Collaborative Testing Services, Inc.

Paper & Paperboard Testing Program

Summary Report #3071 S - July 2020

Analysis	Analysis Name
305	Bursting Strength - Printing Papers
310	Bursting Strength - Packaging Papers
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 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

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 Website. The WebCode for each analysis can be found on the datasheets and in the Performance Analysis Report mailed to each participant.

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.

Paper & Paperboard Interlaboratory Testing Program

Analysis 305

Bursting Strength - Printing Papers

TAPPI Official Test Method T403

WebCode	Data Flag	Sample SA81 Lab Mean	Sample SA81 Diff from Grand Mean	Sample SA81 CPV	Sample SA82 Lab Mean	Sample SA82 Diff from Grand Mean	Sample SA82 CPV
2AY3P2		41.58	-2.54	-0.49	40.55	-3.25	-0.68
2NGVD9		42.34	-1.78	-0.35	43.45	-0.35	-0.07
3F44MB		40.58	-3.53	-0.69	42.12	-1.68	-0.35
4XDJHA	*	57.58	13.47	2.61	53.47	9.66	2.02
6BZAH6		43.36	-0.76	-0.15	44.73	0.93	0.19
6KM99A		44.97	0.85	0.17	45.45	1.64	0.34
7GJUZB		43.30	-0.82	-0.16	43.25	-0.55	-0.12
8EA8ZB		43.54	-0.58	-0.11	40.73	-3.08	-0.64
8PRNV4		41.40	-2.72	-0.53	41.50	-2.30	-0.48
97A8ZA		43.35	-0.77	-0.15	43.46	-0.34	-0.07
BBJ4L2		41.24	-2.87	-0.56	41.48	-2.33	-0.49
H3JX7Z		38.94	-5.17	-1.00	40.39	-3.41	-0.71
H7KY7W		43.32	-0.79	-0.15	41.73	-2.08	-0.43
HEE43J		42.70	-1.42	-0.27	40.70	-3.10	-0.65
JKDDJV		46.60	2.48	0.48	46.80	3.00	0.63
JPTK8V		50.09	5.97	1.16	50.75	6.95	1.45
KJLE6X		37.23	-6.88	-1.34	37.55	-6.25	-1.31
KNEDJT		56.30	12.18	2.36	56.10	12.30	2.57
LZ3Y3T		43.03	-1.08	-0.21	42.12	-1.68	-0.35
N9PM69		39.10	-5.02	-0.97	38.40	-5.40	-1.13
Q7UZ9N		49.55	5.43	1.05	49.05	5.25	1.10
VFKAKD		40.45	-3.66	-0.71	39.90	-3.90	-0.82

Summary Statistics	Sample SA81	Sample SA82
Grand Means	44.12 psi	43.80 psi
Stnd Dev Btwn Labs	5.16 psi	4.78 psi

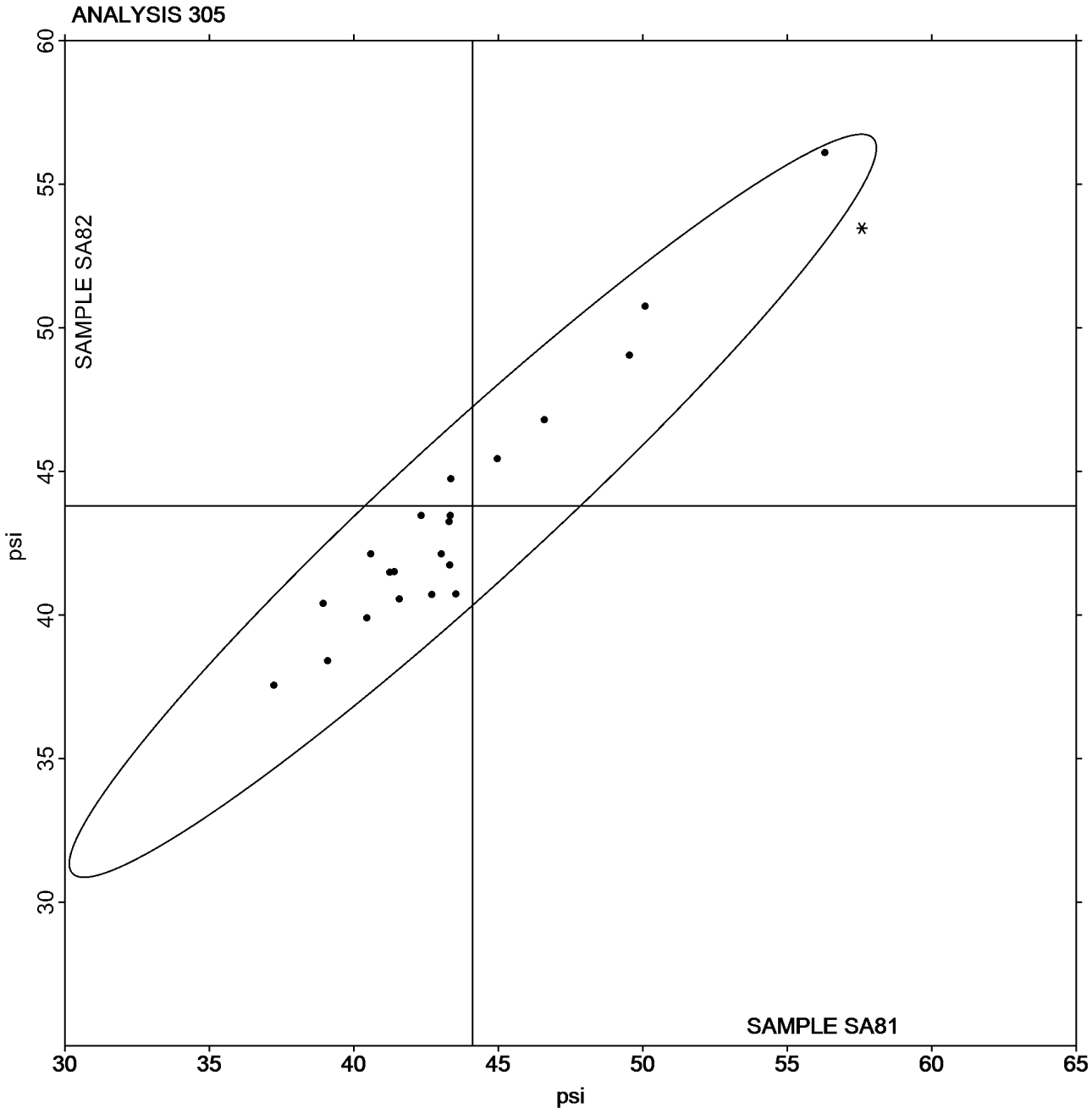
Statistics based on 22 of 22 reporting participants.

Analysis Notes:

KNEDJT - Data appear to be reported as psi, not kg/sq cm as indicated on data entry form. CTS will not correct the Units going forward.

Grand Mean Sample SA81 = 44.116 psi

Grand Mean Sample SA82 = 43.803 psi



Paper & Paperboard Interlaboratory Testing Program

Analysis 310

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

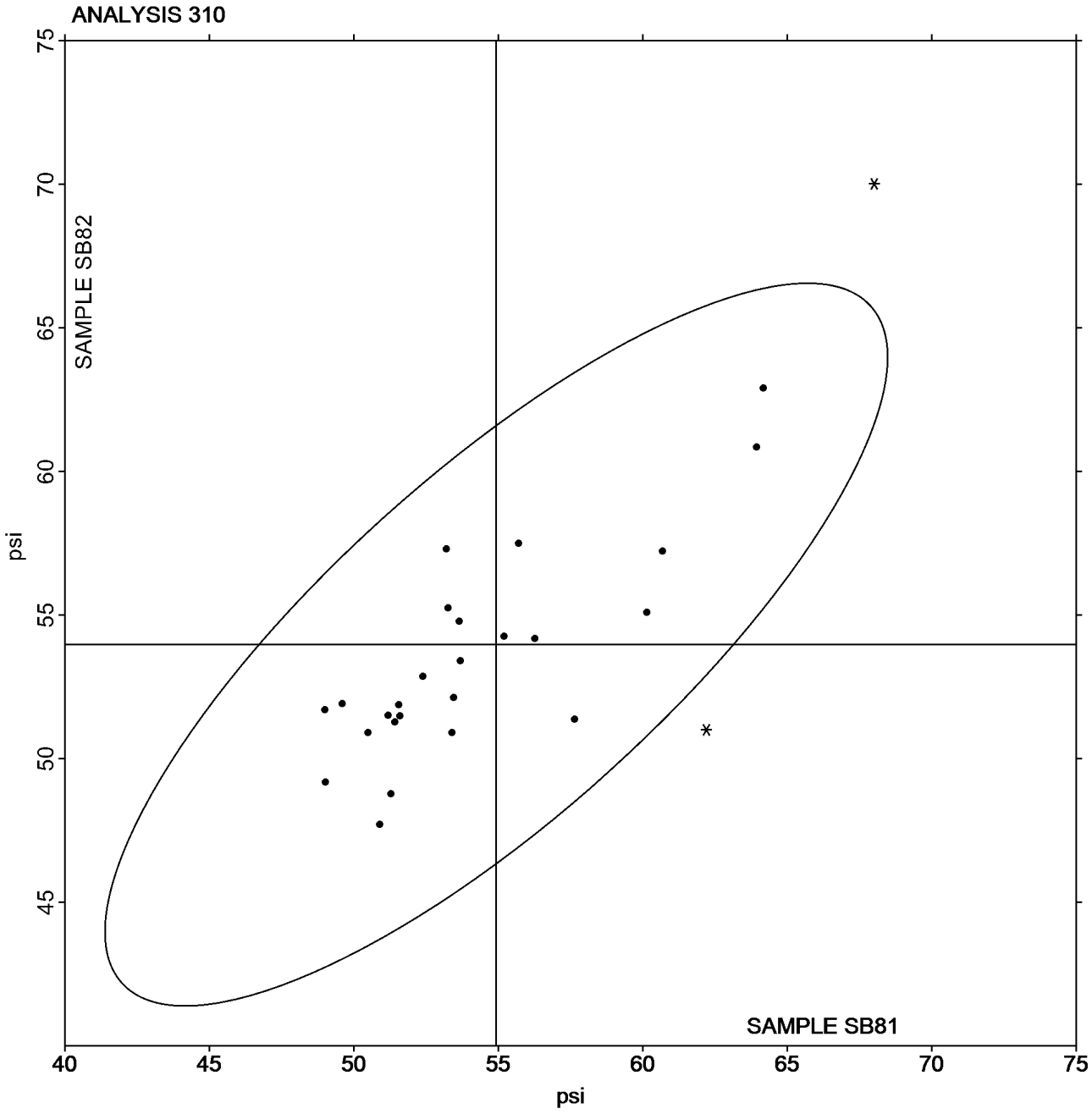
WebCode	Data Flag	Sample SB81 Lab Mean	Sample SB81 Diff from Grand Mean	Sample SB81 CPV	Sample SB82 Lab Mean	Sample SB82 Diff from Grand Mean	Sample SB82 CPV
2Q3MGX		50.89	-4.04	-0.79	47.70	-6.27	-1.32
3W82JE		55.20	0.27	0.05	54.26	0.29	0.06
4QUFB8		57.64	2.71	0.53	51.37	-2.60	-0.55
4XDJHA		64.17	9.24	1.81	62.89	8.92	1.88
6BZAH6		51.55	-3.38	-0.66	51.86	-2.11	-0.44
6G3GW8	*	62.20	7.27	1.42	51.00	-2.97	-0.63
6QDHH9		49.00	-5.93	-1.16	51.70	-2.27	-0.48
AKB3Y2		53.70	-1.23	-0.24	53.40	-0.57	-0.12
BFD298		55.70	0.77	0.15	57.50	3.53	0.74
CBDC7Q		60.68	5.75	1.13	57.22	3.25	0.69
ECFRQ2	*	68.01	13.08	2.56	70.01	16.04	3.38
ERBB64		51.29	-3.64	-0.71	48.76	-5.21	-1.10
JE8L9D		53.40	-1.53	-0.30	50.90	-3.07	-0.65
K7A76Q		51.42	-3.51	-0.69	51.28	-2.69	-0.57
KAAH2Q		53.46	-1.47	-0.29	52.11	-1.86	-0.39
LZ3Y3T		51.60	-3.32	-0.65	51.47	-2.50	-0.53
MCCYCR		53.26	-1.67	-0.33	55.24	1.27	0.27
MWJ8RQ		52.40	-2.53	-0.50	52.85	-1.12	-0.24
N97TAQ		49.02	-5.91	-1.16	49.17	-4.80	-1.01
N9PM69		60.14	5.21	1.02	55.09	1.12	0.24
NBV8T9		56.26	1.33	0.26	54.17	0.20	0.04
Q3PCM7		53.20	-1.73	-0.34	57.30	3.33	0.70
RUEA26		50.50	-4.43	-0.87	50.90	-3.07	-0.65
U7LVJP		49.60	-5.33	-1.04	51.90	-2.07	-0.44
UYZ4Q3		53.65	-1.28	-0.25	54.77	0.80	0.17
YJV6DF		51.20	-3.73	-0.73	51.51	-2.46	-0.52
Z67J9D		63.95	9.02	1.77	60.85	6.88	1.45

Summary Statistics	Sample SB81	Sample SB82
Grand Means	54.93 psi	53.97 psi
Stnd Dev Btwn Labs	5.10 psi	4.74 psi

Statistics based on 27 of 27 reporting participants.

Grand Mean Sample SB81 = 54.929 psi

Grand Mean Sample SB82 = 53.970 psi



Paper & Paperboard Interlaboratory Testing Program

Analysis 312

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SC81 Lab Mean	Sample SC81 Diff from Grand Mean	Sample SC81 CPV	Sample SC82 Lab Mean	Sample SC82 Diff from Grand Mean	Sample SC82 CPV
23YN4Z		63.28	0.74	0.24	61.88	-0.74	-0.27
2AY3P2		60.70	-1.84	-0.60	61.60	-1.02	-0.37
2HRFMF		63.59	1.05	0.34	63.12	0.50	0.18
2NGVD9		64.49	1.95	0.63	65.72	3.10	1.12
2Q3MGX	X	711.80	649.26	210.71	718.50	655.88	237.46
322VGF		67.40	4.86	1.58	65.42	2.80	1.01
3PTRHD		59.70	-2.84	-0.92	59.50	-3.12	-1.13
3W82JE		59.40	-3.14	-1.02	59.18	-3.44	-1.25
4QUFB8		59.63	-2.91	-0.94	60.79	-1.84	-0.67
4XDJHA		61.16	-1.38	-0.45	61.66	-0.96	-0.35
6BZAH6		64.56	2.02	0.66	63.13	0.51	0.18
6KM99A		58.74	-3.80	-1.23	59.48	-3.14	-1.14
6QDHH9		61.89	-0.65	-0.21	63.14	0.52	0.19
74VZHP		66.28	3.74	1.21	64.76	2.14	0.77
8EA8ZB		65.72	3.18	1.03	64.45	1.83	0.66
8PRNV4		61.30	-1.24	-0.40	59.60	-3.02	-1.09
9AU2VN	X	77.54	15.00	4.87	76.13	13.51	4.89
AKB3Y2		69.20	6.66	2.16	68.40	5.78	2.09
AV94C7		65.20	2.66	0.86	65.90	3.28	1.19
BBJ4L2		62.24	-0.30	-0.10	63.48	0.86	0.31
D4VZQ4		61.14	-1.40	-0.45	60.63	-1.99	-0.72
DNHRQZ		60.22	-2.32	-0.75	60.60	-2.02	-0.73
DPAQ6Y	X	88.90	26.36	8.55	92.40	29.78	10.78
ERBB64	X	105.80	43.26	14.04	108.31	45.69	16.54
H7KY7W	*	63.43	0.89	0.29	67.12	4.50	1.63
HEE43J	X	44.84	-17.70	-5.74	44.01	-18.61	-6.74
HZVL8U		58.12	-4.42	-1.43	61.12	-1.50	-0.54
JKDDJV		62.63	0.09	0.03	63.47	0.85	0.31
JPTK8V		64.40	1.86	0.60	65.64	3.02	1.09
JQ3PJY		60.56	-1.98	-0.64	61.28	-1.34	-0.49
JYKYAF		68.80	6.26	2.03	68.20	5.58	2.02
KAAH2Q		61.60	-0.94	-0.30	61.84	-0.79	-0.29
KJLE6X		58.99	-3.55	-1.15	58.53	-4.10	-1.48
LZ3Y3T		62.26	-0.28	-0.09	62.30	-0.32	-0.12
MWJ8RQ		60.09	-2.45	-0.79	60.05	-2.57	-0.93
N8VRNR		61.12	-1.42	-0.46	62.38	-0.24	-0.09
NBV8T9		60.81	-1.73	-0.56	59.99	-2.63	-0.95
NRFXR9		64.44	1.90	0.62	61.58	-1.05	-0.38
NVLBGM		62.70	0.16	0.05	63.38	0.75	0.27
NWGWBD		66.42	3.88	1.26	65.98	3.36	1.22

Paper & Paperboard Interlaboratory Testing Program

Analysis 312

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SC81 Lab Mean	Sample SC81 Diff from Grand Mean	Sample SC81 CPV	Sample SC82 Lab Mean	Sample SC82 Diff from Grand Mean	Sample SC82 CPV
R2DRKN		63.20	0.66	0.21	62.70	0.08	0.03
UX89BK		68.32	5.78	1.88	66.47	3.85	1.39
VFKAKD		64.37	1.84	0.60	65.63	3.01	1.09
Z67J9D		55.68	-6.86	-2.23	56.58	-6.04	-2.19
Z8WN2K		62.39	-0.15	-0.05	61.00	-1.62	-0.59
ZQMYNJ		57.94	-4.60	-1.49	59.91	-2.71	-0.98

Summary Statistics	Sample SC81	Sample SC82
Grand Means	62.54 Grams	62.62 Grams
Stnd Dev Btwn Labs	3.08 Grams	2.76 Grams

Statistics based on 41 of 46 reporting participants.

Comments on Assigned Data Flags for Test #312

HEE43J (X) - Extreme Data.

ERBB64 (X) - Extreme Data.

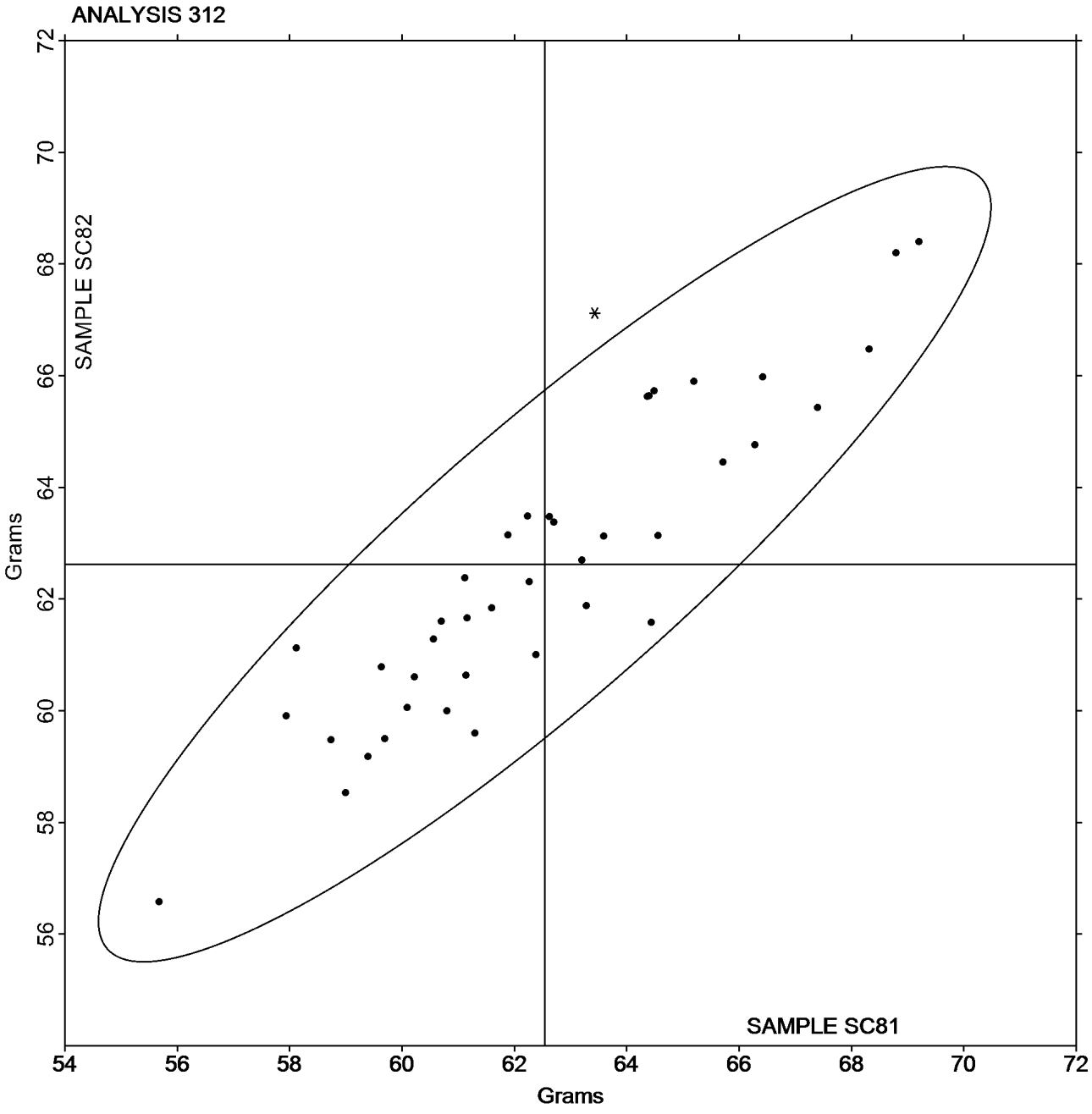
DPAQ6Y (X) - Extreme Data.

9AU2VN (X) - Data for both samples are high. Possible Systematic Error.

2Q3MGX (X) - Extreme Data.

Grand Mean Sample SC81 = 62.539 Grams

Grand Mean Sample SC82 = 62.624 Grams



Paper & Paperboard Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SD81 Lab Mean	Sample SD81 Diff from Grand Mean	Sample SD81 CPV	Sample SD82 Lab Mean	Sample SD82 Diff from Grand Mean	Sample SD82 CPV
2X6REA		258.7	32.9	1.10	263.1	39.0	1.34
677DVY		205.9	-19.9	-0.66	203.6	-20.5	-0.70
6BZAH6		219.4	-6.4	-0.21	228.0	3.9	0.14
72Q8NQ		230.1	4.3	0.14	231.0	6.9	0.24
7GJUZB		217.3	-8.5	-0.28	212.0	-12.1	-0.42
8HAHWB		239.0	13.2	0.44	236.1	12.0	0.41
AKB3Y2		200.0	-25.8	-0.86	205.2	-18.9	-0.65
BFD298	*	210.8	-15.0	-0.50	190.5	-33.6	-1.15
C2BR4X		221.4	-4.4	-0.15	218.0	-6.1	-0.21
C6NWFX		216.8	-9.1	-0.30	207.3	-16.8	-0.58
CBDC7Q		243.9	18.1	0.60	228.0	3.9	0.14
CFRW8K		271.5	45.7	1.52	269.6	45.5	1.56
DFKZH7		248.1	22.2	0.74	238.8	14.7	0.51
DKFRQ4		250.1	24.3	0.81	247.9	23.8	0.82
DPDBUM		189.5	-36.3	-1.21	200.4	-23.7	-0.81
E6H3AW		264.0	38.2	1.27	265.1	41.0	1.41
EJ3K3Z		233.6	7.7	0.26	228.9	4.8	0.16
ERBB64		232.6	6.7	0.22	229.1	5.0	0.17
EW8ZNW		259.6	33.8	1.13	253.7	29.6	1.02
EXYVB6		219.1	-6.7	-0.22	220.9	-3.2	-0.11
FPMY7X		245.8	20.0	0.67	238.3	14.2	0.49
HVZY8E		193.0	-32.9	-1.10	199.8	-24.3	-0.83
K7A76Q		191.1	-34.7	-1.16	201.3	-22.8	-0.78
KRU9ZQ		293.2	67.4	2.25	283.6	59.5	2.04
LFVRNU		233.5	7.7	0.26	234.8	10.7	0.37
MCCYCR		197.0	-28.9	-0.96	197.6	-26.5	-0.91
N4ZZFV		235.4	9.5	0.32	240.6	16.5	0.57
N76TAU		229.9	4.1	0.14	225.7	1.6	0.06
N97TAQ		248.9	23.1	0.77	238.2	14.1	0.48
N9PM69		226.0	0.2	0.01	225.6	1.5	0.05
Q3PCM7		160.4	-65.5	-2.18	156.5	-67.6	-2.32
QL4TU6		153.3	-72.5	-2.42	155.9	-68.2	-2.34
QNWFVA		245.7	19.8	0.66	245.6	21.4	0.74
R2DRKN		222.2	-3.6	-0.12	221.6	-2.5	-0.09
RUEA26		221.9	-3.9	-0.13	217.1	-7.0	-0.24
T789AM		245.5	19.7	0.66	239.9	15.8	0.54
TUUTL3		242.2	16.4	0.55	241.4	17.3	0.60
U7LVJP		233.4	7.5	0.25	237.6	13.5	0.46
UYZ4Q3		255.4	29.6	0.99	263.4	39.3	1.35
W8376X		193.0	-32.8	-1.09	187.2	-36.9	-1.27

Paper & Paperboard Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SD81 Lab Mean	Sample SD81 Diff from Grand Mean	Sample SD81 CPV	Sample SD82 Lab Mean	Sample SD82 Diff from Grand Mean	Sample SD82 CPV
WHN64G		160.7	-65.2	-2.17	159.2	-64.9	-2.23

Summary Statistics	Sample SD81	Sample SD82
Grand Means	225.82 Grams	224.10 Grams
Stnd Dev Btwn Labs	30.00 Grams	29.10 Grams

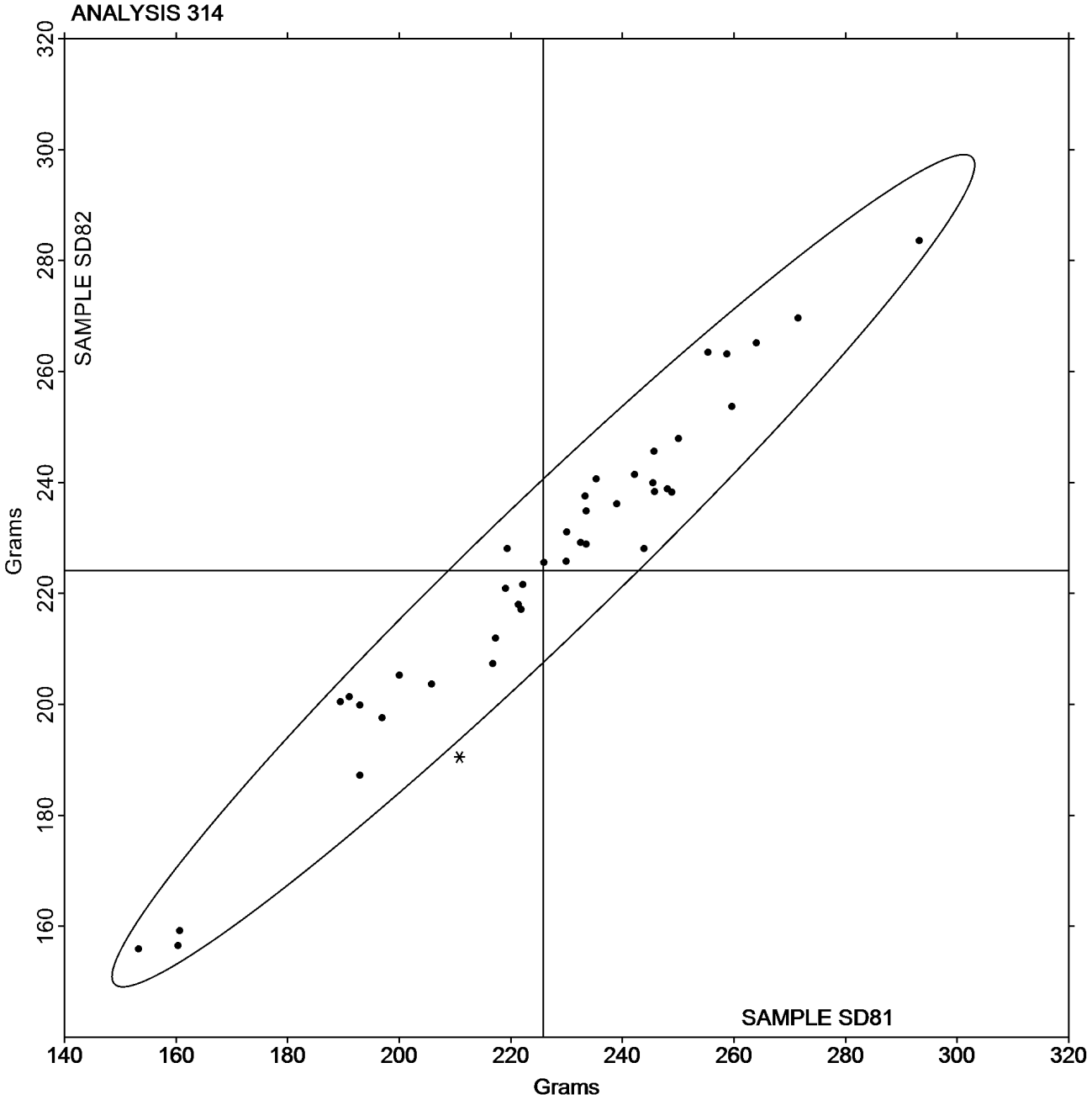
Statistics based on 41 of 41 reporting participants.

Analysis Notes:

FPMY7X - One determination removed from the Lab Mean of Sample SD82 per Grubb's Test at 1% risk (TAPPI 1205).

Grand Mean Sample SD81 = 225.82 Grams

Grand Mean Sample SD82 = 224.10 Grams



Paper & Paperboard Interlaboratory Testing Program

Analysis 320

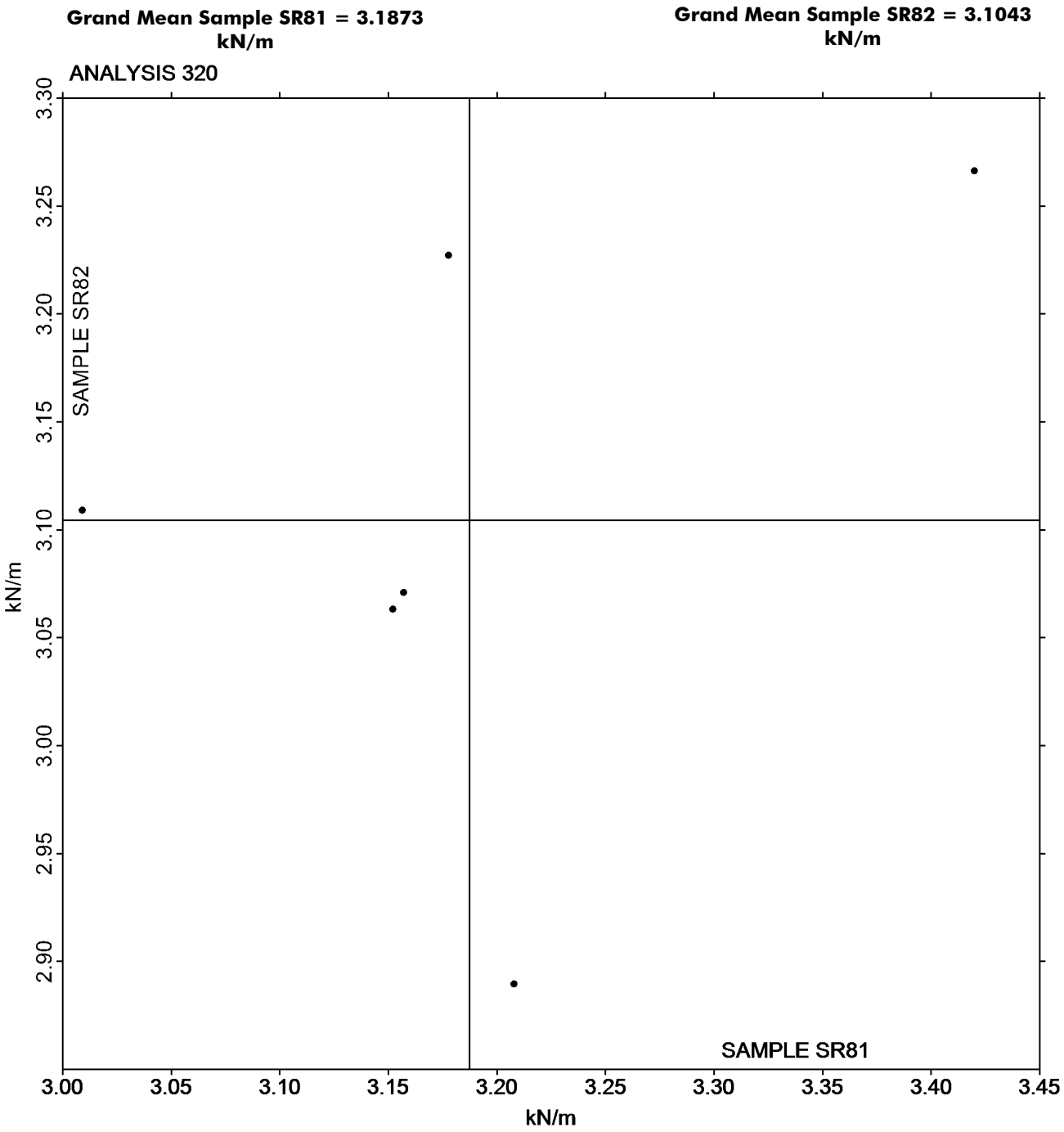
Tensile Breaking Strength - Newsprint

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SR81 Lab Mean	Sample SR81 Diff from Grand Mean	Sample SR81 CPV	Sample SR82 Lab Mean	Sample SR82 Diff from Grand Mean	Sample SR82 CPV
8PRNV4		3.420	0.233	1.75	3.266	0.162	1.21
97A8ZA		3.009	-0.178	-1.34	3.109	0.005	0.03
C2BR4X		3.208	0.021	0.16	2.889	-0.215	-1.60
LZ3Y3T		3.178	-0.010	-0.07	3.227	0.123	0.91
NVLBGM		3.152	-0.035	-0.26	3.063	-0.041	-0.31
Z8WN2K		3.157	-0.030	-0.23	3.071	-0.033	-0.25

Summary Statistics	Sample SR81	Sample SR82
Grand Means	3.19 kN/m	3.10 kN/m
Stnd Dev Btwn Labs	0.13 kN/m	0.13 kN/m

Statistics based on 6 of 6 reporting participants.



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

Paper & Paperboard Interlaboratory Testing Program

Analysis 321

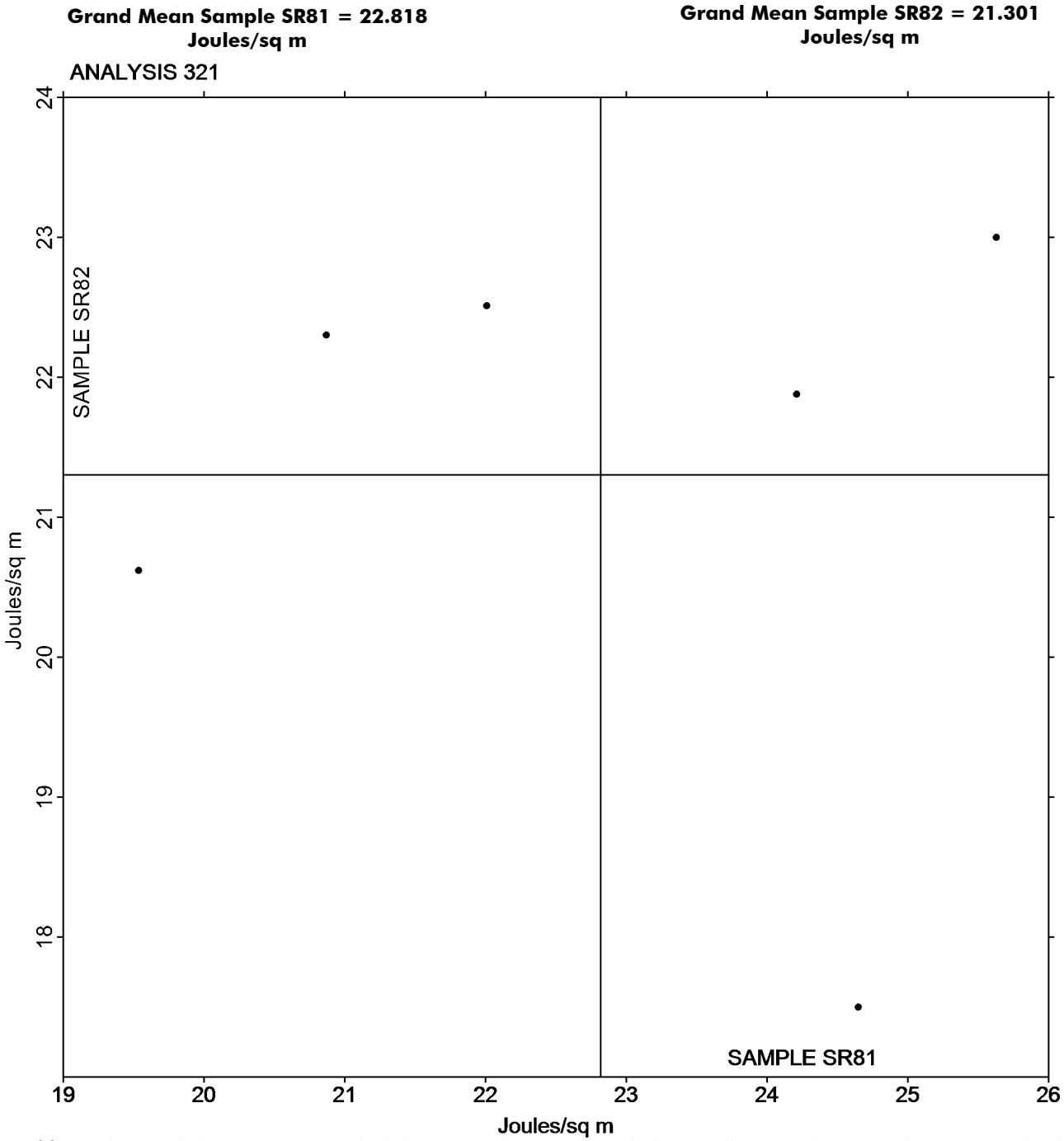
Tensile Energy Absorption - Newsprint

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SR81 Lab Mean	Sample SR81 Diff from Grand Mean	Sample SR81 CPV	Sample SR82 Lab Mean	Sample SR82 Diff from Grand Mean	Sample SR82 CPV
8PRNV4		24.21	1.39	0.58	21.88	0.58	0.28
97A8ZA		19.54	-3.28	-1.38	20.62	-0.68	-0.34
C2BR4X		24.65	1.83	0.77	17.50	-3.80	-1.87
LZ3Y3T		20.87	-1.95	-0.82	22.30	1.00	0.49
NVLBGM		25.63	2.81	1.18	23.00	1.70	0.84
Z8WN2K		22.01	-0.81	-0.34	22.51	1.21	0.60

Summary Statistics	Sample SR81	Sample SR82
Grand Means	22.82 Joules/sq m	21.30 Joules/sq m
Stnd Dev Btwn Labs	2.38 Joules/sq m	2.03 Joules/sq m

Statistics based on 6 of 6 reporting participants.



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

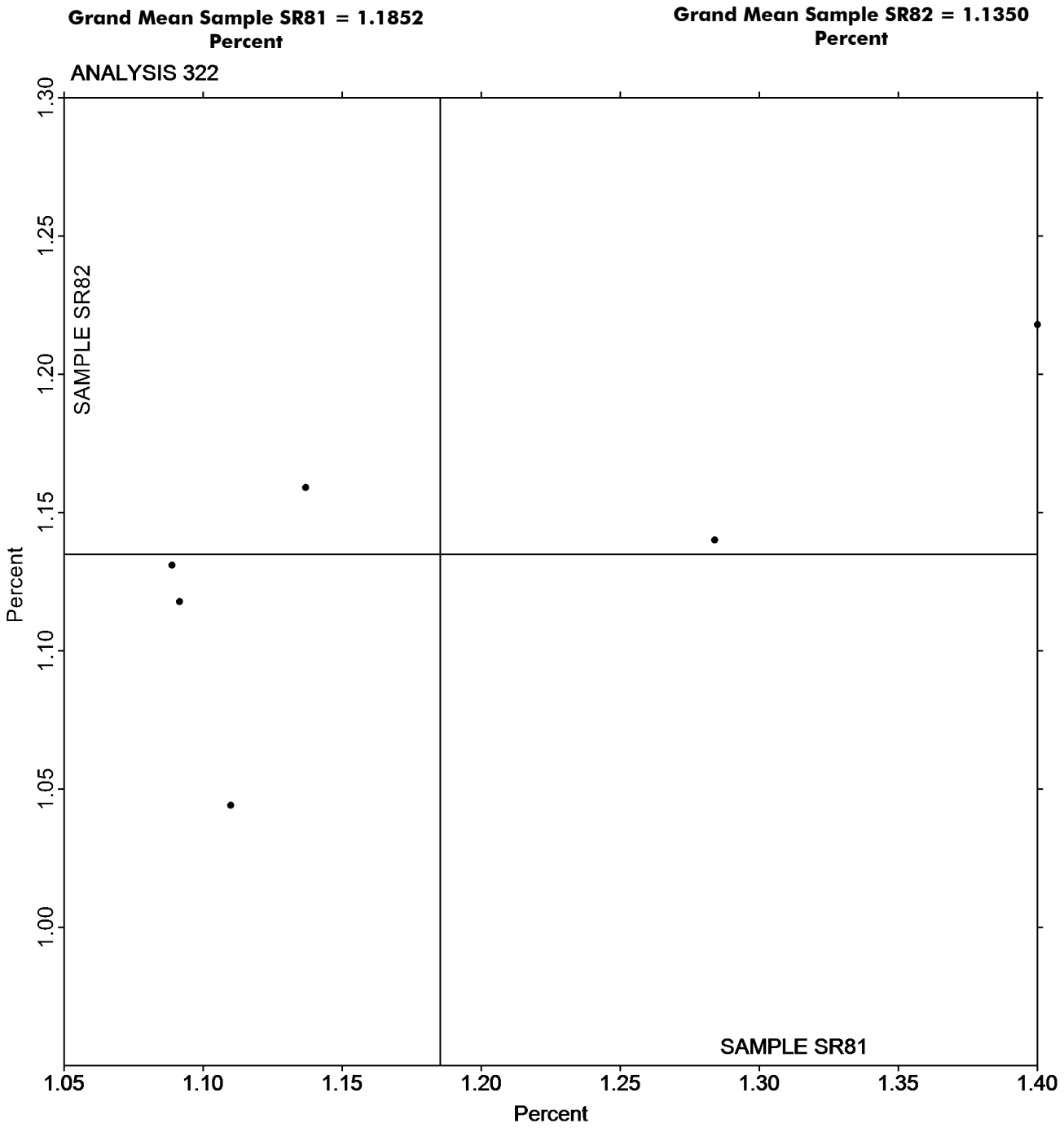
Paper & Paperboard Interlaboratory Testing Program

Analysis 322
Elongation to Break - Newsprint
TAPPI Official Test Method T494

WebCode	Data Flag	Sample SR81 Lab Mean	Sample SR81 Diff from Grand Mean	Sample SR81 CPV	Sample SR82 Lab Mean	Sample SR82 Diff from Grand Mean	Sample SR82 CPV
8PRNV4		1.284	0.099	0.77	1.140	0.005	0.09
97A8ZA		1.092	-0.094	-0.73	1.118	-0.017	-0.30
C2BR4X		1.400	0.215	1.68	1.218	0.083	1.46
LZ3Y3T		1.089	-0.096	-0.75	1.131	-0.004	-0.07
NVLBGM		1.110	-0.075	-0.59	1.044	-0.091	-1.60
Z8WN2K		1.137	-0.048	-0.38	1.159	0.024	0.42

Summary Statistics	Sample SR81	Sample SR82
Grand Means	1.19 Percent	1.13 Percent
Stnd Dev Btwn Labs	0.13 Percent	0.06 Percent

Statistics based on 6 of 6 reporting participants.



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

Paper & Paperboard Interlaboratory Testing Program

Analysis 325

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF81 Lab Mean	Sample SF81 Diff from Grand Mean	Sample SF81 CPV	Sample SF82 Lab Mean	Sample SF82 Diff from Grand Mean	Sample SF82 CPV	Instr Code
23YN4Z		6.410	-0.358	-1.01	6.471	-0.315	-0.98	TO
2AY3P2		6.544	-0.224	-0.63	6.502	-0.284	-0.88	TB
2HRFMF		6.838	0.070	0.20	6.806	0.020	0.06	LI
2NGVD9		6.843	0.075	0.21	6.941	0.155	0.48	LF
3PTRHD		6.923	0.156	0.44	7.146	0.360	1.12	TC
3YRUEU		6.420	-0.348	-0.98	6.632	-0.154	-0.48	XX
6BZAH6		6.778	0.010	0.03	6.759	-0.027	-0.08	LH
6KM99A		7.397	0.630	1.78	7.122	0.336	1.04	TJ
74VZHP		6.571	-0.197	-0.56	6.532	-0.254	-0.79	TO
8EA8ZB		6.160	-0.608	-1.71	6.345	-0.441	-1.37	LA
96HBEZ		6.764	-0.004	-0.01	6.897	0.111	0.34	FP
9AU2VN		7.378	0.610	1.72	7.309	0.523	1.62	LA
AV94C7		6.087	-0.680	-1.92	6.346	-0.440	-1.37	TO
BBJ4L2		6.317	-0.451	-1.27	6.212	-0.574	-1.78	LX
D4VZQ4		6.932	0.164	0.46	6.751	-0.035	-0.11	LI
DPAQ6Y		7.545	0.777	2.19	7.296	0.510	1.58	FP
EXYVB6		6.461	-0.307	-0.87	6.805	0.019	0.06	LI
F2Y9PG		7.336	0.568	1.60	7.492	0.706	2.19	LE
H3JX7Z		7.193	0.425	1.20	7.116	0.330	1.02	LH
H7KY7W		6.911	0.143	0.40	6.992	0.206	0.64	LH
HEE43J		6.533	-0.235	-0.66	6.434	-0.352	-1.09	IX
HP9NXG		6.340	-0.428	-1.21	6.436	-0.350	-1.09	XX
HZVL8U		6.888	0.120	0.34	6.947	0.161	0.50	LH
JKDDJV		6.737	-0.031	-0.09	6.750	-0.036	-0.11	LH
JPTK8V		6.923	0.155	0.44	6.832	0.046	0.14	TV
JQ3PJY		6.259	-0.509	-1.43	6.404	-0.382	-1.18	TF
KAAH2Q		6.761	-0.007	-0.02	6.744	-0.042	-0.13	LH
KJLE6X		7.137	0.370	1.04	7.351	0.565	1.75	LX
LZ3Y3T		6.499	-0.269	-0.76	6.629	-0.157	-0.49	LH
MWJ8RQ		6.895	0.127	0.36	6.988	0.202	0.63	TF
N8VRNR		6.769	0.001	0.00	6.671	-0.115	-0.36	LE
NBV8T9		6.610	-0.158	-0.45	6.600	-0.186	-0.58	LH
NRFXR9		6.806	0.038	0.11	6.934	0.148	0.46	XX
UX89BK		6.553	-0.215	-0.61	6.431	-0.355	-1.10	VM
VFKAKD	*	6.959	0.191	0.54	7.353	0.567	1.76	LI
VH9LJJ		6.327	-0.441	-1.24	6.332	-0.454	-1.41	ID
VVJWBF		6.702	-0.065	-0.18	6.568	-0.218	-0.68	RE
XLJGCL	X	6.996	0.228	0.64	7.657	0.871	2.70	LA
Z67J9D		6.940	0.172	0.49	6.867	0.081	0.25	TO
ZNYMND		6.901	0.134	0.38	6.806	0.020	0.06	TV

Paper & Paperboard Interlaboratory Testing Program

Analysis 325

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

		Sample SF81			Sample SF82			
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
ZQMYNJ	*	7.365	0.598	1.69	6.894	0.108	0.34	FP

Summary Statistics	Sample SF81	Sample SF82
Grand Means	6.77 kN/m	6.79 kN/m
Stnd Dev Btwn Labs	0.35 kN/m	0.32 kN/m

Statistics based on 40 of 41 reporting participants.

Comments on Assigned Data Flags for Test #325

XLJGCL (X) - Data for sample SF82 are high. Inconsistent within the determinations of sample SF82.

Analysis Notes:

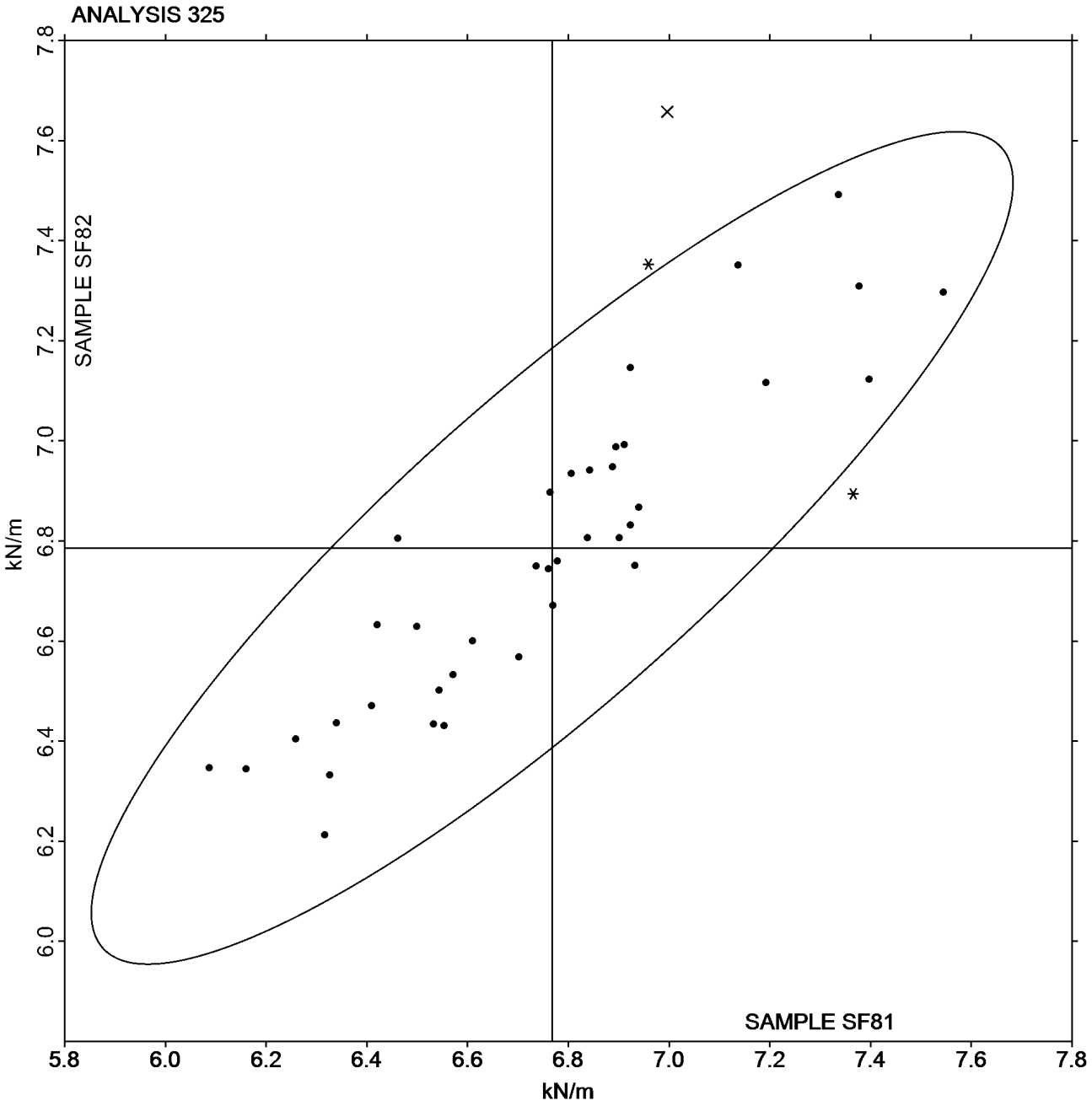
9AU2VN - Data appear to be reported as kN/m, not lb/inch as indicated on data entry form. CTS will not correct the Units going forward.

Key to Instrument Codes Reported by Participants

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IX	Instron (model not specified)	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)	RE	Regmed
TB	Thwing-Albert EJA/1000	TC	Thwing-Albert Electro-Hydraulic, Model 30LT
TF	Thwing-Albert EJA Vantage-1	TJ	Thwing-Albert QC II-XS
TO	Thwing-Albert QC-1000	TV	Thwing-Albert Vantage NX
VM	Valmet PaperLab (was Kajaani/Robotest)	XX	Instrument make/model not specified by lab

Grand Mean Sample SF81 = 6.7678 kN/m

Grand Mean Sample SF82 = 6.7861 kN/m



Paper & Paperboard Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF81 Lab Mean	Sample SF81 Diff from Grand Mean	Sample SF81 CPV	Sample SF82 Lab Mean	Sample SF82 Diff from Grand Mean	Sample SF82 CPV	Instr Code
23YN4Z		97.20	2.11	0.24	101.57	5.20	0.62	TO
2AY3P2		103.85	8.76	0.99	101.22	4.85	0.58	TB
2HRFMF		83.33	-11.76	-1.33	85.20	-11.17	-1.33	LI
2NGVD9		96.48	1.39	0.16	101.04	4.67	0.56	LF
6BZAH6		95.70	0.61	0.07	95.11	-1.26	-0.15	LH
74VZHP		99.38	4.30	0.49	99.09	2.72	0.32	TO
8EA8ZB	*	67.07	-28.01	-3.17	72.63	-23.74	-2.82	LA
96HBEZ		105.12	10.03	1.13	109.28	12.91	1.54	FP
9AU2VN		96.03	0.94	0.11	93.71	-2.66	-0.32	LA
AV94C7		89.26	-5.83	-0.66	93.78	-2.59	-0.31	TO
BBJ4L2		92.54	-2.55	-0.29	88.99	-7.38	-0.88	LX
D4VZQ4		84.66	-10.43	-1.18	81.48	-14.89	-1.77	LX
EXYVB6		84.66	-10.43	-1.18	92.18	-4.19	-0.50	LI
H3JX7Z		98.88	3.79	0.43	100.87	4.50	0.54	LH
H7KY7W		95.48	0.39	0.04	96.90	0.53	0.06	LH
HEE43J		102.96	7.87	0.89	96.38	0.01	0.00	IX
HP9NXG		103.51	8.43	0.95	100.86	4.49	0.53	XX
HZVL8U		92.58	-2.50	-0.28	95.81	-0.56	-0.07	LH
JKDDJV		87.36	-7.73	-0.87	90.00	-6.37	-0.76	LH
JPTK8V		109.45	14.37	1.62	107.41	11.04	1.31	TV
KAAH2Q		96.78	1.69	0.19	97.51	1.14	0.14	LH
KJLE6X		93.18	-1.91	-0.22	100.77	4.40	0.52	LX
LZ3Y3T		85.90	-9.19	-1.04	90.35	-6.02	-0.72	LH
MWJ8RQ		91.27	-3.81	-0.43	92.92	-3.45	-0.41	TF
NBV8T9		92.97	-2.12	-0.24	88.91	-7.46	-0.89	LH
NRFXR9		105.02	9.93	1.12	111.18	14.81	1.76	XX
VFKAKD		96.59	1.50	0.17	104.62	8.25	0.98	LI
VH9LJJ		87.98	-7.10	-0.80	90.42	-5.95	-0.71	ID
VVJWBF		91.80	-3.29	-0.37	88.28	-8.09	-0.96	RE
XLJGCL		100.80	5.71	0.65	104.35	7.98	0.95	LA
Z67J9D		105.81	10.72	1.21	104.64	8.27	0.98	TO
ZNYMND		109.21	14.12	1.60	106.37	10.00	1.19	TV
ZQMYNJ	X	122.40	27.31	3.09	135.77	39.40	4.69	FP

Summary Statistics	Sample SF81	Sample SF82
Grand Means	95.09 Joules/sq m	96.37 Joules/sq m
Stnd Dev Btwn Labs	8.84 Joules/sq m	8.41 Joules/sq m

Statistics based on 32 of 33 reporting participants.

Comments on Assigned Data Flags for Test #327

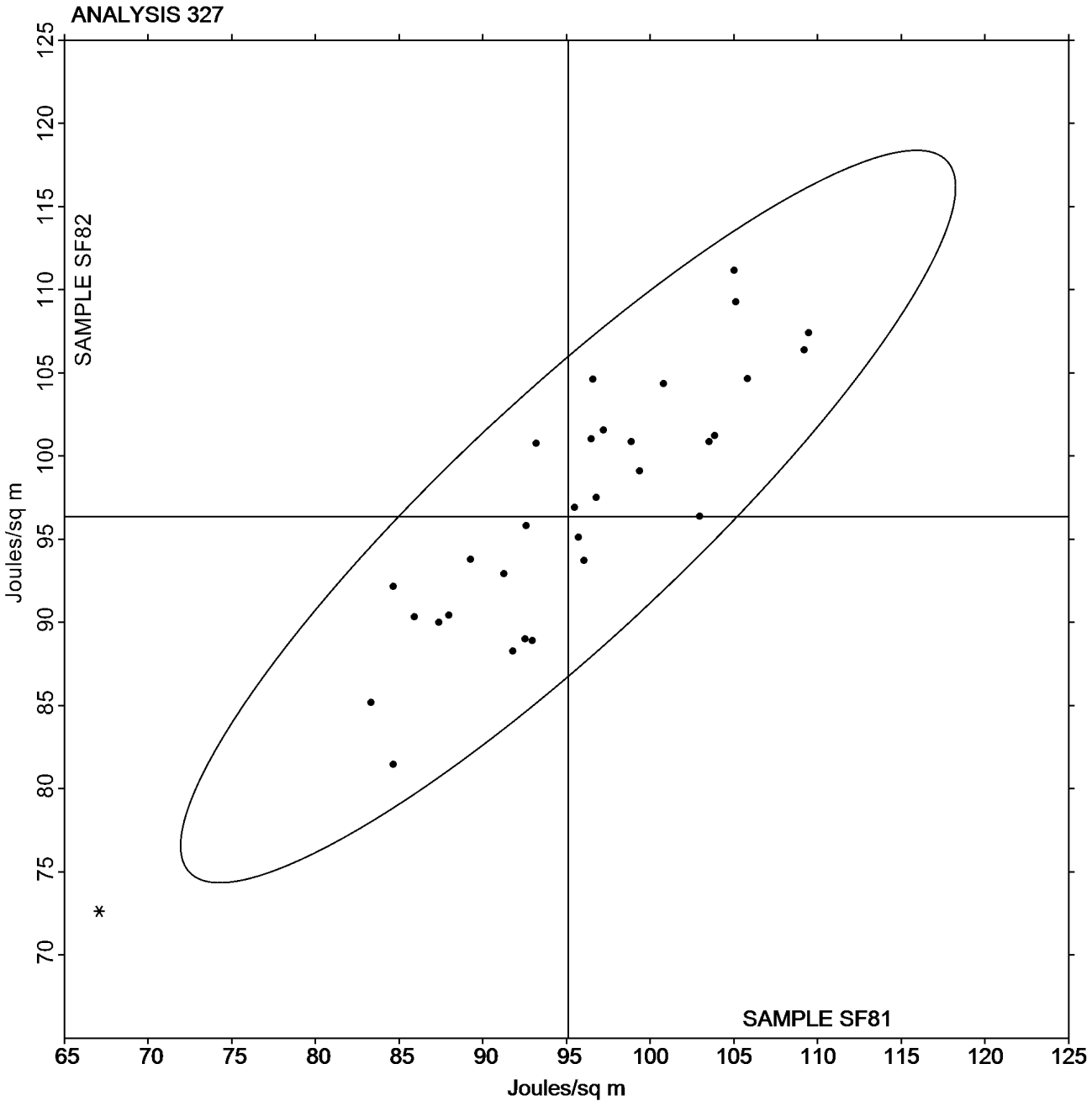
ZQMYNJ (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of sample SF81.

Key to Instrument Codes Reported by Participants

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IX	Instron (model not specified)	LA	L & W Tensile - Autoline 300
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)
RE	Regmed	TB	Thwing-Albert EJA/1000
TF	Thwing-Albert EJA Vantage-1	TO	Thwing-Albert QC-1000
TV	Thwing-Albert Vantage NX	XX	Instrument make/model not specified by lab

Grand Mean Sample SF81 = 95.088 Joules/sq m

Grand Mean Sample SF82 = 96.370 Joules/sq m



Paper & Paperboard Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF81 Lab Mean	Sample SF81 Diff from Grand Mean	Sample SF81 CPV	Sample SF82 Lab Mean	Sample SF82 Diff from Grand Mean	Sample SF82 CPV	Instr Code
23YN4Z		2.306	0.116	0.51	2.347	0.137	0.70	TO
2AY3P2		2.492	0.302	1.32	2.434	0.224	1.14	TB
2HRFMF		1.896	-0.294	-1.28	1.946	-0.264	-1.35	LI
2NGVD9		2.147	-0.043	-0.19	2.209	-0.001	0.00	LF
6BZAH6		2.215	0.025	0.11	2.165	-0.045	-0.23	LH
74VZHP		2.452	0.262	1.14	2.459	0.249	1.27	TO
8EA8ZB		2.055	-0.135	-0.59	2.171	-0.039	-0.20	LA
96HBEZ		2.438	0.248	1.08	2.467	0.257	1.31	FP
9AU2VN	*	1.810	-0.380	-1.65	1.776	-0.434	-2.21	LA
AV94C7		2.250	0.060	0.26	2.259	0.049	0.25	TX
BBJ4L2		2.225	0.035	0.15	2.176	-0.034	-0.17	LX
D4VZQ4		1.936	-0.254	-1.11	1.908	-0.302	-1.54	LI
EXYVB6		2.039	-0.151	-0.66	2.102	-0.108	-0.55	LI
H3JX7Z		2.082	-0.108	-0.47	2.144	-0.066	-0.34	LH
H7KY7W		2.109	-0.081	-0.35	2.113	-0.097	-0.49	LH
HEE43J		2.545	0.355	1.55	2.405	0.195	0.99	IX
HP9NXG		2.716	0.526	2.29	2.575	0.365	1.86	XX
HZVL8U		2.078	-0.112	-0.49	2.122	-0.088	-0.45	LH
JKDDJV		1.979	-0.211	-0.92	2.022	-0.188	-0.96	LH
JPTK8V		2.530	0.340	1.48	2.466	0.256	1.31	TV
JQ3PJY		2.053	-0.137	-0.60	2.193	-0.017	-0.09	TF
KAAH2Q		2.194	0.004	0.02	2.213	0.003	0.02	LH
KJLE6X		1.989	-0.201	-0.87	2.098	-0.112	-0.57	LX
LZ3Y3T		2.011	-0.179	-0.78	2.070	-0.140	-0.71	LH
MWJ8RQ		2.140	-0.050	-0.22	2.154	-0.056	-0.28	TF
NBV8T9		2.190	0.000	0.00	2.200	-0.010	-0.05	LH
NRFXR9		2.347	0.157	0.69	2.460	0.250	1.28	XX
UX89BK	*	1.960	-0.230	-1.00	2.190	-0.020	-0.10	VM
VFKAKD		1.952	-0.238	-1.04	2.010	-0.200	-1.02	LI
VH9LJJ		2.141	-0.049	-0.21	2.198	-0.012	-0.06	ID
VVJWBF		2.192	0.002	0.01	2.140	-0.070	-0.35	RE
XLJGCL		1.910	-0.280	-1.22	1.934	-0.276	-1.41	LA
Z67J9D		2.439	0.249	1.09	2.414	0.204	1.04	TO
ZNYMND		2.633	0.443	1.93	2.596	0.386	1.97	TV
ZQMYNJ	X	2.616	0.426	1.86	3.050	0.840	4.28	FP

Paper & Paperboard Interlaboratory Testing Program

Analysis 328
Elongation to Break - Printing Papers
TAPPI Official Test Method T494

Summary Statistics	Sample SF81	Sample SF82
Grand Means	2.19 Percent	2.21 Percent
Stnd Dev Btwn Labs	0.23 Percent	0.20 Percent

Statistics based on 34 of 35 reporting participants.

Comments on Assigned Data Flags for Test #328

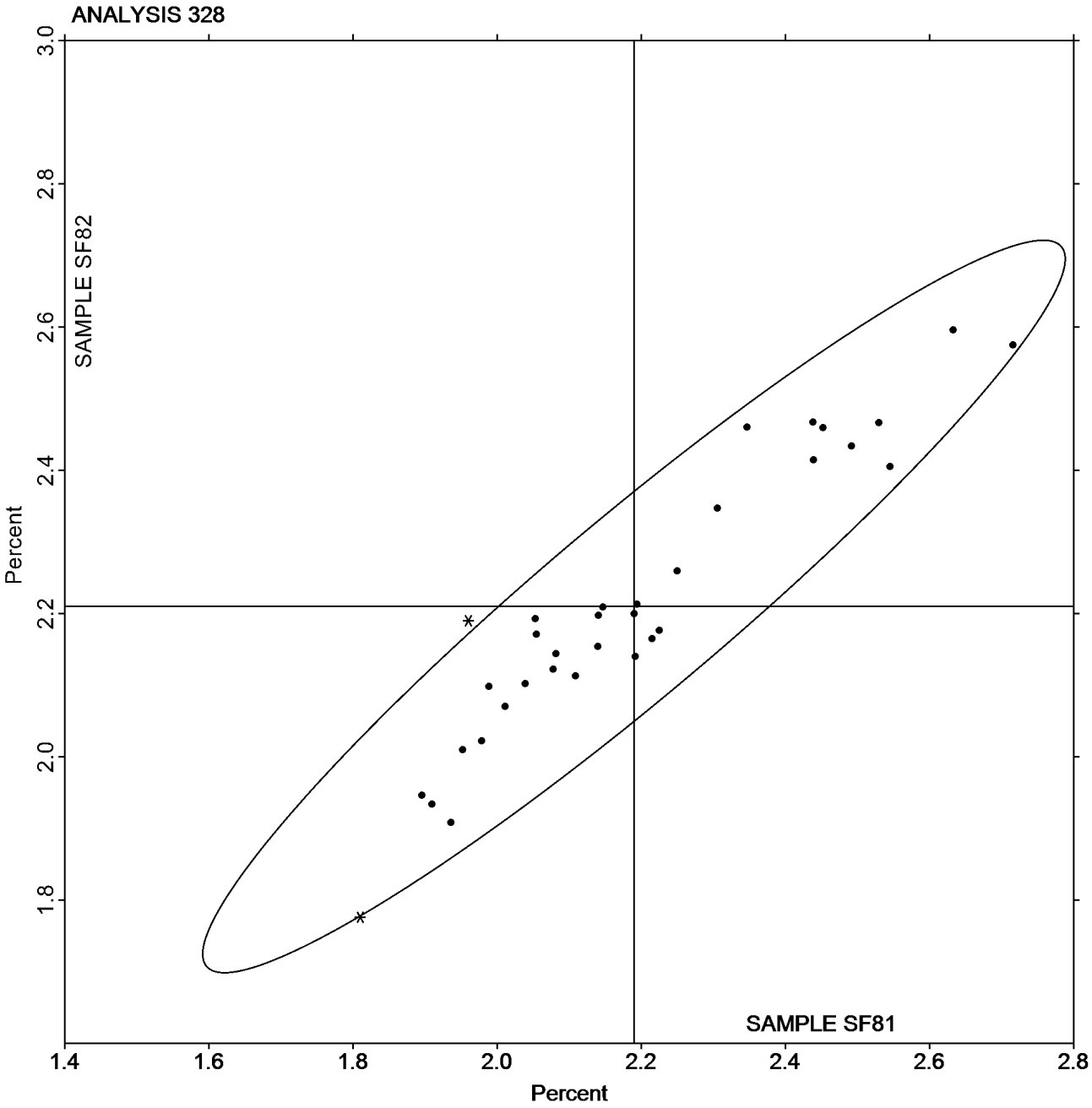
ZQMYNJ (X) - Data for sample SF82 are high. Inconsistent within the determinations of both samples.

Key to Instrument Codes Reported by Participants

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IX	Instron (model not specified)	LA	L & W Tensile - Autoline 300
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)
RE	Regmed	TB	Thwing-Albert EJA/1000
TF	Thwing-Albert EJA Vantage-1	TO	Thwing-Albert QC-1000
TV	Thwing-Albert Vantage NX	TX	Thwing-Albert (model not specified)
VM	Valmet PaperLab (was Kajaani/Robotest)	XX	Instrument make/model not specified by lab

Grand Mean Sample SF81 = 2.1897
Percent

Grand Mean Sample SF82 = 2.2099
Percent



Paper & Paperboard Interlaboratory Testing Program

Analysis 330

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE81 Lab Mean	Sample SE81 Diff from Grand Mean	Sample SE81 CPV	Sample SE82 Lab Mean	Sample SE82 Diff from Grand Mean	Sample SE82 CPV	Instr Code
2Q3MGX		15.39	0.60	0.55	15.44	0.63	0.55	LW
2X6REA		15.78	0.99	0.92	15.93	1.12	0.98	ID
33UQ7A		13.01	-1.78	-1.64	13.15	-1.66	-1.46	TT
3W82JE		15.57	0.78	0.72	15.41	0.60	0.52	IF
4XDJHA		15.83	1.04	0.96	15.63	0.81	0.71	TR
677DVY		15.34	0.55	0.51	15.11	0.30	0.26	TO
6BZAH6		14.59	-0.20	-0.18	14.57	-0.24	-0.21	LH
6D39TW		13.67	-1.12	-1.03	13.66	-1.15	-1.01	IM
6G3GW8		15.29	0.50	0.47	16.09	1.28	1.12	IK
72Q8NQ		13.63	-1.16	-1.07	14.36	-0.45	-0.40	IN
8HAHWB		12.68	-2.11	-1.95	13.33	-1.48	-1.30	LH
8NZPG6		15.15	0.36	0.33	14.58	-0.23	-0.20	TX
9FL7W7		16.05	1.27	1.17	16.62	1.80	1.58	LA
AKB3Y2		15.69	0.90	0.84	15.87	1.06	0.93	IF
ATKRCZ		14.24	-0.55	-0.51	14.26	-0.56	-0.49	TH
BCPP92		15.42	0.63	0.58	15.73	0.92	0.81	TB
C6NWFX		14.06	-0.73	-0.67	14.07	-0.75	-0.65	IF
CBDC7Q		14.45	-0.34	-0.32	14.14	-0.67	-0.59	LH
DKFRQ4		14.67	-0.11	-0.10	14.52	-0.30	-0.26	LW
DPDBUM		15.25	0.46	0.43	15.28	0.46	0.41	LW
EARFRV		16.36	1.57	1.45	16.27	1.46	1.28	LI
ECFRQ2		13.85	-0.94	-0.87	14.33	-0.49	-0.43	TB
EJ3K3Z		14.77	-0.02	-0.02	14.33	-0.48	-0.42	LE
ERBB64		13.90	-0.89	-0.82	14.31	-0.50	-0.44	LE
EXYVB6		14.61	-0.17	-0.16	14.66	-0.15	-0.13	LW
HVZY8E	X	12.40	-2.38	-2.20	11.10	-3.71	-3.26	IN
K7A76Q		15.52	0.73	0.68	15.77	0.96	0.84	ID
KRU9ZQ		15.53	0.74	0.68	15.71	0.90	0.79	LX
LFVRNU		13.62	-1.17	-1.08	13.64	-1.17	-1.03	TK
MWJ8RQ		14.16	-0.63	-0.58	14.38	-0.43	-0.38	TO
N97TAQ		14.52	-0.27	-0.25	14.32	-0.50	-0.43	IM
N9PM69		15.34	0.55	0.51	15.72	0.91	0.80	TH
NWGWBD		12.81	-1.97	-1.82	12.82	-2.00	-1.75	XX
NZCNGP		16.49	1.70	1.57	16.19	1.38	1.21	CE
Q3PCM7		15.70	0.91	0.84	15.26	0.45	0.39	LE
R2DRKN		14.00	-0.79	-0.73	14.11	-0.70	-0.62	TA
RUEA26		13.74	-1.05	-0.97	13.38	-1.43	-1.25	LA
RYCM6H		16.89	2.10	1.94	16.82	2.01	1.76	DM
T789AM		13.44	-1.34	-1.24	13.24	-1.57	-1.38	LE
TN9W2L		14.80	0.02	0.01	14.58	-0.24	-0.21	TH

Paper & Paperboard Interlaboratory Testing Program

Analysis 330

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE81 Lab Mean	Sample SE81 Diff from Grand Mean	Sample SE81 CPV	Sample SE82 Lab Mean	Sample SE82 Diff from Grand Mean	Sample SE82 CPV	Instr Code
TUUTL3	*	14.76	-0.03	-0.02	13.69	-1.12	-0.98	IF
UYZ4Q3		17.48	2.69	2.49	17.41	2.60	2.28	LA
VGGN87		14.51	-0.28	-0.26	14.64	-0.17	-0.15	IM
W24E6G		15.77	0.99	0.91	15.74	0.93	0.82	LA
W8376X	*	13.93	-0.86	-0.79	12.73	-2.09	-1.83	IN
WB2GZX		12.47	-2.32	-2.14	12.20	-2.62	-2.29	IM
WHN64G		14.28	-0.51	-0.47	14.99	0.18	0.16	IM
XLJGCL		15.50	0.71	0.66	15.71	0.89	0.78	LA
YDNXBH		15.06	0.27	0.25	15.35	0.54	0.47	LE
YJV6DF		15.03	0.24	0.22	15.79	0.98	0.86	TB

Summary Statistics	Sample SE81	Sample SE82
Grand Means	14.79 kN/m	14.81 kN/m
Stnd Dev Btwn Labs	1.08 kN/m	1.14 kN/m

Statistics based on 49 of 50 reporting participants.

Comments on Assigned Data Flags for Test #330

HVZY8E (X) - Data for sample SE82 are low. Inconsistent within the determinations of sample SE82.

Analysis Notes:

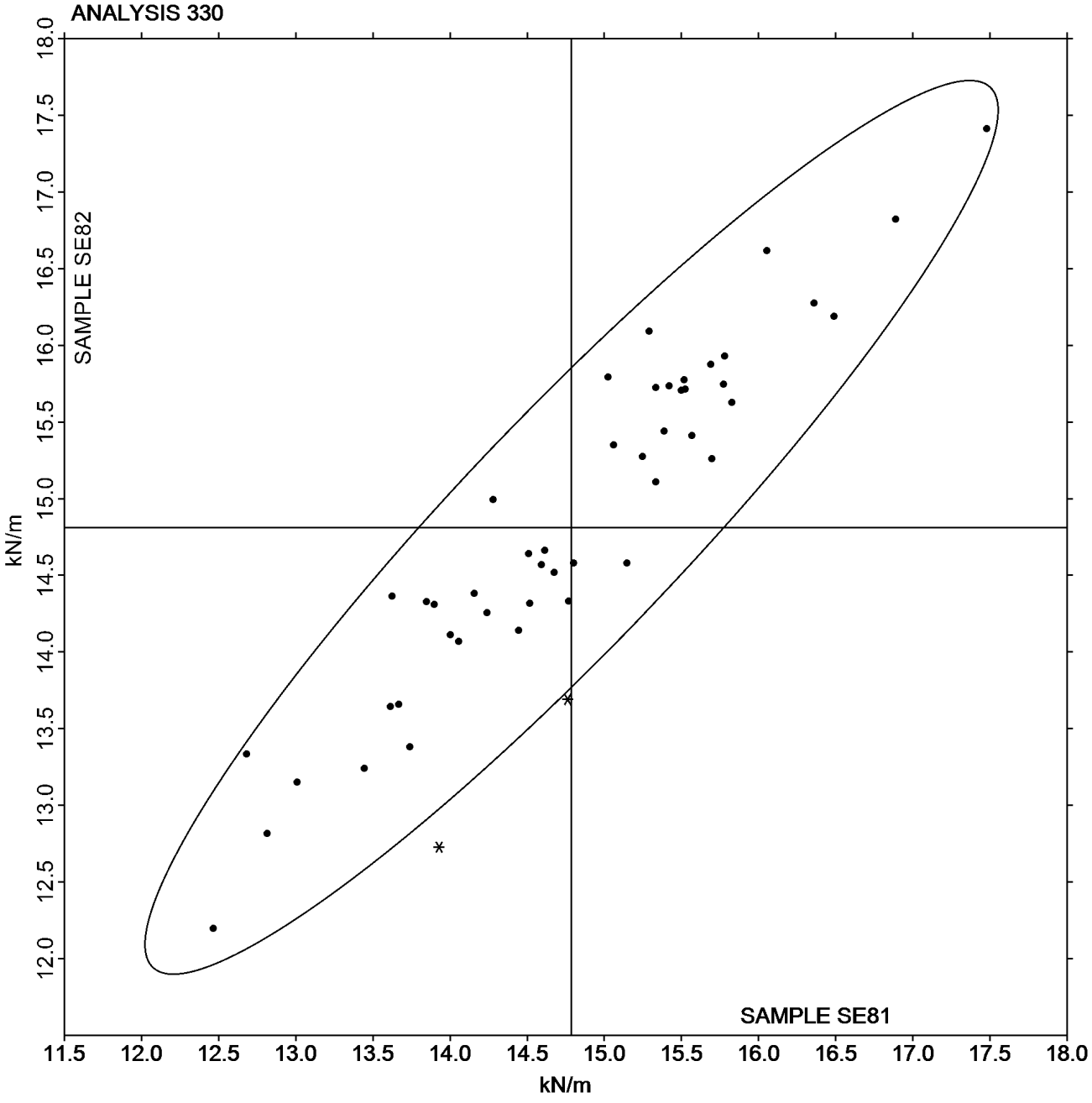
KRU9ZQ - Data appear to be reported as kN/m, not lb/15 mm as indicated on data entry form. CTS will not correct the Unit going forward.

Key to Instrument Codes Reported by Participants

CE	Chatillon Model ET1100	DM	IDM MTC-100 Tensile Tester
ID	Instron 4200 Series	IF	Instron 3340 Series
IK	Instron 4400 Series	IM	Instron 5500 Series
IN	Instron 3360 Series	LA	L & W Autoline
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LI	LLoyds Instruments	LW	L & W Tensile Tester SE062
LX	L & W (model not specified)	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
TR	TMI Horizontal Tensile Tester	TT	Tinius Olsen Model MHT
TX	Thwing-Albert (model not specified)	XX	Instrument make/model not specified by lab

Grand Mean Sample SE81 = 14.788 kN/m

Grand Mean Sample SE82 = 14.813 kN/m



Paper & Paperboard Interlaboratory Testing Program

Analysis 331

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE81 Lab Mean	Sample SE81 Diff from Grand Mean	Sample SE81 CPV	Sample SE82 Lab Mean	Sample SE82 Diff from Grand Mean	Sample SE82 CPV	Instr Code
2Q3MGX		212.4	-30.9	-1.00	209.0	-33.1	-1.02	LW
33UQ7A		210.5	-32.9	-1.07	194.2	-47.9	-1.48	TT
3W82JE		254.8	11.4	0.37	252.6	10.4	0.32	IF
4XDJHA		252.8	9.4	0.30	257.7	15.6	0.48	TR
677DVY		239.7	-3.7	-0.12	233.4	-8.8	-0.27	TO
6BZAH6		221.9	-21.5	-0.70	222.8	-19.3	-0.60	LH
6D39TW		224.3	-19.1	-0.62	223.4	-18.8	-0.58	IM
6G3GW8		273.4	30.0	0.97	264.4	22.3	0.69	XX
72Q8NQ		267.7	24.3	0.79	256.0	13.9	0.43	IN
8HAHWB		203.9	-39.5	-1.28	209.7	-32.4	-1.00	LH
8NZPG6		276.9	33.5	1.09	257.5	15.4	0.47	XX
9FL7W7		237.7	-5.7	-0.18	256.0	13.9	0.43	LA
AKB3Y2		247.0	3.7	0.12	249.4	7.3	0.22	IN
ATKRCZ		298.6	55.2	1.79	299.7	57.6	1.78	TH
BCPP92		268.6	25.2	0.82	279.8	37.6	1.16	TB
CBDC7Q		235.5	-7.9	-0.26	219.4	-22.7	-0.70	LH
DKFRQ4		228.3	-15.1	-0.49	224.5	-17.6	-0.54	LW
DPDBUM		225.4	-18.0	-0.58	228.0	-14.1	-0.44	LW
ECFRQ2		217.9	-25.5	-0.83	238.0	-4.1	-0.13	TB
EJ3K3Z		222.4	-21.0	-0.68	216.9	-25.2	-0.78	LE
ERBB64		214.9	-28.5	-0.92	227.0	-15.1	-0.47	LE
EXYVB6		223.1	-20.3	-0.66	232.7	-9.4	-0.29	LW
HVZY8E	X	224.0	-19.4	-0.63	166.4	-75.7	-2.33	IN
K7A76Q	*	342.5	99.1	3.22	342.9	100.8	3.11	ID
KRU9ZQ		263.2	19.8	0.64	244.0	1.8	0.06	LX
LFVRNU		242.5	-0.9	-0.03	244.8	2.6	0.08	TK
MWJ8RQ		250.4	7.1	0.23	254.5	12.4	0.38	TO
N97TAQ		298.2	54.8	1.78	288.3	46.1	1.42	IM
N9PM69		260.1	16.7	0.54	280.1	38.0	1.17	TH
NWGWBD		239.3	-4.1	-0.13	230.1	-12.0	-0.37	XX
Q3PCM7		234.1	-9.3	-0.30	222.8	-19.3	-0.59	LE
RUEA26		250.1	6.8	0.22	227.8	-14.3	-0.44	LA
RYCM6H		310.7	67.4	2.18	308.1	66.0	2.03	DM
T789AM		214.8	-28.5	-0.93	202.4	-39.7	-1.22	LE
TUUTL3		205.3	-38.1	-1.23	185.5	-56.6	-1.75	IF
UYZ4Q3		248.4	5.0	0.16	234.8	-7.4	-0.23	LA
VGGN87		245.7	2.3	0.08	239.5	-2.6	-0.08	IM
W24E6G		234.6	-8.7	-0.28	240.1	-2.1	-0.06	LA
W8376X		179.9	-63.4	-2.06	170.8	-71.3	-2.20	IN
WB2GZX	X	108.7	-134.7	-4.37	97.4	-144.7	-4.46	IM

Paper & Paperboard Interlaboratory Testing Program

Analysis 331

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE81 Lab Mean	Sample SE81 Diff from Grand Mean	Sample SE81 CPV	Sample SE82 Lab Mean	Sample SE82 Diff from Grand Mean	Sample SE82 CPV	Instr Code
WHN64G		238.7	-4.7	-0.15	248.0	5.8	0.18	IM
XLJGCL		236.3	-7.0	-0.23	234.0	-8.1	-0.25	LA
YDNXBH		244.3	0.9	0.03	259.9	17.8	0.55	LE
YJV6DF	*	224.8	-18.5	-0.60	258.9	16.8	0.52	TB

Summary Statistics	Sample SE81	Sample SE82
Grand Means	243.37 Joules/sq m	242.13 Joules/sq m
Stnd Dev Btwn Labs	30.83 Joules/sq m	32.42 Joules/sq m

Statistics based on 42 of 44 reporting participants.

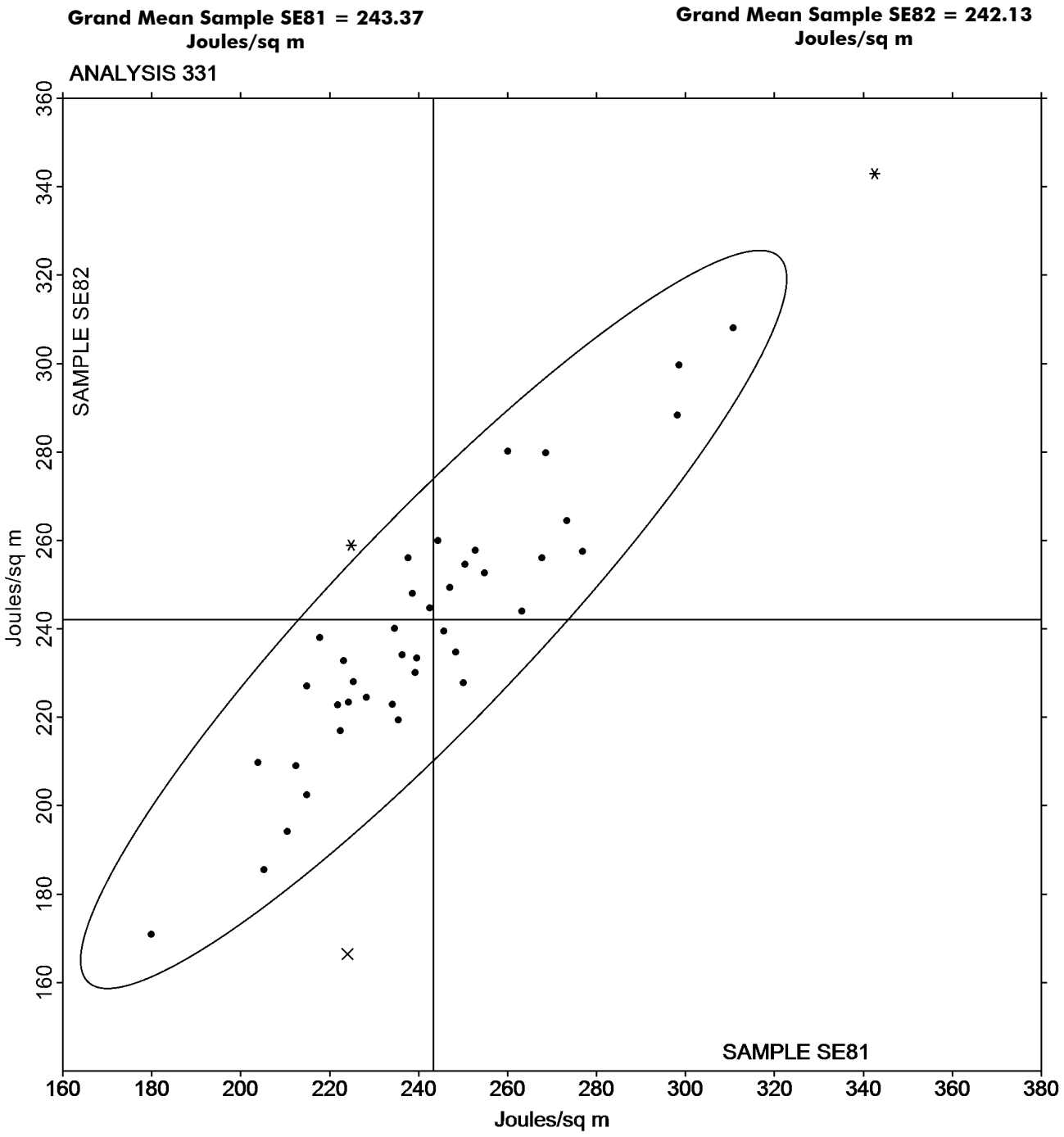
Comments on Assigned Data Flags for Test #331

HVZY8E (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.

WB2GZX (X) - Data for both samples are low. Possible Systematic Error.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	ID	Instron 4200 series
IF	Instron 3340 Series	IM	Instron 5500 Series
IN	Instron 3360 Series	LA	L & W Autoline
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LW	L & W Tensile Tester SE062	LX	L & W (model not specified)
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
TK	Thwing-Albert Model 37-4	TO	Thwing-Albert QC-1000
TR	TMI Horizontal Tensile Tester	TT	Tinius Olsen Model MHT
XX	Instrument make/model not specified by lab		



Paper & Paperboard Interlaboratory Testing Program

Analysis 332

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE81 Lab Mean	Sample SE81 Diff from Grand Mean	Sample SE81 CPV	Sample SE82 Lab Mean	Sample SE82 Diff from Grand Mean	Sample SE82 CPV	Instr Code
2Q3MGX		2.100	-0.337	-0.87	2.069	-0.355	-0.88	LW
2X6REA		2.498	0.061	0.16	2.461	0.037	0.09	ID
33UQ7A		2.599	0.162	0.42	2.433	0.009	0.02	TT
3W82JE		2.619	0.182	0.47	2.610	0.186	0.46	IF
4XDJHA	X	1.970	-0.467	-1.21	2.503	0.079	0.20	TR
677DVY		2.539	0.102	0.26	2.521	0.097	0.24	TO
6BZAH6		2.246	-0.191	-0.49	2.227	-0.197	-0.49	LH
6D39TW		2.401	-0.036	-0.09	2.385	-0.039	-0.10	IM
6G3GW8		2.567	0.130	0.34	2.419	-0.005	-0.01	XX
8HAHWB		2.159	-0.278	-0.72	2.274	-0.150	-0.37	LH
8NZPG6		2.834	0.397	1.03	2.739	0.315	0.78	XX
9FL7W7		2.105	-0.332	-0.86	2.174	-0.250	-0.62	LA
AKB3Y2		2.327	-0.110	-0.28	2.316	-0.108	-0.27	IN
ATKRCZ		3.347	0.910	2.35	3.340	0.916	2.28	TH
BCPP92		2.587	0.150	0.39	2.646	0.222	0.55	TB
CBDC7Q		2.351	-0.086	-0.22	2.245	-0.179	-0.45	LH
DKFRQ4		2.286	-0.151	-0.39	2.271	-0.153	-0.38	LW
DPDBUM		2.170	-0.267	-0.69	2.187	-0.237	-0.59	LW
ECFRQ2		2.307	-0.130	-0.34	2.438	0.014	0.03	TB
EJ3K3Z		2.192	-0.245	-0.63	2.197	-0.227	-0.57	LE
ERBB64		2.262	-0.175	-0.45	2.317	-0.107	-0.27	LE
EXYVB6		2.251	-0.186	-0.48	2.333	-0.091	-0.23	LW
HVZY8E		1.818	-0.619	-1.60	1.637	-0.787	-1.96	IN
K7A76Q		3.262	0.825	2.13	3.239	0.814	2.02	ID
KRU9ZQ		2.445	0.008	0.02	2.466	0.042	0.10	LX
LFVRNU		2.644	0.207	0.53	2.675	0.251	0.62	TK
MWJ8RQ		2.602	0.165	0.43	2.655	0.231	0.57	TO
N97TAQ		3.070	0.633	1.64	3.023	0.599	1.49	IM
N9PM69		2.675	0.238	0.61	2.710	0.286	0.71	TH
NWGWBD		2.678	0.241	0.62	2.620	0.196	0.49	XX
Q3PCM7		2.175	-0.262	-0.68	2.129	-0.295	-0.73	LE
R2DRKN		2.403	-0.034	-0.09	2.470	0.046	0.11	TB
RUEA26	*	2.672	0.235	0.61	2.410	-0.014	-0.04	LA
RYCM6H		2.724	0.286	0.74	2.712	0.287	0.71	DM
T789AM		2.316	-0.121	-0.31	2.218	-0.206	-0.51	LE
TUUTL3		1.648	-0.789	-2.04	1.596	-0.829	-2.06	IF
UYZ4Q3		1.963	-0.474	-1.22	1.877	-0.547	-1.36	LA
VGGN87		2.737	0.300	0.77	2.675	0.251	0.62	IM
W24E6G		3.143	0.706	1.82	3.180	0.756	1.88	LA
W8376X	X	1.970	-0.467	-1.21	1.534	-0.891	-2.21	IN

Paper & Paperboard Interlaboratory Testing Program

Analysis 332

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE81 Lab Mean	Sample SE81 Diff from Grand Mean	Sample SE81 CPV	Sample SE82 Lab Mean	Sample SE82 Diff from Grand Mean	Sample SE82 CPV	Instr Code
WB2GZX		1.492	-0.945	-2.44	1.440	-0.984	-2.45	IM
WHN64G		2.574	0.137	0.35	2.594	0.170	0.42	IM
XLJGCL		1.892	-0.545	-1.41	1.868	-0.556	-1.38	LA
YDNXBH		2.386	-0.051	-0.13	2.485	0.061	0.15	LE
YJV6DF	*	2.726	0.289	0.75	2.967	0.543	1.35	TB

Summary Statistics	Sample SE81	Sample SE82
Grand Means	2.44 Percent	2.42 Percent
Stnd Dev Btwn Labs	0.39 Percent	0.40 Percent

Statistics based on 43 of 45 reporting participants.

Comments on Assigned Data Flags for Test #332

4XDJHA (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SE81.

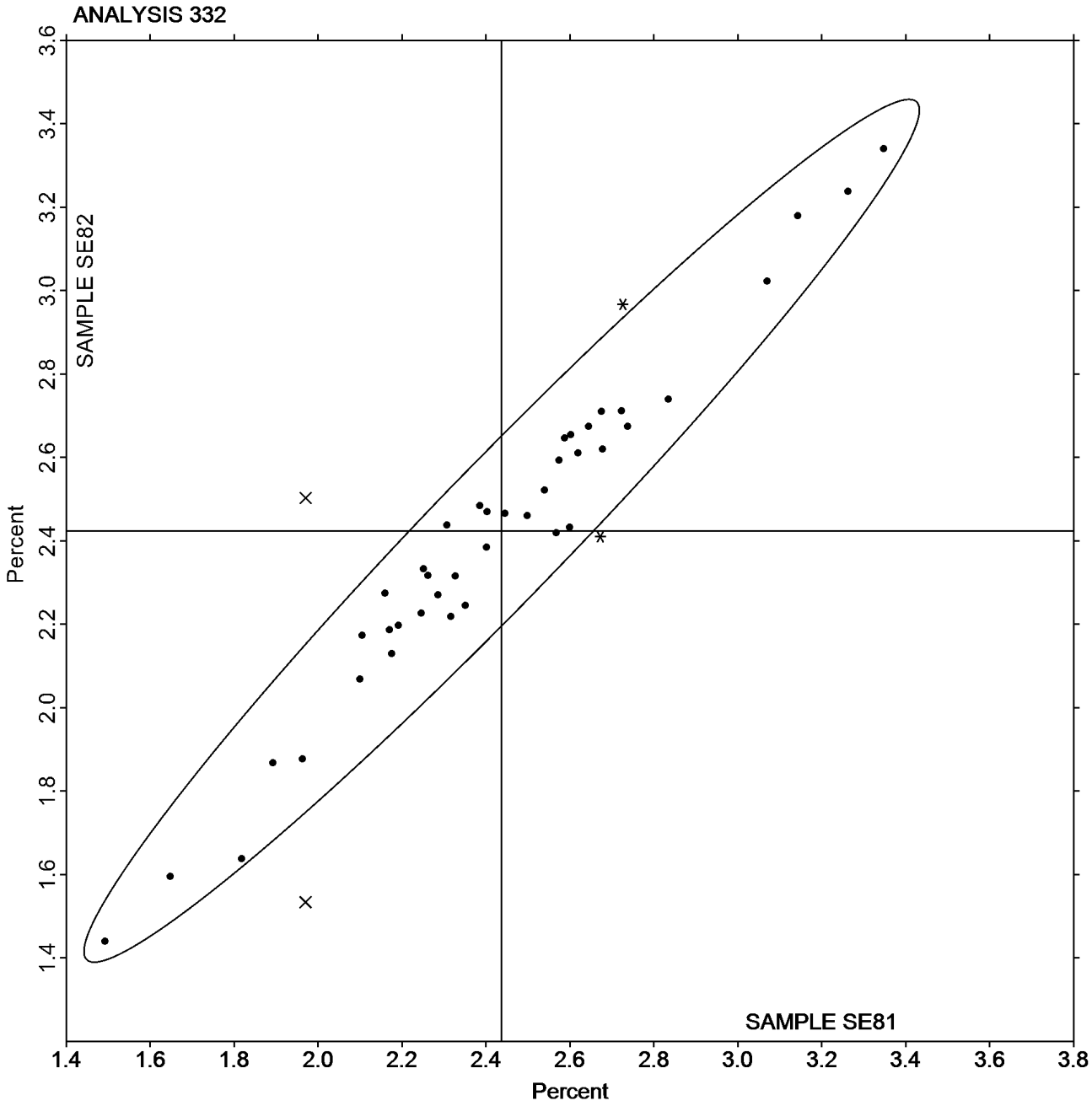
W8376X (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SE81.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	ID	Instron 4200 Series
IF	Instron 3340 Series	IM	Instron 5500 Series
IN	Instron 3360 Series	LA	L & W Autoline 300
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LW	L & W Tensile Tester SE062	LX	L & W (model not specified)
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
TK	Thwing-Albert Model 37-4	TO	Thwing-Albert QC-1000
TR	TMI Horizontal Tensile Tester	TT	Tinius Olsen Model MHT
XX	Instrument make/model not specified by lab		

Grand Mean Sample SE81 = 2.4370 Percent

Grand Mean Sample SE82 = 2.4244 Percent



Paper & Paperboard Interlaboratory Testing Program

Analysis 334

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

WebCode	Data Flag	Sample SG81 Lab Mean	Sample SG81 Diff from Grand Mean	Sample SG81 CPV	Sample SG82 Lab Mean	Sample SG82 Diff from Grand Mean	Sample SG82 CPV	Instr Code
2HRFMF		34.10	9.42	1.65	48.80	11.23	0.81	MT
4XDJHA	X	259.60	234.92	41.26	352.00	314.43	22.69	MI
ATKRCZ		22.80	-1.88	-0.33	30.70	-6.87	-0.50	MT
EXYVB6		20.60	-4.08	-0.72	28.80	-8.77	-0.63	MT
HEE43J		17.00	-7.68	-1.35	38.80	1.23	0.09	MT
JQ3PJY		26.70	2.02	0.35	39.30	1.73	0.12	MT
N8VRNR		24.20	-0.48	-0.08	24.80	-12.77	-0.92	MT
N97TAQ		31.30	6.62	1.16	32.40	-5.17	-0.37	MT
NWGWBD		25.40	0.72	0.13	51.50	13.93	1.01	MT
R2DRKN		29.10	4.42	0.78	68.40	30.83	2.22	MT
RP3KJG		25.00	0.32	0.06	27.10	-10.47	-0.76	MT
UX89BK		15.30	-9.38	-1.65	22.70	-14.87	-1.07	MT

Summary Statistics	Sample SG81	Sample SG82
Grand Means	24.68 Double Folds	37.57 Double Folds
Stnd Dev Btwn Labs	5.69 Double Folds	13.86 Double Folds

Statistics based on 11 of 12 reporting participants.

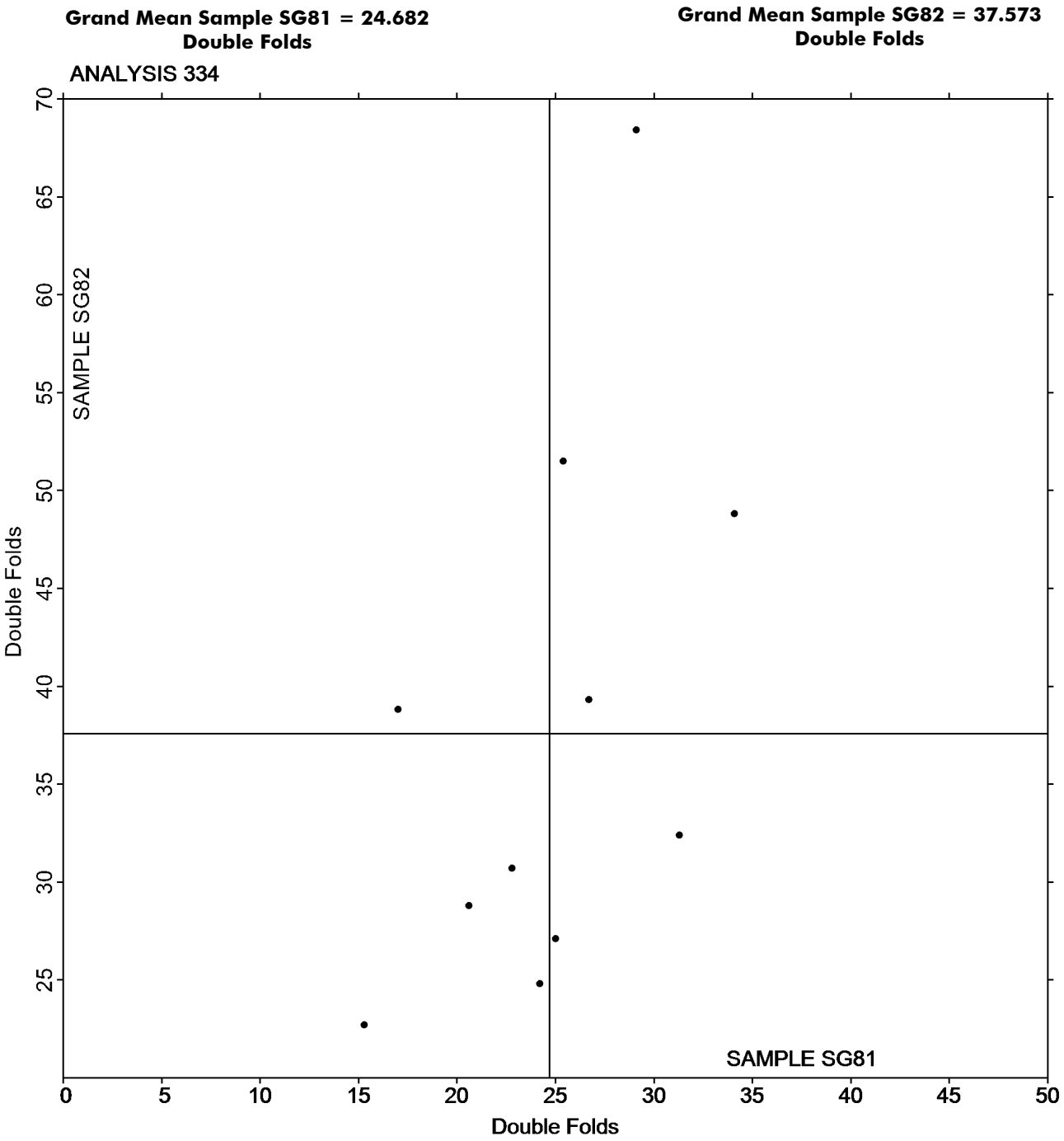
Comments on Assigned Data Flags for Test #334

4XDJHA (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

MI MIT Flex Tester – Folding Endurance Tester

MT MIT - Tinius Olsen



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

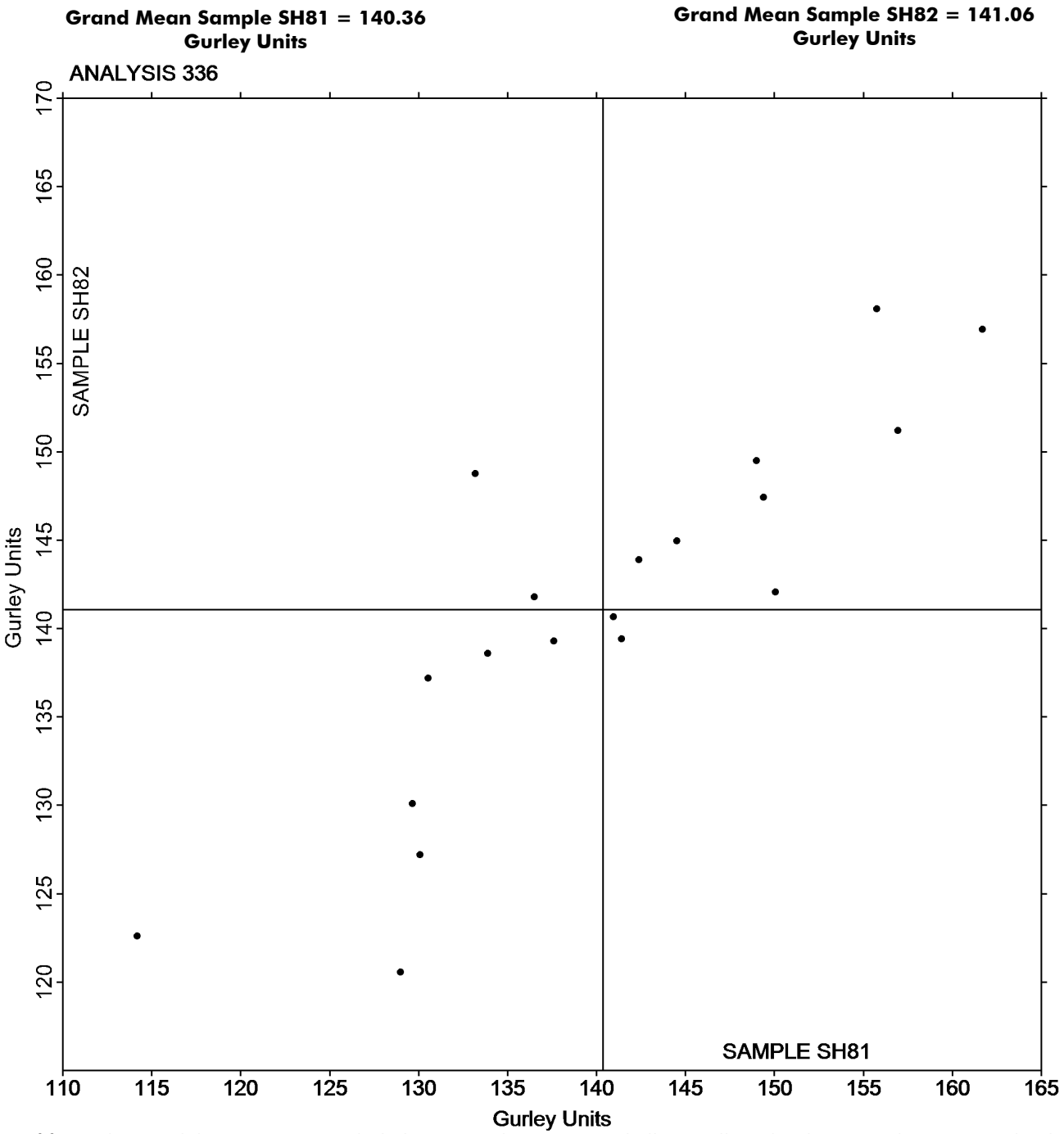
Paper & Paperboard Interlaboratory Testing Program

Analysis 336
Bending Resistance, Gurley Type
TAPPI Official Test Method T543

WebCode	Data Flag	Sample SH81 Lab Mean	Sample SH81 Diff from Grand Mean	Sample SH81 CPV	Sample SH82 Lab Mean	Sample SH82 Diff from Grand Mean	Sample SH82 CPV
23YN4Z		140.9	0.6	0.05	140.7	-0.4	-0.04
2AY3P2		141.4	1.1	0.09	139.4	-1.6	-0.16
3PTRHD		133.9	-6.5	-0.55	138.6	-2.5	-0.24
3W82JE		133.2	-7.2	-0.61	148.8	7.7	0.74
7GJUZB		161.7	21.3	1.82	156.9	15.8	1.53
97A8ZA		130.5	-9.8	-0.84	137.2	-3.9	-0.37
DPAQ6Y		130.1	-10.3	-0.87	127.2	-13.9	-1.33
ECFRQ2		129.0	-11.4	-0.97	120.5	-20.5	-1.98
H7KY7W		155.8	15.4	1.31	158.1	17.0	1.64
HEE43J		137.6	-2.7	-0.23	139.3	-1.8	-0.17
HZVL8U		114.2	-26.2	-2.23	122.6	-18.5	-1.78
JPTK8V		149.4	9.0	0.77	147.4	6.3	0.61
JYKYAF		136.5	-3.9	-0.33	141.8	0.7	0.07
KNEDJT		150.1	9.7	0.82	142.1	1.0	0.10
N97TAQ		144.5	4.2	0.35	145.0	3.9	0.38
NWGWBD		157.0	16.6	1.41	151.2	10.1	0.98
R2DRKN		149.0	8.6	0.73	149.5	8.4	0.81
UX89BK		142.4	2.0	0.17	143.9	2.8	0.27
Z67J9D		129.6	-10.7	-0.91	130.1	-11.0	-1.06

Summary Statistics	Sample SH81	Sample SH82
Grand Means	140.36 Gurley Units	141.06 Gurley Units
Stnd Dev Btwn Labs	11.76 Gurley Units	10.38 Gurley Units

Statistics based on 19 of 19 reporting participants.



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

Paper & Paperboard Interlaboratory Testing Program

Analysis 338

Bending Resistance, Taber Type - 0 to 10 Units

TAPPI Official Test Method T566

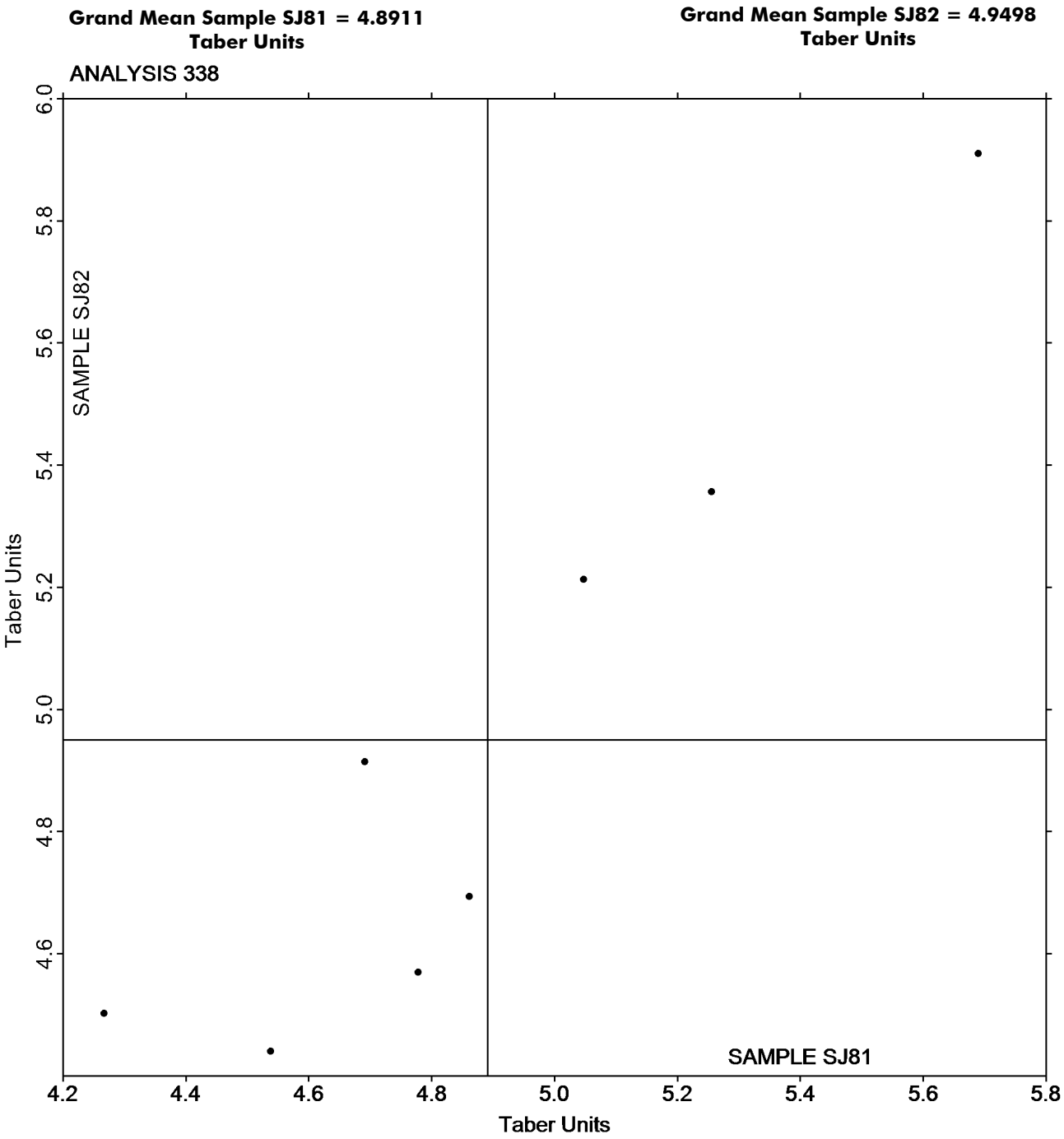
WebCode	Data Flag	Sample SJ81 Lab Mean	Sample SJ81 Diff from Grand Mean	Sample SJ81 CPV	Sample SJ82 Lab Mean	Sample SJ82 Diff from Grand Mean	Sample SJ82 CPV
2AY3P2		4.779	-0.113	-0.26	4.570	-0.380	-0.74
3W82JE		4.691	-0.200	-0.45	4.914	-0.036	-0.07
3YRUEU		4.538	-0.353	-0.80	4.440	-0.510	-1.00
6KM99A	X	48.905	44.014	99.73	4.779	-0.171	-0.33
74VZHP		4.267	-0.624	-1.41	4.502	-0.448	-0.88
AKB3Y2		5.690	0.799	1.81	5.910	0.960	1.88
F2Y9PG		5.256	0.365	0.83	5.356	0.406	0.79
H7KY7W		4.861	-0.030	-0.07	4.694	-0.256	-0.50
N97TAQ		5.047	0.156	0.35	5.213	0.263	0.52

Summary Statistics	Sample SJ81	Sample SJ82
Grand Means	4.89 Taber Units	4.95 Taber Units
Stnd Dev Btwn Labs	0.44 Taber Units	0.51 Taber Units

Statistics based on 8 of 9 reporting participants.

Comments on Assigned Data Flags for Test #338

6KM99A (X) - Extreme Data for Sample SJ81.



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

Paper & Paperboard Interlaboratory Testing Program

Analysis 339

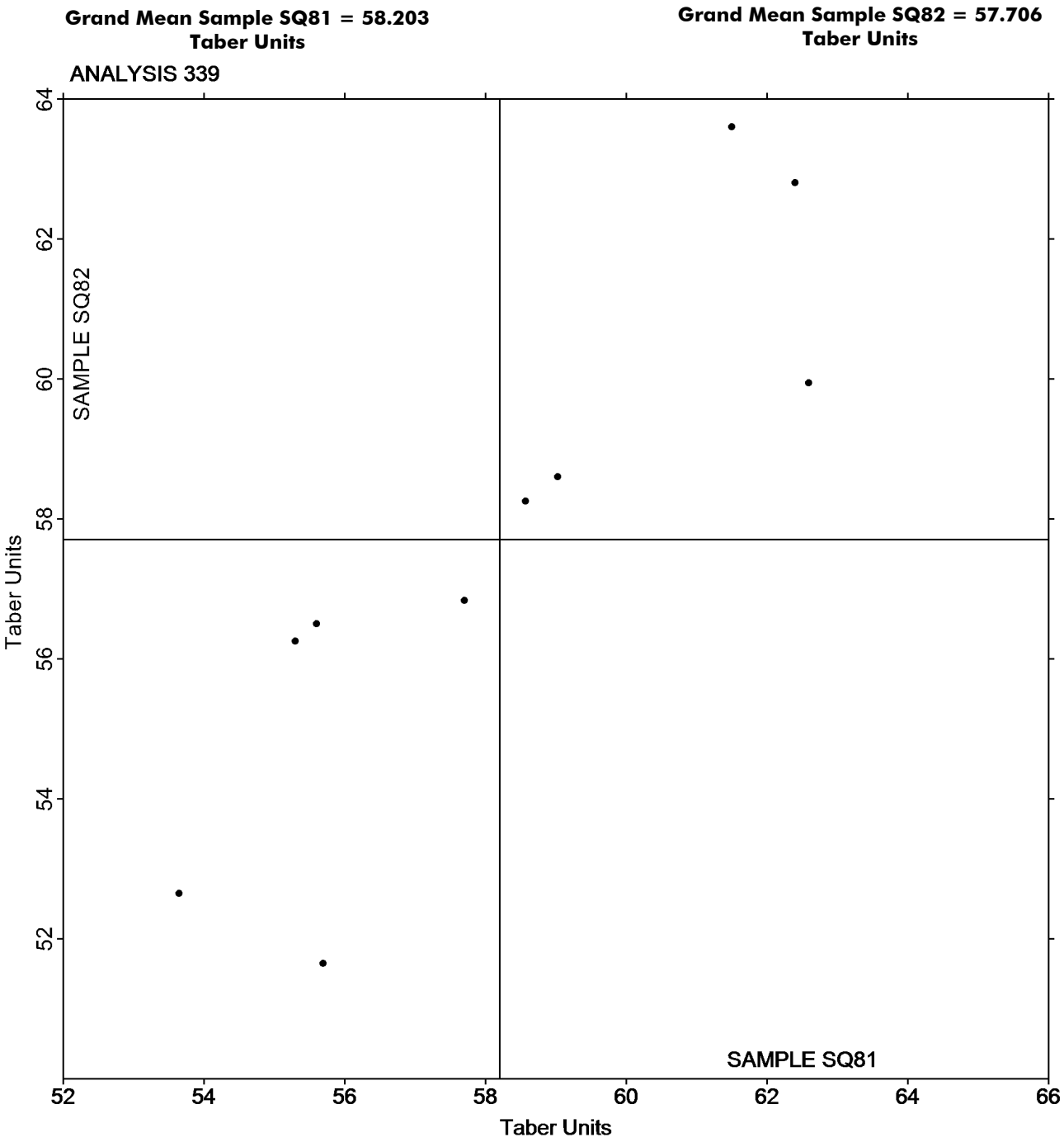
Bending Resistance, Taber Type - 10 to 100 Taber Units

TAPPI Official Test Method T489

WebCode	Data Flag	Sample SQ81 Lab Mean	Sample SQ81 Diff from Grand Mean	Sample SQ81 CPV	Sample SQ82 Lab Mean	Sample SQ82 Diff from Grand Mean	Sample SQ82 CPV
97A8ZA		59.03	0.83	0.26	58.60	0.89	0.23
AV94C7		55.60	-2.60	-0.82	56.50	-1.21	-0.31
BCPP92		58.57	0.37	0.12	58.25	0.54	0.14
DPDBUM		53.65	-4.55	-1.43	52.65	-5.06	-1.31
EJ3K3Z		55.30	-2.90	-0.91	56.25	-1.46	-0.38
EXYVB6		62.59	4.39	1.38	59.94	2.23	0.58
N76TAU		61.50	3.30	1.04	63.60	5.89	1.53
YDNXBH		62.40	4.20	1.32	62.80	5.09	1.32
YJV6DF		57.70	-0.50	-0.16	56.83	-0.88	-0.23
ZQMYNJ		55.69	-2.51	-0.79	51.64	-6.06	-1.57

Summary Statistics	Sample SQ81	Sample SQ82
Grand Means	58.20 Taber Units	57.71 Taber Units
Stnd Dev Btwn Labs	3.18 Taber Units	3.85 Taber Units

Statistics based on 10 of 10 reporting participants.



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

Paper & Paperboard Interlaboratory Testing Program

Analysis 340

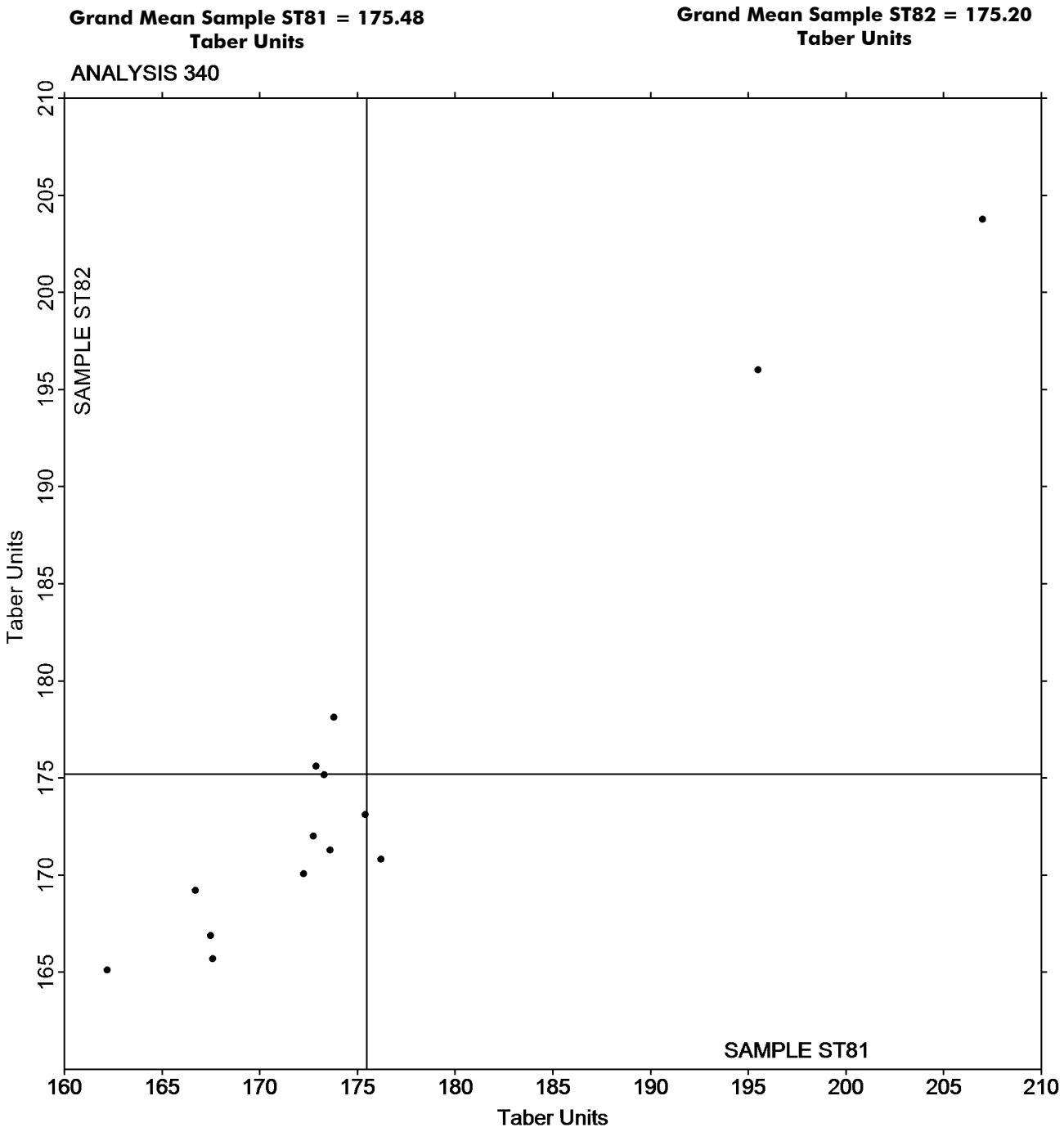
Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard

TAPPI Official Test Method T489

WebCode	Data Flag	Sample ST81 Lab Mean	Sample ST81 Diff from Grand Mean	Sample ST81 CPV	Sample ST82 Lab Mean	Sample ST82 Diff from Grand Mean	Sample ST82 CPV
2VZYKB		173.3	-2.2	-0.18	175.2	0.0	0.00
97A8ZA		172.8	-2.7	-0.23	172.0	-3.2	-0.29
ATKRCZ		167.6	-7.9	-0.67	165.7	-9.5	-0.85
BFD298		166.7	-8.8	-0.74	169.2	-6.0	-0.54
C4C2RK		172.3	-3.2	-0.27	170.1	-5.1	-0.46
C6NWFX		172.9	-2.6	-0.22	175.6	0.4	0.04
DFKZH7		176.2	0.7	0.06	170.8	-4.4	-0.39
DZR9W6		175.4	-0.1	-0.01	173.1	-2.1	-0.19
EXYVB6		173.6	-1.9	-0.16	171.3	-3.9	-0.35
MCCYCR		173.8	-1.7	-0.14	178.1	2.9	0.26
NWGWBD		167.5	-8.0	-0.68	166.9	-8.3	-0.74
NZCNGP		195.5	20.0	1.70	196.0	20.8	1.86
TN9W2L		207.0	31.5	2.67	203.8	28.6	2.55
ZBYLCC		162.2	-13.3	-1.13	165.1	-10.1	-0.90

Summary Statistics	Sample ST81	Sample ST82
Grand Means	175.48 Taber Units	175.20 Taber Units
Stnd Dev Btwn Labs	11.80 Taber Units	11.20 Taber Units

Statistics based on 14 of 14 reporting participants.



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

Paper & Paperboard Interlaboratory Testing Program

Analysis 343
Z-Direction Tensile
TAPPI Official Test Method T541

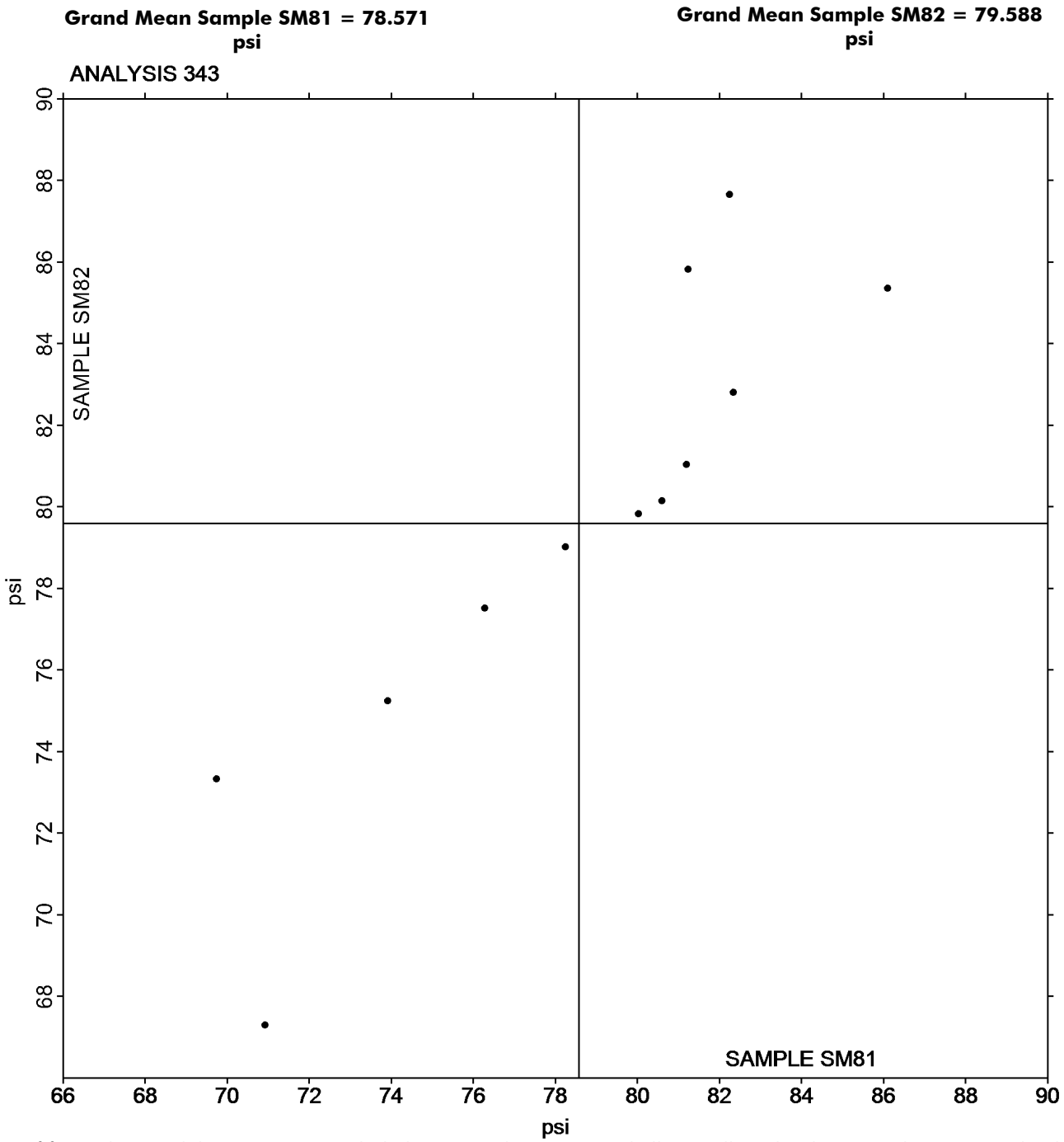
WebCode	Data Flag	Sample SM81 Lab Mean	Sample SM81 Diff from Grand Mean	Sample SM81 CPV	Sample SM82 Lab Mean	Sample SM82 Diff from Grand Mean	Sample SM82 CPV	Instr Code
2NGVD9		69.73	-8.84	-1.79	73.33	-6.26	-1.09	LW
3W82JE		82.25	3.68	0.75	87.66	8.07	1.40	TL
4T2UHD		81.24	2.67	0.54	85.82	6.23	1.08	DX
ATKRCZ		86.10	7.53	1.52	85.36	5.77	1.00	LW
BCPP92		80.60	2.03	0.41	80.14	0.55	0.10	TA
EXYVB6		82.34	3.77	0.76	82.80	3.21	0.56	LW
HCN6LZ		73.92	-4.65	-0.94	75.24	-4.35	-0.76	DX
N76TAU		81.20	2.63	0.53	81.04	1.45	0.25	TA
N97TAQ		70.92	-7.65	-1.55	67.30	-12.29	-2.14	CD
NVLBGM		76.28	-2.29	-0.46	77.52	-2.07	-0.36	DT
YDNXBH		78.24	-0.33	-0.07	79.02	-0.57	-0.10	TA
ZQMYNJ		80.02	1.45	0.29	79.83	0.24	0.04	LW

Summary Statistics	Sample SM81	Sample SM82
Grand Means	78.57 psi	79.59 psi
Stnd Dev Btwn Labs	4.94 psi	5.75 psi

Statistics based on 12 of 12 reporting participants.

Key to Instrument Codes Reported by Participants

CD	CSI CS-163D	DT	Dek-Tron DCS-163A ZDT Tester
DX	Dek-Tron XP2 Series	LW	L & W ZD Tensile Tester
TA	Thwing-Albert Tensile Tester	TL	TMI Lab Master



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

Paper & Paperboard Interlaboratory Testing Program

Report #3071S, July 2020

Analysis 345

Z-Direction Tensile, Recycled Paperboard

TAPPI Official Test Method T541

WebCode	Data Flag	Sample SZ81 Lab Mean	Sample SZ81 Diff from Grand Mean	Sample SZ81 CPV	Sample SZ82 Lab Mean	Sample SZ82 Diff from Grand Mean	Sample SZ82 CPV	Instr Code
2VZYKB		62.32	0.19	0.03	62.76	-0.24	-0.03	CD
36H36F		60.80	-1.33	-0.21	56.00	-7.00	-0.99	CA
97A8ZA		60.30	-1.83	-0.29	68.02	5.02	0.71	CA
9FL7W7		59.60	-2.53	-0.40	61.18	-1.82	-0.26	TA
BFD298		66.00	3.87	0.60	69.00	6.00	0.85	LW
C4C2RK	*	45.90	-16.23	-2.54	51.00	-12.00	-1.70	TA
DFKZH7		59.24	-2.89	-0.45	59.92	-3.08	-0.44	CD
DZR9W6		63.80	1.67	0.26	65.00	2.00	0.28	TA
EARFRV		69.12	6.99	1.09	72.78	9.78	1.39	CH
EXYVB6		54.14	-7.99	-1.25	49.08	-13.92	-1.97	LW
HTDDJX	X	126.40	64.27	10.06	115.40	52.40	7.43	LW
K7A76Q		63.04	0.91	0.14	60.52	-2.48	-0.35	XX
MCCYCR		63.60	1.47	0.23	65.20	2.20	0.31	CA
NWGWBD		62.64	0.51	0.08	64.68	1.68	0.24	CA
NZCNGP		62.27	0.14	0.02	61.44	-1.56	-0.22	CH
QNWFVA		68.64	6.51	1.02	72.20	9.20	1.30	LW
VDGCB7		60.74	-1.39	-0.22	57.48	-5.52	-0.78	DP
VGGN87		58.20	-3.93	-0.62	57.00	-6.00	-0.85	CA
YJV6DF		71.20	9.07	1.42	68.98	5.98	0.85	DP
ZBYLCC		75.40	13.27	2.08	76.40	13.40	1.90	TA
ZXARZJ		55.74	-6.39	-1.00	61.34	-1.66	-0.24	DP

Summary Statistics	Sample SZ81	Sample SZ82
Grand Means	62.13 psi	63.00 psi
Stnd Dev Btwn Labs	6.39 psi	7.06 psi

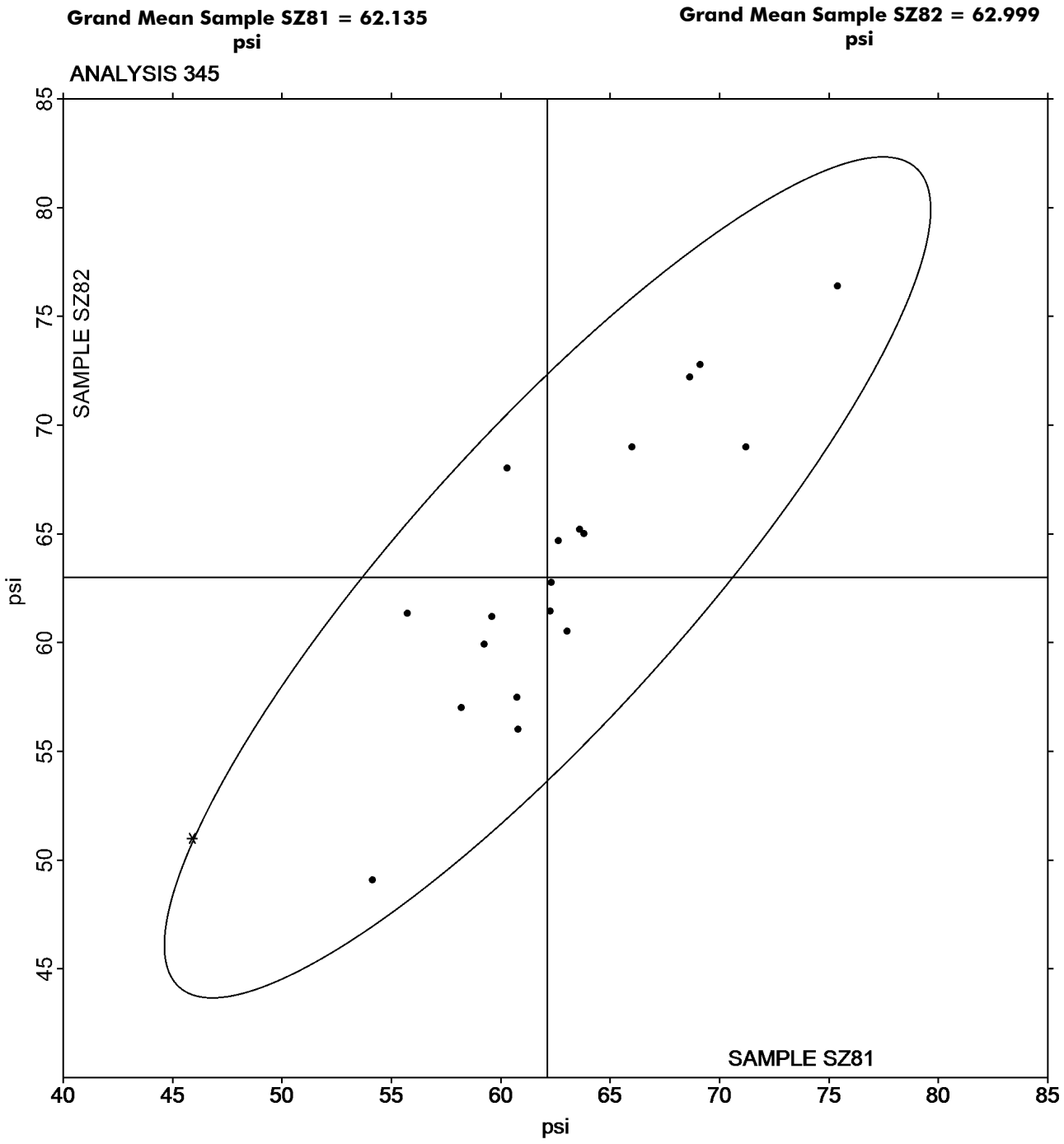
Statistics based on 20 of 21 reporting participants.

Comments on Assigned Data Flags for Test #345

HTDDJX (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

CA	CSI CS-163	CD	CSI CS-163D
CH	Chatillon Ametek	DP	Dek-Tron XP Series
LW	L & W ZD Tensile Tester	TA	Thwing-Albert Tensile Tester
XX	Instrument make/model not specified by lab		



Paper & Paperboard Interlaboratory Testing Program

Analysis 348

Internal Bond Strength - Modified Scott Mechanics

TAPPI Provisional Test Method T569

WebCode	Data Flag	Sample SN81 Lab Mean	Sample SN81 Diff from Grand Mean	Sample SN81 CPV	Sample SN82 Lab Mean	Sample SN82 Diff from Grand Mean	Sample SN82 CPV	Instr Code
677DVY		174.4	0.9	0.06	169.0	-2.7	-0.20	HY
ATKRCZ		131.4	-42.1	-2.66	154.2	-17.5	-1.28	HZ
BCPP92		186.2	12.7	0.80	178.0	6.3	0.46	HZ
C2BR4X		168.2	-5.3	-0.33	162.0	-9.7	-0.71	HZ
ECFRQ2		173.0	-0.5	-0.03	174.4	2.7	0.20	HY
EXYVB6		177.4	3.9	0.25	178.4	6.7	0.49	HY
H7KY7W		153.8	-19.7	-1.24	149.5	-22.2	-1.62	KR
HZVL8U		195.6	22.1	1.40	198.6	26.9	1.96	HZ
JPTK8V		164.8	-8.7	-0.55	161.6	-10.1	-0.74	HY
N76TAU		186.8	13.3	0.84	155.2	-16.5	-1.20	HY
NWGWBD		168.0	-5.5	-0.35	165.6	-6.1	-0.45	HZ
UX89BK		173.8	0.3	0.02	185.0	13.3	0.97	HY
VVJWBF		182.9	9.4	0.60	176.7	5.0	0.37	HY
YDNXBH		189.8	16.3	1.03	186.6	14.9	1.09	HY
Z67J9D		176.2	2.7	0.17	180.8	9.1	0.66	HY

Summary Statistics	Sample SN81	Sample SN82
Grand Means	173.49 1000th ft-lbs	171.71 1000th ft-lbs
Stnd Dev Btwn Labs	15.81 1000th ft-lbs	13.72 1000th ft-lbs

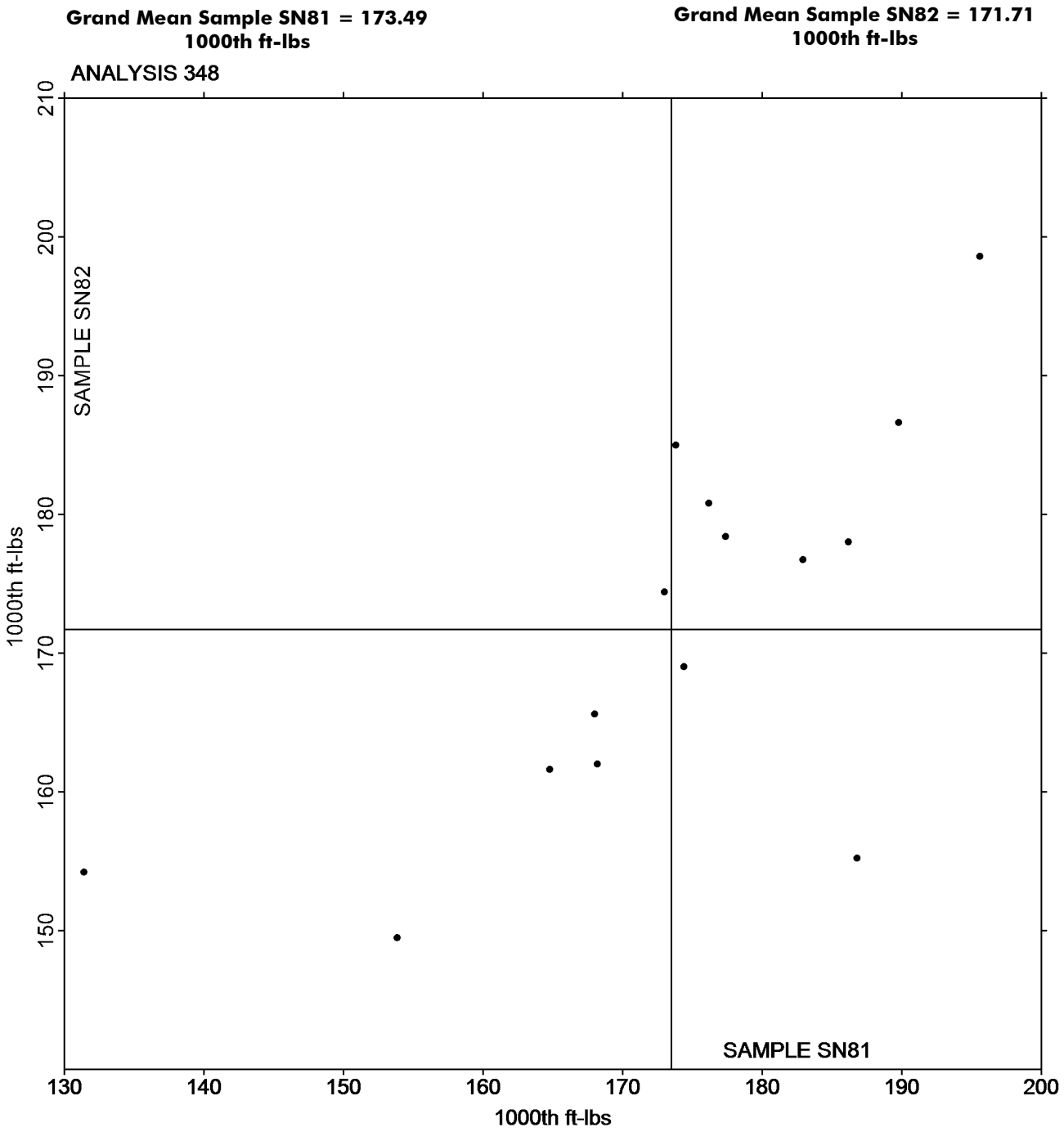
Statistics based on 15 of 15 reporting participants.

Key to Instrument Codes Reported by Participants

HY Huygen Digitized Scott Internal Bond Tester

HZ Huygen Internal Bond Tester with AccuPress

KR Kumagai Riki Kogyo Internal Bond Tester



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

Paper & Paperboard Interlaboratory Testing Program

Analysis 349

Internal Bond Strength - Scott Bond Models

TAPPI Provisional Test Method T569

WebCode	Data Flag	Sample SP81 Lab Mean	Sample SP81 Diff from Grand Mean	Sample SP81 CPV	Sample SP82 Lab Mean	Sample SP82 Diff from Grand Mean	Sample SP82 CPV	Instr Code
2AY3P2		180.1	10.5	0.25	179.6	7.6	0.16	TM
3F44MB		133.5	-36.2	-0.86	127.1	-44.9	-0.93	TM
6BZAH6		154.0	-15.6	-0.37	153.4	-18.5	-0.38	TM
74VZHP		132.6	-37.0	-0.88	133.8	-38.2	-0.79	SC
9AU2VN		189.8	20.2	0.48	195.8	23.8	0.49	SC
9FL7W7		145.7	-24.0	-0.57	147.0	-25.0	-0.52	SC
DPDBUM		192.9	23.3	0.55	193.7	21.7	0.45	XX
EARFRV		132.6	-37.0	-0.88	140.6	-31.4	-0.65	TM
LZ3Y3T		127.2	-42.4	-1.00	125.9	-46.0	-0.95	XX
Q3PCM7		224.0	54.4	1.29	224.0	52.0	1.08	SC
RUEA26		263.6	94.0	2.23	289.8	117.8	2.44	SC
YG6XV6		159.6	-10.0	-0.24	152.8	-19.2	-0.40	XX

Summary Statistics	Sample SP81	Sample SP82
Grand Means	169.63 1000th ft-lbs	171.95 1000th ft-lbs
Stnd Dev Btwn Labs	42.22 1000th ft-lbs	48.24 1000th ft-lbs

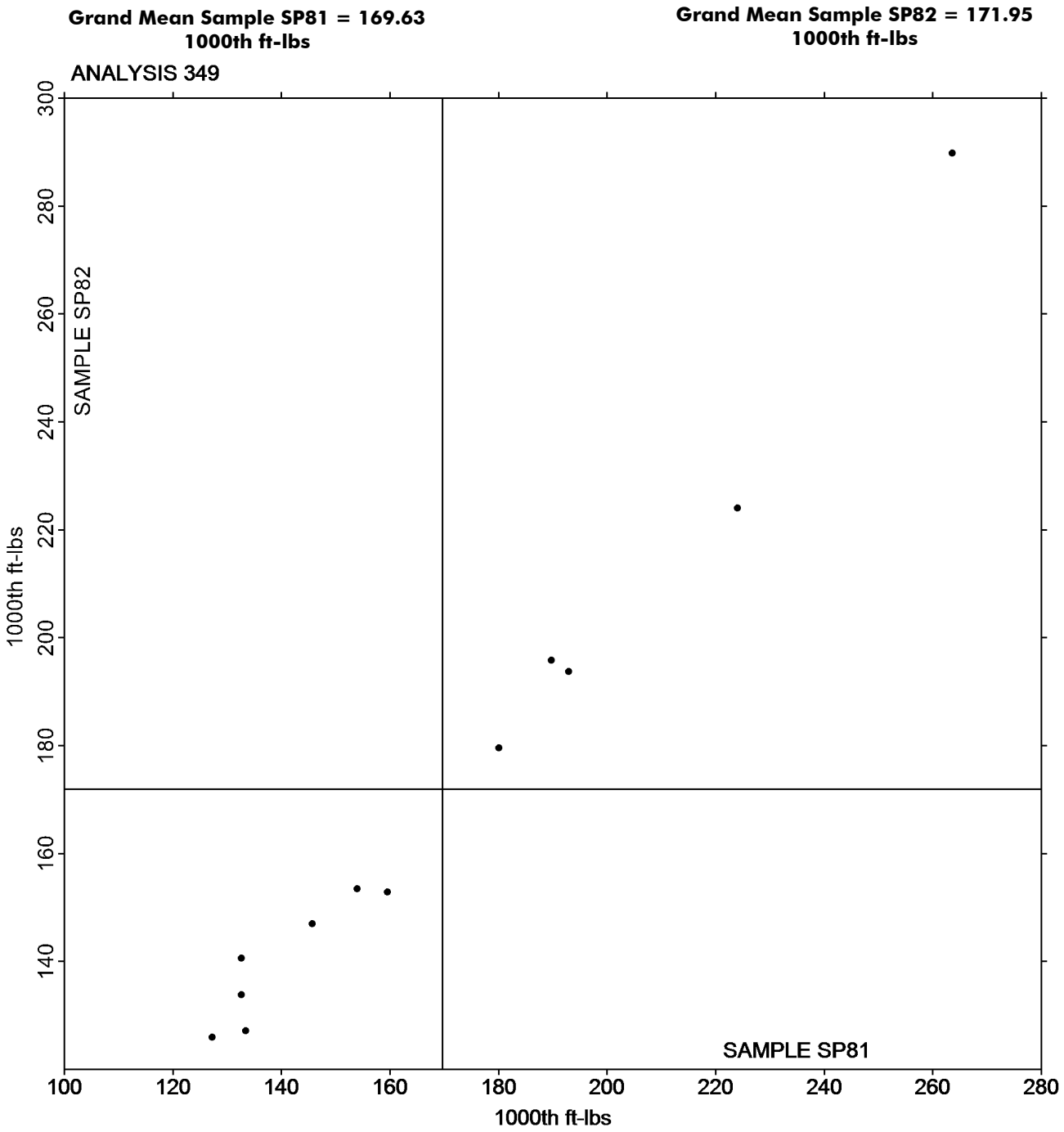
Statistics based on 12 of 12 reporting participants.

Key to Instrument Codes Reported by Participants

SC Scott Internal Bond Tester (Manual)

TM TMI Monitor/Internal Bond Tester

XX Instrument make/model not specified by lab



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

-End of Report-

