Collaborative Testing Services, Inc.

Paper & Paperboard Testing Program

Summary Report #3161 S - January 2022

Analysis	Analysis Name
305	Bursting Strength - Printing Papers
310	Bursting Strength - Packaging Papers
312	Tearing Strength - Printing Papers
314	Tearing Strength - Packaging Papers
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

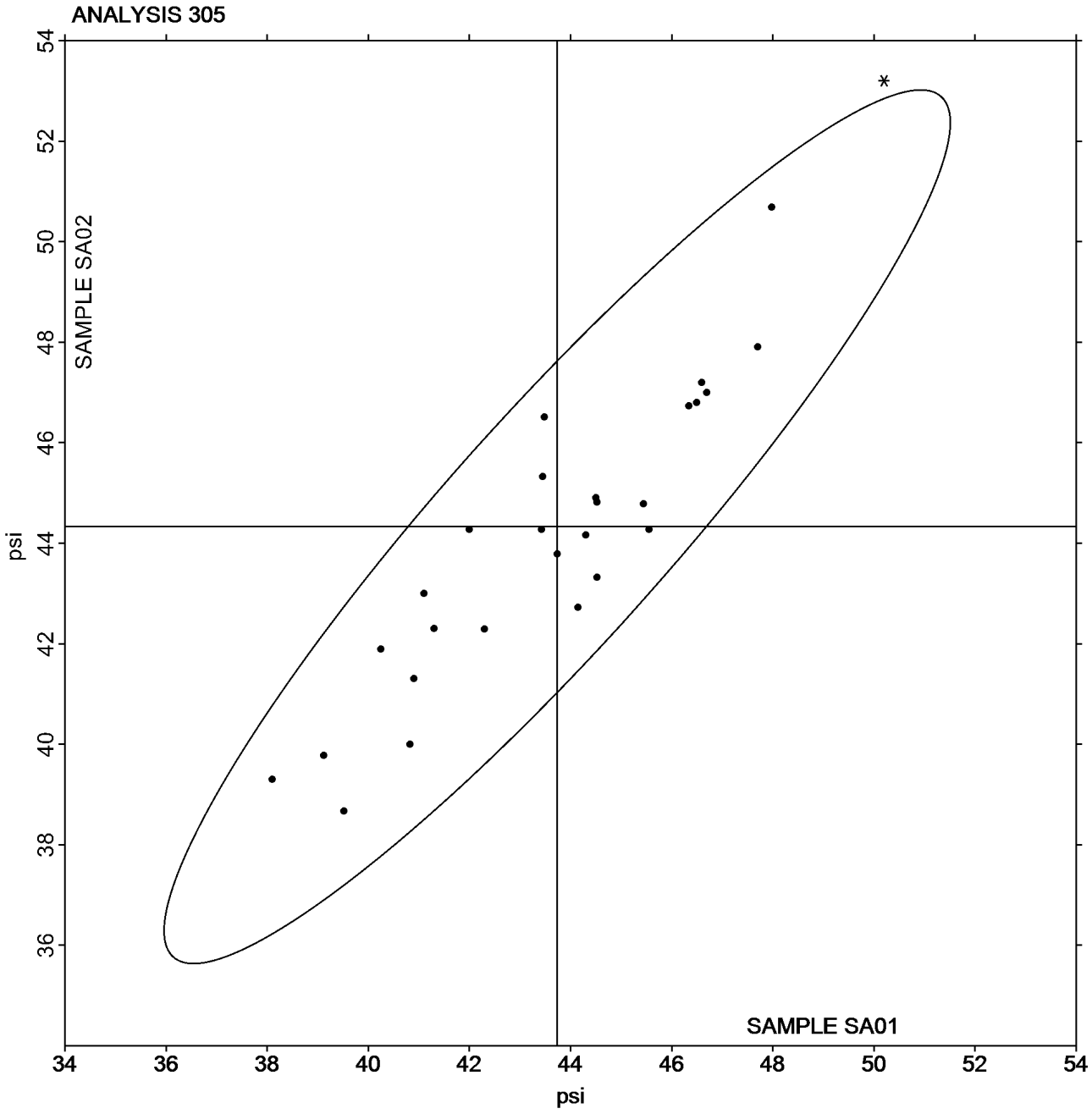
WebCode	Data Flag	Sample SA01 Lab Mean	Sample SA01 Diff from Grand Mean	Sample SA01 CPV	Sample SA02 Lab Mean	Sample SA02 Diff from Grand Mean	Sample SA02 CPV
28YNM7		40.83	-2.90	-0.99	40.00	-4.33	-1.32
3P8ZKT		46.70	2.97	1.01	47.00	2.67	0.81
3UKKRE		47.98	4.25	1.44	50.68	6.35	1.93
78JMHD		41.30	-2.43	-0.83	42.30	-2.03	-0.62
93UTJU	*	50.20	6.47	2.20	53.20	8.87	2.70
9HR8U6		41.10	-2.63	-0.90	43.00	-1.33	-0.40
9X4LEN		46.60	2.87	0.98	47.20	2.87	0.87
D7ZE64		43.45	-0.28	-0.10	45.32	1.00	0.30
DNHCB2		44.50	0.77	0.26	44.90	0.57	0.17
FWA76D		40.25	-3.49	-1.19	41.89	-2.44	-0.74
GL3U42		43.49	-0.25	-0.08	46.50	2.18	0.66
H9R8KN		44.53	0.79	0.27	43.32	-1.00	-0.31
HZZUKN		45.56	1.83	0.62	44.27	-0.06	-0.02
J7FJBV		42.00	-1.73	-0.59	44.27	-0.06	-0.02
KER33T		44.53	0.79	0.27	44.82	0.49	0.15
KFND33		38.10	-5.63	-1.92	39.30	-5.03	-1.53
LXZJR4		39.12	-4.61	-1.57	39.78	-4.55	-1.38
M7A999		46.34	2.60	0.89	46.73	2.41	0.73
NVJAR3		42.31	-1.43	-0.49	42.29	-2.03	-0.62
QBBLEW		45.44	1.71	0.58	44.78	0.45	0.14
QNGWN4		43.42	-0.31	-0.11	44.27	-0.06	-0.02
T2DVN7		39.52	-4.21	-1.43	38.67	-5.66	-1.72
TPN7ZE		44.15	0.42	0.14	42.72	-1.61	-0.49
VHVFHV		46.50	2.77	0.94	46.80	2.47	0.75
VQQHGL		44.31	0.57	0.20	44.16	-0.16	-0.05
WNEZ3M		43.74	0.01	0.00	43.79	-0.54	-0.16
XVXLPY		47.70	3.97	1.35	47.90	3.57	1.09
Z2TWKZ		40.90	-2.83	-0.96	41.30	-3.03	-0.92

Summary Statistics	Sample SA01	Sample SA02
Grand Means	43.73 psi	44.33 psi
Stnd Dev Btwn Labs	2.94 psi	3.29 psi

Statistics based on 28 of 28 reporting participants.

Grand Mean Sample SA01 = 43.735 psi

Grand Mean Sample SA02 = 44.327 psi



Paper & Paperboard Interlaboratory Testing Program

Analysis 310
Bursting Strength - Packaging Papers
TAPPI Official Test Method T403

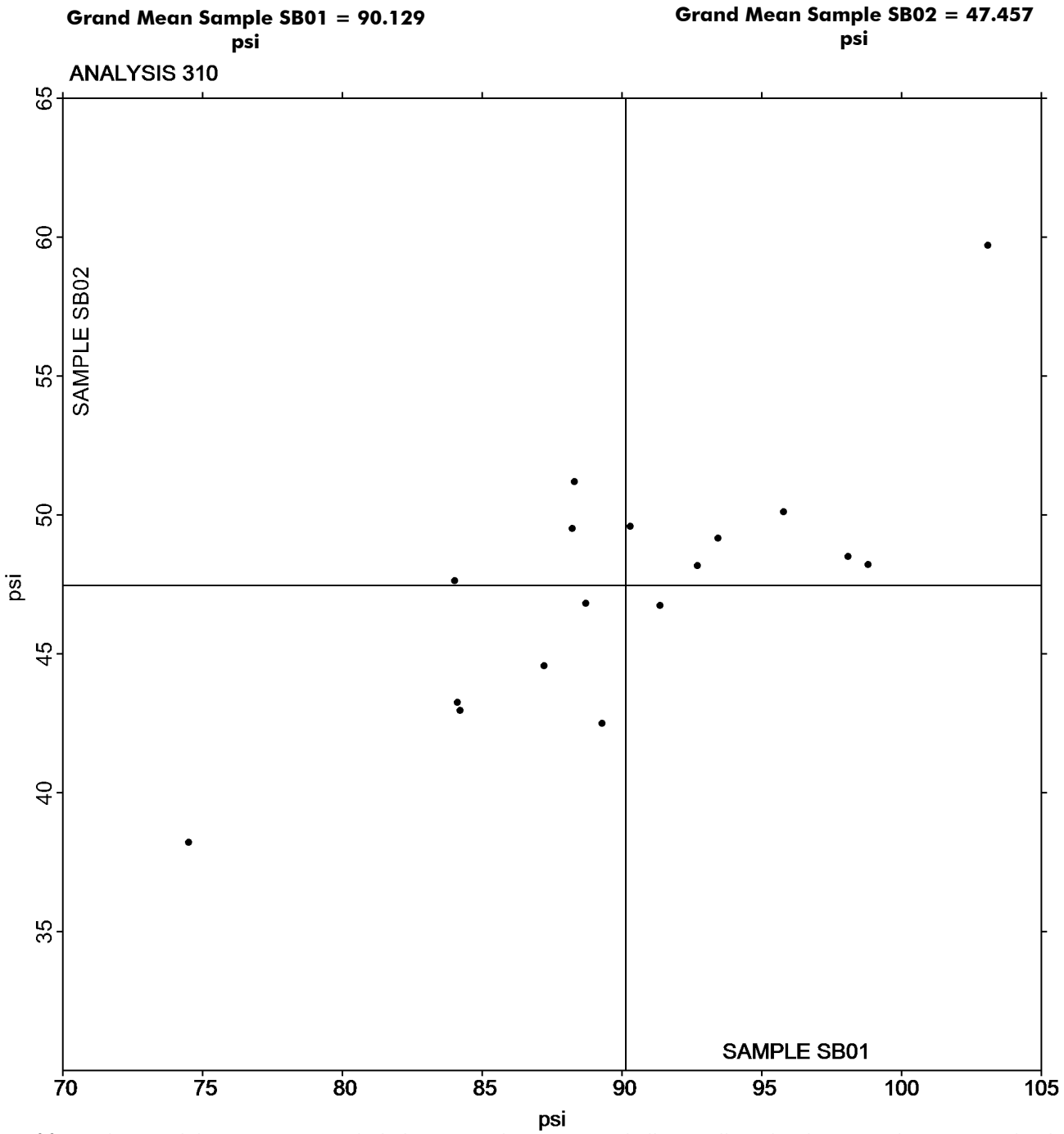
WebCode	Data Flag	Sample SB01 Lab Mean	Sample SB01 Diff from Grand Mean	Sample SB01 CPV	Sample SB02 Lab Mean	Sample SB02 Diff from Grand Mean	Sample SB02 CPV
2PCY4G		93.43	3.30	0.49	49.15	1.70	0.37
2Q7NMD		89.30	-0.83	-0.12	42.50	-4.96	-1.07
3B877D		84.21	-5.92	-0.88	42.96	-4.50	-0.97
3CKTNR		84.11	-6.02	-0.89	43.25	-4.21	-0.91
76EZ69		98.80	8.67	1.28	48.20	0.74	0.16
7UQ9EA		87.23	-2.90	-0.43	44.57	-2.89	-0.62
9CMBB6		95.79	5.66	0.84	50.10	2.64	0.57
A44K3H		88.71	-1.42	-0.21	46.81	-0.65	-0.14
ADELNJ		91.37	1.24	0.18	46.74	-0.72	-0.16
GL3U42		88.22	-1.91	-0.28	49.50	2.04	0.44
HFB3CY		92.71	2.58	0.38	48.17	0.71	0.15
HQAXCE		98.10	7.97	1.18	48.50	1.04	0.23
KFND33		90.30	0.17	0.03	49.59	2.13	0.46
NPYABP		103.10	12.97	1.92	59.70	12.24	2.65
QNGWN4		84.02	-6.11	-0.90	47.63	0.17	0.04
RWN4BC		74.50	-15.63	-2.32	38.20	-9.26	-2.00
V29UYQ		88.30	-1.83	-0.27	51.20	3.74	0.81

Summary Statistics	Sample SB01	Sample SB02
Grand Means	90.13 psi	47.46 psi
Stnd Dev Btwn Labs	6.75 psi	4.62 psi

Statistics based on 17 of 17 reporting participants.

Analysis Notes:

9CMBB6 - Data appear to be reported as kPa, not psi as indicated on data entry form. CTS will not correct the Units going forward.



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 312

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SC01 Lab Mean	Sample SC01 Diff from Grand Mean	Sample SC01 CPV	Sample SC02 Lab Mean	Sample SC02 Diff from Grand Mean	Sample SC02 CPV
28YNM7		61.94	-0.68	-0.13	62.82	-2.16	-0.38
2PCY4G		60.66	-1.96	-0.37	61.25	-3.73	-0.66
2Q7NMD		58.94	-3.68	-0.70	60.17	-4.81	-0.85
3P8ZKT		63.90	1.28	0.24	65.70	0.72	0.13
3UKKRE		66.24	3.62	0.68	70.06	5.08	0.90
72A2JY		59.60	-3.02	-0.57	60.40	-4.58	-0.81
76EZ69		55.04	-7.58	-1.43	58.31	-6.67	-1.18
7UQ9EA		64.33	1.71	0.32	65.44	0.45	0.08
83G7KA		54.02	-8.60	-1.63	56.58	-8.40	-1.48
97XTWT		59.82	-2.80	-0.53	62.98	-2.00	-0.35
9X4LEN		61.40	-1.22	-0.23	62.70	-2.28	-0.40
ADELNJ		63.75	1.13	0.21	67.34	2.36	0.42
ADTNGP		53.48	-9.14	-1.73	55.60	-9.38	-1.66
BMVVKB		74.53	11.91	2.25	77.85	12.86	2.27
BUHFUJ	*	61.61	-1.01	-0.19	59.99	-5.00	-0.88
CJQLU7		66.93	4.31	0.82	68.41	3.43	0.61
D7ZE64		63.69	1.07	0.20	66.64	1.66	0.29
DNHCB2		58.40	-4.22	-0.80	62.70	-2.28	-0.40
FE62EF		61.80	-0.82	-0.16	64.00	-0.98	-0.17
FWA76D		55.31	-7.32	-1.38	56.83	-8.16	-1.44
GKAYNK	X	39.96	-22.66	-4.29	37.50	-27.48	-4.86
GL3U42		62.50	-0.12	-0.02	65.18	0.20	0.03
GPGPN6		63.06	0.44	0.08	67.84	2.86	0.50
H9R8KN		65.52	2.90	0.55	68.88	3.90	0.69
HQAXCE		67.40	4.78	0.90	70.60	5.62	0.99
J7FJBV		62.88	0.26	0.05	67.16	2.18	0.38
KER33T		65.87	3.25	0.62	68.31	3.33	0.59
LRCATK		55.61	-7.01	-1.33	57.75	-7.23	-1.28
LXZJR4	*	76.78	14.16	2.68	80.58	15.60	2.76
M7A999		56.74	-5.88	-1.11	59.08	-5.90	-1.04
MY8U8K		65.00	2.38	0.45	66.08	1.10	0.19
QNGWN4		58.22	-4.41	-0.83	60.63	-4.35	-0.77
QTUHUP		63.52	0.90	0.17	65.74	0.76	0.13
RQJXN2		62.52	-0.11	-0.02	65.13	0.15	0.03
T2DVN7		63.99	1.36	0.26	65.37	0.38	0.07
UGHJCQ		61.69	-0.93	-0.18	62.26	-2.72	-0.48
V2PBUJ	*	76.32	13.70	2.59	80.12	15.14	2.67
VFANAY		62.00	-0.62	-0.12	62.70	-2.28	-0.40
VHVFHV		62.80	0.18	0.03	65.00	0.02	0.00
VQQHGL		65.99	3.36	0.64	68.37	3.39	0.60

Paper & Paperboard Interlaboratory Testing Program

Analysis 312

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SC01 Lab Mean	Sample SC01 Diff from Grand Mean	Sample SC01 CPV	Sample SC02 Lab Mean	Sample SC02 Diff from Grand Mean	Sample SC02 CPV
XVXLPY		65.93	3.31	0.63	68.13	3.15	0.56
XZNVYX	*	54.56	-8.06	-1.53	59.69	-5.29	-0.94
ZY4T6U		65.85	3.23	0.61	68.94	3.96	0.70

Summary Statistics	Sample SC01	Sample SC02
Grand Means	62.62 Grams	64.98 Grams
Stnd Dev Btwn Labs	5.29 Grams	5.66 Grams

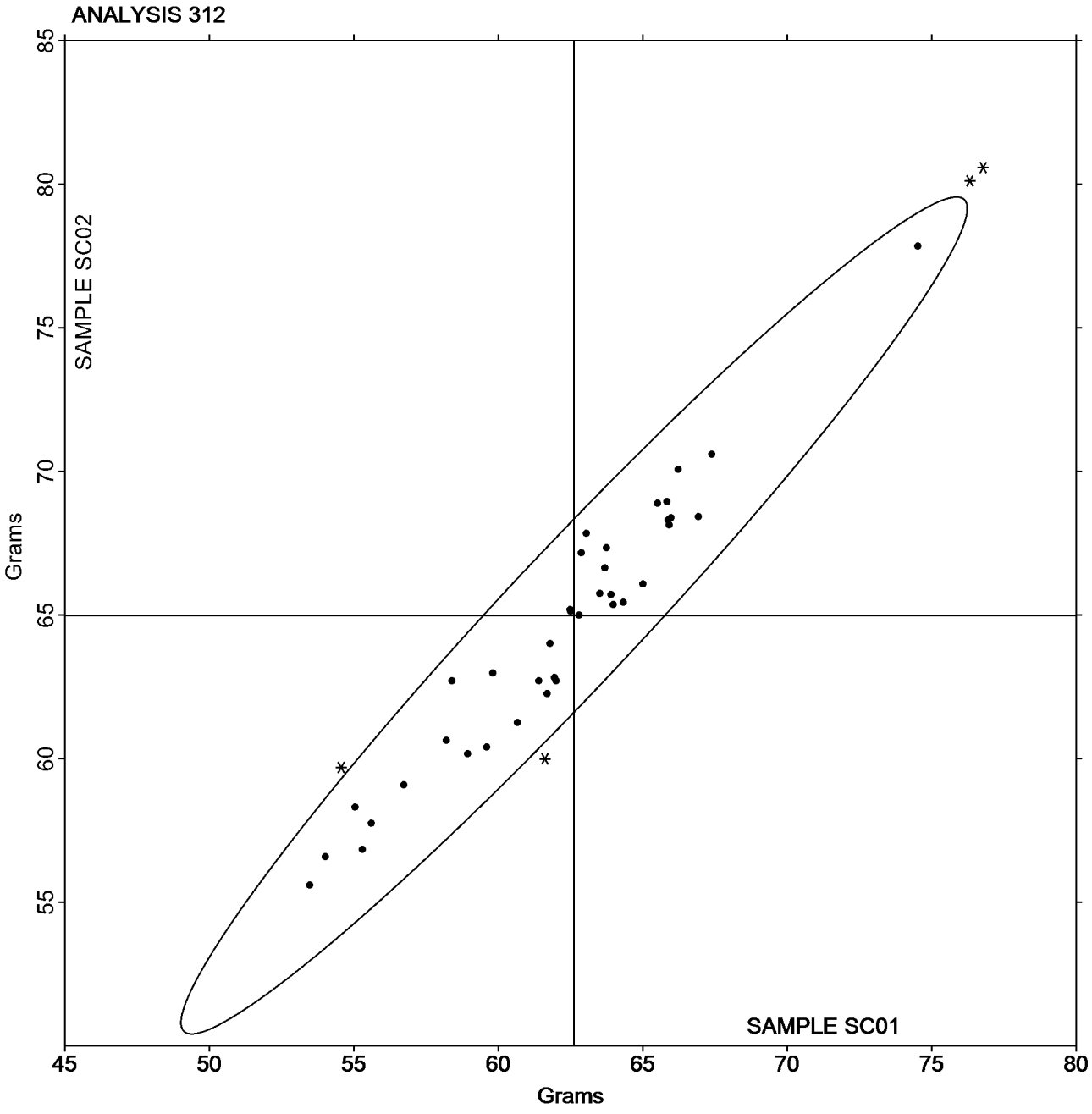
Statistics based on 42 of 43 reporting participants.

Comments on Assigned Data Flags for Test #312

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

Grand Mean Sample SC01 = 62.622 Grams

Grand Mean Sample SC02 = 64.984 Grams



Paper & Paperboard Interlaboratory Testing Program

Analysis 314

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample SD01 Lab Mean	Sample SD01 Diff from Grand Mean	Sample SD01 CPV	Sample SD02 Lab Mean	Sample SD02 Diff from Grand Mean	Sample SD02 CPV
28U2YJ		152.2	-13.9	-0.81	109.5	-11.9	-1.00
2J74KG		188.4	22.3	1.30	134.2	12.7	1.07
3B877D		151.2	-14.9	-0.87	113.4	-8.0	-0.67
3CKTNR		162.5	-3.6	-0.21	118.8	-2.6	-0.22
3LCFQ3		151.5	-14.6	-0.85	110.0	-11.5	-0.96
4GCGJP		186.7	20.6	1.20	133.7	12.3	1.03
642BZB	*	117.3	-48.8	-2.85	86.5	-34.9	-2.93
78JMHD		147.5	-18.6	-1.09	111.7	-9.7	-0.82
93UTJU	X	194.7	28.6	1.67	157.0	35.5	2.98
9CMBB6		158.0	-8.1	-0.47	112.8	-8.6	-0.72
9NB6AW		184.2	18.0	1.05	133.2	11.7	0.98
9X4LEN		153.0	-13.1	-0.76	115.4	-6.0	-0.51
A44K3H		177.4	11.2	0.66	133.8	12.4	1.04
ADELNJ		174.7	8.6	0.50	126.8	5.4	0.45
B8HJWN		162.7	-3.4	-0.20	113.7	-7.8	-0.65
BFFL9T		174.5	8.4	0.49	126.9	5.4	0.45
CEZCJ8		135.0	-31.1	-1.82	96.8	-24.6	-2.06
GJUXGC		147.8	-18.3	-1.07	105.9	-15.5	-1.30
GL3U42		167.3	1.2	0.07	122.5	1.0	0.09
HFB3CY		168.7	2.6	0.15	123.0	1.6	0.13
HQAXCE		166.0	-0.1	-0.01	123.6	2.2	0.18
HZZUKN		150.1	-16.0	-0.93	114.4	-7.0	-0.59
KFND33		175.6	9.5	0.55	135.6	14.2	1.19
N2AENC		192.3	26.2	1.53	132.5	11.0	0.93
N6AQKC		183.6	17.5	1.02	128.8	7.3	0.61
PZRRLN		190.6	24.4	1.43	143.0	21.6	1.81
QBBLEW		182.8	16.7	0.97	132.4	11.0	0.92
RWN4BC		187.8	21.7	1.26	131.4	10.0	0.84
T8G8RB		167.0	0.9	0.05	123.6	2.2	0.18
TPN7ZE		169.7	3.5	0.21	125.6	4.2	0.35
U9PDEJ		163.1	-3.0	-0.18	119.7	-1.8	-0.15
VD2CTX		180.9	14.8	0.86	131.9	10.5	0.88
VTGCM3		179.2	13.1	0.76	132.4	11.0	0.92
WNEZ3M		148.2	-17.9	-1.04	111.5	-9.9	-0.83
Y2XRQZ		159.8	-6.3	-0.37	117.8	-3.6	-0.30
YZ6486		156.8	-9.4	-0.55	117.5	-3.9	-0.33
Z8X7WG	X	150.3	-15.8	-0.92	142.6	21.2	1.78

Summary Statistics	Sample SD01	Sample SD02
Grand Means	166.11 Grams	121.44 Grams
Stnd Dev Btwn Labs	17.15 Grams	11.93 Grams

Statistics based on 35 of 37 reporting participants.

Comments on Assigned Data Flags for Test #314

93UTJU (X) - Data for sample SD02 are high.

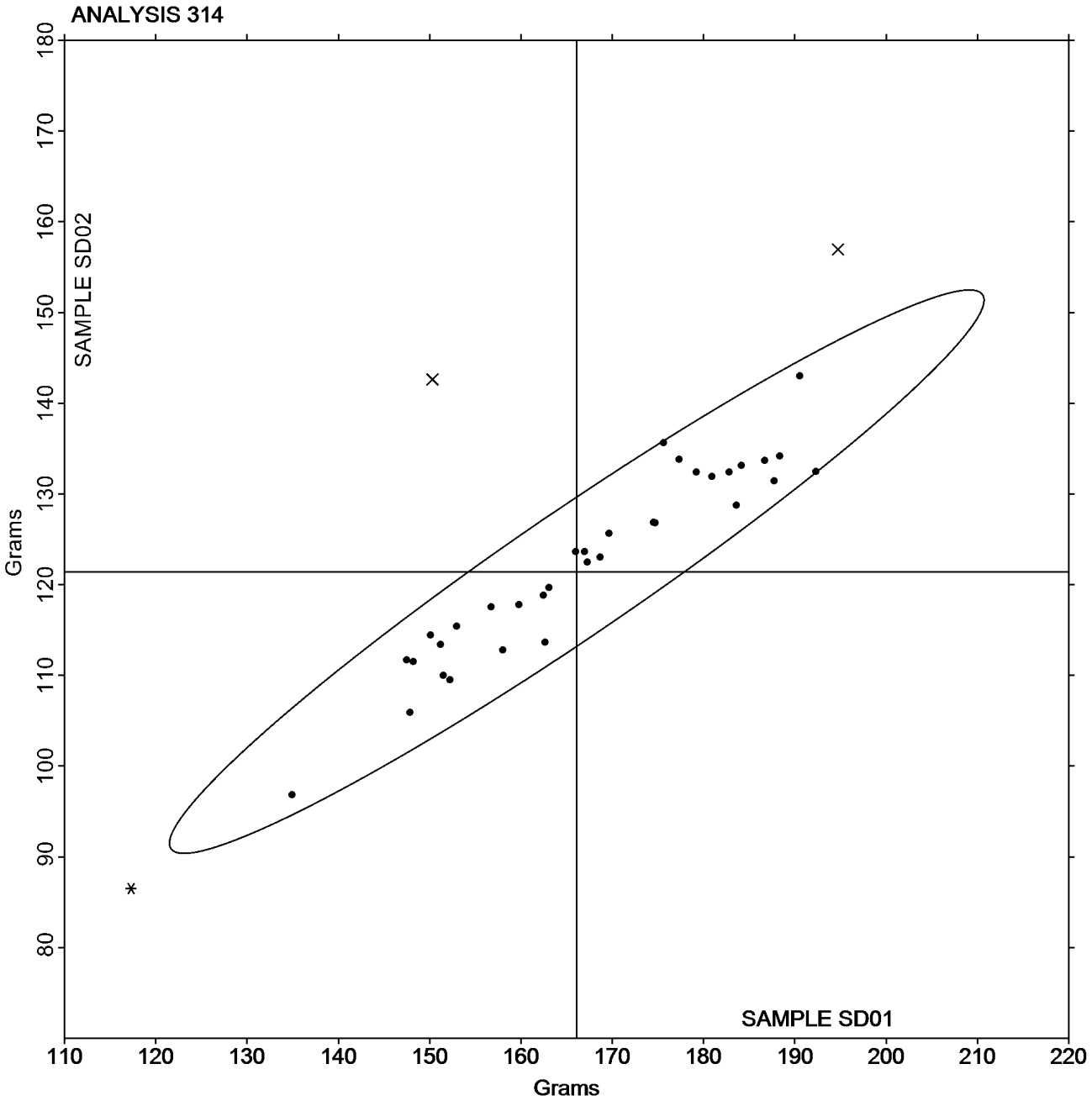
Z8X7WG (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SD02.

Analysis Notes:

9CMBB6 - Data appear to be reported as gf, not mN as indicated on data entry form. CTS will not correct the Units going forward.

Grand Mean Sample SD01 = 166.11 Grams

Grand Mean Sample SD02 = 121.44 Grams



Paper & Paperboard Interlaboratory Testing Program

Analysis 325

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF01 Lab Mean	Sample SF01 Diff from Grand Mean	Sample SF01 CPV	Sample SF02 Lab Mean	Sample SF02 Diff from Grand Mean	Sample SF02 CPV	Instr Code
28YNM7		6.730	-0.237	-0.53	6.798	-0.224	-0.49	TB
2PCY4G		6.650	-0.318	-0.71	6.650	-0.372	-0.81	LH
3P8ZKT		6.540	-0.428	-0.96	6.623	-0.399	-0.87	TO
3PPTFB		6.364	-0.604	-1.36	6.230	-0.792	-1.73	RE
3UKKRE		6.887	-0.080	-0.18	7.020	-0.002	-0.01	TV
4DC7NP		7.224	0.256	0.58	6.914	-0.108	-0.24	LC
4GCGJP		6.209	-0.759	-1.70	6.033	-0.989	-2.16	LI
62FWPZ		6.095	-0.873	-1.96	6.179	-0.843	-1.85	ID
72A2JY		7.067	0.100	0.22	7.165	0.143	0.31	TC
76EZ69		7.172	0.205	0.46	7.265	0.243	0.53	TF
83G7KA		6.660	-0.308	-0.69	6.668	-0.354	-0.77	TB
97XTWT		6.511	-0.457	-1.03	6.733	-0.289	-0.63	TF
ADTNGP		7.326	0.358	0.80	7.208	0.186	0.41	TO
BMVVKB		6.916	-0.052	-0.12	7.045	0.023	0.05	LA
BUHFUJ		6.747	-0.221	-0.50	7.057	0.035	0.08	FP
CJQLU7		6.079	-0.889	-2.00	6.436	-0.586	-1.28	TO
DNHCB2		7.135	0.167	0.38	6.788	-0.234	-0.51	TJ
FE62EF		6.837	-0.131	-0.29	7.161	0.139	0.30	LB
FWA76D	*	8.226	1.259	2.83	8.128	1.106	2.42	LB
GKAYNK		7.203	0.235	0.53	7.391	0.369	0.81	TP
GL3U42		6.836	-0.131	-0.29	6.652	-0.370	-0.81	LH
GPGPN6		7.473	0.505	1.13	7.588	0.566	1.24	XX
H9R8KN		6.628	-0.340	-0.76	7.006	-0.016	-0.04	LH
J7FJBV		6.726	-0.242	-0.54	6.877	-0.145	-0.32	LX
KER33T		6.993	0.025	0.06	7.074	0.052	0.11	LI
LRCATK		7.594	0.626	1.41	7.658	0.636	1.39	LI
LXZJR4		7.909	0.941	2.11	7.986	0.964	2.11	VM
M7A999		7.033	0.065	0.15	7.462	0.440	0.96	TJ
PM9872		7.466	0.499	1.12	7.579	0.557	1.22	TV
QJ28KU		7.171	0.204	0.46	7.185	0.163	0.36	XX
QNGWN4		6.978	0.010	0.02	7.009	-0.013	-0.03	LH
QNXV4M		6.960	-0.008	-0.02	6.924	-0.098	-0.21	TV
RQJXN2		7.064	0.096	0.22	7.206	0.184	0.40	LB
T2DVN7		7.254	0.286	0.64	7.425	0.403	0.88	LX
UGHJCQ		6.979	0.011	0.03	6.800	-0.222	-0.49	TO
UN6BKJ		6.968	0.000	0.00	7.097	0.075	0.16	FP
UT3T36		6.599	-0.369	-0.83	6.558	-0.464	-1.01	ID
V2PBUJ		7.754	0.787	1.77	7.851	0.829	1.81	LH
VFANAY		6.799	-0.169	-0.38	6.651	-0.371	-0.81	LE
VHVFHV		7.467	0.499	1.12	7.518	0.496	1.09	TO

Paper & Paperboard Interlaboratory Testing Program

Analysis 325

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF01 Lab Mean	Sample SF01 Diff from Grand Mean	Sample SF01 CPV	Sample SF02 Lab Mean	Sample SF02 Diff from Grand Mean	Sample SF02 CPV	Instr Code
VQQHGL		7.004	0.036	0.08	7.202	0.180	0.39	LF
XVXLPY		6.608	-0.359	-0.81	6.699	-0.323	-0.71	LH
XZNVYX	*	7.219	0.251	0.56	6.716	-0.306	-0.67	VM
Z2TWKZ		6.837	-0.131	-0.29	7.250	0.228	0.50	IN
Z8X7WG		7.254	0.286	0.64	7.177	0.155	0.34	TO
ZY4T6U		6.361	-0.607	-1.36	6.370	-0.652	-1.43	IM

Summary Statistics	Sample SF01	Sample SF02
Grand Means	6.97 kN/m	7.02 kN/m
Stnd Dev Btwn Labs	0.45 kN/m	0.46 kN/m

Statistics based on 46 of 46 reporting participants.

Analysis Notes:

LXZJR4 - Data appear to be reported as lb/inch, not kN/m as indicated on data entry form. CTS will not correct the Units going forward.

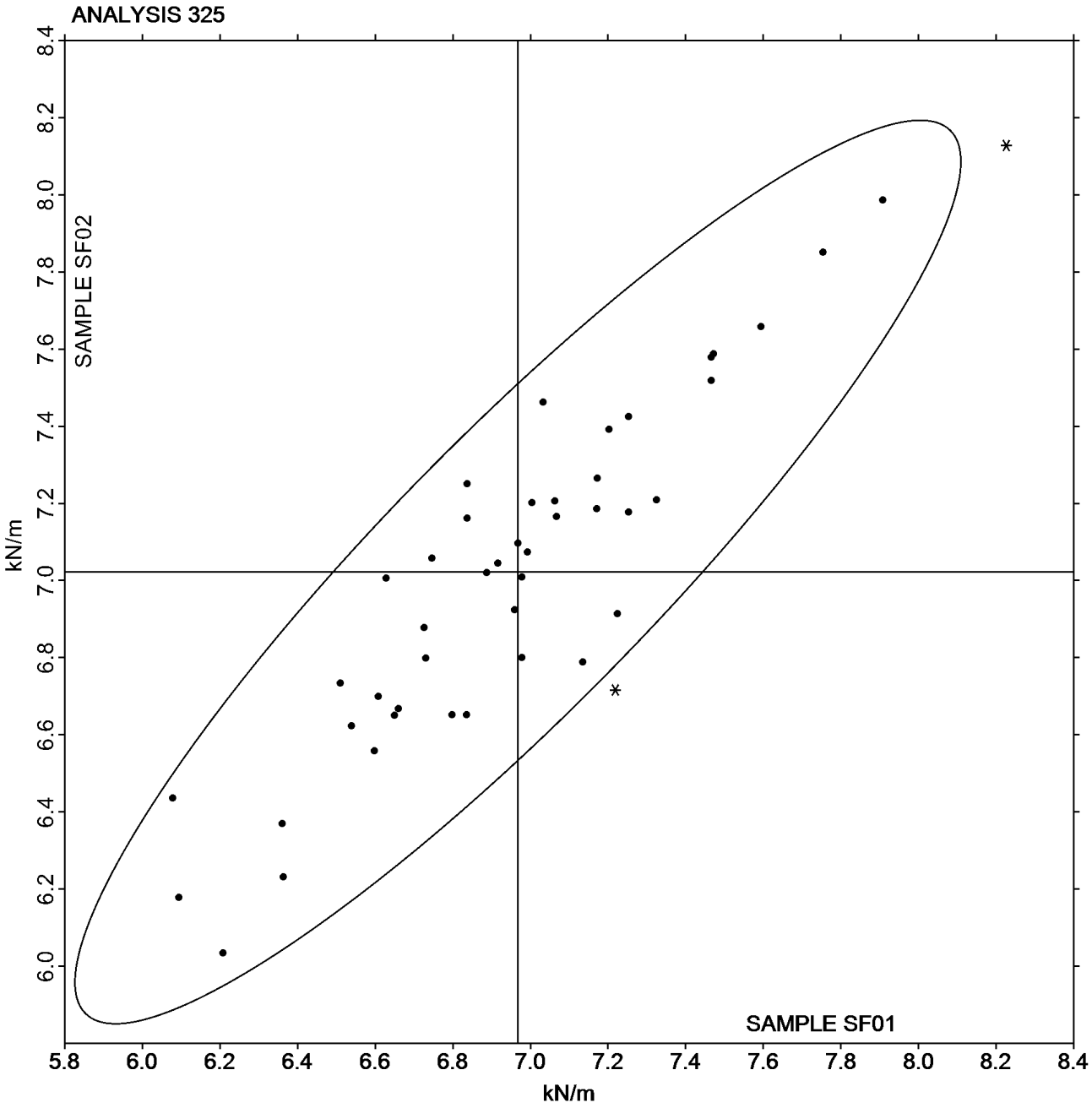
PM9872 - Data appear to be reported as lb/inch, not kN/m as indicated on data entry form. CTS will not correct the Units going forward.

Key to Instrument Codes Reported by Participants

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IM	Instron 5500 Series	IN	Instron 3340 series
LA	L & W Tensile - Autoline 300	LB	L & W Tensile - Autoline 400
LC	L & W Tensile - Autoline 600	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
TP	TMI Monitor/Tensile 100 (84-21-01)	TV	Thwing-Albert Vantage NX
VM	Valmet PaperLab (was Kajaani/Robotest)	XX	Instrument make/model not specified by lab

Grand Mean Sample SF01 = 6.9676 kN/m

Grand Mean Sample SF02 = 7.0220 kN/m



Paper & Paperboard Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF01 Lab Mean	Sample SF01 Diff from Grand Mean	Sample SF01 CPV	Sample SF02 Lab Mean	Sample SF02 Diff from Grand Mean	Sample SF02 CPV	Instr Code
28YNM7		102.10	5.87	0.42	107.88	8.29	0.60	TB
2PCY4G		94.22	-2.01	-0.15	96.82	-2.77	-0.20	LH
3P8ZKT		87.69	-8.54	-0.62	94.67	-4.92	-0.35	TO
3PPTFB		92.77	-3.46	-0.25	93.57	-6.01	-0.43	RE
3UKKRE		115.85	19.61	1.42	120.36	20.78	1.50	TV
4DC7NP		109.75	13.52	0.98	104.04	4.45	0.32	LC
4GCGJP		90.88	-5.36	-0.39	91.62	-7.96	-0.57	LI
62FWPZ		97.72	1.49	0.11	101.43	1.85	0.13	ID
76EZ69		88.48	-7.75	-0.56	94.99	-4.60	-0.33	TF
BMVVKB		95.61	-0.62	-0.04	101.03	1.44	0.10	LA
BUHFUJ		118.83	22.60	1.63	129.43	29.84	2.15	FP
CJQLU7		86.54	-9.69	-0.70	96.17	-3.41	-0.25	TO
DNHCB2		121.07	24.84	1.79	130.63	31.04	2.24	TX
FE62EF		93.10	-3.13	-0.23	106.68	7.09	0.51	LB
FWA76D		65.72	-30.52	-2.20	64.81	-34.77	-2.51	LB
GL3U42		91.53	-4.71	-0.34	91.27	-8.32	-0.60	LH
GPGPN6		96.22	-0.01	0.00	99.14	-0.45	-0.03	XX
H9R8KN		91.83	-4.40	-0.32	102.61	3.02	0.22	LH
J7FJBV		87.91	-8.32	-0.60	97.06	-2.52	-0.18	LX
KER33T		98.51	2.28	0.16	101.43	1.84	0.13	LI
LRCATK		69.34	-26.90	-1.94	75.30	-24.28	-1.75	LX
LXZJR4		114.40	18.17	1.31	114.26	14.67	1.06	VM
PM9872		94.06	-2.17	-0.16	95.59	-3.99	-0.29	TV
QNGWN4		89.27	-6.96	-0.50	91.29	-8.30	-0.60	LH
QNXV4M		115.81	19.58	1.41	111.31	11.73	0.85	TV
RQJXN2		61.64	-34.59	-2.50	68.01	-31.58	-2.28	LB
T2DVN7		98.32	2.08	0.15	102.80	3.22	0.23	LX
UGHJCQ		109.60	13.37	0.97	107.56	7.97	0.58	TO
UN6BKJ		109.14	12.91	0.93	114.39	14.80	1.07	FP
UT3T36		98.66	2.43	0.18	101.73	2.15	0.15	ID
V2PBUJ		82.08	-14.16	-1.02	85.58	-14.01	-1.01	LH
VHVFHV		82.63	-13.60	-0.98	83.93	-15.66	-1.13	XX
VQQHGL		104.12	7.89	0.57	110.63	11.04	0.80	LF
XVXLPY		88.70	-7.53	-0.54	90.26	-9.32	-0.67	LH
Z2TWKZ	*	110.20	13.97	1.01	97.74	-1.85	-0.13	IN
Z8X7WG		105.35	9.12	0.66	104.20	4.62	0.33	TO
ZY4T6U		100.94	4.71	0.34	104.43	4.84	0.35	IM

Paper & Paperboard Interlaboratory Testing Program

Analysis 327

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

Summary Statistics	Sample SF01	Sample SF02
Grand Means	96.23 Joules/sq m	99.59 Joules/sq m
Stnd Dev Btwn Labs	13.85 Joules/sq m	13.86 Joules/sq m

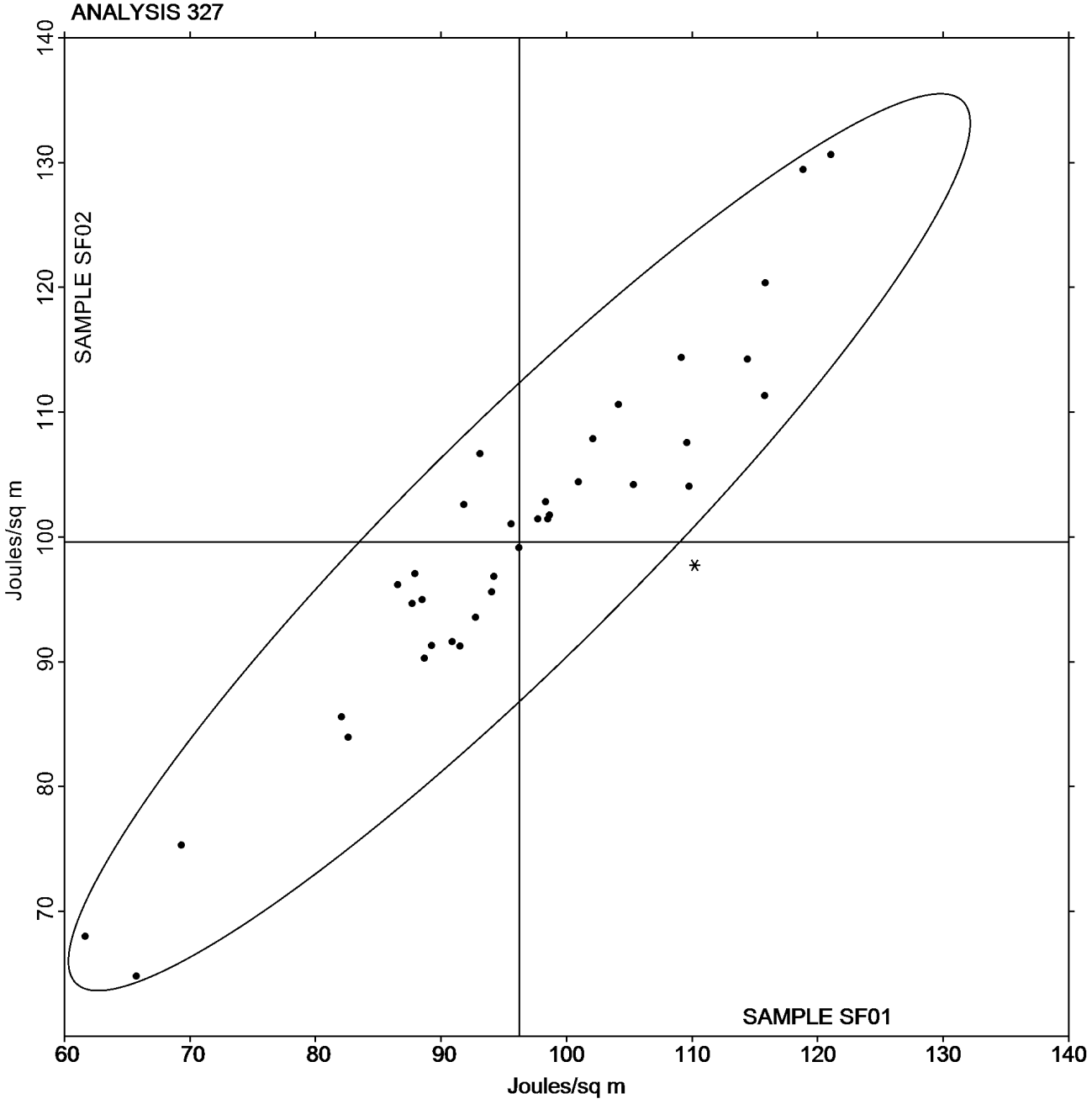
Statistics based on 37 of 37 reporting participants.

Key to Instrument Codes Reported by Participants

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IM	Instron 5500 Series	IN	Instron 3340 series
LA	L & W Tensile - Autoline 300	LB	L & W Tensile - Autoline 400
LC	L & W Tensile - Autoline 600	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 SF01 = 96.232 Joules/sq m

Grand Mean Sample SF02 = 99.585 Joules/sq m



WebCode	Data Flag	Sample SF01 Lab Mean	Sample SF01 Diff from Grand Mean	Sample SF01 CPV	Sample SF02 Lab Mean	Sample SF02 Diff from Grand Mean	Sample SF02 CPV	Instr Code
28YNM7		2.376	0.184	0.58	2.478	0.234	0.74	TB
2PCY4G		2.200	0.008	0.03	2.280	0.036	0.11	LH
3P8ZKT		2.040	-0.152	-0.47	2.178	-0.066	-0.21	TO
3PPTFB		2.333	0.141	0.44	2.353	0.109	0.34	RE
3UKKRE		2.787	0.595	1.86	2.847	0.603	1.90	TV
4DC7NP		2.329	0.137	0.43	2.293	0.049	0.15	LC
4GCGJP		2.292	0.100	0.31	2.381	0.137	0.43	LI
62FWPZ		2.542	0.350	1.10	2.591	0.346	1.09	ID
76EZ69		2.058	-0.134	-0.42	2.138	-0.106	-0.33	TF
83G7KA	*	2.354	0.162	0.51	2.146	-0.098	-0.31	TF
97XTWT		2.079	-0.113	-0.35	2.131	-0.113	-0.36	TF
BMVVKB		1.923	-0.269	-0.84	1.995	-0.249	-0.79	LA
BUHFUJ		2.829	0.637	1.99	2.937	0.693	2.18	FP
CJQLU7		2.566	0.374	1.17	2.631	0.387	1.22	TO
DNHCB2	*	2.200	0.008	0.03	2.030	-0.214	-0.68	TJ
FE62EF		1.875	-0.317	-0.99	2.066	-0.178	-0.56	LB
FWA76D		1.760	-0.432	-1.35	1.751	-0.493	-1.56	LB
GL3U42		2.012	-0.180	-0.56	2.008	-0.236	-0.74	LH
GPGPN6		2.056	-0.136	-0.42	2.058	-0.186	-0.59	XX
H9R8KN		2.100	-0.092	-0.29	2.218	-0.026	-0.08	LH
J7FJBV		1.945	-0.247	-0.77	2.160	-0.084	-0.27	LX
KER33T		1.969	-0.223	-0.70	2.012	-0.232	-0.73	LI
LRCATK		1.483	-0.709	-2.22	1.576	-0.668	-2.11	LI
LXZJR4		1.876	-0.316	-0.99	1.936	-0.308	-0.97	VM
PM9872		1.981	-0.211	-0.66	1.985	-0.259	-0.82	TV
QNGWN4		1.969	-0.223	-0.70	1.996	-0.248	-0.78	LH
QNXV4M		2.743	0.552	1.73	2.661	0.416	1.31	TV
RQJXN2		1.667	-0.525	-1.64	1.796	-0.448	-1.41	LB
T2DVN7		2.070	-0.122	-0.38	2.103	-0.141	-0.45	LX
UGHJCQ		2.489	0.297	0.93	2.583	0.339	1.07	TO
UN6BKJ		2.412	0.220	0.69	2.550	0.306	0.96	FP
UT3T36		2.270	0.078	0.25	2.357	0.113	0.36	ID
V2PBUJ		1.647	-0.545	-1.70	1.692	-0.552	-1.74	LH
VHVFHV		2.694	0.502	1.57	2.685	0.441	1.39	TO
VQQHGL		2.268	0.076	0.24	2.324	0.080	0.25	LF
XVXLPY		2.049	-0.143	-0.45	2.058	-0.186	-0.59	LH
XZNVYX	X	1.820	-0.372	-1.16	1.570	-0.674	-2.13	VM
Z2TWKZ		2.313	0.121	0.38	2.469	0.225	0.71	IN
Z8X7WG		2.472	0.280	0.88	2.522	0.278	0.88	TO
ZY4T6U		2.448	0.256	0.80	2.549	0.305	0.96	IM

Paper & Paperboard Interlaboratory Testing Program

Analysis 328

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

Summary Statistics	Sample SF01	Sample SF02
Grand Means	2.19 Percent	2.24 Percent
Stnd Dev Btwn Labs	0.32 Percent	0.32 Percent

Statistics based on 39 of 40 reporting participants.

Comments on Assigned Data Flags for Test #328

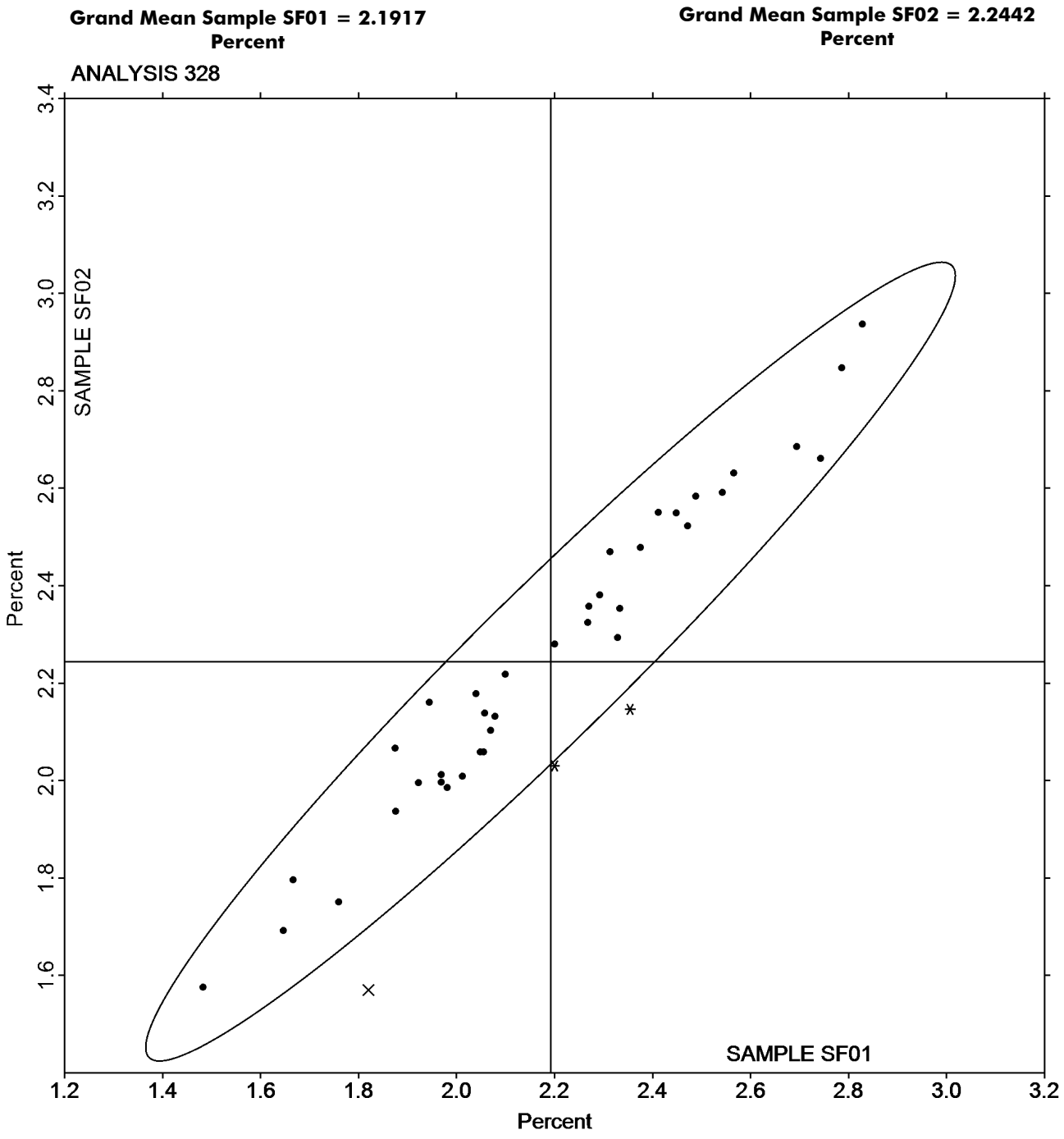
XZNVYX (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SF02.

Analysis Notes:

83G7KA - Data appears to be transposed between Analysis 327 (T.E.A.) and Analysis 328 (% Elongation). CTS will not correct going forward.

Key to Instrument Codes Reported by Participants

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IM	Instron 5500 Series	IN	Instron 3340 Series
LA	L & W Tensile - Autoline 300	LB	L & W Tensile - Autoline 400
LC	L & W Tensile - Autoline 600	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
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		



Paper & Paperboard Interlaboratory Testing Program

Analysis 330

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE01 Lab Mean	Sample SE01 Diff from Grand Mean	Sample SE01 CPV	Sample SE02 Lab Mean	Sample SE02 Diff from Grand Mean	Sample SE02 CPV	Instr Code
227FTH		13.04	0.25	0.29	11.06	0.09	0.13	MA
28U2YJ	X	10.33	-2.46	-2.83	6.48	-4.49	-6.26	IM
3B877D		12.25	-0.54	-0.62	10.68	-0.29	-0.40	TX
3CKTNR		12.37	-0.43	-0.49	10.66	-0.31	-0.43	IM
3LCFQ3		13.16	0.37	0.42	11.36	0.39	0.55	LE
4DC7NP		12.68	-0.12	-0.13	10.96	-0.01	-0.02	LC
4GCGJP		11.17	-1.62	-1.86	9.86	-1.11	-1.54	LW
76EZ69		13.56	0.77	0.89	11.17	0.20	0.28	TO
78JMHD		12.61	-0.19	-0.21	10.84	-0.13	-0.19	LE
7UQ9EA		12.37	-0.42	-0.49	10.56	-0.41	-0.57	XX
9NB6AW		12.62	-0.17	-0.20	10.68	-0.29	-0.40	TR
9X4LEN		12.38	-0.41	-0.47	10.75	-0.22	-0.31	TB
ADELNJ		12.27	-0.52	-0.60	10.64	-0.33	-0.46	LE
BPZMB4	X	13.10	0.31	0.35	10.37	-0.60	-0.84	TH
CV7EJ2		12.06	-0.73	-0.84	10.51	-0.46	-0.64	TT
EE8BP2		14.58	1.79	2.06	12.61	1.64	2.29	LI
FMGRPQ		12.46	-0.33	-0.38	10.74	-0.23	-0.33	IR
GL3U42		12.73	-0.06	-0.07	11.15	0.18	0.25	LH
HQAXCE		13.28	0.49	0.57	11.52	0.55	0.76	IF
HZZUKN		13.59	0.79	0.91	11.69	0.72	1.00	TO
KFND33		12.48	-0.32	-0.36	11.24	0.27	0.37	TH
MWJRCR		12.54	-0.25	-0.29	10.28	-0.69	-0.96	TH
MY8U8K		11.91	-0.89	-1.02	10.21	-0.76	-1.06	XX
N4E8HB		13.58	0.79	0.91	11.41	0.44	0.62	LE
NPYABP		13.46	0.67	0.77	11.71	0.74	1.03	IK
PZRRLN		12.68	-0.12	-0.13	10.85	-0.12	-0.17	ID
QBBLEW		14.66	1.87	2.15	12.42	1.45	2.02	LA
QPU7YP		14.15	1.36	1.56	11.87	0.90	1.26	LA
RWN4BC		10.87	-1.92	-2.21	9.22	-1.75	-2.44	LE
T8G8RB		12.09	-0.70	-0.80	10.28	-0.69	-0.97	LE
TPN7ZE		12.36	-0.43	-0.49	10.64	-0.33	-0.46	IF
TW6CNR		13.29	0.50	0.57	11.41	0.44	0.61	TB
U9PDEJ		12.80	0.00	0.00	10.82	-0.15	-0.21	IF
V89GMJ	X	16.00	3.20	3.68	14.77	3.80	5.30	LA
VD2CTX		11.53	-1.26	-1.45	10.16	-0.80	-1.12	LH
VJ8K4D		11.92	-0.87	-1.00	10.04	-0.93	-1.30	IM
VKMAGK		14.31	1.52	1.74	12.40	1.43	2.00	TH
VTGCM3		13.32	0.53	0.61	11.73	0.76	1.06	LX
W9JH9H	*	14.27	1.48	1.70	11.72	0.75	1.05	DM
WNEZ3M		12.78	-0.02	-0.02	10.72	-0.25	-0.34	LA

Paper & Paperboard Interlaboratory Testing Program

Analysis 330

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE01 Lab Mean	Sample SE01 Diff from Grand Mean	Sample SE01 CPV	Sample SE02 Lab Mean	Sample SE02 Diff from Grand Mean	Sample SE02 CPV	Instr Code
YN6ZUH		12.28	-0.51	-0.59	10.56	-0.41	-0.58	TB
YZ6486		12.44	-0.35	-0.40	10.70	-0.27	-0.38	LE

Summary Statistics	Sample SE01	Sample SE02
Grand Means	12.79 kN/m	10.97 kN/m
Stnd Dev Btwn Labs	0.87 kN/m	0.72 kN/m

Statistics based on 39 of 42 reporting participants.

Comments on Assigned Data Flags for Test #330

BPZMB4 (X) - Inconsistent in testing between samples.

V89GMJ (X) - Data for both samples are high. Possible Systematic Error.

28U2YJ (X) - Extreme Data.

Analysis Notes:

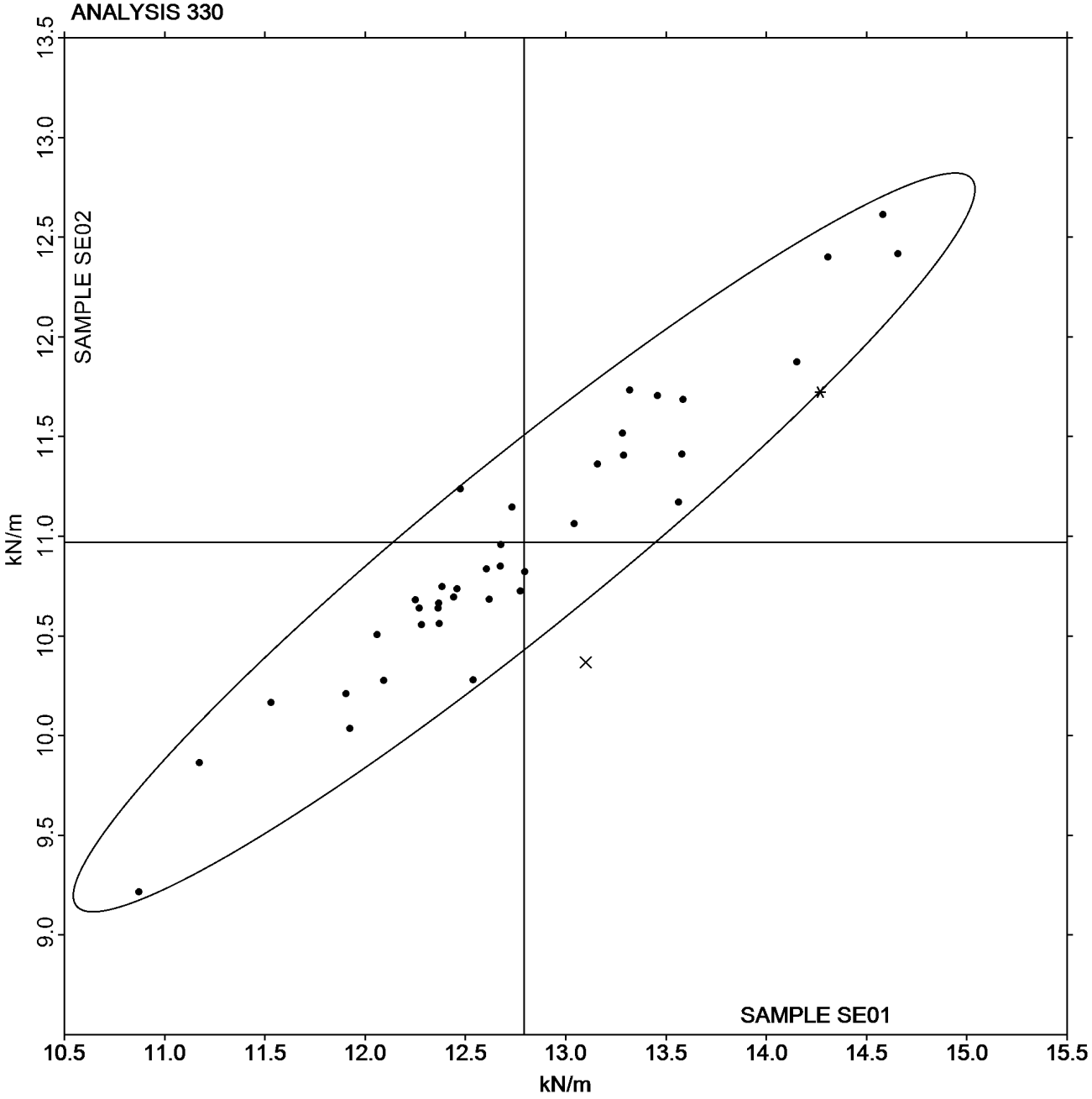
TW6CNR - Data appears to be transposed between samples. CTS will not correct going forward.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	ID	Instron 4200 Series
IF	Instron 3340 Series	IK	Instron 4400 Series
IM	Instron 5500 Series	IR	Instron 5900 Series
LA	L & W Autoline	LC	L & W Tensile - Autoline 600
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)	MA	Mark-10 ESM301L
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
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 SE01 = 12.792 kN/m

Grand Mean Sample SE02 = 10.969 kN/m



Paper & Paperboard Interlaboratory Testing Program

Analysis 331

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE01 Lab Mean	Sample SE01 Diff from Grand Mean	Sample SE01 CPV	Sample SE02 Lab Mean	Sample SE02 Diff from Grand Mean	Sample SE02 CPV	Instr Code
28U2YJ	X	146.2	-81.1	-3.81	49.6	-137.7	-7.86	IM
3B877D		253.0	25.7	1.21	214.2	26.9	1.54	TX
3CKTNR		239.7	12.5	0.59	203.9	16.6	0.95	IM
3LCFQ3		216.7	-10.6	-0.50	178.3	-9.0	-0.51	LE
4DC7NP		230.7	3.4	0.16	201.3	14.0	0.80	LC
4GCGJP		202.2	-25.1	-1.18	171.6	-15.7	-0.90	LW
76EZ69		219.2	-8.1	-0.38	163.6	-23.7	-1.35	TO
78JMHD		212.8	-14.5	-0.68	179.7	-7.7	-0.44	LE
7UQ9EA	X	2.3	-225.0	-10.58	1.9	-185.4	-10.58	XX
9NB6AW		212.2	-15.1	-0.71	176.6	-10.7	-0.61	TR
ADELNJ		216.2	-11.1	-0.52	179.6	-7.7	-0.44	LE
BPZMB4		236.9	9.6	0.45	175.1	-12.2	-0.70	TH
CV7EJ2		203.1	-24.2	-1.14	174.1	-13.2	-0.75	TT
FMGRPQ		222.5	-4.8	-0.22	183.8	-3.6	-0.20	IR
GL3U42		219.1	-8.2	-0.39	188.6	1.2	0.07	LH
HQAXCE		219.0	-8.3	-0.39	188.1	0.8	0.04	IN
HZZUKN		234.0	6.7	0.31	195.1	7.8	0.44	TO
KFND33		242.9	15.6	0.73	201.9	14.6	0.83	TH
MWJRCR	*	194.7	-32.6	-1.53	138.9	-48.4	-2.76	TH
MY8U8K		231.2	4.0	0.19	187.8	0.4	0.02	XX
N4E8HB		253.7	26.4	1.24	199.5	12.2	0.70	LE
NPYABP		187.6	-39.7	-1.87	172.6	-14.7	-0.84	IF
QBBLEW		240.3	13.0	0.61	197.8	10.5	0.60	LA
QPU7YP		235.9	8.6	0.41	192.0	4.7	0.27	LA
T8G8RB		208.4	-18.9	-0.89	168.1	-19.3	-1.10	LE
TPN7ZE		227.7	0.4	0.02	184.4	-2.9	-0.17	IF
TW6CNR		249.7	22.4	1.05	203.0	15.7	0.90	TB
V89GMJ		205.2	-22.1	-1.04	185.0	-2.3	-0.13	LA
VD2CTX		201.7	-25.6	-1.20	169.7	-17.6	-1.00	LH
VJ8K4D		224.2	-3.1	-0.14	175.8	-11.5	-0.66	IM
VTGCM3		241.8	14.6	0.68	210.3	23.0	1.31	LX
W9JH9H	*	279.8	52.5	2.47	213.4	26.1	1.49	DM
WNEZ3M		245.9	18.6	0.88	198.5	11.2	0.64	LA
YN6ZUH		273.6	46.3	2.18	227.5	40.2	2.30	TB
YZ6486		218.8	-8.5	-0.40	181.7	-5.6	-0.32	LE

Paper & Paperboard Interlaboratory Testing Program

Analysis 331
Tensile Energy Absorption - Packaging Papers
TAPPI Official Test Method T494

Summary Statistics	Sample SE01	Sample SE02
Grand Means	227.28 Joules/sq m	187.31 Joules/sq m
Stnd Dev Btwn Labs	21.26 Joules/sq m	17.52 Joules/sq m

Statistics based on 33 of 35 reporting participants.

Comments on Assigned Data Flags for Test #331

7UQ9EA (X) - Extreme Data.

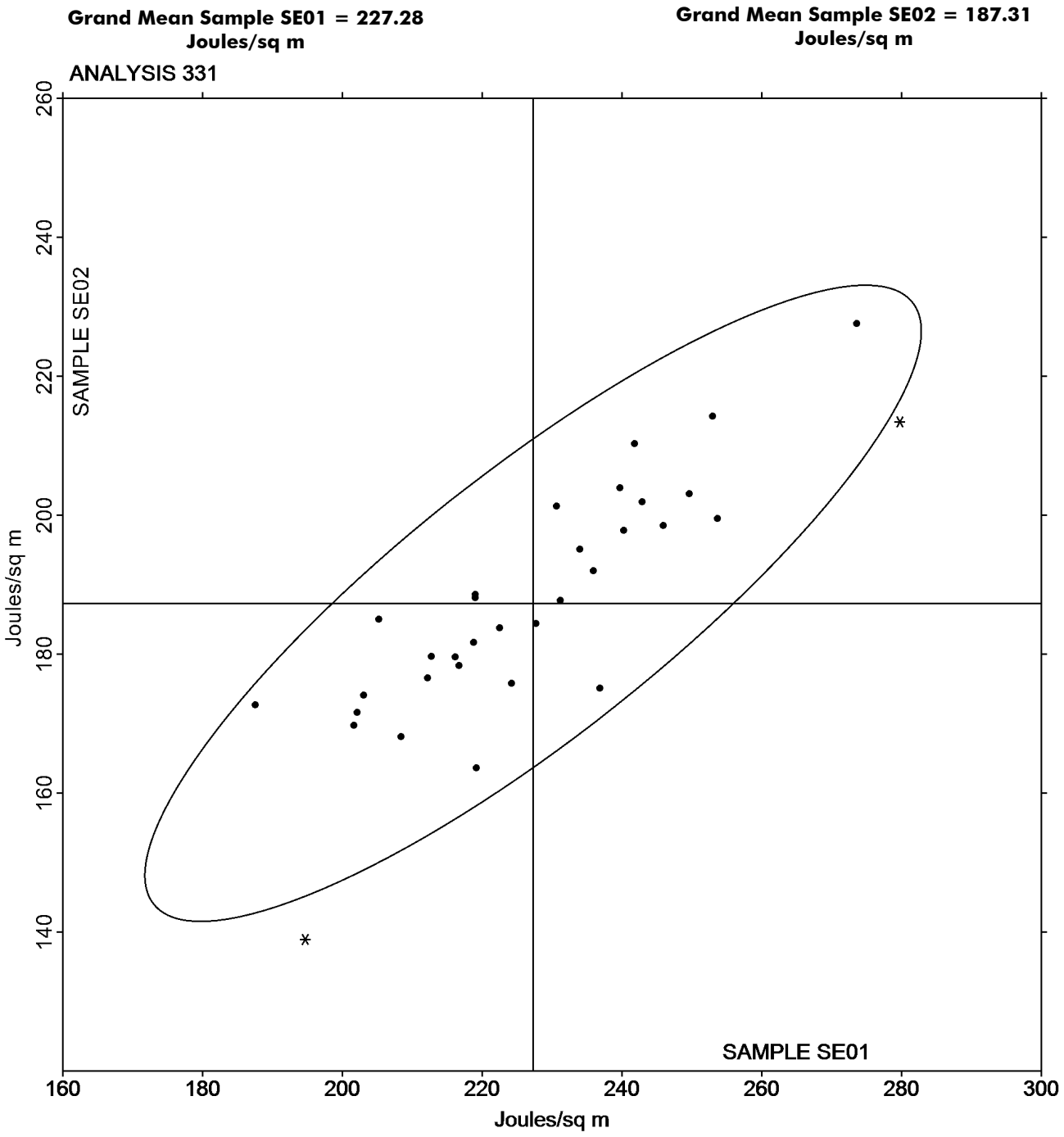
28U2YJ (X) - Extreme Data.

Analysis Notes:

TW6CNR - Data appears to be transposed between samples. CTS will not correct going forward.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	IF	Instron 3340 Series
IM	Instron 5500 Series	IN	Instron 3360 Series
IR	Instron 5900 Series	LA	L & W Autoline
LC	L & W Tensile - Autoline 600	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	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



Paper & Paperboard Interlaboratory Testing Program

Analysis 332

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE01 Lab Mean	Sample SE01 Diff from Grand Mean	Sample SE01 CPV	Sample SE02 Lab Mean	Sample SE02 Diff from Grand Mean	Sample SE02 CPV	Instr Code
28U2YJ	X	2.263	-0.443	-1.78	1.301	-1.308	-5.17	IM
3B877D		3.055	0.349	1.41	2.945	0.336	1.33	TX
3CKTNR		2.914	0.208	0.84	2.851	0.243	0.96	IM
3LCFQ3		2.453	-0.253	-1.02	2.315	-0.294	-1.16	LE
4DC7NP		2.596	-0.110	-0.44	2.633	0.024	0.10	LC
4GCGJP		2.685	-0.021	-0.08	2.567	-0.042	-0.16	LW
76EZ69		2.488	-0.218	-0.88	2.300	-0.309	-1.22	TO
78JMHD		2.499	-0.207	-0.83	2.430	-0.179	-0.71	LE
7UQ9EA		2.707	0.001	0.00	2.613	0.004	0.02	XX
9NB6AW		2.562	-0.144	-0.58	2.489	-0.120	-0.47	TR
9X4LEN		2.706	0.000	0.00	2.670	0.061	0.24	TB
ADELNJ		2.600	-0.106	-0.43	2.467	-0.142	-0.56	LE
BPZMB4		2.743	0.037	0.15	2.604	-0.005	-0.02	TH
CV7EJ2		2.644	-0.062	-0.25	2.572	-0.037	-0.14	TT
FMGRPQ		2.631	-0.075	-0.30	2.503	-0.106	-0.42	IR
GL3U42		2.587	-0.119	-0.48	2.512	-0.097	-0.38	LH
HQAXCE		2.512	-0.194	-0.78	2.461	-0.148	-0.58	IN
HZZUKN		2.685	-0.021	-0.08	2.604	-0.005	-0.02	TO
KFND33		2.924	0.218	0.88	2.953	0.344	1.36	TH
MWJRCR	*	2.400	-0.306	-1.23	2.090	-0.519	-2.05	TH
MY8U8K		2.925	0.219	0.88	2.760	0.151	0.60	XX
N4E8HB		2.748	0.042	0.17	2.559	-0.050	-0.20	LE
NPYABP		2.505	-0.201	-0.81	2.626	0.017	0.07	XX
PZRRLN		2.700	-0.006	-0.02	2.559	-0.050	-0.20	ID
QBBLEW		2.249	-0.457	-1.84	2.191	-0.418	-1.65	LA
QPU7YP		2.417	-0.289	-1.16	2.341	-0.268	-1.06	LA
T8G8RB		2.532	-0.174	-0.70	2.395	-0.214	-0.84	LE
TPN7ZE		2.729	0.023	0.09	2.559	-0.050	-0.20	IF
TW6CNR		2.634	-0.072	-0.29	2.791	0.182	0.72	TB
V89GMJ	*	3.116	0.410	1.65	3.202	0.593	2.35	LA
VD2CTX		2.560	-0.146	-0.59	2.430	-0.179	-0.71	LH
VJ8K4D		3.056	0.350	1.41	2.851	0.242	0.96	IM
VTGCM3		2.643	-0.063	-0.25	2.598	-0.011	-0.04	LX
W9JH9H		2.974	0.268	1.08	2.739	0.130	0.52	DM
WNEZ3M	*	3.314	0.608	2.45	3.028	0.419	1.66	LA
YN6ZUH		3.337	0.631	2.54	3.221	0.612	2.42	TB
YZ6486		2.584	-0.122	-0.49	2.481	-0.128	-0.50	LE

Summary Statistics	Sample SE01	Sample SE02
Grand Means	2.71 Percent	2.61 Percent
Stnd Dev Btwn Labs	0.25 Percent	0.25 Percent

Statistics based on 36 of 37 reporting participants.

Comments on Assigned Data Flags for Test #332

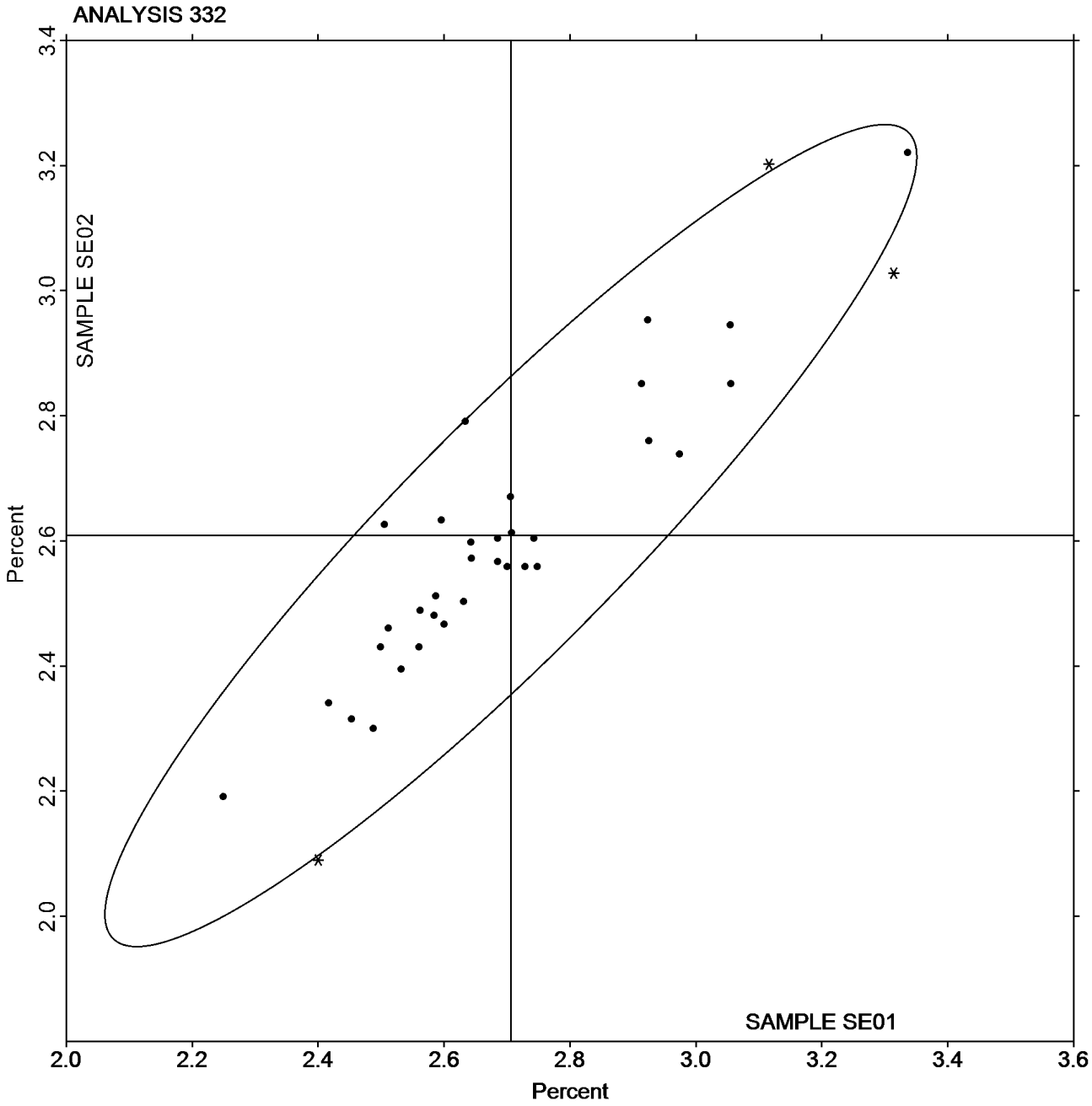
28U2YJ (X) - Data for sample SE02 are low. Inconsistent within the determinations of sample SE01.

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	IR	Instron 5900 Series
LA	L & W Autoline 300	LC	L & W Tensile - Autoline 600
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
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 SE01 = 2.7059 Percent

Grand Mean Sample SE02 = 2.6086 Percent



Paper & Paperboard Interlaboratory Testing Program

Analysis 334

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

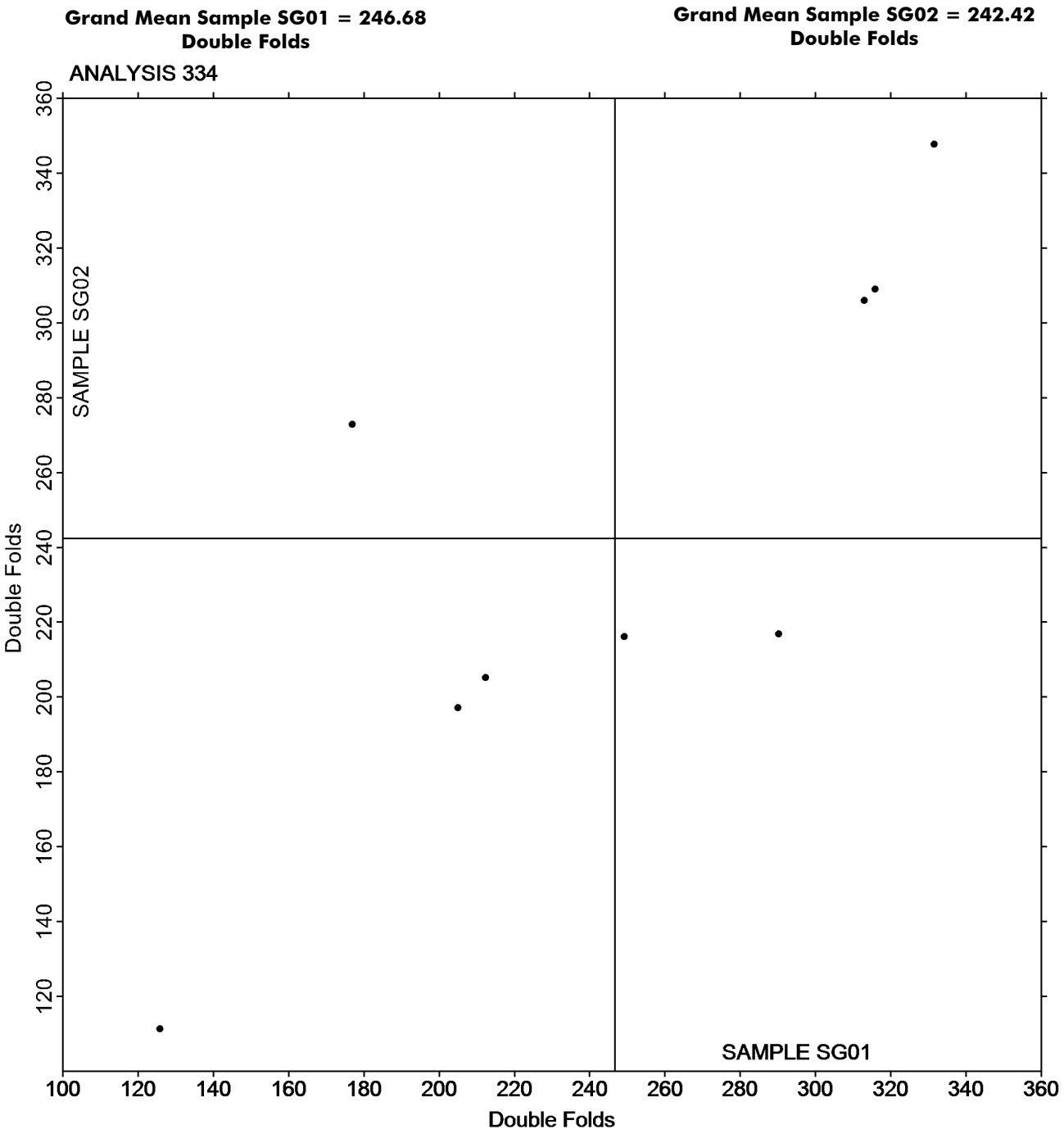
WebCode	Data Flag	Sample SG01 Lab Mean	Sample SG01 Diff from Grand Mean	Sample SG01 CPV	Sample SG02 Lab Mean	Sample SG02 Diff from Grand Mean	Sample SG02 CPV	Instr Code
3CKTNR		249.2	2.5	0.04	216.1	-26.3	-0.36	MT
4GCGJP		290.3	43.6	0.61	216.8	-25.6	-0.35	MT
97XTWT		177.0	-69.7	-0.98	272.8	30.4	0.42	MT
9X4LEN		212.3	-34.4	-0.48	205.1	-37.3	-0.51	MT
BPZMB4		315.9	69.2	0.97	309.0	66.6	0.91	MT
UT3T36		313.0	66.3	0.93	305.9	63.5	0.87	MT
VFANAY		331.5	84.8	1.19	347.7	105.3	1.45	MT
XZNVYX		125.9	-120.8	-1.69	111.3	-131.1	-1.80	MT
Z2TWKZ		205.0	-41.7	-0.58	197.1	-45.3	-0.62	MT

Summary Statistics	Sample SG01	Sample SG02
Grand Means	246.68 Double Folds	242.42 Double Folds
Stnd Dev Btwn Labs	71.29 Double Folds	72.85 Double Folds

Statistics based on 9 of 9 reporting participants.

Key to Instrument Codes Reported by Participants

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.

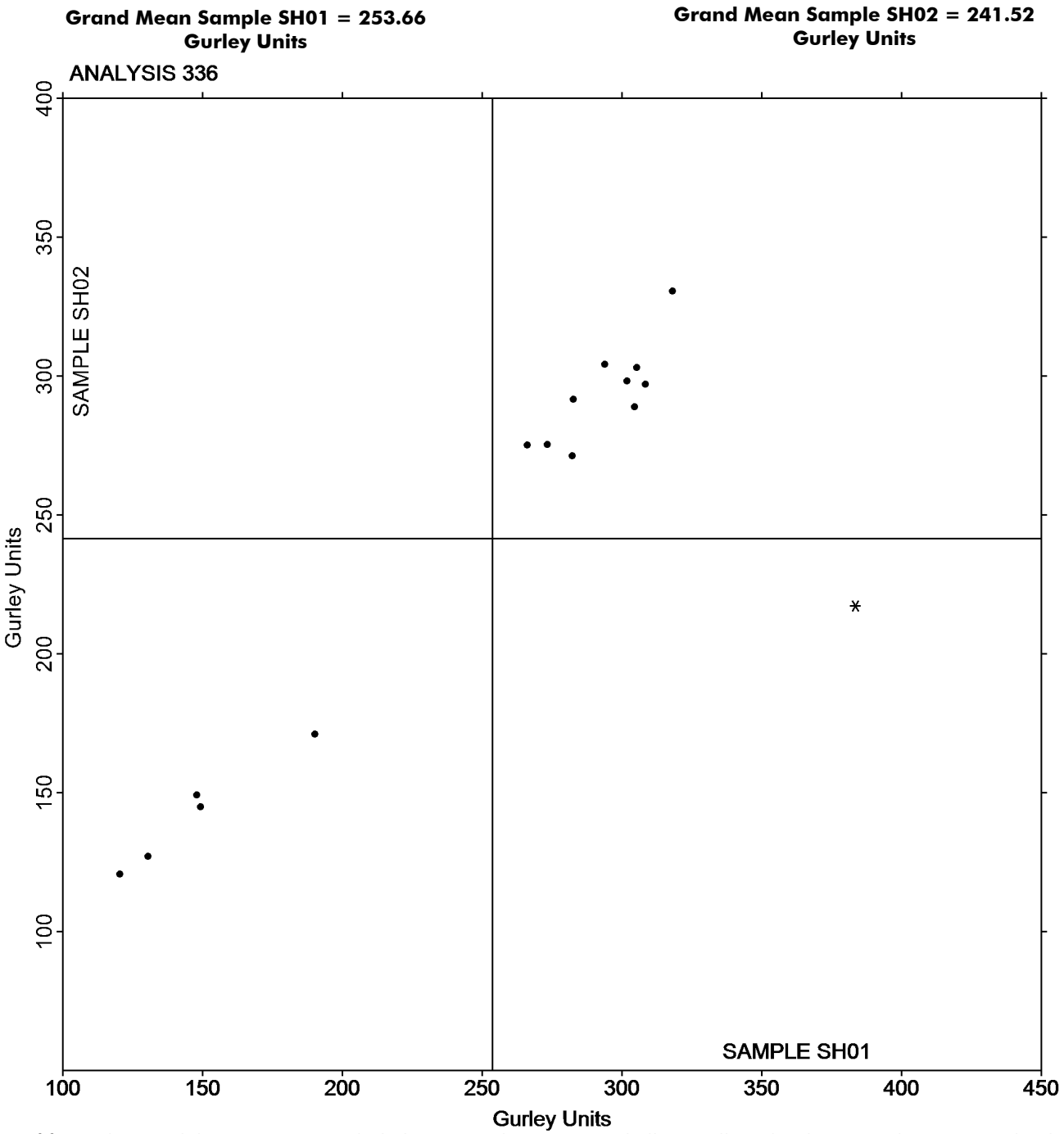
Paper & Paperboard Interlaboratory Testing Program

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

WebCode	Data Flag	Sample SH01 Lab Mean	Sample SH01 Diff from Grand Mean	Sample SH01 CPV	Sample SH02 Lab Mean	Sample SH02 Diff from Grand Mean	Sample SH02 CPV
28YNM7		282.7	29.0	0.37	291.6	50.1	0.68
3CKTNR		301.8	48.1	0.61	298.1	56.6	0.77
3UKKRE		282.3	28.6	0.36	271.1	29.6	0.40
72A2JY		305.4	51.7	0.65	303.0	61.5	0.84
93UTJU		318.1	64.4	0.81	330.6	89.1	1.21
9X4LEN		130.5	-123.2	-1.55	127.0	-114.5	-1.56
ADTNGP		120.5	-133.1	-1.68	120.5	-121.0	-1.65
FWA76D		190.2	-63.5	-0.80	171.0	-70.5	-0.96
H9R8KN		308.5	54.8	0.69	296.9	55.4	0.75
M7A999		149.3	-104.4	-1.32	144.8	-96.8	-1.32
MY8U8K		304.5	50.8	0.64	288.9	47.4	0.64
UT3T36		266.3	12.6	0.16	275.1	33.6	0.46
V2PBUJ		147.9	-105.8	-1.33	149.1	-92.4	-1.26
VHVFHV		273.3	19.6	0.25	275.2	33.7	0.46
XZNVYX	*	383.5	129.8	1.64	217.2	-24.3	-0.33
Z2TWKZ		293.9	40.3	0.51	304.1	62.6	0.85

Summary Statistics	Sample SH01	Sample SH02
Grand Means	253.66 Gurley Units	241.52 Gurley Units
Stnd Dev Btwn Labs	79.34 Gurley Units	73.49 Gurley Units

Statistics based on 16 of 16 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 SJ01 Lab Mean	Sample SJ01 Diff from Grand Mean	Sample SJ01 CPV	Sample SJ02 Lab Mean	Sample SJ02 Diff from Grand Mean	Sample SJ02 CPV
28YNM7		2.146	-0.108	-0.74	2.069	-0.157	-1.53
3CKTNR	X	23.040	20.786	141.68	22.960	20.735	202.45
3LCFQ3		2.090	-0.164	-1.12	2.170	-0.055	-0.54
CJQLU7		2.147	-0.107	-0.73	2.174	-0.051	-0.50
FE62EF		2.350	0.096	0.66	2.261	0.036	0.35
H9R8KN		2.285	0.031	0.21	2.220	-0.005	-0.05
HQAXCE		2.280	0.026	0.18	2.230	0.005	0.05
LXZJR4		2.270	0.016	0.11	2.253	0.028	0.27
M7A999		2.163	-0.091	-0.62	2.144	-0.081	-0.79
QJ28KU		2.603	0.349	2.38	2.455	0.230	2.24
VHVFHV		2.205	-0.049	-0.33	2.277	0.052	0.51

Summary Statistics	Sample SJ01	Sample SJ02
Grand Means	2.25 Taber Units	2.23 Taber Units
Stnd Dev Btwn Labs	0.15 Taber Units	0.10 Taber Units

Statistics based on 10 of 11 reporting participants.

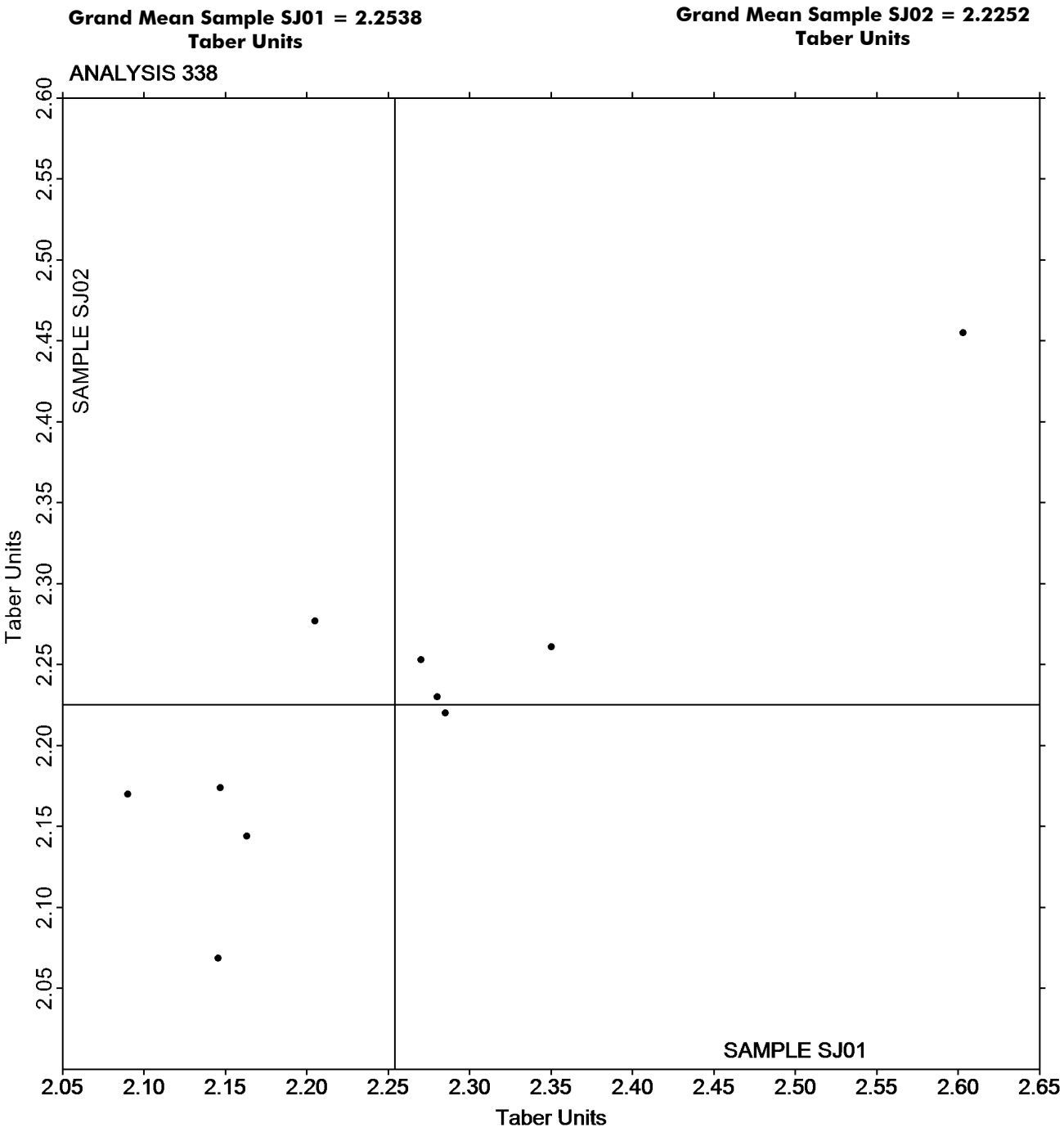
Comments on Assigned Data Flags for Test #338

3CKTNR (X) - Extreme Data.

Analysis Notes:

CJQLU7 - Data appear to be reported as g-cm, not mN-m as indicated on data entry form. CTS will not correct the Units going forward.

LXZJR4 - Data appear to be reported as g-cm, not mN-m as indicated on data entry form. CTS will not correct the Units going forward.



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

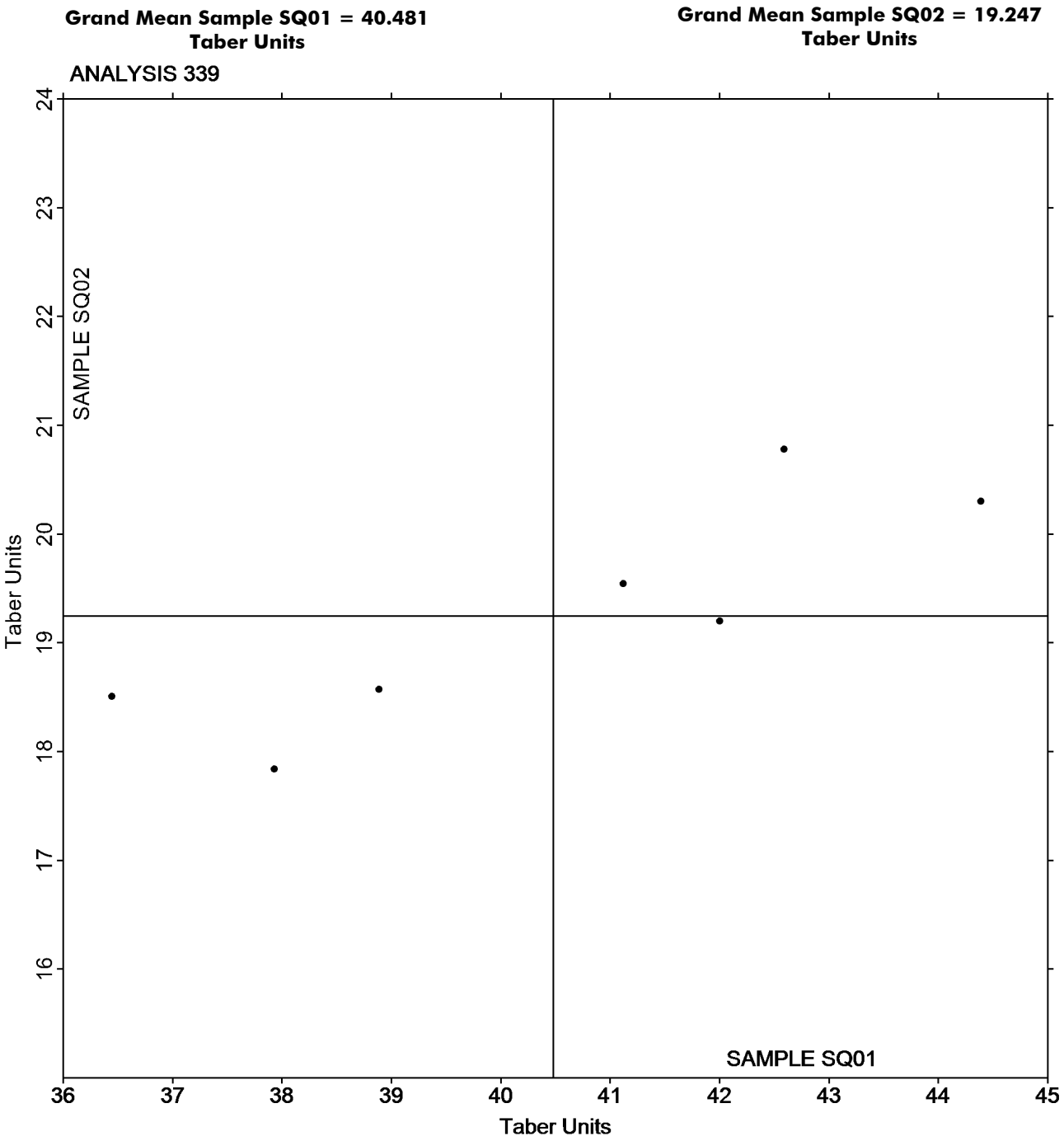
WebCode	Data Flag	Sample SQ01 Lab Mean	Sample SQ01 Diff from Grand Mean	Sample SQ01 CPV	Sample SQ02 Lab Mean	Sample SQ02 Diff from Grand Mean	Sample SQ02 CPV
3P8ZKT		42.00	1.52	0.54	19.20	-0.05	-0.05
4GCGJP		38.89	-1.59	-0.56	18.57	-0.68	-0.65
B8HJWN		44.39	3.91	1.39	20.30	1.05	1.01
BUHFUJ		36.44	-4.04	-1.43	18.51	-0.74	-0.71
C6V669	X	1.34	-39.14	-13.87	0.81	-18.44	-17.67
GKAYNK		42.59	2.11	0.75	20.78	1.53	1.47
TW6CNR		37.93	-2.55	-0.90	17.84	-1.41	-1.35
UT3T36		41.12	0.64	0.23	19.54	0.29	0.28

Summary Statistics	Sample SQ01	Sample SQ02
Grand Means	40.48 Taber Units	19.25 Taber Units
Stnd Dev Btwn Labs	2.82 Taber Units	1.04 Taber Units

Statistics based on 7 of 8 reporting participants.

Comments on Assigned Data Flags for Test #339

C6V669 (X) - Extreme Data.



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

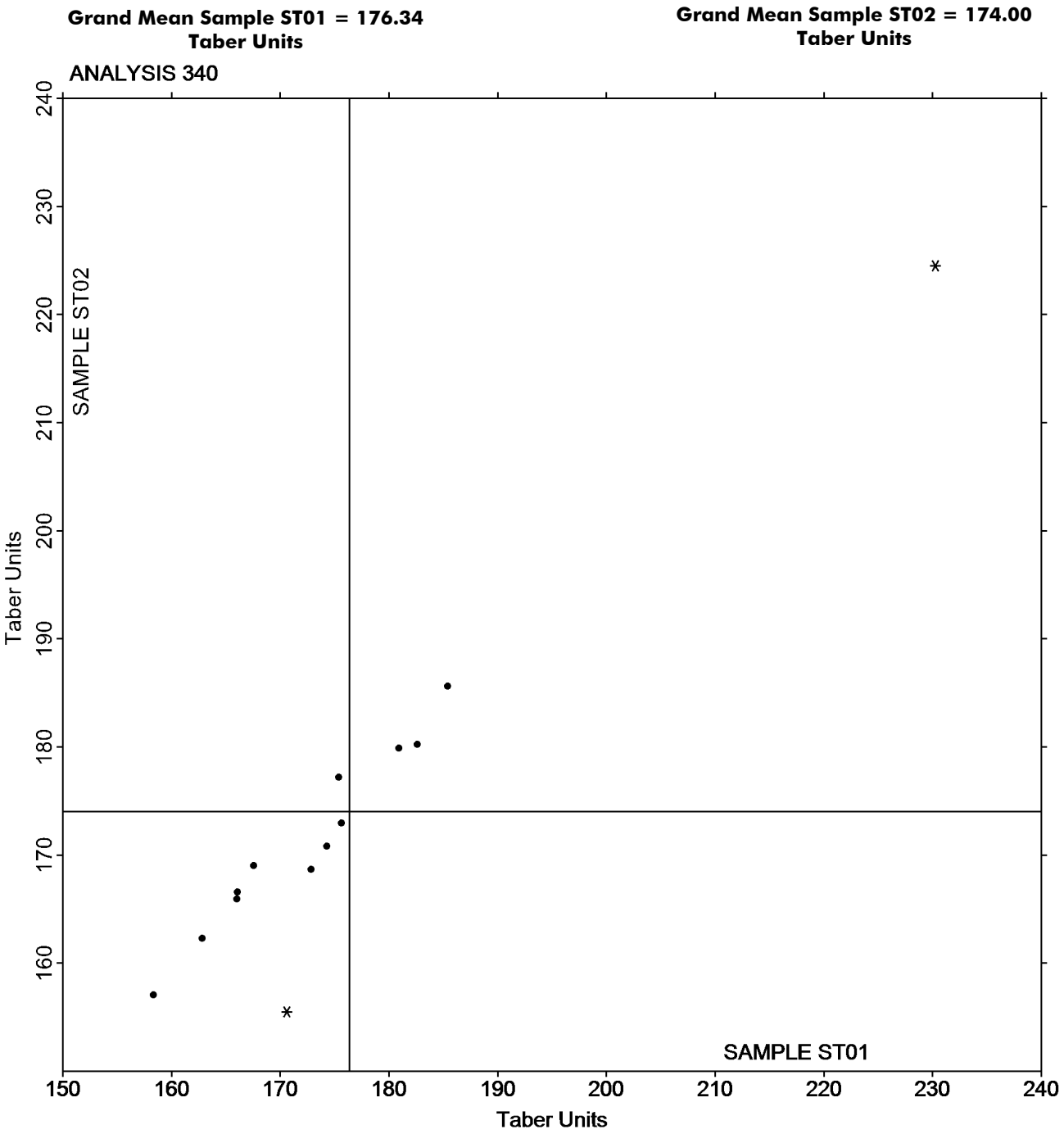
WebCode	Data Flag	Sample ST01 Lab Mean	Sample ST01 Diff from Grand Mean	Sample ST01 CPV	Sample ST02 Lab Mean	Sample ST02 Diff from Grand Mean	Sample ST02 CPV
4GCGJP		158.4	-18.0	-1.04	157.0	-17.0	-1.00
642BZB		180.9	4.6	0.26	179.9	5.9	0.35
9CMBB6		172.8	-3.5	-0.20	168.7	-5.3	-0.32
9NB6AW		162.9	-13.5	-0.78	162.3	-11.7	-0.69
BPZMB4	*	170.6	-5.7	-0.33	155.5	-18.5	-1.09
GJUXGC		182.6	6.3	0.36	180.2	6.2	0.37
HFB3CY		166.0	-10.3	-0.60	165.9	-8.1	-0.48
HVMJHZ		167.6	-8.8	-0.51	169.0	-5.0	-0.30
JDGYXH		175.4	-0.9	-0.05	177.2	3.2	0.19
MY8U8K		166.1	-10.2	-0.59	166.6	-7.5	-0.44
U9PDEJ		174.3	-2.0	-0.12	170.8	-3.2	-0.19
UT3T36		175.6	-0.7	-0.04	173.0	-1.1	-0.06
VKMAGK	*	230.3	53.9	3.12	224.5	50.5	2.98
W647AF		185.4	9.0	0.52	185.6	11.6	0.68

Summary Statistics	Sample ST01	Sample ST02
Grand Means	176.34 Taber Units	174.00 Taber Units
Stnd Dev Btwn Labs	17.31 Taber Units	16.92 Taber Units

Statistics based on 14 of 14 reporting participants.

Analysis Notes:

W647AF - Data appear to be reported as mN-m, not g-cm as indicated on data entry form. CTS will not correct the Units going forward.



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

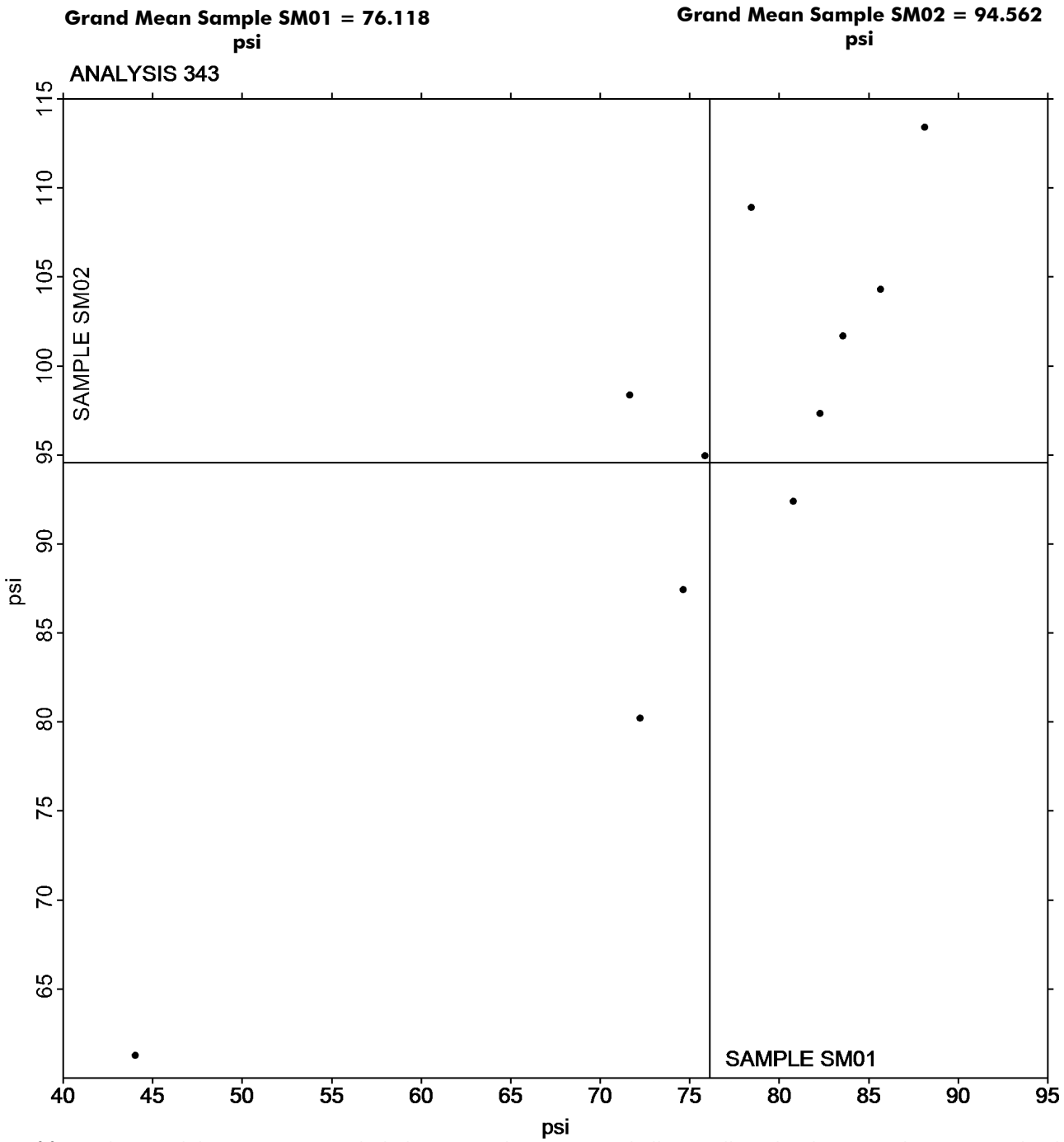
WebCode	Data Flag	Sample SM01 Lab Mean	Sample SM01 Diff from Grand Mean	Sample SM01 CPV	Sample SM02 Lab Mean	Sample SM02 Diff from Grand Mean	Sample SM02 CPV	Instr Code
3CKTNR		72.24	-3.88	-0.33	80.20	-14.36	-0.99	CD
4GCGJP		75.86	-0.26	-0.02	94.96	0.40	0.03	LW
9CMBB6		44.03	-32.09	-2.69	61.26	-33.30	-2.30	LW
B8HJWN		78.44	2.32	0.19	108.88	14.32	0.99	CD
BPZMB4		88.12	12.00	1.01	113.40	18.84	1.30	LW
BUHFUJ		82.29	6.17	0.52	97.31	2.75	0.19	LW
MWJRCR		80.80	4.68	0.39	92.40	-2.16	-0.15	TA
N4E8HB		83.56	7.44	0.62	101.68	7.12	0.49	CD
TW6CNR		85.66	9.54	0.80	104.30	9.74	0.67	TA
VQQHGL		74.64	-1.48	-0.12	87.43	-7.13	-0.49	LW
W3WHJA		71.66	-4.46	-0.37	98.36	3.80	0.26	DX

Summary Statistics	Sample SM01	Sample SM02
Grand Means	76.12 psi	94.56 psi
Stnd Dev Btwn Labs	11.93 psi	14.49 psi

Statistics based on 11 of 11 reporting participants.

Key to Instrument Codes Reported by Participants

CD	CSI CS-163D	DX	Dek-Tron XP2 Series
LW	L & W ZD Tensile Tester	TA	Thwing-Albert Tensile 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 345
Z-Direction Tensile, Recycled Paperboard
TAPPI Official Test Method T541

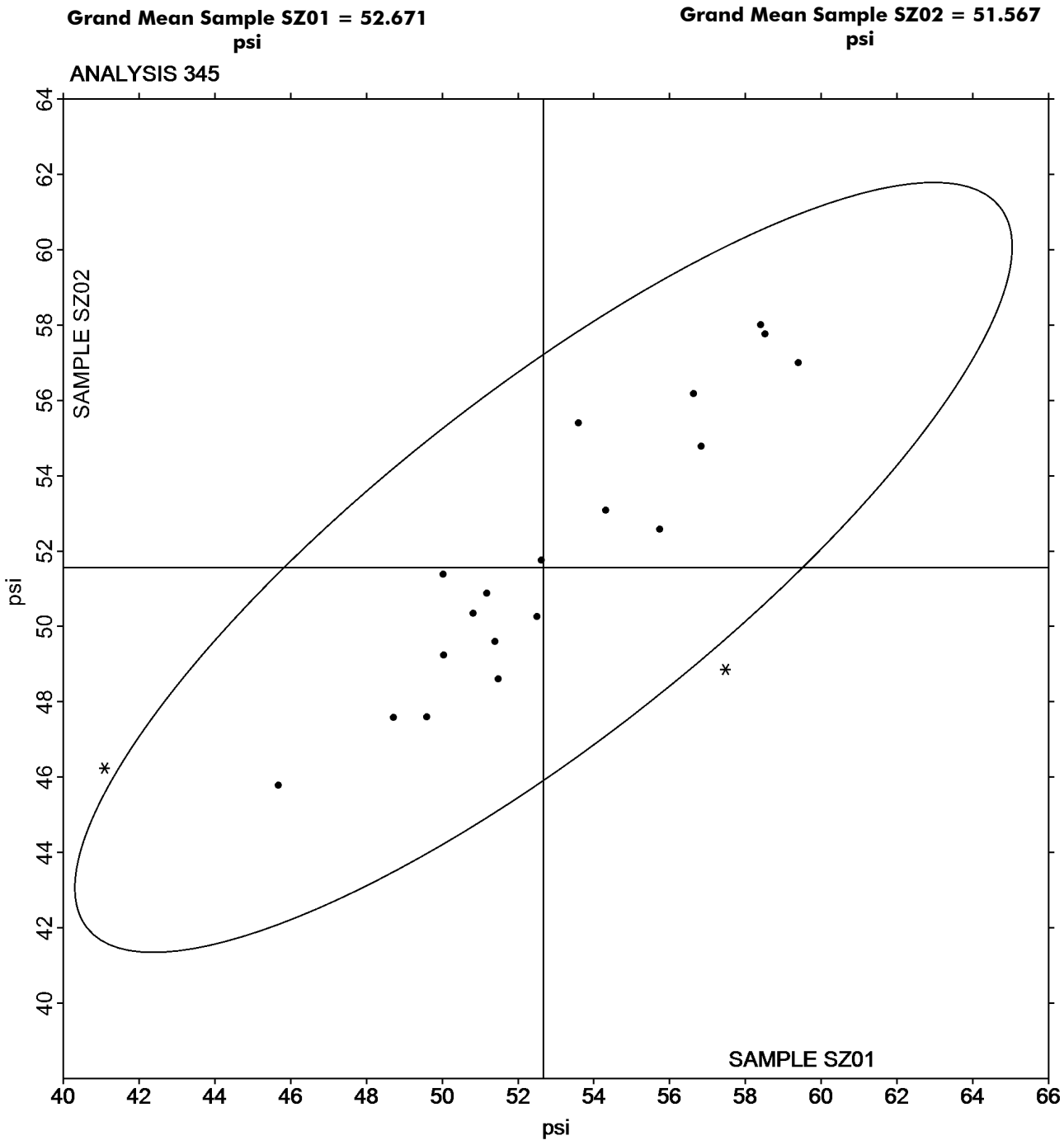
WebCode	Data Flag	Sample SZ01 Lab Mean	Sample SZ01 Diff from Grand Mean	Sample SZ01 CPV	Sample SZ02 Lab Mean	Sample SZ02 Diff from Grand Mean	Sample SZ02 CPV	Instr Code
3B877D	*	41.09	-11.58	-2.55	46.24	-5.33	-1.42	XX
4GCGJP		45.68	-6.99	-1.54	45.78	-5.79	-1.54	LW
642BZB		51.48	-1.19	-0.26	48.60	-2.97	-0.79	CD
78Z2QM		53.60	0.93	0.20	55.40	3.83	1.02	CA
EE8BP2		58.53	5.86	1.29	57.76	6.19	1.65	CH
GJUXGC		54.32	1.65	0.36	53.08	1.51	0.40	CD
HFB3CY		51.40	-1.27	-0.28	49.60	-1.97	-0.52	CA
HVMJHZ		50.02	-2.65	-0.58	51.38	-0.19	-0.05	TA
JDGYXH		58.40	5.73	1.26	58.00	6.43	1.71	TA
MY8U8K		51.18	-1.49	-0.33	50.88	-0.69	-0.18	CA
NXB4QR		50.04	-2.63	-0.58	49.24	-2.33	-0.62	TA
QPU7YP		52.62	-0.05	-0.01	51.76	0.19	0.05	TA
TT27W7	*	57.48	4.80	1.06	48.86	-2.71	-0.72	LW
U9PDEJ		50.82	-1.85	-0.41	50.34	-1.23	-0.33	LW
UT3T36		48.72	-3.95	-0.87	47.58	-3.99	-1.06	CA
VJ8K4D		49.60	-3.07	-0.68	47.60	-3.97	-1.06	CA
W647AF		59.40	6.73	1.48	57.00	5.43	1.45	TA
Y2XRQZ		55.74	3.07	0.68	52.58	1.01	0.27	LW
YN6ZUH		56.64	3.97	0.87	56.18	4.61	1.23	DP
ZFAP97		56.84	4.17	0.92	54.78	3.21	0.86	LW
ZXTND4		52.50	-0.17	-0.04	50.26	-1.31	-0.35	LW

Summary Statistics	Sample SZ01	Sample SZ02
Grand Means	52.67 psi	51.57 psi
Stnd Dev Btwn Labs	4.54 psi	3.75 psi

Statistics based on 21 of 21 reporting participants.

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 SN01 Lab Mean	Sample SN01 Diff from Grand Mean	Sample SN01 CPV	Sample SN02 Lab Mean	Sample SN02 Diff from Grand Mean	Sample SN02 CPV	Instr Code
3UKKRE		159.0	11.4	1.17	166.2	8.2	0.60	HY
4GCGJP		144.4	-3.2	-0.33	146.4	-11.6	-0.85	HY
B8HJWN		156.0	8.4	0.86	172.4	14.4	1.05	HY
BPZMB4		127.2	-20.4	-2.10	129.0	-29.0	-2.12	HZ
H9R8KN		136.4	-11.2	-1.15	139.1	-18.9	-1.38	KR
HFB3CY		148.2	0.6	0.06	166.8	8.8	0.64	XX
HZZUKN		149.2	1.6	0.17	172.8	14.8	1.08	HY
J7FJBV		146.5	-1.1	-0.11	153.1	-4.9	-0.36	HX
MY8U8K		160.6	13.0	1.34	162.8	4.8	0.35	HZ
N4E8HB		160.6	13.0	1.34	144.0	-14.0	-1.02	HY
TW6CNR		147.6	0.0	0.00	172.0	14.0	1.02	HZ
UGHJCQ		136.8	-10.8	-1.11	153.2	-4.8	-0.35	HY
V2PBUJ		154.4	6.8	0.70	173.6	15.6	1.14	HZ
XZNVYX		139.4	-8.2	-0.84	160.8	2.8	0.20	HY
Z8X7WG		147.6	0.0	0.00	157.8	-0.2	-0.01	HZ

Summary Statistics	Sample SN01	Sample SN02
Grand Means	147.59 1000th ft-lbs	158.00 1000th ft-lbs
Stnd Dev Btwn Labs	9.73 1000th ft-lbs	13.67 1000th ft-lbs

Statistics based on 15 of 15 reporting participants.

Key to Instrument Codes Reported by Participants

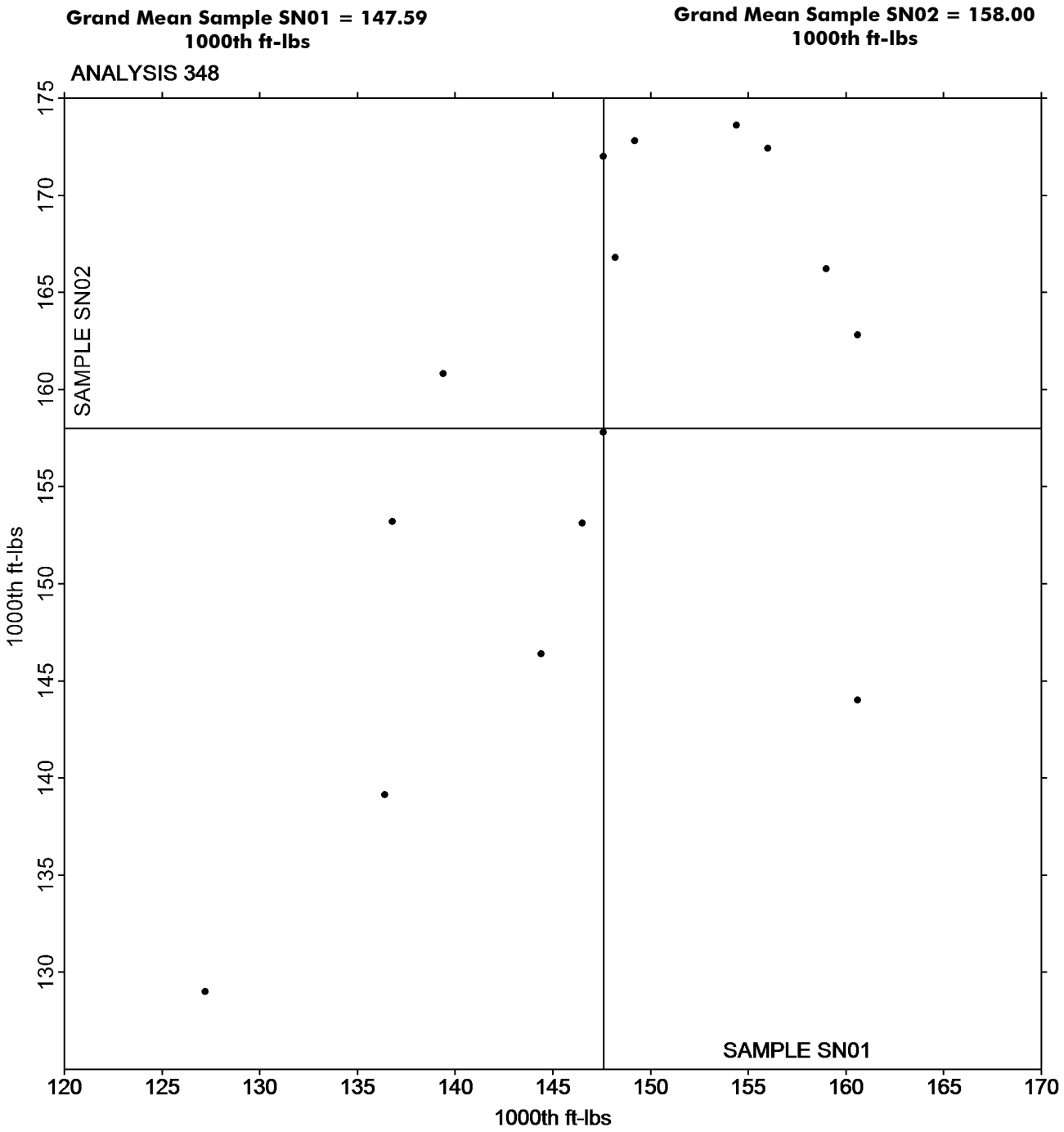
HX Huygen Internal Scott Bond Tester

HY Huygen Digitized Internal Scott Bond Tester

HZ Huygen Internal Bond Tester with AccuPress

KR Kumagai Riki Kogyo 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.

Paper & Paperboard Interlaboratory Testing Program

Analysis 349

Internal Bond Strength - Scott Bond Models

TAPPI Provisional Test Method T569

WebCode	Data Flag	Sample SP01 Lab Mean	Sample SP01 Diff from Grand Mean	Sample SP01 CPV	Sample SP02 Lab Mean	Sample SP02 Diff from Grand Mean	Sample SP02 CPV	Instr Code
28YNM7		149.8	18.3	1.31	159.8	20.5	1.01	TM
78JMHD		119.8	-11.7	-0.84	115.2	-24.1	-1.19	TM
9CMBB6		115.8	-15.7	-1.13	122.2	-17.1	-0.84	TM
ADTNGP	X	0.3	-131.2	-9.42	0.1	-139.2	-6.86	TM
BMVVKB		146.2	14.7	1.05	145.4	6.1	0.30	SC
CJQLU7		127.2	-4.3	-0.31	146.2	6.9	0.34	SC
D3XBK9		161.4	29.9	2.14	187.4	48.1	2.37	XX
EE8BP2		129.8	-1.7	-0.12	134.2	-5.1	-0.25	TM
GL3U42		130.0	-1.5	-0.11	130.3	-9.0	-0.44	TM
QNGWN4		118.3	-13.2	-0.95	126.9	-12.4	-0.61	XX
VHVFHV		126.4	-5.2	-0.37	139.9	0.6	0.03	SC
WNEZ3M		136.2	4.7	0.34	154.0	14.7	0.72	TM
YN6ZUH		115.6	-15.9	-1.14	111.6	-27.7	-1.37	TM
Z4YUZG		133.2	1.7	0.12	137.9	-1.4	-0.07	SC

Summary Statistics	Sample SP01	Sample SP02
Grand Means	131.51 1000th ft-lbs	139.30 1000th ft-lbs
Stnd Dev Btwn Labs	13.93 1000th ft-lbs	20.29 1000th ft-lbs

Statistics based on 13 of 14 reporting participants.

Comments on Assigned Data Flags for Test #349

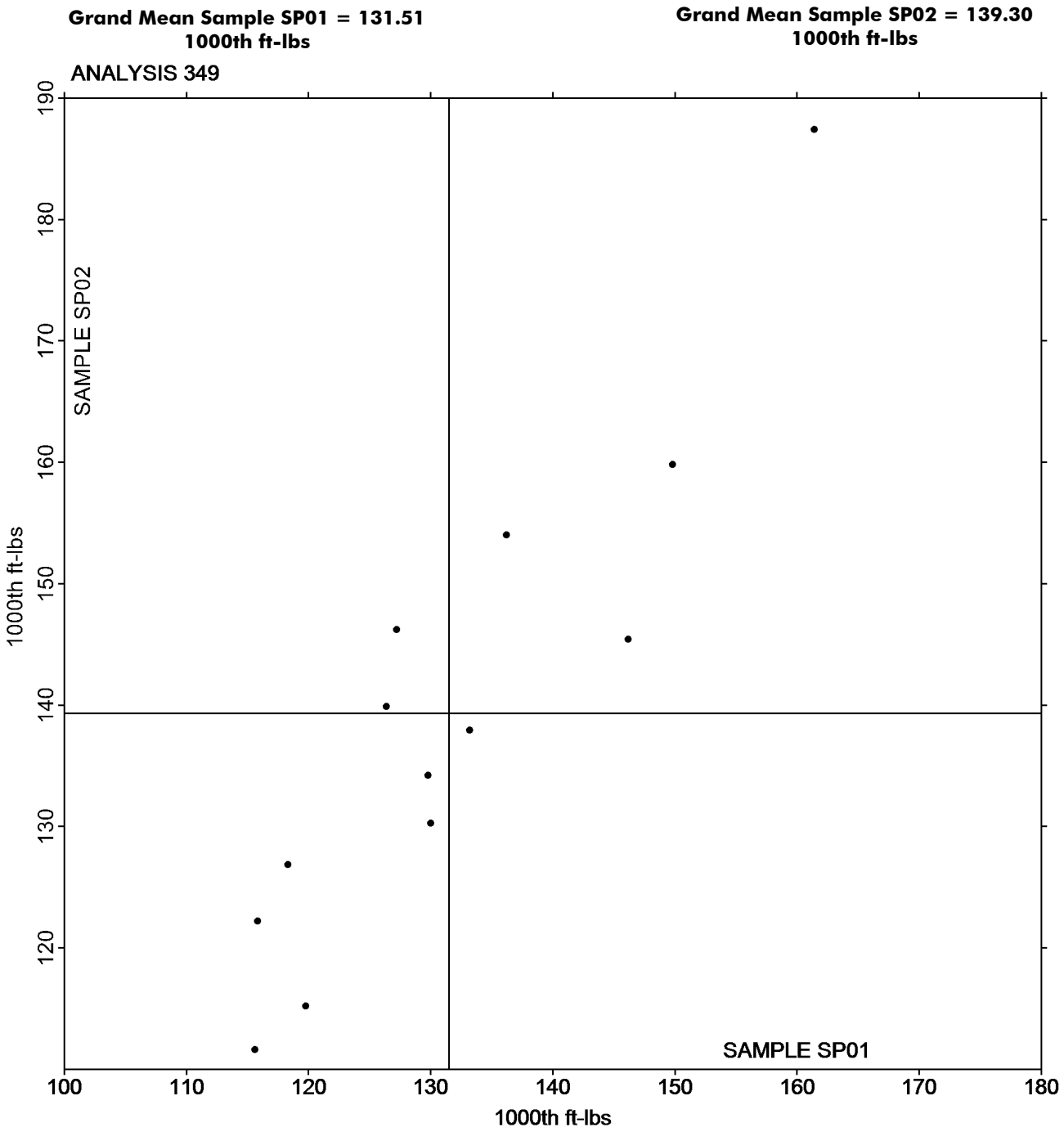
ADTNGP (X) - Extreme Data.

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-

