	0.34	VM

	Sample SF53	Summary Statistics	Sample SF54
Grand Means	4.8800 kN/m		5.7084 kN/m
SD Btwn Labs	0.3300 kN/m		0.3624 kN/m
Statistics based on 62 of 67 reporting participants			

Comments on assigned Data Flags for Test #325

2B94N2 (X) - Extreme data.

3GTG9L (X) - Data appears to be transposed between samples. Data switched by CTS.

6797RH (X) - Inconsistent in testing between samples, data for Sample SF54 are low.

U7LXY7 (X) - Inconsistent in testing between samples.

YZ8ZAF (X) - Inconsistent in testing between samples and within the determinations for Sample SF53.

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

Analysis Notes:

6797RH - Data appears to be transposed between Analysis 328 (Elongation to Break) and Analysis 325 (Tensile Breaking Strength). Data switched by CTS.

J6BCC3 - Data appear to be reported as lb/in, not kN/m as indicated on datasheet. Unit changed by CTS.

PAXTRR - Data appear to be off by a factor of 1000; data converted by CTS (/1000).

UWHAE2 - One determination removed from the Lab Mean of Sample SF54 per Grubb's Test at 1% risk (TAPPI 1205).

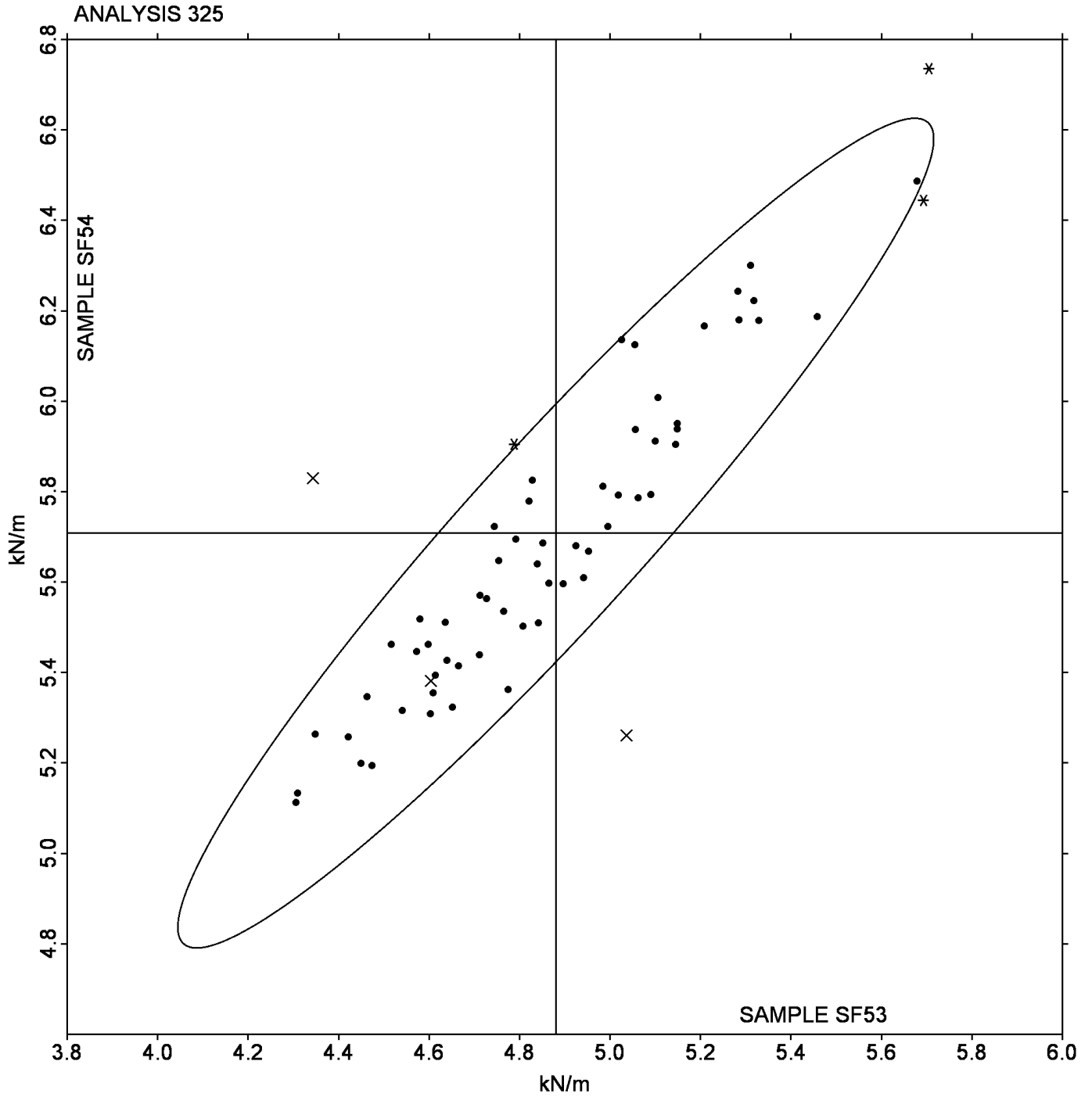
Instrument Code List

(DL) - EMIC DL500 Universal Testing Machines	(IA) - Instron 1011
(ID) - Instron 4201/4202	(IK) - Instron 4400 Series
(IM) - Instron 5500 Series	(IN) - Instron 3340 series
(IX) - Instron (model not specified)	(KA) - Zwick Model 1425
(LA) - L & W Tensile - Autoline 300	(LH) - L & W Alwetron TH1 (Horizontal) SE 060/065F
(LI) - L & W Tensile Tester SE 062	(LX) - L & W (model not specified)
(MN) - Minebea	(MR) - MTS Alliance RT series
(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)	(TX) - Thwing-Albert (model not specified)
(VM) - Valmet PaperLab (was Kajaani/Robotest)	(XX) - Instrument make/model not specified by lab

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

Grand Mean Sample SF53 = 4.8800 kN/m

Grand Mean Sample SF54 = 5.7084 kN/m



TAPPI-CTS Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

WebCode	Data Flag	Sample SF53			Sample SF54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2EL7YC	X	50.64	-12.05	-2.67	78.66	-0.18	-0.03	VM
4GYQWB		65.98	3.29	0.73	80.43	1.60	0.32	XX
4V7CY3		67.28	4.60	1.02	80.28	1.44	0.29	ID
63YYWR		57.06	-5.63	-1.25	75.46	-3.38	-0.67	LI
6EYPTL	*	72.68	9.99	2.21	91.65	12.81	2.53	XX
6N7PNY		64.54	1.85	0.41	80.37	1.53	0.30	LH
8HZLDJ		64.50	1.82	0.40	78.46	-0.38	-0.07	LH
8J2M94		65.23	2.54	0.56	78.34	-0.50	-0.10	LX
8P4LKZ		56.76	-5.93	-1.31	75.76	-3.08	-0.61	IM
8ZNYQC		63.77	1.08	0.24	83.16	4.33	0.86	XX
9APJRJ		60.49	-2.20	-0.49	78.24	-0.60	-0.12	LH
9CRLCE		62.87	0.18	0.04	75.57	-3.27	-0.65	LI
AVQJMR		56.11	-6.58	-1.46	69.81	-9.02	-1.79	LH
B4KKMM		61.47	-1.22	-0.27	71.80	-7.03	-1.39	LA
CJVLVJ		62.41	-0.28	-0.06	76.84	-1.99	-0.39	TB
DYL9WN		62.75	0.07	0.01	80.93	2.10	0.41	KA
E8L6GX		65.37	2.69	0.60	84.47	5.63	1.11	LH
FWEN7U		61.36	-1.32	-0.29	78.57	-0.26	-0.05	LH
GJ8WGT		64.75	2.06	0.46	80.62	1.78	0.35	LI
HFDRMT		59.81	-2.88	-0.64	73.43	-5.41	-1.07	ID
HRZ6FV		64.89	2.20	0.49	76.32	-2.51	-0.50	XX
HTMPT3	X	45.78	-16.91	-3.74	56.16	-22.68	-4.49	XX
JX269Q		63.67	0.99	0.22	79.14	0.30	0.06	XX
KPAGGZ		68.60	5.92	1.31	83.47	4.63	0.92	LH
KVZAQ2	X	43.57	-19.11	-4.23	52.79	-26.05	-5.15	LX
LPDF9F	*	55.52	-7.17	-1.59	80.19	1.35	0.27	LH
LXR9JB		66.18	3.49	0.77	79.59	0.75	0.15	LI
M7PQRR		61.54	-1.14	-0.25	74.60	-4.23	-0.84	LH
R8XYRF	X	17.78	-44.91	-9.95	48.13	-30.71	-6.07	IN
RA3RH8		54.96	-7.73	-1.71	70.75	-8.09	-1.60	IM
T8JBGL		62.29	-0.39	-0.09	81.04	2.21	0.44	LH
TGM72X		63.28	0.60	0.13	82.49	3.66	0.72	DL
TL9JLK		70.38	7.70	1.70	88.07	9.23	1.83	TB
TWZZNL		59.98	-2.71	-0.60	78.02	-0.82	-0.16	LH
U9AX7U		65.77	3.09	0.68	87.98	9.15	1.81	IM
UYP2RT	X	63.34	0.65	0.14	42.03	-36.81	-7.28	TI
VPMEFV		64.23	1.55	0.34	84.14	5.30	1.05	TO
WJLXYT		71.73	9.05	2.00	86.45	7.61	1.51	IM
WKRMZG		60.65	-2.04	-0.45	77.94	-0.90	-0.18	LH
XH8C43		64.09	1.41	0.31	72.59	-6.24	-1.24	MR
XJERX4		63.50	0.81	0.18	71.77	-7.06	-1.40	LH
Y97KGG		55.07	-7.62	-1.69	76.29	-2.54	-0.50	TB
YFT8NU		63.56	0.87	0.19	81.78	2.95	0.58	TO

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

WebCode	Data Flag	Sample SF53			Sample SF54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
ZK3J2Q		52.04	-10.64	-2.36	70.34	-8.49	-1.68	LH
ZQ66MU	X	4.46	-58.23	-12.90	3.99	-74.85	-14.81	TP
ZQCQRV		60.31	-2.37	-0.53	76.29	-2.55	-0.50	TA

Summary Statistics	
Sample SF53	Sample SF54
Grand Means	62.686 Joules/sq m
SD Btwn Labs	4.515 Joules/sq m
	78.837 Joules/sq m
	5.055 Joules/sq m
Statistics based on 40 of 46 reporting participants	

Comments on assigned Data Flags for Test #327

- 2EL7YC (X) - Inconsistent in testing between samples and within the determinations for Sample SF53.
- HTMPT3 (X) - Systematic error (data for both samples are low).
- KVZAQ2 (X) - Extreme data.
- R8XYRF (X) - Extreme data.
- UYP2RT (X) - Extreme data for Sample SF54.
- ZQ66MU (X) - Extreme data.

Analysis Notes:

- 8ZNYQC - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq m as indicated on datasheet. Unit changed by CTS.
- HTMPT3 - Data appear to be reported as kg-m/sq m, not inch-lb/sq inch as indicated on datasheet. Unit changed by CTS.
- U9AX7U - Data appear to be reported as kg-m/sq m, not J/sq m as indicated on datasheet. Unit changed by CTS.
- Y97KGG - Data appear to be reported as kg-m/sq m, not inch-lb/sq inch as indicated on datasheet. Unit changed by CTS.

Instrument Code List

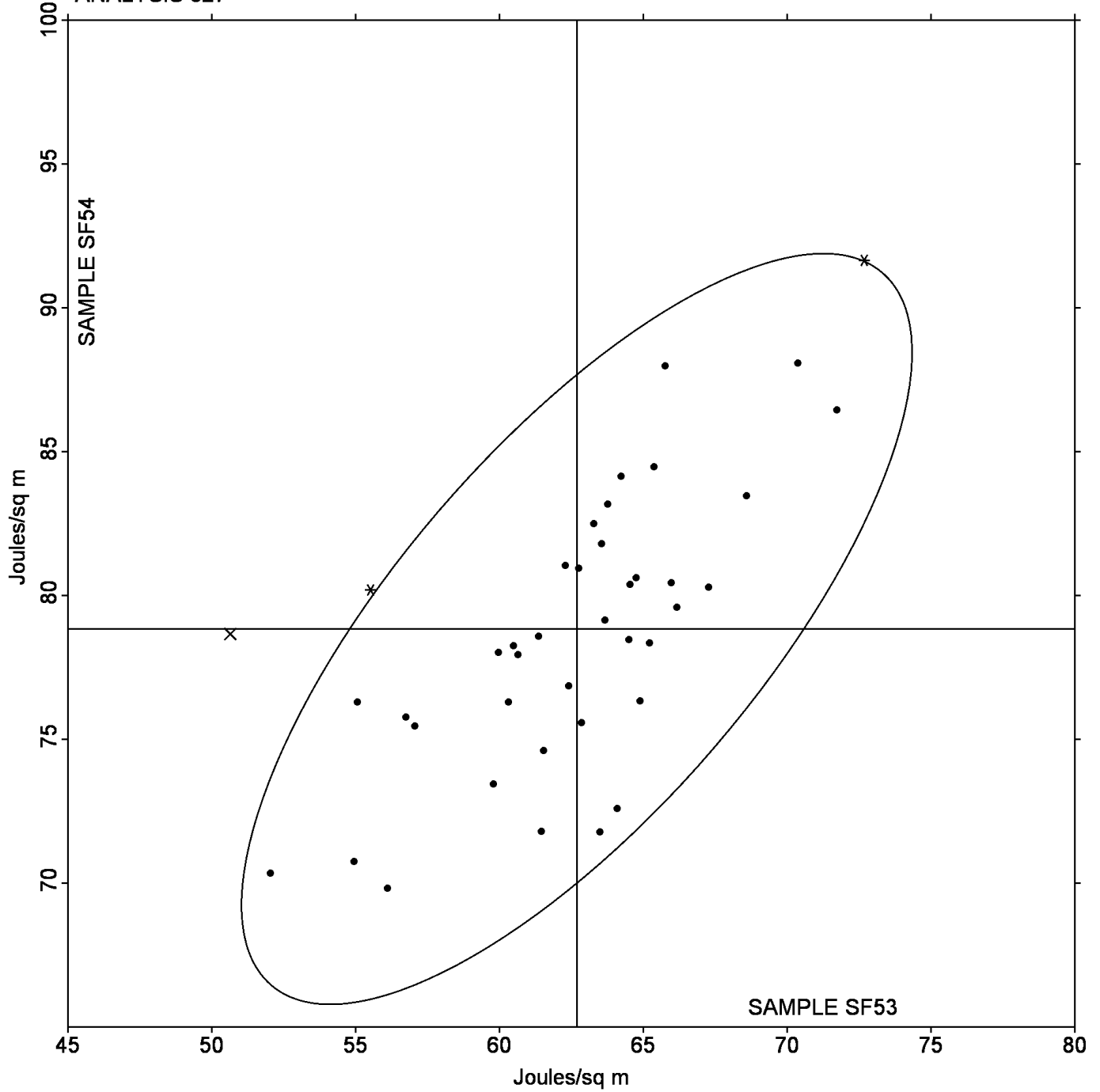
- | | |
|--|---|
| <ul style="list-style-type: none"> (DL) - EMIC DL500 Universal Testing Machines (IM) - Instron 5500 Series (KA) - Zwick Model 1425 (LH) - L & W Alwetron TH1 (Horizontal) SE 060 (LX) - L & W (model not specified) (TA) - Thwing-Albert (TI) - Thwing-Albert QC II (TP) - TMI Monitor/Tensile 100 (84-21-01) (XX) - Instrument make/model not specified by lab | <ul style="list-style-type: none"> (ID) - Instron 4201 (IN) - Instron 3340 series (LA) - L & W Tensile - Autoline 300 (LI) - L & W Tensile Tester SE 062 (MR) - MTS Alliance RT series (TB) - Thwing-Albert EJA/1000 (TO) - Thwing-Albert QC-1000 (VM) - Valmet PaperLab (was Kajaani/Robotest) |
|--|---|

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

Grand Mean Sample SF53 = 62.686 Joules/sq m

Grand Mean Sample SF54 = 78.837 Joules/sq m

ANALYSIS 327



TAPPI-CTS Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

WebCode	Data Flag	Sample SF53			Sample SF54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
26KW8Z		1.596	-0.411	-1.91	1.709	-0.427	-2.13	LH
3BF2YW		1.670	-0.337	-1.56	1.800	-0.336	-1.68	IM
3CAMTM	X	3.072	1.065	4.95	3.273	1.137	5.67	TO
3VBRUA		2.114	0.107	0.50	2.205	0.069	0.34	XX
439YT9		1.950	-0.057	-0.26	2.140	0.004	0.02	LH
44PWGR		1.960	-0.047	-0.22	2.130	-0.007	-0.03	TX
67T8Q2		1.961	-0.046	-0.21	2.156	0.020	0.10	KA
74VXKJ		2.081	0.074	0.35	2.258	0.122	0.61	DL
7DVPTJ		1.824	-0.183	-0.85	2.084	-0.052	-0.26	LH
7PRDHT	*	2.640	0.633	2.94	2.640	0.504	2.51	TF
8A9EB7	*	2.030	0.023	0.11	2.400	0.264	1.32	VM
8RTXLJ		2.079	0.072	0.34	2.293	0.157	0.78	TO
8ZDWHJ	X	2.750	0.743	3.45	2.909	0.773	3.86	XX
AVYXEF	X	49.918	47.911	222.51	53.146	51.010	254.59	TB
BP7T2B		1.923	-0.084	-0.39	1.987	-0.149	-0.75	LI
CKJGGK		1.850	-0.157	-0.73	1.950	-0.186	-0.93	IA
DJRU2	X	2.765	0.758	3.52	3.166	1.030	5.14	TB
DTVXQ7		1.926	-0.081	-0.38	1.989	-0.147	-0.74	LH
F8RRB4		2.170	0.163	0.76	2.180	0.044	0.22	TF
FC26Y6		1.981	-0.026	-0.12	2.089	-0.047	-0.24	LH
FJ26AW		2.279	0.272	1.27	2.409	0.272	1.36	TB
FKPQJN	X	3.452	1.445	6.71	2.034	-0.102	-0.51	LI
H2MLAK		1.760	-0.247	-1.15	1.773	-0.363	-1.81	LH
HL3CQA		1.509	-0.498	-2.31	1.713	-0.423	-2.11	LH
HUV39G		1.904	-0.103	-0.48	2.125	-0.011	-0.06	LA
J2DFLT		2.266	0.259	1.20	2.337	0.201	1.00	TO
JEZ3YU		2.041	0.034	0.16	2.153	0.017	0.08	XX
K7NQP9		2.139	0.132	0.61	2.111	-0.025	-0.13	TP
K9PWPM		1.820	-0.187	-0.87	2.020	-0.116	-0.58	IM
LBN83E		2.073	0.066	0.31	2.082	-0.054	-0.27	MR
LLD87Q		2.196	0.189	0.88	2.305	0.169	0.84	MN
LW4RMA		2.220	0.213	0.99	2.438	0.302	1.51	TJ
MVMWD		1.927	-0.080	-0.37	1.998	-0.138	-0.69	LX
P6UPJ8		1.988	-0.019	-0.09	2.084	-0.052	-0.26	LI
P7E6CG		2.167	0.160	0.74	2.270	0.133	0.67	ID
PBTG7G		2.016	0.009	0.04	2.180	0.044	0.22	LH
QMB8QX		2.353	0.346	1.61	2.464	0.328	1.64	IK
QPFYYY		1.934	-0.073	-0.34	2.143	0.007	0.03	LH
TDCQDT		2.004	-0.003	-0.01	2.095	-0.041	-0.21	LX
THNFQF		1.934	-0.073	-0.34	2.093	-0.043	-0.22	LH
UALJ8G		2.037	0.030	0.14	2.124	-0.012	-0.06	ID
UKB7GC	X	1.228	-0.779	-3.62	1.858	-0.278	-1.39	IN
V2D767		1.745	-0.262	-1.22	2.035	-0.101	-0.51	LH

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

WebCode	Data Flag	Sample SF53			Sample SF54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
VHE8DJ		1.766	-0.241	-1.12	2.002	-0.134	-0.67	LH
VRBWTE		1.904	-0.103	-0.48	2.048	-0.088	-0.44	XX
VRHDBR		1.560	-0.447	-2.08	1.690	-0.446	-2.23	TJ
W24YRA		2.069	0.062	0.29	2.179	0.043	0.21	XX
WMU3ZM		1.885	-0.121	-0.56	2.049	-0.087	-0.44	TB
WQYVKR		2.081	0.074	0.35	2.302	0.165	0.83	TB
WX2398		2.228	0.221	1.03	2.321	0.185	0.92	LH
XR2T3T		2.013	0.006	0.03	2.101	-0.035	-0.18	LH
Y463ZU	X	2.052	0.045	0.21	1.524	-0.612	-3.06	TI
Y9264G		2.242	0.235	1.09	2.299	0.163	0.81	XX
YRM93Z		2.230	0.223	1.04	2.200	0.064	0.32	TJ
ZM6PJD		1.924	-0.083	-0.38	2.051	-0.085	-0.43	LH
ZWZ6NP		2.364	0.357	1.66	2.479	0.342	1.71	IM

Sample SF53		Summary Statistics	Sample SF54	
Grand Means	2.0068 Percent		2.1364	Percent
SD Btw Labs	0.2153 Percent		0.2004	Percent
Statistics based on 49 of 56 reporting participants				

Comments on assigned Data Flags for Test #328

3CAMTM (X) - Extreme data.

8ZDWHJ (X) - Systematic error (data for both samples are high).

AVYXEF (X) - Extreme data.

DJRUK2 (X) - Extreme data.

FKPQJN (X) - Extreme data for Sample SF53.

UKB7GC (X) - Inconsistent in testing between samples, data for sample SF53 are low; and inconsistent within the determinations for Sample SF53.

Y463ZU (X) - Inconsistent in testing between samples, data for Sample SF54 are low.

Analysis Notes:

Y463ZU - Data appears to be transposed between Analysis 325 (Tensile Breaking Strength) and Analysis 328 (Elongation to Break). Data switched by CTS.

YRM93Z - One determination removed from the Lab Mean of Sample SF54 per Grubb's Test at 1% risk (TAPPI 1205).

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

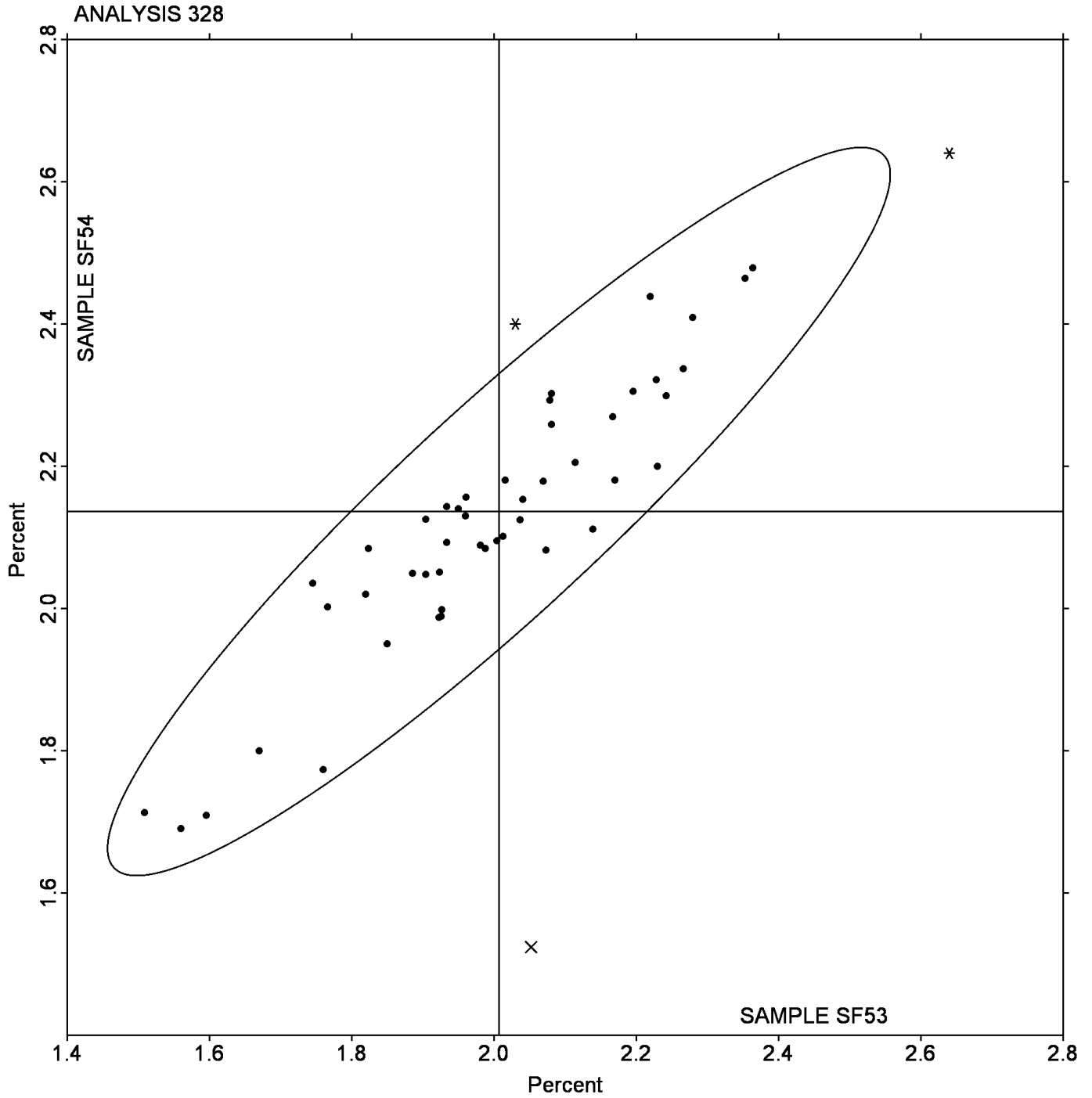
Instrument Code List

(DL) - EMIC DL500 Universal Testing Machines	(IA) - Instron 1011
(ID) - Instron 4201	(IK) - Instron 4400 Series
(IM) - Instron 5500	(IN) - Instron 3340 Series
(KA) - Zwick Model 1425	(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)	(MN) - Minebea
(MR) - MTS Alliance RT series	(TB) - Thwing-Albert EJA/1000
(TF) - Thwing-Albert EJA Vantage-1	(TI) - Thwing-Albert QC II
(TJ) - Thwing-Albert QC II-XS	(TO) - Thwing-Albert QC-1000
(TP) - TMI Monitor/Tensile 100 (84-21-01)	(TX) - Thwing-Albert (model not specified)
(VM) - Valmet PaperLab (was Kajaani/Robotest)	(XX) - Instrument make/model not specified by lab

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

Grand Mean Sample SF53 = 2.0068 Percent

Grand Mean Sample SF54 = 2.1364 Percent



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

WebCode	Data Flag	Sample SE53			Sample SE54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2DENEM	X	9.403	0.080	0.13	9.287	-0.013	-0.02	LH
2Q3CKK		9.672	0.350	0.58	9.355	0.055	0.09	TE
4F9F7H		9.333	0.010	0.02	9.320	0.020	0.03	ID
68VUQD		9.661	0.339	0.56	9.628	0.328	0.56	IK
793BKC		8.785	-0.537	-0.89	8.608	-0.693	-1.19	SB
7HLY4H		8.619	-0.703	-1.17	8.513	-0.787	-1.35	IF
82DET8		9.430	0.107	0.18	9.720	0.420	0.72	TP
86A2DU		9.268	-0.055	-0.09	8.928	-0.372	-0.64	TO
B283ZL		9.375	0.053	0.09	9.460	0.160	0.28	SP
B7Q7C9		9.058	-0.265	-0.44	8.921	-0.379	-0.65	LW
CAMHL9		9.118	-0.205	-0.34	8.992	-0.308	-0.53	TB
CDCLXE		10.249	0.926	1.54	9.943	0.643	1.11	TH
CK7V2H		9.480	0.157	0.26	9.474	0.174	0.30	TO
DULCWV		9.070	-0.253	-0.42	9.080	-0.220	-0.38	TB
DZAC8C		9.514	0.191	0.32	9.422	0.122	0.21	IA
FWAFTZ		9.120	-0.202	-0.34	8.982	-0.318	-0.55	XX
G74TVY		8.280	-1.043	-1.73	8.134	-1.166	-2.01	XX
HVMFX9		9.842	0.520	0.86	9.868	0.568	0.98	TK
JC7VEB		9.140	-0.182	-0.30	9.490	0.190	0.33	TK
JNAZQP		9.993	0.670	1.11	10.071	0.771	1.33	TP
K7A4F8	*	7.714	-1.609	-2.67	8.266	-1.034	-1.78	IF
K7MPVB		9.799	0.476	0.79	10.091	0.790	1.36	LA
KUFX7A	*	9.856	0.534	0.89	9.138	-0.162	-0.28	TO
L2Z9EU		8.304	-1.019	-1.69	8.222	-1.078	-1.86	SA
LN3DLG		9.779	0.457	0.76	9.821	0.521	0.90	TB
LN9PKY	*	10.900	1.578	2.62	10.698	1.398	2.41	LA
MB9JPD		9.406	0.083	0.14	9.228	-0.072	-0.12	LH
N8F2JK		9.607	0.285	0.47	9.605	0.305	0.53	LH
RHTAWF		9.740	0.417	0.69	10.029	0.729	1.26	TO
RPW7UU		9.294	-0.029	-0.05	9.310	0.010	0.02	LH
T6J49V		8.431	-0.892	-1.48	8.819	-0.481	-0.83	IM
U4GTRH		9.015	-0.308	-0.51	8.923	-0.377	-0.65	LW
UJGJ3M		9.180	-0.142	-0.24	9.087	-0.213	-0.37	ID
WYVTCZ		9.628	0.306	0.51	9.347	0.046	0.08	LH
XARTAK		8.753	-0.570	-0.94	9.000	-0.300	-0.52	IN
YAWWQ		8.890	-0.433	-0.72	8.772	-0.528	-0.91	XX
YYGTUP		10.217	0.894	1.48	10.339	1.039	1.79	TA
ZCLFQD		9.468	0.145	0.24	9.672	0.371	0.64	IM
ZWLCR8		9.269	-0.053	-0.09	9.129	-0.171	-0.29	XX

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

	Sample SE53	Summary Statistics	Sample SE54
Grand Means	9.3225 kN/m		9.3002 kN/m
SD Btwn Labs	0.6029 kN/m		0.5809 kN/m
Statistics based on 38 of 39 reporting participants			

Comments on assigned Data Flags for Test #330

2DENEM (X) - Data appears to be transposed between Analysis 330 (Tensile Breaking Strength) and Analysis 332 (Elongation to Break). Data switched by CTS.

Analysis Notes:

K7MPVB - Data appear to be reported as lb/inch , not kN/m as indicated on datasheet. Unit change by CTS.

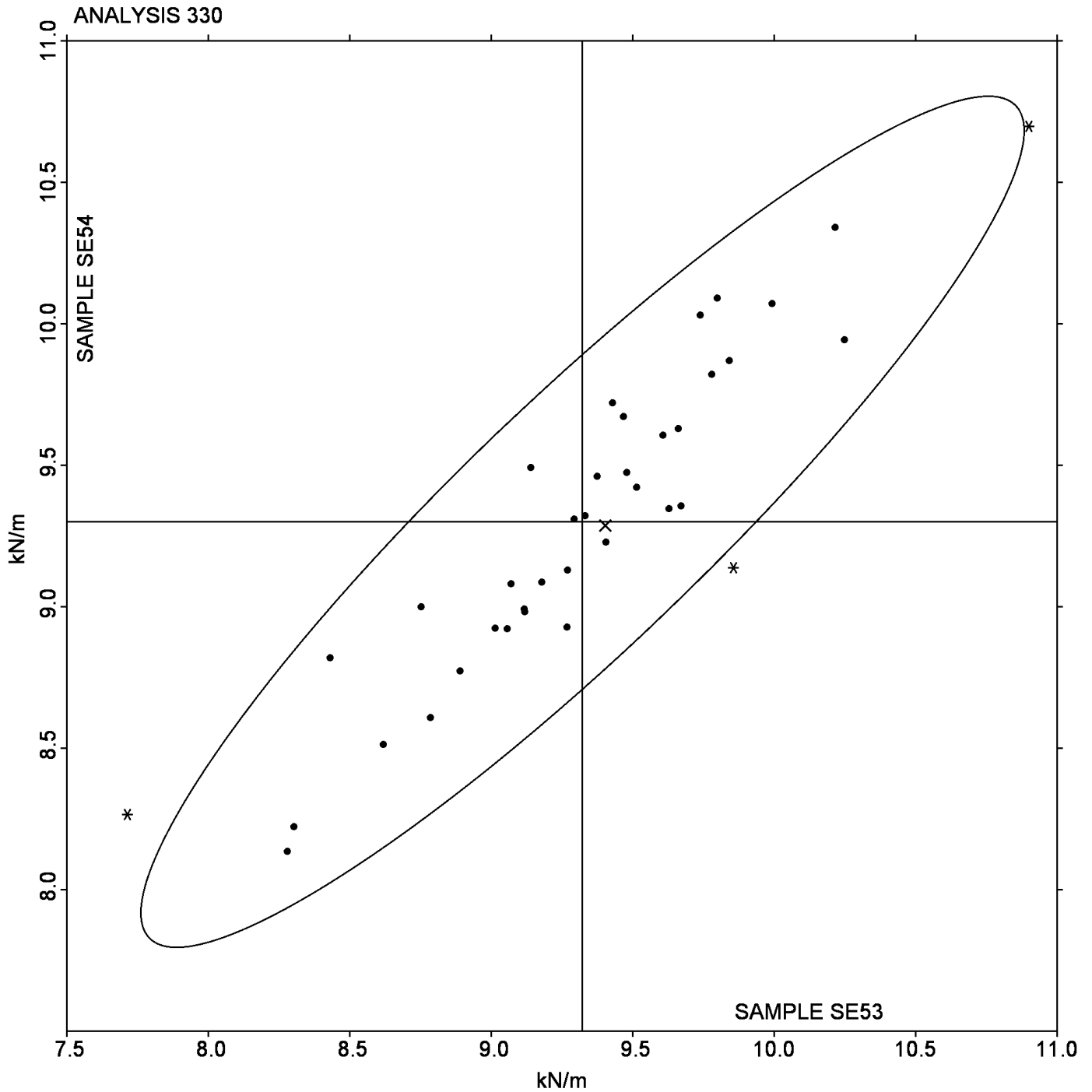
Instrument Code List

- | | |
|---|---|
| (IA) - Instron 1011 | (ID) - Instron 4201 |
| (IF) - Instron 3340 Series | (IK) - Instron 4400 Series |
| (IM) - Instron 5500 Series | (IN) - Instron 3360 Series |
| (LA) - L & W Autoline | (LH) - L & W Alwetron TH1 (Horizontal) SE 060 |
| (LW) - L & W Tensile Tester SE062 | (SA) - Shimadzu Autograph AG 2000 A |
| (SB) - Shimadzu Autograph DSS 500 | (SP) - Schopper Type Tensile Tester (TMI) |
| (TA) - Thwing-Albert Tensile Tester | (TB) - Thwing-Albert EJA/1000 |
| (TE) - Thwing-Albert Intellect 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) | (XX) - Instrument make/model not specified by lab |

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

Grand Mean Sample **SE53** = 9.3225 kN/m

Grand Mean Sample **SE54** = 9.3002 kN/m



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

WebCode	Data Flag	Sample SE53			Sample SE54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2RLV6K		122.6	-4.9	-0.34	124.0	-3.4	-0.26	LH
2WCFJZ		145.5	18.0	1.25	131.5	4.1	0.32	TO
3MUX3E		127.0	-0.5	-0.03	122.9	-4.5	-0.35	SB
4M7YHL		148.3	20.9	1.45	133.6	6.2	0.48	TH
64FJAG		133.0	5.5	0.38	132.4	5.0	0.38	TE
6A4PQJ		132.1	4.7	0.32	129.3	1.9	0.15	IA
77JTJQ		116.6	-10.9	-0.75	110.3	-17.1	-1.32	LH
7W3YRV		138.8	11.4	0.79	148.1	20.7	1.60	TO
8CFJ39		113.4	-14.1	-0.98	114.6	-12.8	-0.99	XX
EZXGP9		124.7	-2.7	-0.19	122.4	-5.0	-0.39	IA
H6HFUE		150.3	22.8	1.58	150.8	23.4	1.81	TB
JFRWVW		115.9	-11.6	-0.80	112.1	-15.3	-1.18	SA
JNTVLX		153.1	25.6	1.78	152.5	25.1	1.94	IK
JPZ87F		121.9	-5.6	-0.39	116.5	-11.0	-0.85	LH
LHBFMR		142.7	15.2	1.06	143.2	15.8	1.22	TP
N63BPN		130.8	3.3	0.23	139.8	12.4	0.96	IM
P8EML4		130.6	3.2	0.22	128.6	1.1	0.09	TO
PTYXWU		117.5	-10.0	-0.69	114.6	-12.8	-0.99	LW
PWK8YN		114.6	-12.9	-0.89	117.2	-10.2	-0.79	LW
QDZZZW		108.3	-19.1	-1.33	124.2	-3.2	-0.25	IM
RNKL3X	*	93.7	-33.7	-2.34	110.4	-17.1	-1.32	IF
T79L2F		119.1	-8.3	-0.58	125.0	-2.4	-0.19	TB
UNJGQM		124.2	-3.3	-0.23	120.9	-6.5	-0.51	IN
UTZGND		133.7	6.2	0.43	131.6	4.2	0.33	TO
XTVGFW		142.5	15.0	1.04	145.1	17.7	1.37	LA
Y23RWL		113.1	-14.4	-1.00	111.1	-16.3	-1.26	XX

Sample SE53		Summary Statistics	Sample SE54	
Grand Means	127.46 Joules/sq m		127.41 Joules/sq m	
SD Btwn Labs	14.43 Joules/sq m		12.93 Joules/sq m	
Statistics based on 26 of 26 reporting participants				

Notes for Analysis 331

No Data Flags assigned for this analysis.

Analysis Notes:

2WCFJZ - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Unit changed by CTS.

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

Instrument Code List

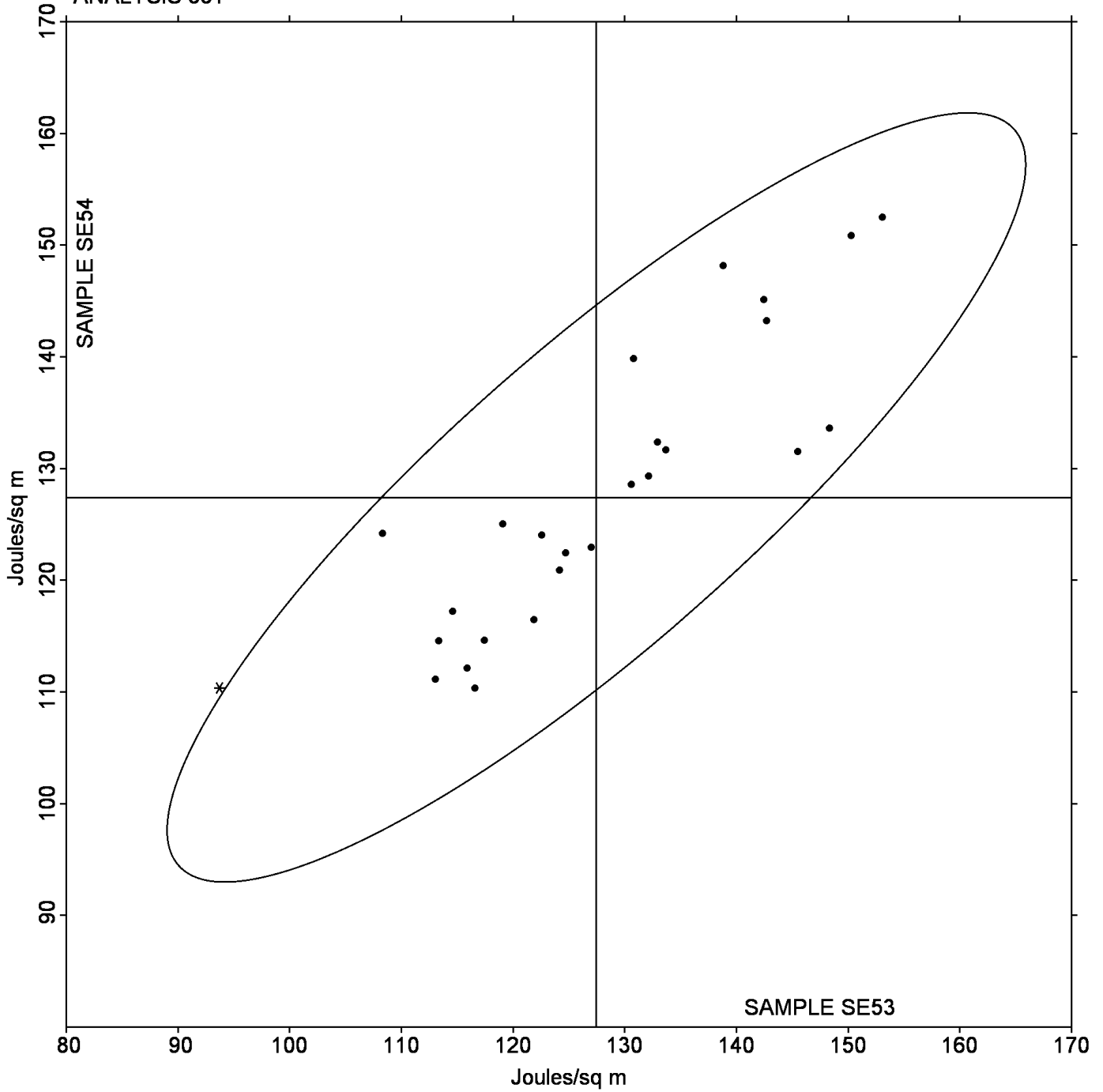
(IA) - Instron 1011	(IF) - Instron 3340 Series
(IK) - Instron 4400 Series	(IM) - Instron 5500 Series
(IN) - Instron 3360 Series	(LA) - L & W Autoline
(LH) - L & W Alwetron TH1 (Horizontal) SE 060	(LW) - L & W Tensile Tester SE062
(SA) - Shimadzu Autograph AG 2000 A	(SB) - Shimadzu Autograph DSS 500
(TB) - Thwing-Albert EJA/1000	(TE) - Thwing-Albert Intellect II
(TH) - Thwing-Albert QC-3A	(TO) - Thwing-Albert QC-1000
(TP) - TMI Monitor/Tensile 100 (84-21-01)	(XX) - Instrument make/model not specified by lab

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

Grand Mean Sample **SE53** = 127.46 Joules/sq m

Grand Mean Sample **SE54** = 127.41 Joules/sq m

ANALYSIS 331



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

WebCode	Data Flag	Sample SE53			Sample SE54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
23AURA		2.081	-0.078	-0.31	2.063	-0.101	-0.45	XX
2NVD9L		2.080	-0.079	-0.32	2.144	-0.020	-0.09	IA
4TECPK		2.140	-0.019	-0.08	2.180	0.016	0.07	IA
688G48		1.899	-0.260	-1.04	1.954	-0.210	-0.94	LW
6J8X2P		2.084	-0.075	-0.30	2.066	-0.098	-0.44	LA
8A38XC		1.903	-0.256	-1.03	1.913	-0.251	-1.12	XX
8DGHKA		2.728	0.569	2.28	2.641	0.477	2.13	IN
9GE397		2.015	-0.144	-0.58	2.015	-0.149	-0.66	XX
9P9QXM		1.810	-0.349	-1.40	1.770	-0.394	-1.76	LH
AE44GA		1.969	-0.190	-0.76	1.947	-0.217	-0.97	TB
BAZDC2		2.175	0.016	0.06	2.287	0.123	0.55	IM
C94CPB	X	2.076	-0.083	-0.33	2.064	-0.100	-0.45	LH
DLRZW9		2.254	0.095	0.38	2.302	0.138	0.62	TE
E8DBC6		1.960	-0.199	-0.80	1.990	-0.174	-0.78	XX
EPGG8U		2.623	0.464	1.86	2.578	0.414	1.85	TP
FBRYW2		2.094	-0.065	-0.26	2.100	-0.064	-0.28	SB
FEZ7F8	X	0.200	-1.959	-7.86	0.179	-1.985	-8.87	TO
GG2G2A		1.875	-0.285	-1.14	2.028	-0.136	-0.61	IF
GVA6JV		2.245	0.086	0.34	2.219	0.055	0.25	TO
GXGVZ7		2.209	0.050	0.20	2.380	0.216	0.97	IM
L9PAWF		2.229	0.070	0.28	2.296	0.132	0.59	TH
P73JYJ		2.438	0.279	1.12	2.371	0.207	0.93	SA
PPH7Q8		2.372	0.213	0.85	2.382	0.218	0.98	TB
TGCMPL		1.860	-0.299	-1.20	1.897	-0.267	-1.19	XX
UVGVTM		2.452	0.292	1.17	2.479	0.316	1.41	IK
VLA6PH		1.950	-0.209	-0.84	2.040	-0.124	-0.55	TB
WEX8Z3		1.913	-0.246	-0.99	1.861	-0.303	-1.35	LH
WXQ69W		2.273	0.114	0.46	2.266	0.102	0.46	TO
X7YNTK		1.948	-0.211	-0.85	1.925	-0.239	-1.07	LW
XEADNR	*	2.494	0.335	1.34	2.259	0.095	0.43	TH
Y9FR2W		2.547	0.388	1.56	2.390	0.226	1.01	TO

	Sample SE53	Summary Statistics	Sample SE54
Grand Means	2.1593 Percent		2.1636 Percent
SD Btwn Labs	0.2493 Percent		0.2237 Percent
Statistics based on 29 of 31 reporting participants			

Comments on assigned Data Flags for Test #332

C94CPB (X) - Data appears to be transposed between Analysis 330 (Tensile Breaking Strength) and Analysis 332 (Elongation to Break). Data switched by CTS.

FEZ7F8 (X) - Extreme data.

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

Instrument Code List

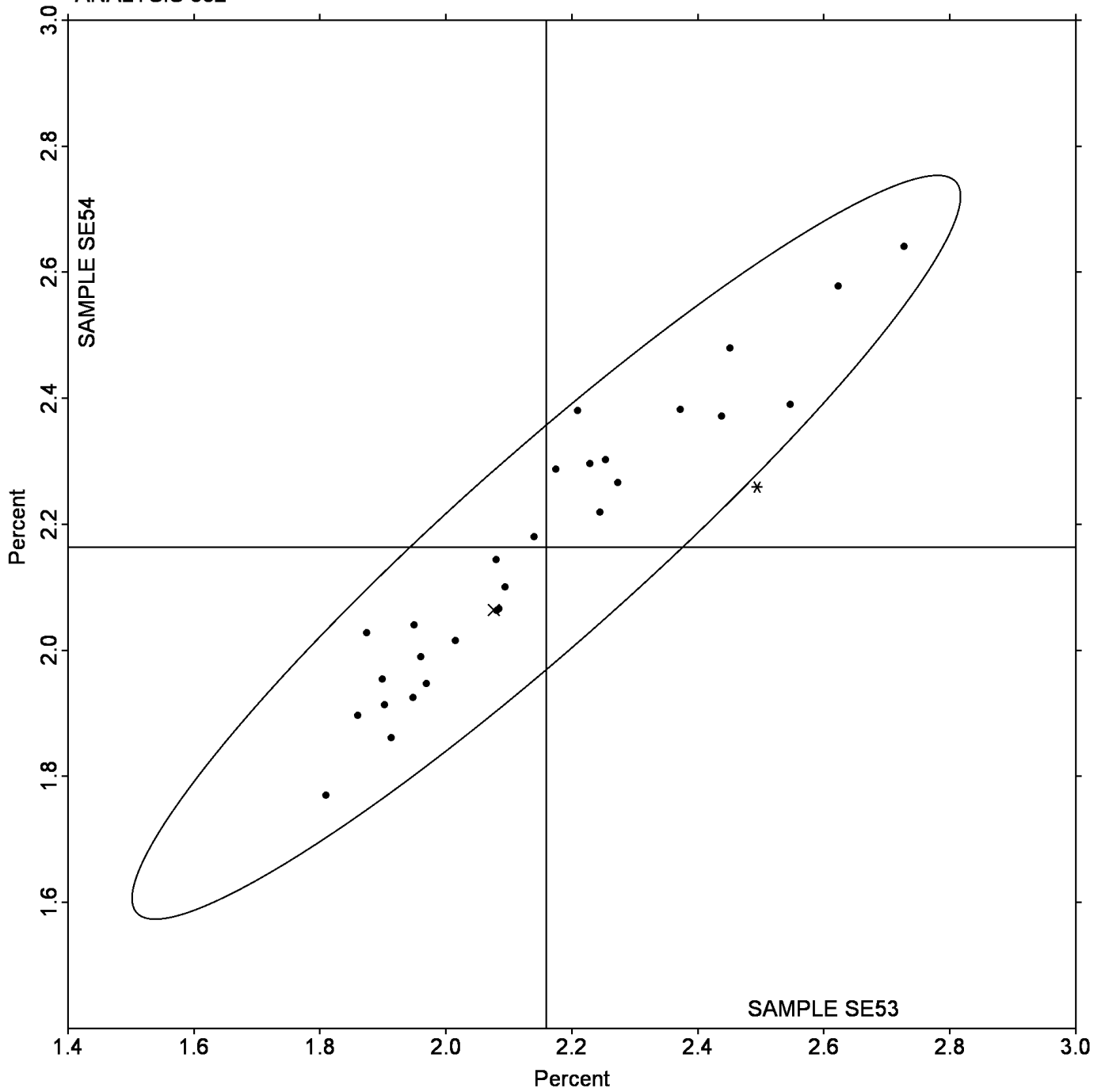
(IA) - Instron 1011	(IF) - Instron 3340 Series
(IK) - Instron 4400 Series	(IM) - Instron 5500 Series
(IN) - Instron 3360 Series	(LA) - L & W Autoline 300
(LH) - L & W Alwetron TH1 (Horizontal) SE 060	(LW) - L & W Tensile Tester SE062
(SA) - Shimadzu Autograph AG 2000 A	(SB) - Shimadzu Autograph DSS 500
(TB) - Thwing-Albert EJA/1000	(TE) - Thwing-Albert Intellect II
(TH) - Thwing-Albert QC-3A	(TO) - Thwing-Albert QC-1000
(TP) - TMI Monitor/Tensile 100 (84-21-01)	(XX) - Instrument make/model not specified by lab

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

Grand Mean Sample **SE53** = 2.1593 Percent

Grand Mean Sample **SE54** = 2.1636 Percent

ANALYSIS 332



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

WebCode	Data Flag	Sample SG53			Sample SG54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2TZ8XM		62.30	13.89	1.30	75.70	27.28	2.22	MT
4Y9AAV		47.80	-0.61	-0.06	34.60	-13.82	-1.12	MT
7K2L8W		41.20	-7.21	-0.67	40.20	-8.22	-0.67	MT
8VHJYL		40.90	-7.51	-0.70	41.20	-7.22	-0.59	MT
96MZYQ		47.80	-0.61	-0.06	40.70	-7.72	-0.63	MT
AH4VFU		53.30	4.89	0.46	44.70	-3.72	-0.30	MT
CL2E4J		59.00	10.59	0.99	52.30	3.88	0.32	XX
CRHB77		50.40	1.99	0.19	48.00	-0.42	-0.03	XX
DQCYAV		41.10	-7.31	-0.68	36.50	-11.92	-0.97	MT
DQVNTB		48.90	0.49	0.05	50.30	1.88	0.15	MT
E93XYV		48.10	-0.31	-0.03	59.70	11.28	0.92	MT
GZN9CD		58.40	9.99	0.94	65.30	16.88	1.37	MT
JHWQDE		32.40	-16.01	-1.50	43.00	-5.42	-0.44	MT
MEZXNU		48.80	0.39	0.04	57.50	9.08	0.74	MT
MYGXDG		51.90	3.49	0.33	53.30	4.88	0.40	MT
PDQF9N		36.30	-12.11	-1.13	25.10	-23.32	-1.89	MT
QYWTRT		66.90	18.49	1.73	44.30	-4.12	-0.33	MT
RZK3ZF		59.80	11.39	1.07	65.40	16.98	1.38	MT
X6WKZN		24.50	-23.91	-2.24	42.10	-6.32	-0.51	MT

Sample SG53		Summary Statistics	Sample SG54	
Grand Means	48.411 Double Folds		48.416 Double Folds	
SD Btwn Labs	10.683 Double Folds		12.306 Double Folds	
Statistics based on 19 of 19 reporting participants				

Notes for Analysis 334

No Data Flags assigned for this analysis.

Instrument Code List

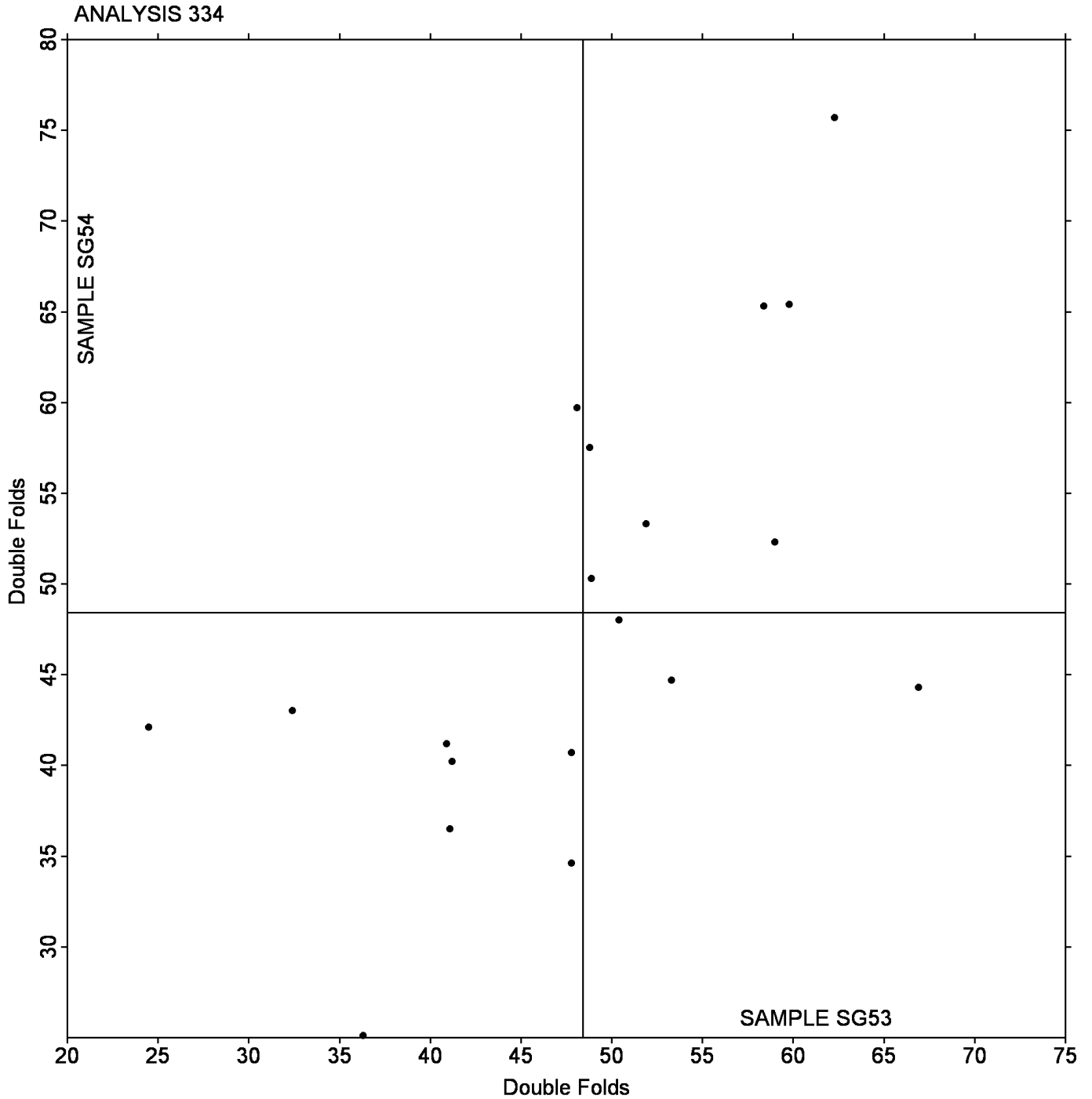
(MT) - MIT - Tinius Olsen

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

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

Grand Mean Sample **SG53** = 48.411 Double Folds

Grand Mean Sample **SG54** = 48.416 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 SH53			Sample SH54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2P2W3M		148.7	6.8	0.56	270.3	12.0	0.58
42HTCH		133.2	-8.7	-0.72	257.8	-0.4	-0.02
6T64CP		138.8	-3.2	-0.26	253.1	-5.1	-0.25
6WHYXD		162.9	21.0	1.73	308.1	49.9	2.39
7NU9NT		129.7	-12.3	-1.01	252.2	-6.1	-0.29
8PH66X		142.1	0.2	0.01	280.3	22.1	1.06
BVMG98	X	153.2	11.2	0.93	137.6	-120.6	-5.78
CZXUQ7		144.9	3.0	0.24	263.1	4.9	0.23
DL24UE		149.6	7.7	0.63	251.6	-6.7	-0.32
F4LYV2		150.1	8.1	0.67	275.1	16.9	0.81
FCDMEA		143.6	1.7	0.14	266.0	7.7	0.37
FJJWJG	X	69.8	-72.1	-5.94	135.6	-122.7	-5.88
GJCDER	X	256.4	114.5	9.42	281.9	23.7	1.13
JNZC4C		141.5	-0.4	-0.04	229.5	-28.7	-1.38
JURX9X		168.0	26.1	2.15	280.0	21.8	1.04
KX8PX7		142.1	0.1	0.01	259.4	1.1	0.05
QQ4GFC		137.0	-5.0	-0.41	245.3	-12.9	-0.62
U2LQHP		118.5	-23.4	-1.93	228.4	-29.8	-1.43
XDENDH		140.1	-1.8	-0.15	269.1	10.9	0.52
XW7DG4		142.2	0.3	0.03	247.6	-10.7	-0.51
Y2NB6R	X	188.0	46.0	3.79	268.2	10.0	0.48
ZEGDJY		143.8	1.9	0.16	251.9	-6.3	-0.30
ZEHA3U		145.6	3.7	0.30	262.8	4.6	0.22
ZV9MNU		116.1	-25.8	-2.13	213.1	-45.1	-2.16

Sample SH53		Summary Statistics	Sample SH54	
Grand Means	141.93 Gurley Units		258.24 Gurley Units	
SD Btw Labs	12.15 Gurley Units		20.88 Gurley Units	
Statistics based on 20 of 24 reporting participants				

Comments on assigned Data Flags for Test #336

BVMG98 (X) - Extreme data for Sample SH54.

FJJWJG (X) - Extreme data.

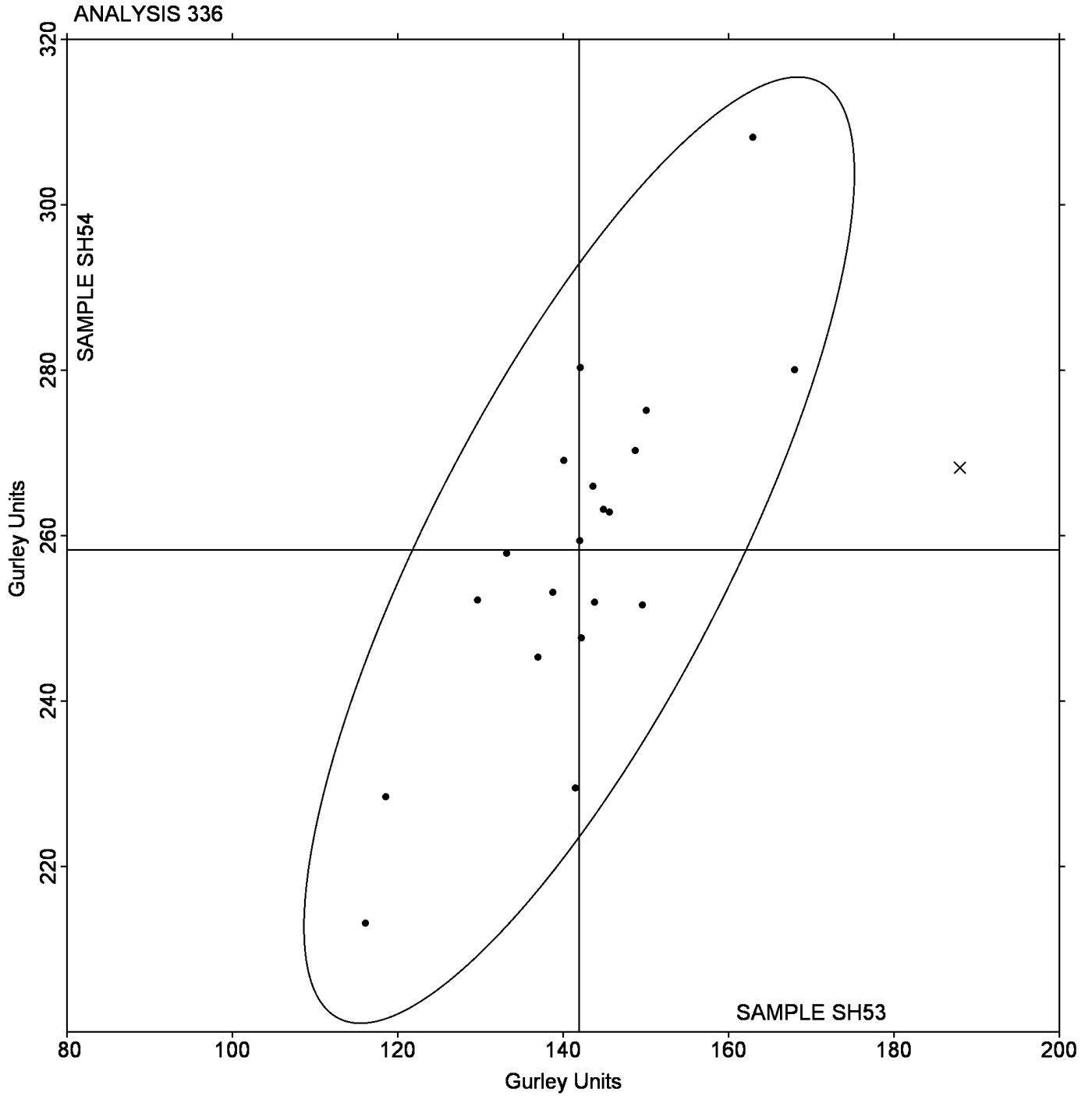
GJCDER (X) - Extreme data for Sample SH53.

Y2NB6R (X) - Inconsistent in testing between samples and within the determinations for Sample SH53.

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

Grand Mean Sample **SH53** = 141.93 Gurley Units

Grand Mean Sample **SH54** = 258.24 Gurley Units



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

WebCode	Data Flag	Sample SJ53			Sample SJ54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
4UEYAA		2.457	0.340	1.24	4.170	0.688	1.13
6N3TVA		1.873	-0.244	-0.89	3.383	-0.099	-0.16
6XZCXP		1.634	-0.483	-1.77	2.872	-0.610	-1.00
874RGN	X	52.200	50.083	183.27	38.930	35.448	58.01
98ARWE		2.630	0.513	1.88	4.063	0.581	0.95
9E7WKJ		2.231	0.114	0.42	3.340	-0.142	-0.23
HGNTAR		2.243	0.126	0.46	3.728	0.246	0.40
JBVX4E	X	6.680	4.563	16.70	7.630	4.148	6.79
KA9N9X	X	0.185	-1.933	-7.07	0.345	-3.137	-5.13
KMC442		2.090	-0.027	-0.10	3.746	0.264	0.43
LXDN49	*	1.998	-0.119	-0.44	1.887	-1.595	-2.61
M3UD9T		2.215	0.097	0.36	3.615	0.133	0.22
PAGYC7		2.326	0.208	0.76	4.084	0.602	0.99
PFT2DT		1.800	-0.317	-1.16	3.120	-0.362	-0.59
PXPV3R		2.070	-0.047	-0.17	3.770	0.288	0.47
ZXPFFH		1.959	-0.159	-0.58	3.483	0.001	0.00

Sample SJ53		Summary Statistics	Sample SJ54	
Grand Means	2.1173 Taber Units		3.4816 Taber Units	
SD Btwn Labs	0.2733 Taber Units		0.6111 Taber Units	
Statistics based on 13 of 16 reporting participants				

Comments on assigned Data Flags for Test #338

- 874RGN (X) - Extreme data.
- JBVX4E (X) - Extreme data.
- KA9N9X (X) - Extreme data.

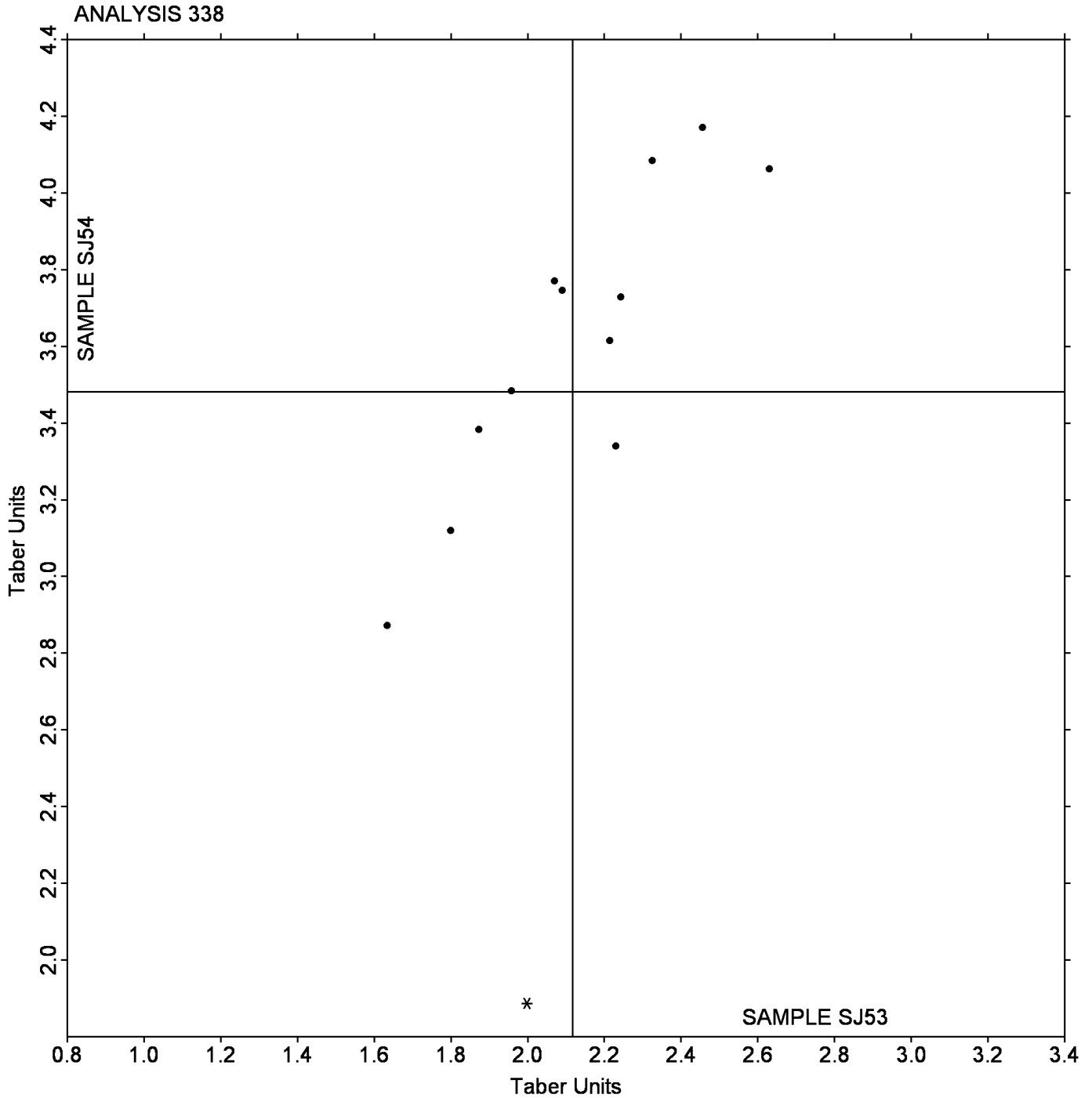
Analysis Notes:

- LXDN49 - Data appear to be off by a factor of 10; data converted by CTS (/10).
- PAGYC7 - Data appear to be off by a factor of 10; data converted by CTS (/10).

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

Grand Mean Sample **SJ53** = 2.1173 Taber Units

Grand Mean Sample **SJ54** = 3.4816 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 SQ53			Sample SQ54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2C9HJR		9.330	0.241	0.34	20.36	0.28	0.34
3RCGXA		9.600	0.511	0.73	19.65	-0.43	-0.52
7JXQ2Z		8.500	-0.589	-0.84	20.85	0.77	0.93
EDBD9J	X	57.200	48.111	68.40	35.00	14.92	18.13
FFVPHA		8.124	-0.965	-1.37	18.63	-1.45	-1.76
GG7TP7		9.310	0.221	0.31	19.67	-0.42	-0.51
K8WFKX		9.150	0.061	0.09	21.00	0.92	1.12
MKFCP8		9.165	0.076	0.11	20.33	0.25	0.30
NCLEWQ		8.260	-0.829	-1.18	19.29	-0.79	-0.96
NLDQHK		10.360	1.271	1.81	20.95	0.87	1.06

		Summary Statistics	
	Sample SQ53		Sample SQ54
Grand Means	9.0888 Taber Units		20.081 Taber Units
SD Btwn Labs	0.7034 Taber Units		0.823 Taber Units
Statistics based on 9 of 10 reporting participants			

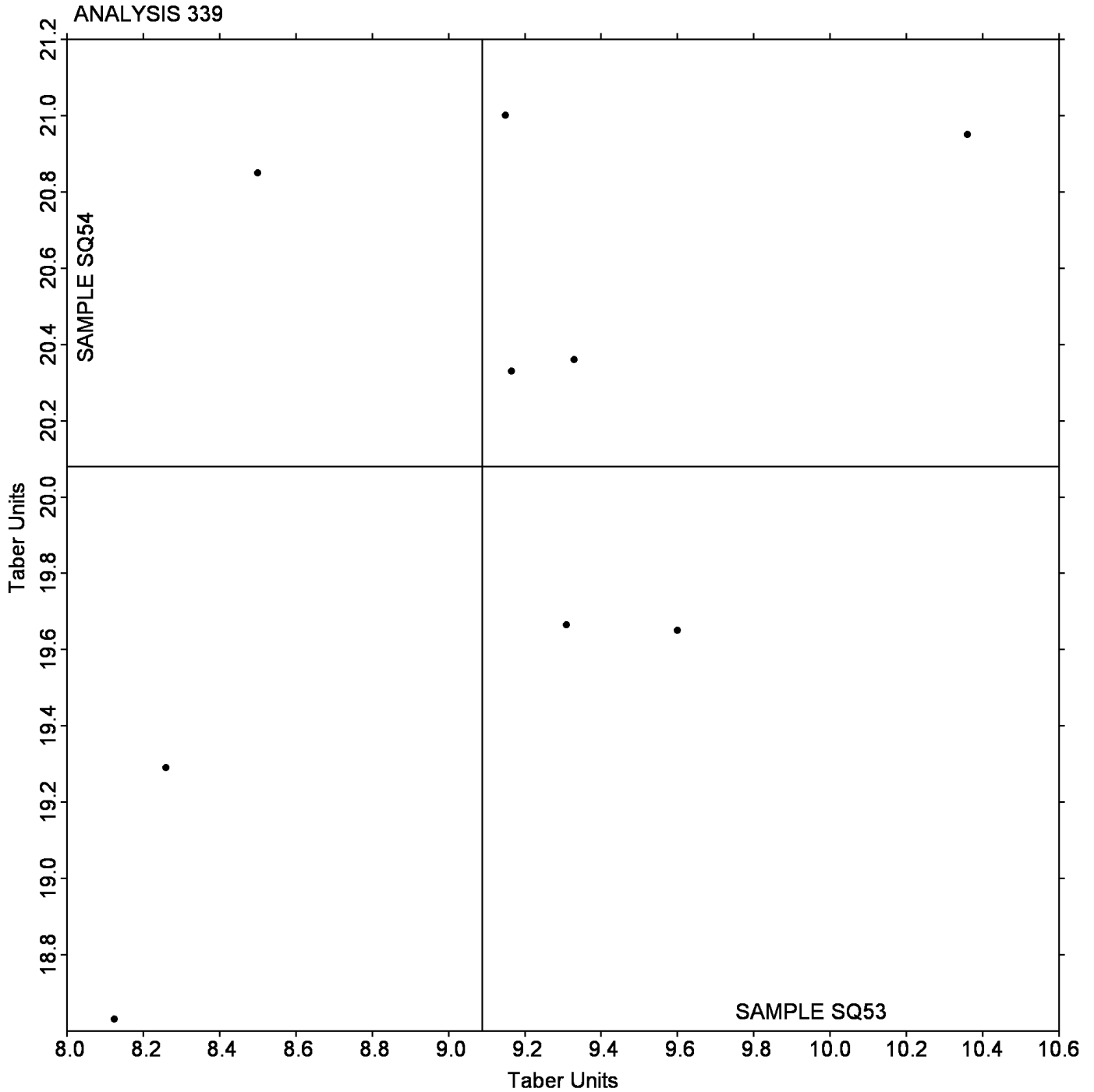
Comments on assigned Data Flags for Test #339

EDBD9J (X) - Extreme data.

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

Grand Mean Sample **SQ53** = 9.0888 Taber Units

Grand Mean Sample **SQ54** = 20.081 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 ST53			Sample ST54		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2TTR33		257.0	6.0	0.79	217.7	8.2	1.27
43JKMX		250.7	-0.3	-0.04	208.6	-0.9	-0.14
473D8C		250.7	-0.3	-0.04	207.9	-1.6	-0.26
6YVV2D		241.6	-9.4	-1.23	205.8	-3.7	-0.58
C26U9D		252.5	1.5	0.20	217.1	7.5	1.17
CJGFZM	X	508.4	257.4	33.90	434.9	225.4	35.10
DCJ3TK		259.8	8.8	1.16	216.6	7.1	1.10
EEPRU8		266.0	15.0	1.98	220.6	11.1	1.73
ET3FKG		250.2	-0.8	-0.10	205.4	-4.1	-0.65
F97EMR		236.0	-15.0	-1.97	203.3	-6.2	-0.97
HH2PB6		238.8	-12.2	-1.61	205.5	-4.0	-0.63
QFAZ4H		250.3	-0.7	-0.09	198.3	-11.2	-1.75
UF3Q9N		258.5	7.5	0.99	214.0	4.5	0.69
XDKXM		251.2	0.2	0.03	207.4	-2.1	-0.33
XDQ8UN		250.7	-0.3	-0.04	212.8	3.3	0.51
XLC9YC		257.0	6.0	0.79	215.0	5.5	0.85
YLQJ7B		246.2	-4.7	-0.62	204.0	-5.6	-0.87
ZG6FBB		249.4	-1.6	-0.21	202.4	-7.2	-1.12

		Summary Statistics	
	Sample ST53		Sample ST54
Grand Means	250.97 Taber Units		209.55 Taber Units
SD Btwn Labs	7.59 Taber Units		6.42 Taber Units
Statistics based on 17 of 18 reporting participants			

Comments on assigned Data Flags for Test #340

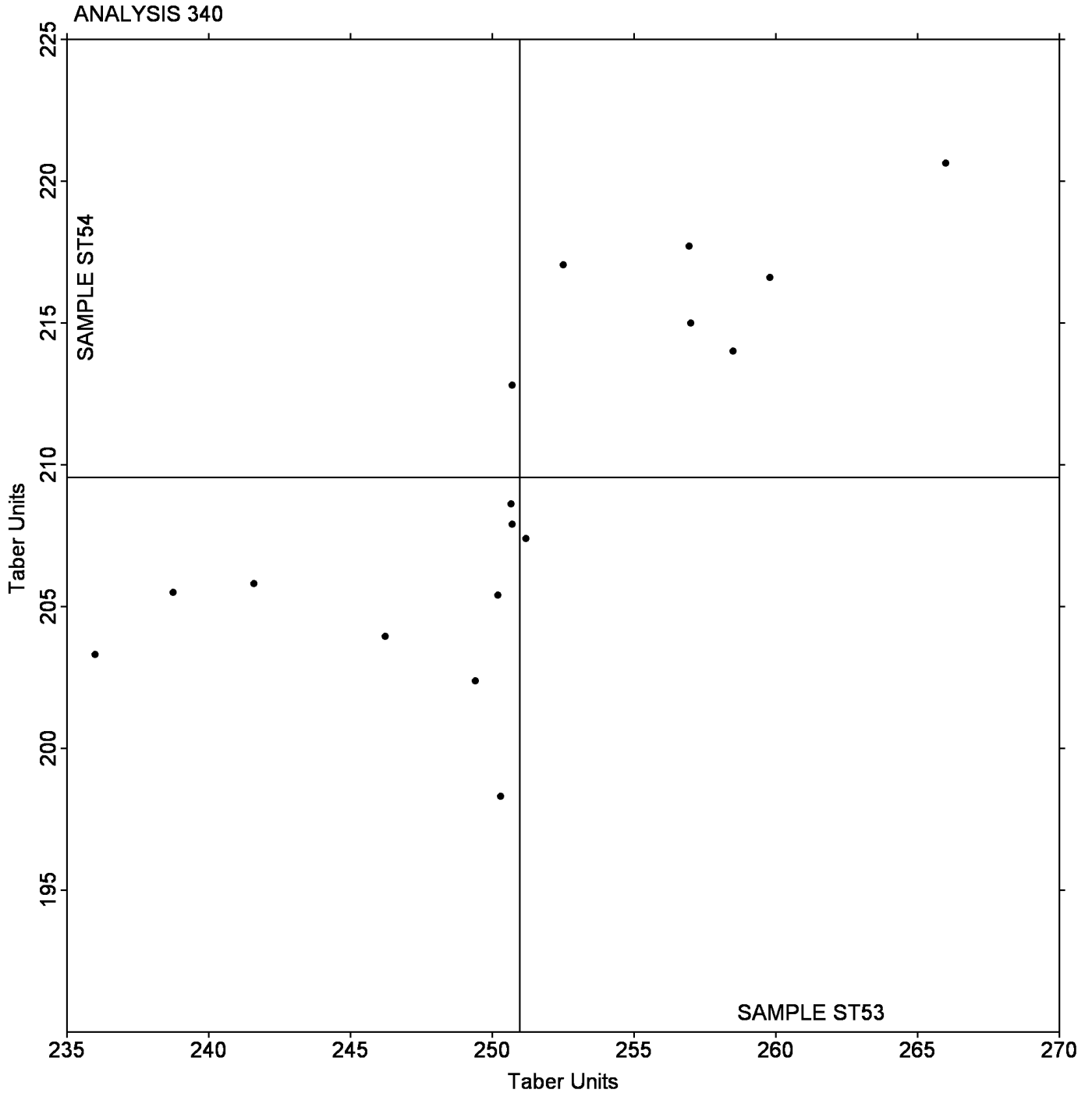
CJGFZM (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program Analysis 340

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

Grand Mean Sample **ST53** = 250.97 Taber Units

Grand Mean Sample **ST54** = 209.55 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 SM53			Sample SM54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2EA8FN		72.14	9.26	0.98	55.46	5.45	0.96	TA
4RNAW4		70.80	7.92	0.84	53.20	3.20	0.57	CA
67DYUJ		52.19	-10.69	-1.13	45.17	-4.84	-0.86	LW
8FXRCU		58.88	-4.00	-0.42	50.20	0.20	0.03	LW
EAC3CJ	X	37.94	-24.94	-2.64	30.43	-19.57	-3.46	XX
FT6JDD		50.34	-12.54	-1.33	42.91	-7.09	-1.25	TZ
GZUDA4		77.52	14.64	1.55	55.56	5.56	0.98	CD
K79CCX		73.20	10.32	1.09	60.04	10.04	1.78	TL
M77RUT		53.12	-9.76	-1.03	44.42	-5.58	-0.99	CD
M7HBBY		63.98	1.10	0.12	48.93	-1.07	-0.19	TA
PVPECG		67.44	4.56	0.48	53.02	3.02	0.53	LW
TEGLBC		69.62	6.74	0.71	53.68	3.68	0.65	DT
UBHHFU		54.40	-8.48	-0.90	42.22	-7.78	-1.38	TZ
YHHYVB		53.81	-9.07	-0.96	45.24	-4.77	-0.84	TZ

Summary Statistics		
	Sample SM53	Sample SM54
Grand Means	62.880 psi	50.003 psi
SD Btwn Labs	9.460 psi	5.653 psi
Statistics based on 13 of 14 reporting participants		

Comments on assigned Data Flags for Test #343

EAC3CJ (X) - Systematic error (data for both samples are low).

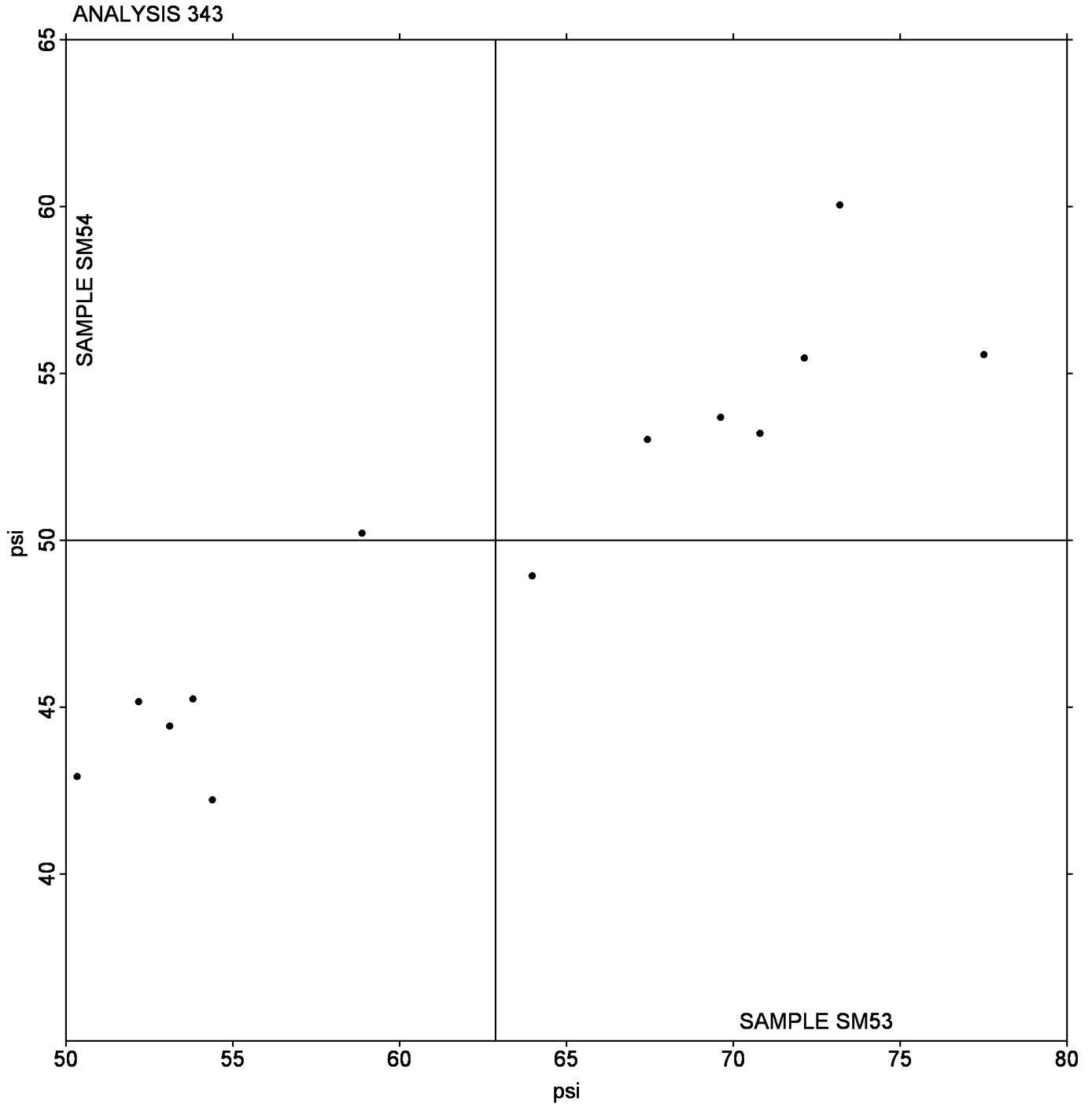
Instrument Code List

- | | |
|-------------------------------------|---|
| (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 **SM53** = 62.880 psi

Grand Mean Sample **SM54** = 50.003 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 SZ53			Sample SZ54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2DMHJG		40.40	-2.35	-0.63	62.60	4.68	0.80	CA
3FHW4J		43.88	1.13	0.30	64.12	6.20	1.07	TL
3YKADJ		39.44	-3.31	-0.89	56.76	-1.16	-0.20	LW
3YLKAV		48.52	5.77	1.56	51.34	-6.58	-1.13	TZ
4LJB JT		45.80	3.05	0.82	59.60	1.68	0.29	CA
AZGFBC		46.24	3.49	0.94	60.74	2.82	0.49	PG
CUY34V		37.39	-5.36	-1.45	51.14	-6.77	-1.16	LW
CVUK6W		48.92	6.17	1.66	49.48	-8.44	-1.45	TL
GPXAHG		38.00	-4.75	-1.28	53.20	-4.72	-0.81	CA
J2UEX6		41.00	-1.75	-0.47	63.80	5.88	1.01	CA
JCDXLV		40.56	-2.19	-0.59	63.34	5.42	0.93	TZ
M2C8WY		41.62	-1.13	-0.31	60.94	3.02	0.52	TL
Y4DLWK		41.56	-1.19	-0.32	49.46	-8.46	-1.45	TZ
ZWAV3T		45.20	2.45	0.66	64.30	6.38	1.10	CD

		Summary Statistics			
		Sample SZ53		Sample SZ54	
Grand Means		42.752 psi		57.916 psi	
SD Btwn Labs		3.705 psi		5.822 psi	
Statistics based on 14 of 14 reporting participants					

Notes for Analysis 345

No Data Flags assigned for this analysis.

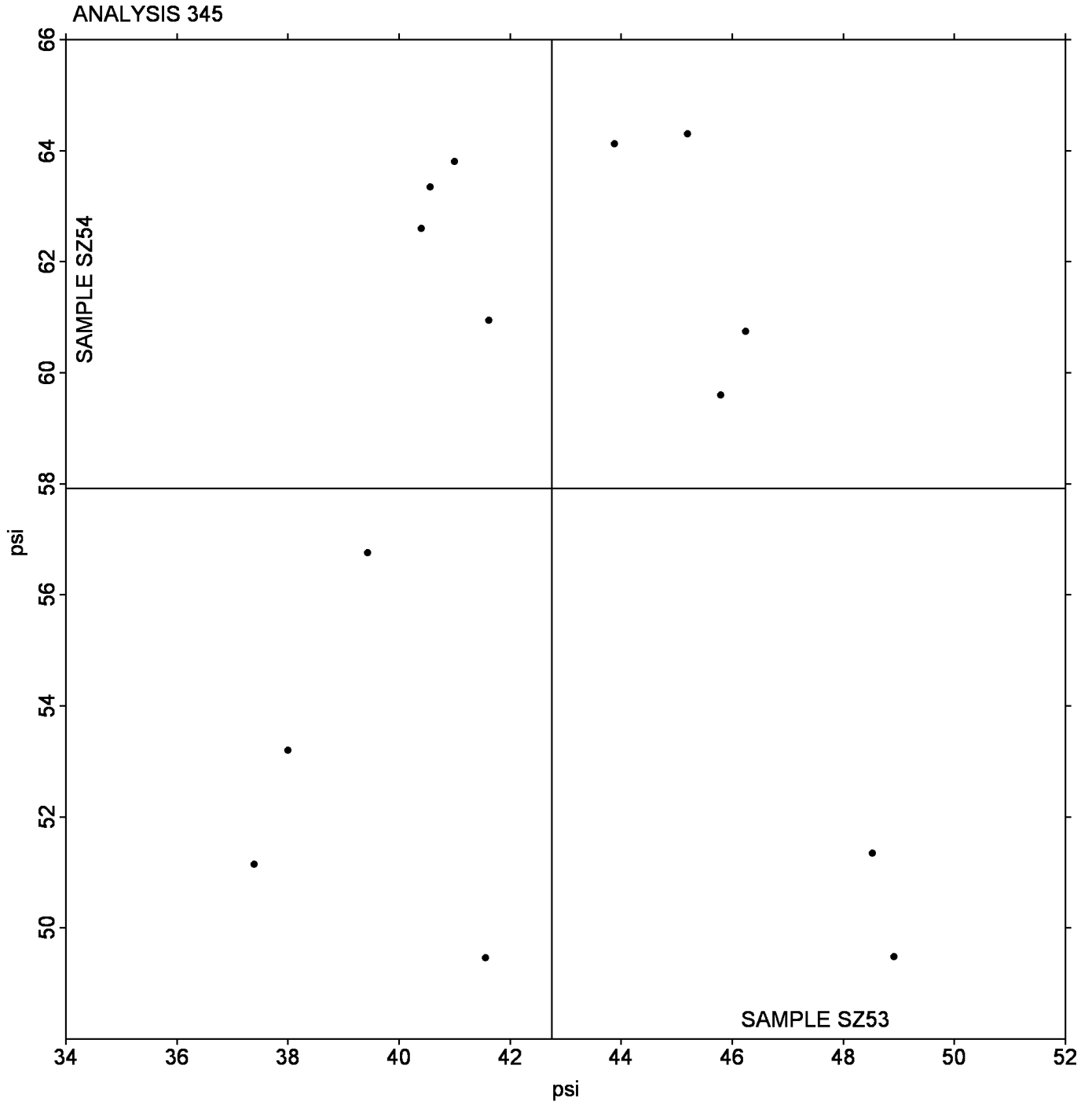
Instrument Code List

- | | |
|--------------------------------|--------------------------------------|
| (CA) - CSI CS-163 | (CD) - CSI CS-163D |
| (LW) - L & W ZD Tensile Tester | (PG) - Perkins Model A Mullen Tester |
| (TL) - TMI Lab Master | (TZ) - TMI Monitor/ZDT Tester |

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

Grand Mean Sample **SZ53** = 42.752 psi

Grand Mean Sample **SZ54** = 57.916 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 SN53			Sample SN54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3Q4J9Y		81.80	-7.16	-0.97	66.80	-10.42	-1.71	HY
3YDNL P		86.20	-2.76	-0.38	77.60	0.38	0.06	HY
4RND6K		91.00	2.04	0.28	76.00	-1.22	-0.20	HY
7H3XE U	*	67.20	-21.76	-2.96	64.60	-12.62	-2.07	HZ
8U2X3K		96.40	7.44	1.01	86.60	9.38	1.54	HY
9C8ZL9		90.60	1.64	0.22	82.20	4.98	0.82	HY
9NJKV4		92.40	3.44	0.47	80.80	3.58	0.59	HY
BTMYLD		81.80	-7.16	-0.97	71.96	-5.26	-0.86	KR
CHJPT2		84.60	-4.36	-0.59	73.00	-4.22	-0.69	XX
CQMMU3		96.40	7.44	1.01	75.40	-1.82	-0.30	HY
DF7XZ4		81.00	-7.96	-1.08	70.40	-6.82	-1.12	HY
JP9WNZ		96.00	7.04	0.96	83.40	6.18	1.01	HZ
L9GFQL		99.67	10.71	1.46	86.70	9.48	1.56	HY
L9X9RW		87.24	-1.72	-0.23	78.88	1.66	0.27	HY
N8KHR6		86.40	-2.56	-0.35	74.80	-2.42	-0.40	HY
PZUJK3		97.80	8.84	1.20	82.20	4.98	0.82	HY
QLU6UX		90.60	1.64	0.22	73.40	-3.82	-0.63	XX
R98674		89.80	0.84	0.11	84.40	7.18	1.18	HZ
RTNJ7H		96.03	7.07	0.96	83.18	5.96	0.98	HY
YG3ET8		91.80	2.84	0.39	78.80	1.58	0.26	XX
Z28WA9		84.00	-4.96	-0.67	73.80	-3.42	-0.56	HY
ZRBXG		88.32	-0.64	-0.09	73.95	-3.27	-0.54	HY

		Summary Statistics	
	Sample SN53		Sample SN54
Grand Means	88.957 1000th ft-lbs		77.221 1000th ft-lbs
SD Btwn Labs	7.348 1000th ft-lbs		6.088 1000th ft-lbs
Statistics based on 22 of 22 reporting participants			

Notes for Analysis 348

No Data Flags assigned for this analysis.

Instrument Code List

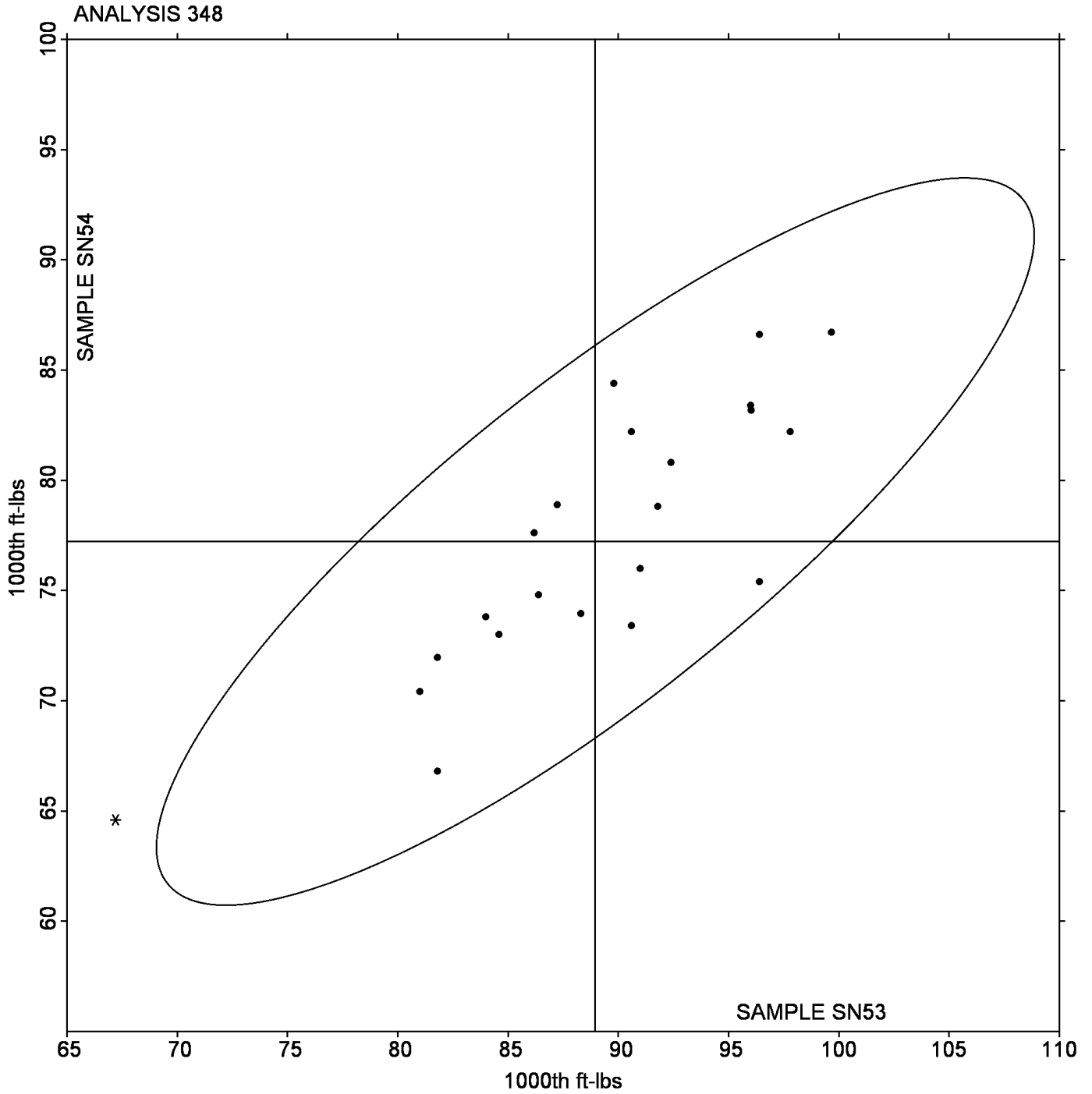
(HY) - Huygen Digitized Scott Internal Bond Tester
 (KR) - Kumagai Riki Kogyo Internal Bond Tester

(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 **SN53** = 88.957 1000th ft-lbs

Grand Mean Sample **SN54** = 77.221 1000th ft-lbs



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

WebCode	Data Flag	Sample SP53			Sample SP54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2EFW36		63.95	-15.12	-1.50	53.20	-13.47	-1.43	TM
6CYG3F		84.20	5.12	0.51	71.40	4.73	0.50	SC
8B8GF3		65.00	-14.08	-1.39	57.40	-9.27	-0.99	TM
97C7FG		80.80	1.72	0.17	73.20	6.53	0.69	SC
BQPFZR		72.40	-6.68	-0.66	65.00	-1.67	-0.18	SC
D9TMLN		71.00	-8.08	-0.80	58.33	-8.34	-0.89	SC
GRRND		84.00	4.92	0.49	64.80	-1.87	-0.20	TM
K73UQ7		81.00	1.92	0.19	61.80	-4.87	-0.52	TM
NBYCCH		81.18	2.10	0.21	68.52	1.85	0.20	XX
P8RYPV		70.80	-8.28	-0.82	57.00	-9.67	-1.03	TM
RA9XZV		98.28	19.20	1.90	81.86	15.19	1.61	TM
TP7QYA		83.20	4.12	0.41	70.60	3.93	0.42	XX
Z9YWC9		92.20	13.12	1.30	83.60	16.93	1.80	SC

		Summary Statistics			
		Sample SP53		Sample SP54	
Grand Means		79.078	1000th ft-lbs	66.670	1000th ft-lbs
SD Btwn Labs		10.103	1000th ft-lbs	9.405	1000th ft-lbs
Statistics based on 13 of 13 reporting participants					

Notes for Analysis 349

No Data Flags assigned for this analysis.

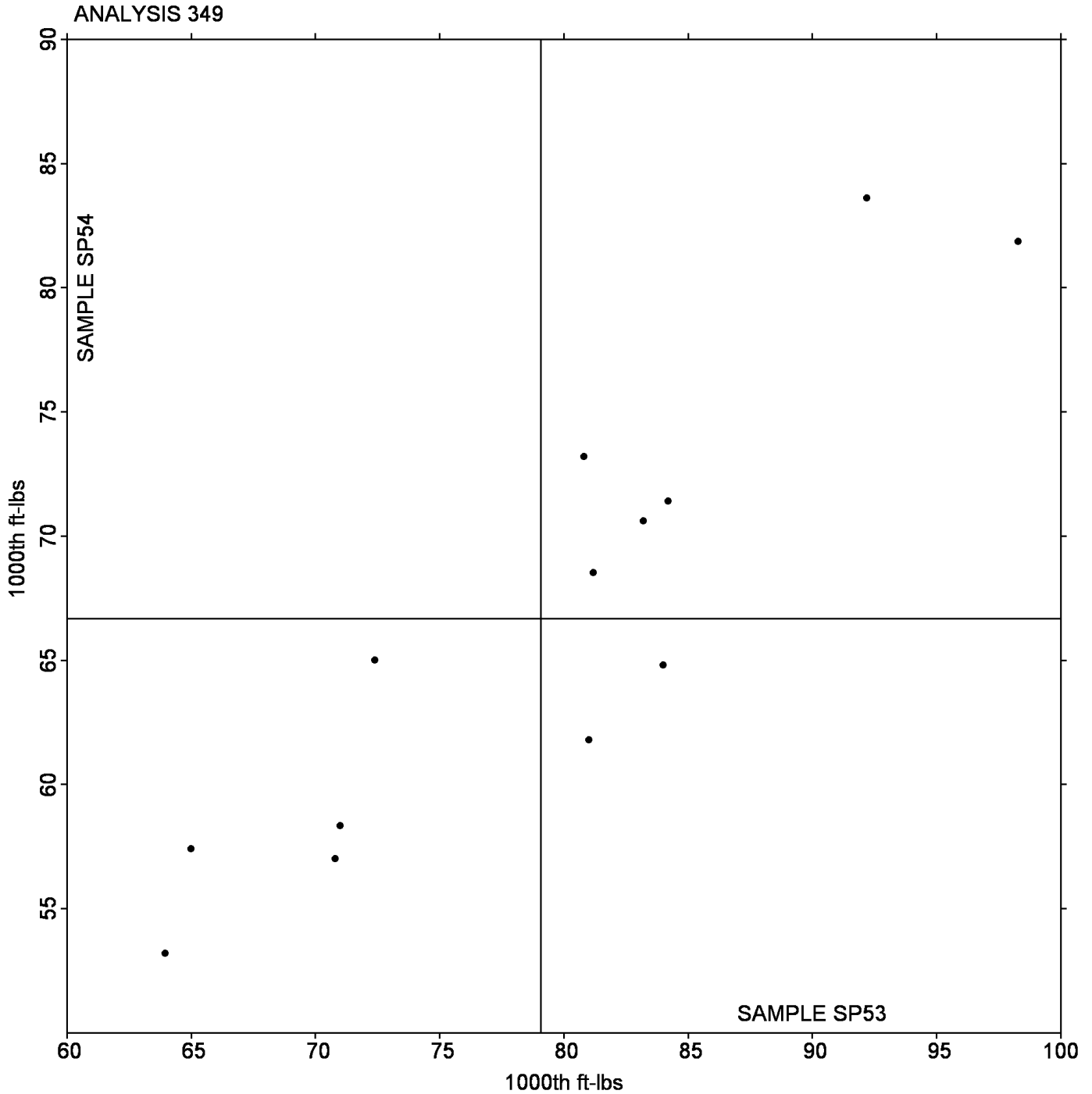
Instrument Code List

- (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 **SP53** = 79.078 1000th ft-lbs

Grand Mean Sample **SP54** = 66.670 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.