Paper & Paperboard Testing Program

Summary Report #4401 - January 2026

Analysis	Analysis Name
3101	Thickness (Caliper), Printing papers
3111	Bursting Strength - Printing Papers
3113	Tearing Strength - Printing Papers
3115	Tensile Breaking Strength - Printing Papers
3116	Tensile Energy Absorption - Printing Papers
3117	Elongation to Break - Printing Papers
3121	Air Resistance - Gurley Oil Type
3131	Roughness - Print Surf Method - 2.5 to 6.0 Microns
3133	Roughness - Sheffield Type
3135	Grammage (Mass per Unit Area)
3141	Opacity (89% Reflectance Backing) - Fine Papers
3145	Directional Brightness of Fluorescent Samples
3146	Fluorescent Component of Directional Brightness
3201	Bending Resistance, Taber Type - 0 to 10 Units
3203	Bending Resistance, Taber Type - 10 to 100 Taber Units
3205	Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
3207	Z-Direction Tensile, Recycled Paperboard
3209	Z-Direction Tensile
3211	Internal Bond Strength - Modified Scott Mechanics
3213	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 industries including color, rubber, plastics, fasteners and metals, containerboard, paper, agriculture, hemp, 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 100 countries, currently participate in the CTS programs.

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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 3101

Thickness (Caliper), Printing papers

TAPPI Official Test Method T411

WebCode	Data Flag	Sample CP49 Lab Mean	Sample CP49 Diff from Grand Mean	Sample CP49 CPV	Sample CP50 Lab Mean	Sample CP50 Diff from Grand Mean	Sample CP50 CPV
39G2DB		4.019	0.031	0.43	4.031	0.037	0.49
43RNCM		3.995	0.007	0.10	3.983	-0.010	-0.14
49XG7H		4.013	0.025	0.34	4.021	0.027	0.36
4A8LJ7		3.862	-0.126	-1.74	3.880	-0.114	-1.49
6AB78A		3.943	-0.045	-0.62	3.941	-0.053	-0.69
6K6MWB		3.924	-0.064	-0.89	3.877	-0.117	-1.53
6YQ3ZA		3.979	-0.009	-0.13	3.997	0.003	0.04
6Z22UJ		4.078	0.090	1.24	4.074	0.080	1.05
9NFY33		3.996	0.008	0.11	4.013	0.019	0.25
9REAY3		3.927	-0.061	-0.84	3.881	-0.113	-1.47
CMRTWY		4.030	0.042	0.58	3.997	0.003	0.04
DBFQB2		4.122	0.133	1.84	4.129	0.135	1.77
DNHE3V		4.029	0.041	0.56	4.072	0.078	1.02
FCZEJ8		4.045	0.057	0.79	4.038	0.044	0.58
H2NYP4		4.005	0.017	0.23	3.983	-0.011	-0.14
HUTWNT		3.985	-0.003	-0.04	3.990	-0.004	-0.05
JKXFCU		4.106	0.118	1.63	4.118	0.124	1.62
K4663W		3.881	-0.107	-1.48	3.884	-0.110	-1.43
MV9PQX		3.947	-0.041	-0.57	3.974	-0.020	-0.26
MWG28Y_AL		4.099	0.111	1.53	4.072	0.078	1.02
NX8MEV		4.029	0.040	0.56	4.012	0.019	0.24
PD42C4		3.926	-0.062	-0.86	4.001	0.007	0.09
PPB83W		3.986	-0.002	-0.03	3.972	-0.022	-0.28
QAV9WV		4.016	0.028	0.38	4.016	0.022	0.29
QWR3HQ		4.083	0.094	1.30	4.089	0.096	1.25
RKUL7U		3.913	-0.075	-1.04	3.966	-0.028	-0.36
RZ3DBK		3.963	-0.025	-0.35	3.936	-0.058	-0.75
V99JED		3.904	-0.084	-1.16	3.903	-0.091	-1.19
VFPWFX		3.874	-0.114	-1.58	3.886	-0.108	-1.41
VVGUGT		3.901	-0.087	-1.20	3.890	-0.103	-1.35
WBNB4K		4.025	0.037	0.51	4.070	0.077	1.00
WM6UMG_AL	X	4.991	1.003	13.84	4.999	1.005	13.13
XNBYDB		4.037	0.049	0.67	4.028	0.034	0.45
Y44UNF		3.851	-0.137	-1.89	3.881	-0.113	-1.47
Y9D87E		4.050	0.062	0.85	4.039	0.045	0.59
ZEEJ2C	*	4.044	0.056	0.77	4.137	0.144	1.88

Summary Statistics	Sample CP49	Sample CP50
Grand Means	3.99 mils	3.99 mils
Stnd Dev Btwn Labs	0.07 mils	0.08 mils

Statistics based on 35 of 36 reporting participants.

Comments on Assigned Data Flags for Test #3101

WM6UMG_AL (X) - Extreme Data.

Analysis Notes:

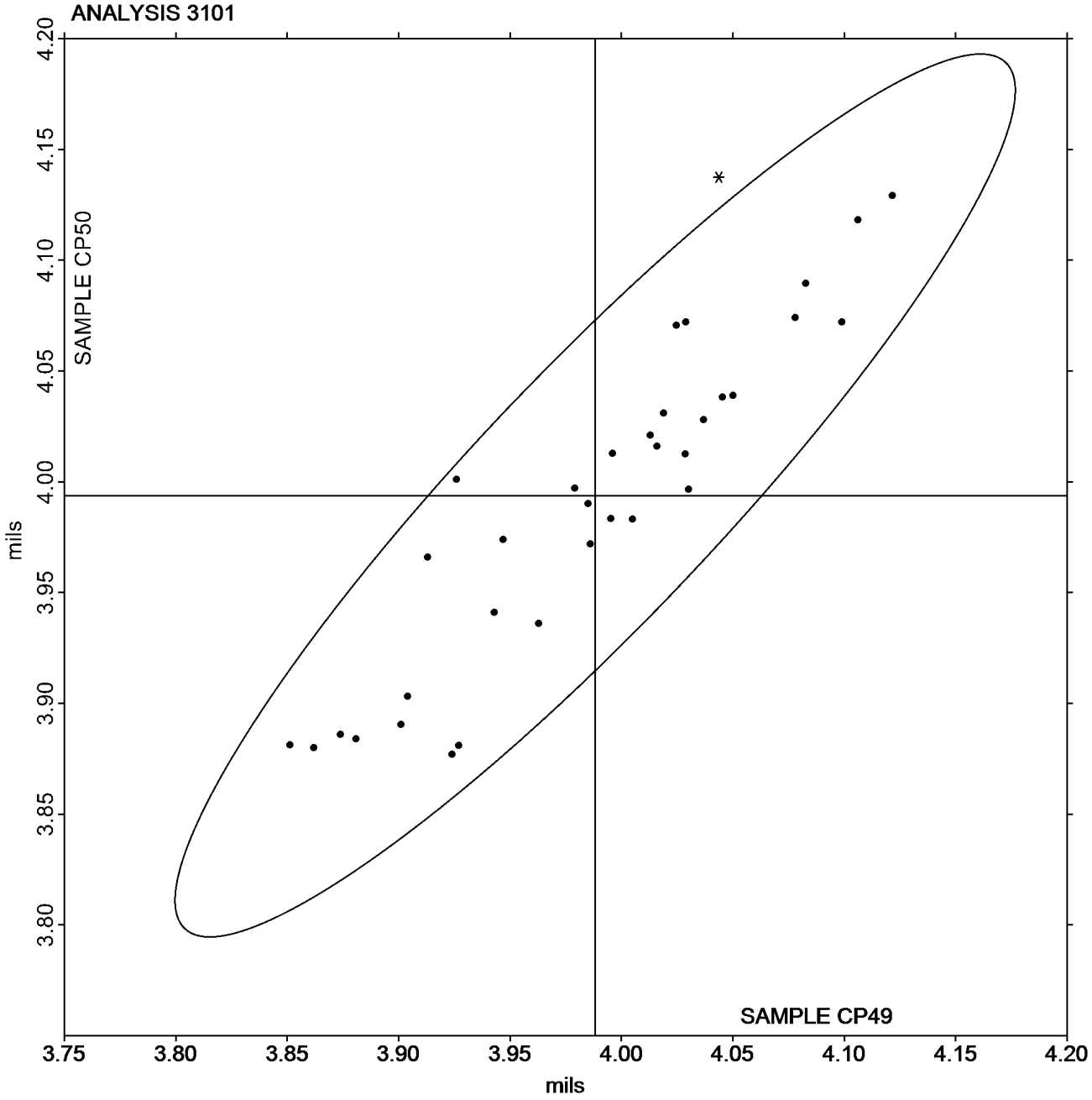
DNHE3V - Data appear to be reported as mils, not micrometers as indicated on data entry form. CTS will not correct the Units going forward.

Key to Instrument Codes Reported by Participants

EM	Emveco	LA	L & W Autoline
LB	L & W Autoline 600	LC	L & W Autoline 400
LW	L & W	MS	Messmer
PP	Technidyne Profile/Plus	TA	Thwing-Albert
TM	TMI		

Grand Mean Sample CP49 = 3.9882 mils

Grand Mean Sample CP50 = 3.9938 mils



Paper & Paperboard Interlaboratory Testing Program

Analysis 3111

Bursting Strength - Printing Papers

TAPPI Official Test Method T403

WebCode	Data Flag	Sample BP49 Lab Mean	Sample BP49 Diff from Grand Mean	Sample BP49 CPV	Sample BP50 Lab Mean	Sample BP50 Diff from Grand Mean	Sample BP50 CPV
43RNCM		22.06	-0.34	-0.23	23.48	1.00	0.60
49XG7H		23.25	0.85	0.58	22.40	-0.08	-0.05
6AB78A		20.62	-1.78	-1.20	20.58	-1.90	-1.13
6K6MWB	X	33.40	11.00	7.43	33.50	11.02	6.58
6YQ3ZA	*	18.35	-4.05	-2.73	17.60	-4.88	-2.91
6Z22UJ		20.98	-1.42	-0.96	20.93	-1.55	-0.92
8GJGD7		22.30	-0.10	-0.07	22.40	-0.08	-0.05
9NFY33		22.94	0.54	0.37	22.89	0.41	0.24
9QJUL6		22.75	0.36	0.24	22.60	0.13	0.07
CWZ938		23.69	1.29	0.87	22.45	-0.03	-0.02
D8VYYY		21.60	-0.80	-0.54	20.60	-1.88	-1.12
DBFQB2		21.12	-1.28	-0.86	21.12	-1.36	-0.81
H2NYP4		21.40	-1.00	-0.67	21.70	-0.78	-0.46
HUTWNT		21.79	-0.61	-0.41	22.46	-0.02	-0.01
PD42C4		24.00	1.60	1.08	24.23	1.75	1.04
PPB83W		22.60	0.20	0.14	23.60	1.12	0.67
QH9CRB		25.40	3.00	2.02	25.89	3.41	2.03
QWR3HQ		22.42	0.03	0.02	23.74	1.26	0.75
RRDR6M		24.06	1.66	1.12	23.96	1.48	0.88
V3H7DP		21.50	-0.90	-0.61	22.40	-0.08	-0.05
WBNB4K		23.37	0.98	0.66	23.54	1.06	0.63
XNBYDB		23.64	1.24	0.84	23.54	1.06	0.63
ZEEJ2C		22.90	0.51	0.34	22.43	-0.05	-0.03

Summary Statistics	Sample BP49	Sample BP50
Grand Means	22.40 psi	22.48 psi
Stnd Dev Btwn Labs	1.48 psi	1.68 psi

Statistics based on 22 of 23 reporting participants.

Comments on Assigned Data Flags for Test #3111

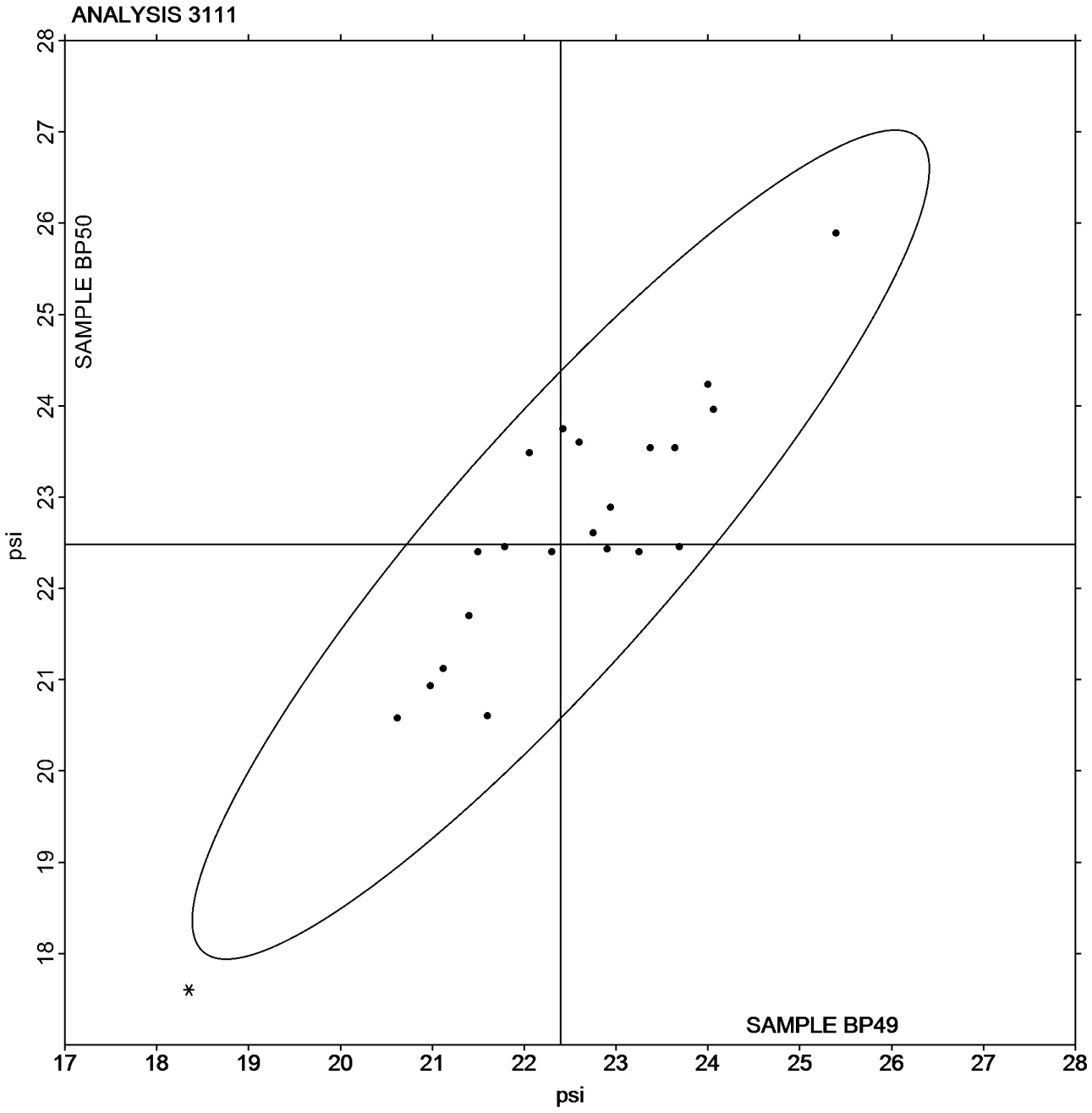
6K6MWB (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample BP49 = 22.398 psi

Grand Mean Sample BP50 = 22.479 psi



Paper & Paperboard Interlaboratory Testing Program

Analysis 3113

Tearing Strength - Printing Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample RP49 Lab Mean	Sample RP49 Diff from Grand Mean	Sample RP49 CPV	Sample RP50 Lab Mean	Sample RP50 Diff from Grand Mean	Sample RP50 CPV
43RNCM		56.45	-0.31	-0.03	57.18	0.42	0.05
49XG7H		76.10	19.34	2.20	74.10	17.34	2.00
6AB78A		58.28	1.52	0.17	59.22	2.46	0.28
6YQ3ZA	X	71.00	14.24	1.62	59.58	2.82	0.32
6Z22UJ		72.47	15.71	1.78	73.50	16.73	1.93
9NFY33		61.28	4.52	0.51	60.75	3.99	0.46
9QJUL6		39.39	-17.37	-1.97	41.36	-15.40	-1.78
BKNJPC		55.50	-1.26	-0.14	54.64	-2.12	-0.25
C98ETZ	X	52.56	-4.20	-0.48	60.68	3.92	0.45
CWZ938		61.42	4.66	0.53	63.08	6.32	0.73
DBFQB2		56.25	-0.51	-0.06	55.42	-1.34	-0.15
DHCJJV		56.52	-0.23	-0.03	56.89	0.13	0.01
DNHE3V		57.44	0.68	0.08	58.72	1.95	0.23
EABTDB		48.19	-8.57	-0.97	47.38	-9.38	-1.08
G3PCX7		51.57	-5.19	-0.59	50.54	-6.22	-0.72
H2NYP4		59.89	3.13	0.36	59.38	2.62	0.30
HUTWNT		55.13	-1.63	-0.18	55.27	-1.49	-0.17
K4663W		51.70	-5.06	-0.57	50.90	-5.86	-0.68
MV9PQX	X	74.86	18.10	2.05	67.94	11.18	1.29
MWG28Y_AL		70.03	13.27	1.51	70.53	13.77	1.59
NX8MEV		55.84	-0.92	-0.10	56.52	-0.24	-0.03
PD42C4		53.78	-2.98	-0.34	55.12	-1.64	-0.19
PPB83W		54.44	-2.32	-0.26	55.94	-0.82	-0.10
PQR4UV	*	63.37	6.61	0.75	59.87	3.10	0.36
QAV9WV		54.74	-2.02	-0.23	53.72	-3.04	-0.35
QAYTKY		49.27	-7.48	-0.85	48.91	-7.85	-0.91
QH9CRB		56.56	-0.20	-0.02	59.04	2.28	0.26
QWR3HQ		59.30	2.54	0.29	57.72	0.95	0.11
RKUL7U		46.08	-10.68	-1.21	46.60	-10.16	-1.17
V3H7DP		74.00	17.24	1.96	73.40	16.64	1.92
WBNB4K		57.26	0.50	0.06	56.65	-0.12	-0.01
WM6UMG_AL		51.30	-5.46	-0.62	53.30	-3.46	-0.40
XNBYDB	*	31.20	-25.56	-2.90	30.10	-26.66	-3.08
XW2KGN		62.32	5.56	0.63	62.07	5.31	0.61
Y9D87E		54.50	-2.26	-0.26	55.48	-1.28	-0.15
YD924F		56.84	0.08	0.01	57.62	0.86	0.10
ZZD87D		61.35	4.59	0.52	59.06	2.30	0.26

Summary Statistics	Sample RP49	Sample RP50
Grand Means	56.76 Grams	56.76 Grams
Stnd Dev Btwn Labs	8.81 Grams	8.67 Grams

Statistics based on 34 of 37 reporting participants.

Comments on Assigned Data Flags for Test #3113

MV9PQX (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.

6YQ3ZA (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.

C98ETZ (X) - Inconsistent in testing between samples.

Analysis Notes:

9QJUL6 - Data appear to be reported as mN, not gf as indicated on data entry form. CTS will not correct the Units going forward.

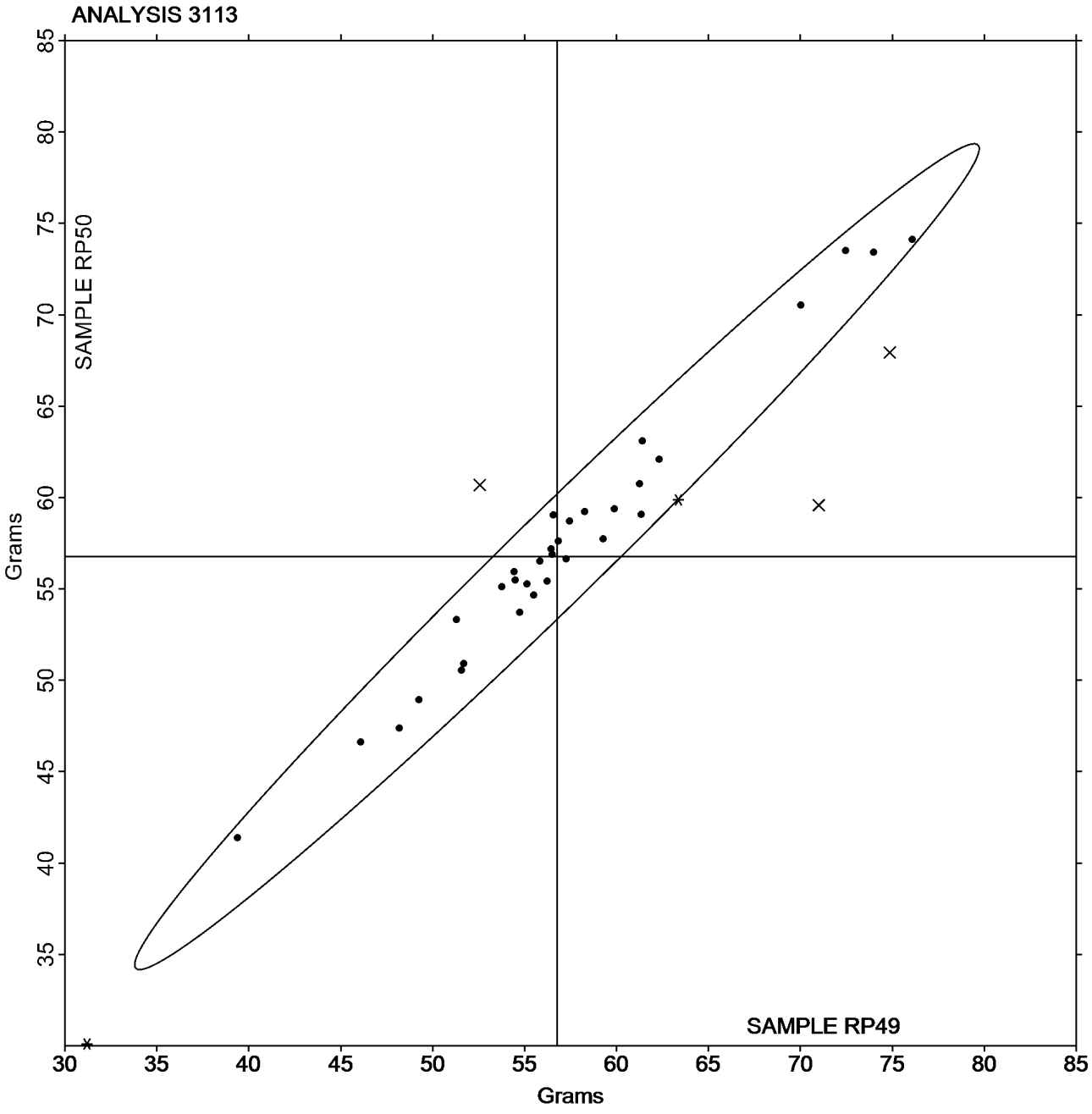
QAYTKY - Data appear to be reported as mN, not gf as indicated on data entry form. CTS will not correct the Units going forward.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample RP49 = 56.757 Grams

Grand Mean Sample RP50 = 56.764 Grams



Paper & Paperboard Interlaboratory Testing Program

Analysis 3115

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NP49 Lab Mean	Sample NP49 Diff from Grand Mean	Sample NP49 CPV	Sample NP50 Lab Mean	Sample NP50 Diff from Grand Mean	Sample NP50 CPV
23G3PF		3.679	0.134	0.22	3.555	-0.034	-0.06
43RNCM		3.655	0.110	0.18	3.682	0.093	0.16
49XG7H		3.217	-0.329	-0.55	3.396	-0.193	-0.33
6AB78A		3.707	0.161	0.27	3.689	0.100	0.17
6YQ3ZA		3.929	0.384	0.64	4.107	0.518	0.88
6Z22UJ		3.335	-0.211	-0.35	3.368	-0.221	-0.37
9NFY33		3.392	-0.153	-0.25	3.399	-0.190	-0.32
BKNJPC		3.067	-0.478	-0.80	3.241	-0.348	-0.59
C98ETZ		3.600	0.055	0.09	3.750	0.161	0.27
CMRTWY		3.809	0.264	0.44	3.793	0.204	0.35
CWZ938		3.406	-0.139	-0.23	3.539	-0.050	-0.08
CXVPF6		3.631	0.086	0.14	3.797	0.208	0.35
DBFQB2	*	1.932	-1.613	-2.69	2.075	-1.514	-2.57
DNHE3V		3.341	-0.204	-0.34	3.497	-0.092	-0.16
EABTDB		4.086	0.541	0.90	4.017	0.428	0.72
EE8CGU		3.612	0.067	0.11	3.465	-0.124	-0.21
G3PCX7		4.227	0.682	1.13	4.191	0.602	1.02
H2NYP4		3.443	-0.102	-0.17	3.410	-0.179	-0.30
JKXFCU		3.602	0.057	0.09	3.464	-0.124	-0.21
K4663W		4.071	0.525	0.87	4.273	0.684	1.16
MV9PQX		4.145	0.599	1.00	4.136	0.547	0.93
MWG28Y_AL	*	2.140	-1.405	-2.34	2.071	-1.518	-2.57
NX8MEV		3.922	0.377	0.63	3.756	0.167	0.28
PD42C4		3.956	0.411	0.68	3.742	0.154	0.26
QAV9WV		3.379	-0.166	-0.28	3.379	-0.210	-0.36
QH9CRB		4.037	0.491	0.82	4.054	0.465	0.79
QWR3HQ		3.507	-0.038	-0.06	3.595	0.006	0.01
RKUL7U		4.679	1.134	1.89	4.616	1.028	1.74
RZ3DBK		4.149	0.603	1.00	4.184	0.595	1.01
VLEAGL	*	2.888	-0.657	-1.09	3.297	-0.292	-0.49
WBNB4K		3.580	0.035	0.06	3.640	0.052	0.09
WM6UMG_AL		2.068	-1.477	-2.46	2.124	-1.465	-2.48
XNBYDB		3.806	0.261	0.43	4.028	0.439	0.74
Y9D87E		2.992	-0.554	-0.92	2.911	-0.678	-1.15
ZZD87D		4.099	0.553	0.92	4.369	0.780	1.32

Paper & Paperboard Interlaboratory Testing Program

Analysis 3115

Tensile Breaking Strength - Printing Papers

TAPPI Official Test Method T494

Summary Statistics	Sample NP49	Sample NP50
Grand Means	3.55 kN/m	3.59 kN/m
Stnd Dev Btwn Labs	0.60 kN/m	0.59 kN/m

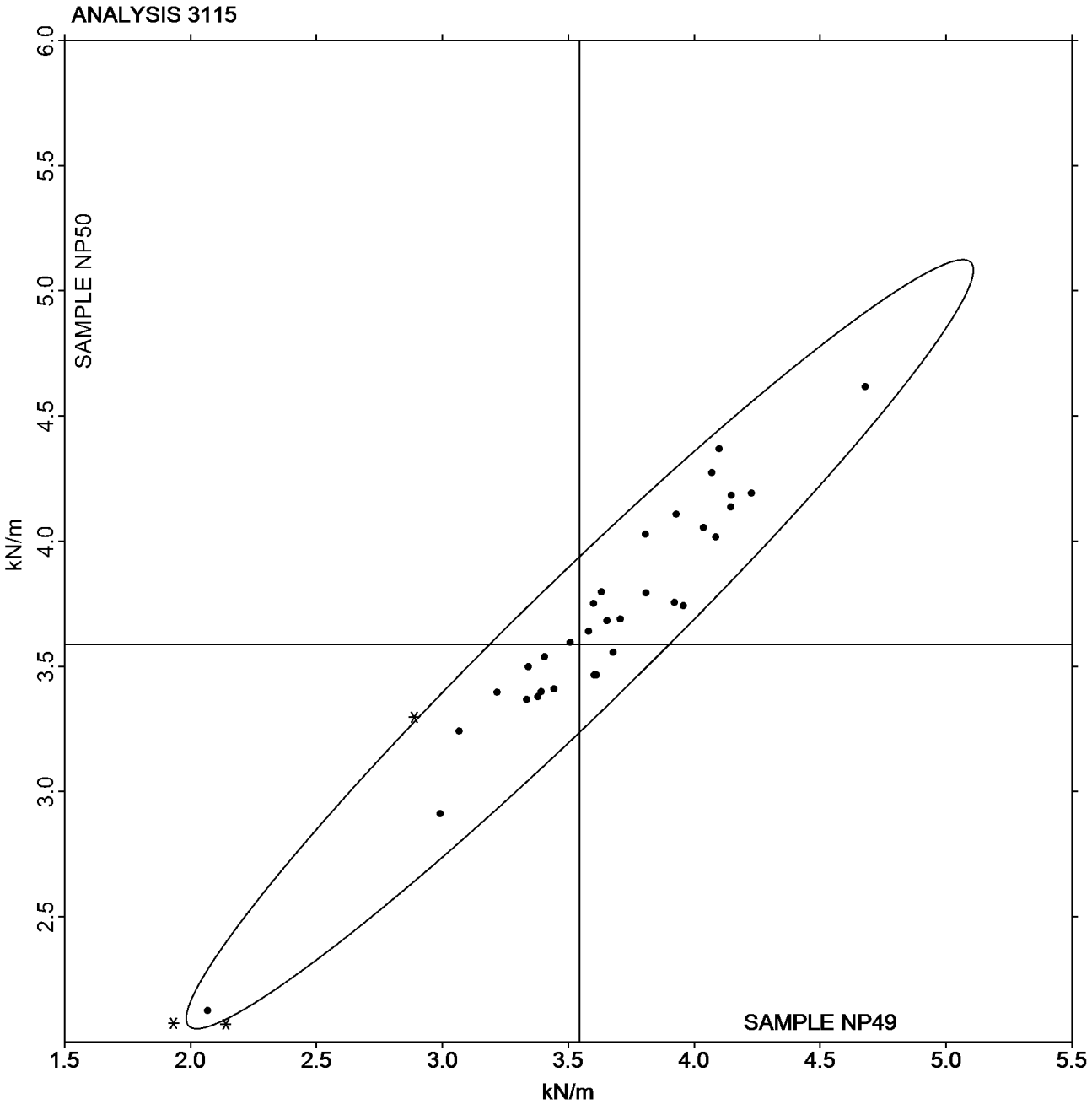
Statistics based on 35 of 35 reporting participants.

Key to Instrument Codes Reported by Participants

IO	Instron 5900 Series	LA	L & W Tensile - Autoline 300
LB	L & W Tensile - Autoline 400	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	LJ	L & W Tensile Tester SE 063
LX	L & W (model not specified)	LY	Lloyd TCD500
TB	Thwing-Albert EJA/1000	TF	Thwing-Albert EJA Vantage-1
TJ	Thwing-Albert QC II-XS	TO	Thwing-Albert QC-1000
TQ	Thwing-Albert QC 3A	TR	Testometric 220D
TT	Tinius Olsen H10KT	TV	Thwing-Albert Vantage NX
VM	Valmet PaperLab (was Kajaani/Robotest)	XX	Instrument make/model not specified by lab

Grand Mean Sample NP49 = 3.5454 kN/m

Grand Mean Sample NP50 = 3.5888 kN/m



Paper & Paperboard Interlaboratory Testing Program

Analysis 3116

Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NP49 Lab Mean	Sample NP49 Diff from Grand Mean	Sample NP49 CPV	Sample NP50 Lab Mean	Sample NP50 Diff from Grand Mean	Sample NP50 CPV
23G3PF		42.11	2.43	0.33	43.36	3.00	0.43
43RNCM		42.04	2.36	0.32	43.31	2.95	0.42
49XG7H		39.10	-0.59	-0.08	38.65	-1.71	-0.25
6AB78A		47.70	8.02	1.10	49.40	9.04	1.30
6YQ3ZA		46.44	6.76	0.93	44.57	4.21	0.61
6Z22UJ		42.56	2.87	0.39	41.51	1.14	0.16
C98ETZ		43.15	3.47	0.48	44.66	4.30	0.62
CWZ938		39.44	-0.24	-0.03	40.30	-0.06	-0.01
CXVPF6		42.68	3.00	0.41	46.53	6.17	0.89
DBFQB2	*	19.19	-20.49	-2.81	22.62	-17.74	-2.55
DNHE3V		34.15	-5.53	-0.76	38.53	-1.84	-0.26
EABTDB		30.66	-9.02	-1.24	28.57	-11.79	-1.70
G3PCX7		40.85	1.16	0.16	44.32	3.96	0.57
H2NYP4		36.88	-2.80	-0.39	36.59	-3.78	-0.54
JKXFCU		44.83	5.15	0.71	41.82	1.46	0.21
K4663W		42.56	2.87	0.39	44.56	4.19	0.60
MV9PQX		41.87	2.19	0.30	38.27	-2.10	-0.30
MWG28Y_AL	*	59.35	19.67	2.70	57.46	17.10	2.46
NX8MEV		37.27	-2.41	-0.33	36.37	-3.99	-0.57
PD42C4		39.53	-0.15	-0.02	36.31	-4.05	-0.58
QWR3HQ		41.23	1.55	0.21	43.30	2.94	0.42
VLEAGL		31.74	-7.95	-1.09	29.73	-10.64	-1.53
WBNB4K		39.81	0.12	0.02	40.11	-0.26	-0.04
XNBYDB		31.83	-7.85	-1.08	35.98	-4.38	-0.63
ZZD87D		35.11	-4.57	-0.63	42.26	1.90	0.27

Summary Statistics	Sample NP49	Sample NP50
Grand Means	39.68 Joules/sq m	40.36 Joules/sq m
Stnd Dev Btwn Labs	7.28 Joules/sq m	6.95 Joules/sq m

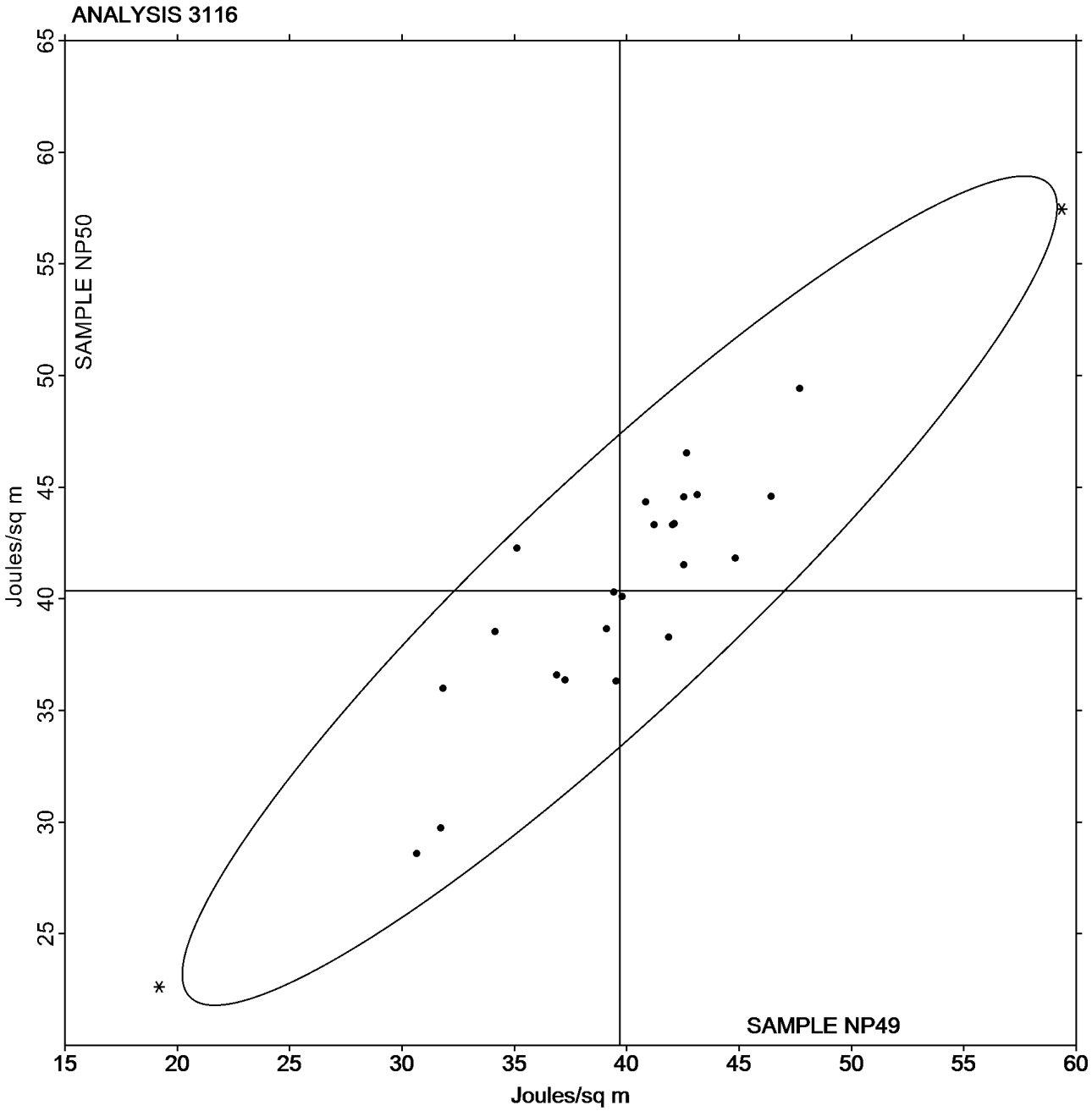
Statistics based on 25 of 25 reporting participants.

Key to Instrument Codes Reported by Participants

IO	Instron 5900 Series	LB	L & W Tensile - Autoline 400
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
LJ	L & W Tensile Tester SE 063	LX	L & W (model not specified)
LY	Lloyd TCD500	TB	Thwing-Albert EJA/1000
TF	Thwing-Albert EJA Vantage-1	TO	Thwing-Albert QC-1000
TQ	Thwing-Albert QC 3A	TT	Tinius Olsen H10KT
TV	Thwing-Albert Vantage NX	XX	Instrument make/model not specified by lab

Grand Mean Sample NP49 = 39.683 Joules/sq m

Grand Mean Sample NP50 = 40.363 Joules/sq m



Paper & Paperboard Interlaboratory Testing Program

Analysis 3117

Elongation to Break - Printing Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NP49 Lab Mean	Sample NP49 Diff from Grand Mean	Sample NP49 CPV	Sample NP50 Lab Mean	Sample NP50 Diff from Grand Mean	Sample NP50 CPV
23G3PF		1.608	-0.053	-0.24	1.670	-0.009	-0.04
43RNCM		1.705	0.044	0.20	1.747	0.068	0.28
49XG7H		1.761	0.100	0.46	1.679	0.000	0.00
6AB78A		2.056	0.396	1.83	2.135	0.455	1.89
6YQ3ZA		1.679	0.018	0.08	1.622	-0.057	-0.24
6Z22UJ		1.872	0.211	0.97	1.839	0.160	0.66
9NFY33		1.875	0.214	0.99	1.861	0.182	0.75
C98ETZ		1.770	0.109	0.50	1.850	0.171	0.71
CWZ938		1.707	0.046	0.21	1.689	0.010	0.04
CXVPF6		1.920	0.259	1.20	2.004	0.324	1.34
DBFQB2		1.467	-0.194	-0.89	1.596	-0.083	-0.35
DNHE3V		1.743	0.082	0.38	1.830	0.151	0.62
EABTDB		1.210	-0.451	-2.08	1.158	-0.521	-2.16
G3PCX7		1.451	-0.210	-0.97	1.577	-0.102	-0.42
H2NYP4		1.599	-0.062	-0.28	1.604	-0.075	-0.31
JKXFCU		1.783	0.123	0.57	1.555	-0.124	-0.51
K4663W		1.666	0.005	0.02	1.637	-0.042	-0.18
MV9PQX		1.646	-0.015	-0.07	1.824	0.145	0.60
MWG28Y_AL	X	3.583	1.922	8.87	3.587	1.908	7.90
NX8MEV		1.451	-0.210	-0.97	1.476	-0.203	-0.84
PD42C4		1.540	-0.121	-0.56	1.694	0.015	0.06
QAV9WV		1.703	0.042	0.20	1.548	-0.131	-0.54
QWR3HQ		1.760	0.099	0.46	1.777	0.098	0.40
RKUL7U		1.280	-0.381	-1.76	1.410	-0.269	-1.12
VLEAGL		1.753	0.092	0.43	1.472	-0.207	-0.86
WBNB4K		1.717	0.056	0.26	1.687	0.008	0.03
XNBYDB	*	2.090	0.429	1.98	2.324	0.645	2.67
Y9D87E		1.305	-0.356	-1.64	1.258	-0.421	-1.75
ZZD87D		1.383	-0.278	-1.28	1.498	-0.181	-0.75

Summary Statistics	Sample NP49	Sample NP50
Grand Means	1.66 Percent	1.68 Percent
Stnd Dev Btwn Labs	0.22 Percent	0.24 Percent

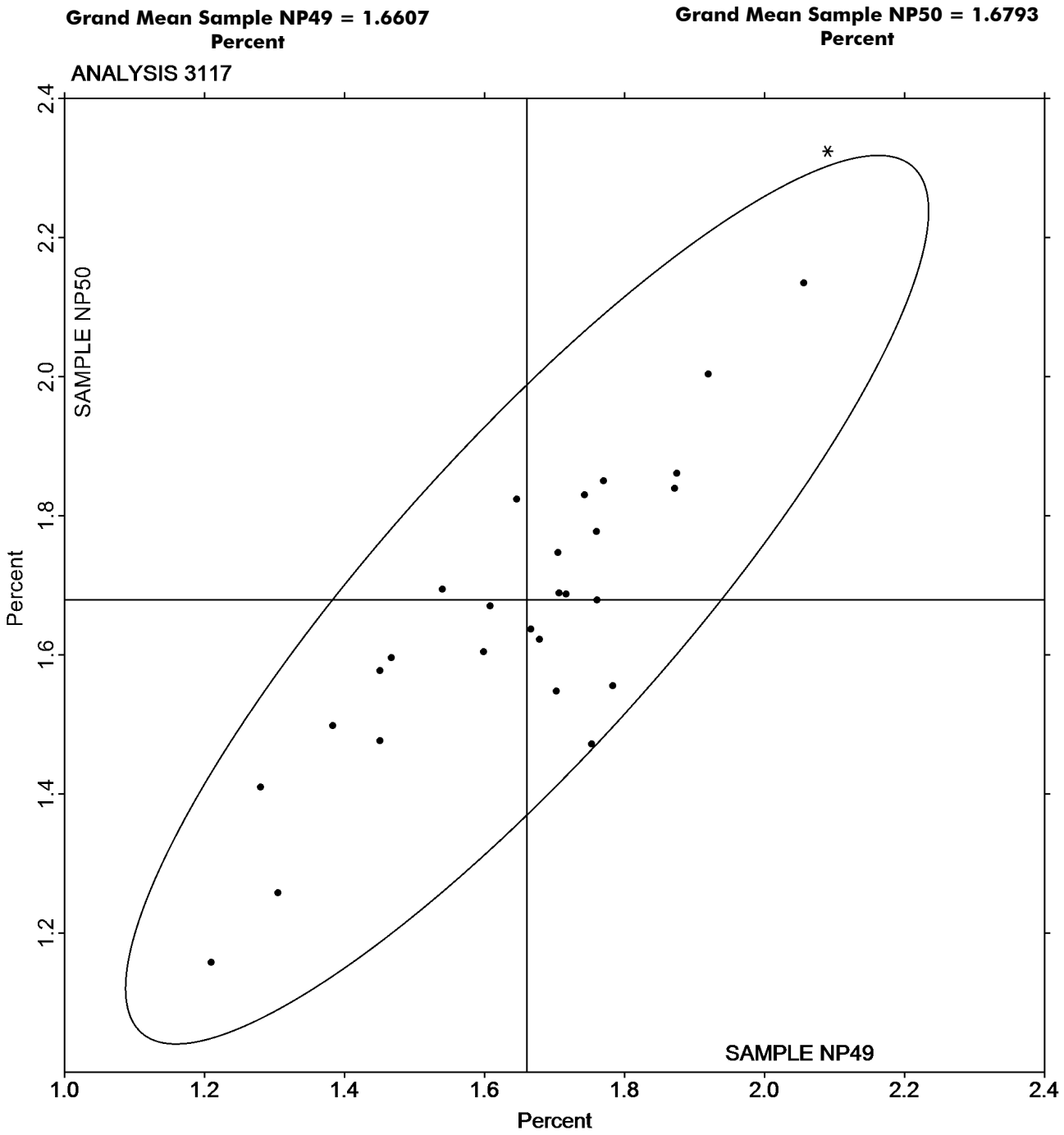
Statistics based on 28 of 29 reporting participants.

Comments on Assigned Data Flags for Test #3117

MWG28Y_AL (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

IO	Instron 5900 Series	LB	L & W Tensile - Autoline 400
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
LJ	L & W Tensile Tester SE 063	LX	L & W (model not specified)
LY	Lloyd TCD500	TB	Thwing-Albert EJA/1000
TF	Thwing-Albert EJA Vantage-1	TO	Thwing-Albert QC-1000
TQ	Thwing-Albert QC 3A	TR	Testometric 220D
TT	Tinius Olsen H10KT	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 3121

Air Resistance - Gurley Oil Type

TAPPI Official Test Method T460

WebCode	Data Flag	Sample PP49 Lab Mean	Sample PP49 Diff from Grand Mean	Sample PP49 CPV	Sample PP50 Lab Mean	Sample PP50 Diff from Grand Mean	Sample PP50 CPV
49XG7H		9.720	0.026	0.04	10.59	0.58	0.97
4A8LJ7		10.318	0.624	0.95	10.08	0.07	0.12
6AB78A		10.613	0.919	1.40	10.48	0.47	0.79
6N9HFD		9.840	0.146	0.22	9.99	-0.02	-0.03
6Z22UJ		9.848	0.154	0.24	10.62	0.61	1.02
8GJGD7		8.907	-0.787	-1.20	9.87	-0.14	-0.23
9QJUL6		8.811	-0.883	-1.35	9.89	-0.12	-0.19
C98ETZ		9.020	-0.674	-1.03	9.45	-0.56	-0.93
CWZ938		9.200	-0.494	-0.75	9.27	-0.74	-1.23
CXVPF6		9.413	-0.281	-0.43	9.88	-0.12	-0.21
D8VYYY		10.120	0.426	0.65	10.14	0.13	0.22
DBFQB2		9.999	0.305	0.47	10.49	0.49	0.81
DNHE3V	*	11.853	2.159	3.30	11.35	1.34	2.23
HUTWNT		9.562	-0.132	-0.20	8.97	-1.03	-1.72
K4663W		9.964	0.270	0.41	9.32	-0.68	-1.14
MWG28Y_AL		10.193	0.499	0.76	10.30	0.29	0.48
PD42C4	X	13.623	3.929	6.00	13.18	3.17	5.28
PPB83W		9.730	0.036	0.05	10.48	0.47	0.79
QAV9WV		9.707	0.013	0.02	9.56	-0.45	-0.75
QH9CRB		8.979	-0.715	-1.09	10.31	0.30	0.50
QWR3HQ		9.510	-0.184	-0.28	9.61	-0.40	-0.66
RKUL7U		9.844	0.150	0.23	11.25	1.25	2.08
V3H7DP		9.500	-0.194	-0.30	10.20	0.19	0.32
WCJT6L		8.920	-0.774	-1.18	9.06	-0.95	-1.58
WM6UMG_AL	X	3.550	-6.144	-9.38	3.66	-6.35	-10.58
XNBYDB		9.620	-0.074	-0.11	9.72	-0.28	-0.47
Y9D87E		9.993	0.299	0.46	9.63	-0.37	-0.62
YRBA8P		8.861	-0.833	-1.27	9.68	-0.33	-0.55

Summary Statistics	Sample PP49	Sample PP50
Grand Means	9.69 sec/100 cc	10.01 sec/100 cc
Stnd Dev Btwn Labs	0.65 sec/100 cc	0.60 sec/100 cc

Statistics based on 26 of 28 reporting participants.

Comments on Assigned Data Flags for Test #3121

PD42C4 (X) - Extreme Data.

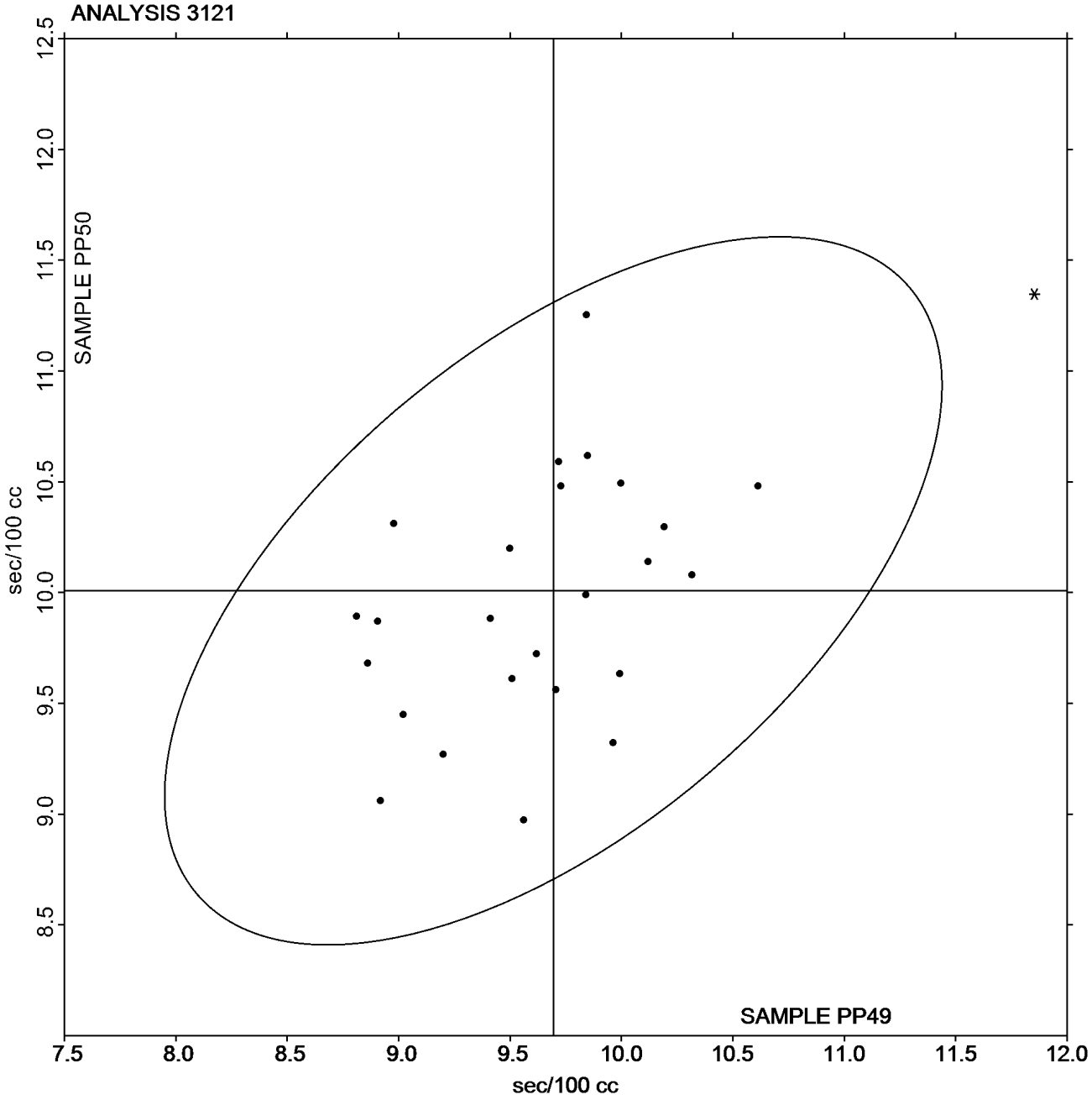
WM6UMG_AL (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	GL	Gurley #4110
GS	Gurley-Hill S-P-S Tester #4190	HG	Technidyne - Hagerty Model #1
LA	L & W Autoline	LP	L & W Densometer, Air Permeance
LR	L & W Air Permeance	PP	Technidyne Profile/Plus
TL	Gurley Densometer #4110, Oil Flotation	WG	W & LE Gurley Tester

Grand Mean Sample PP49 = 9.6940 sec/100 cc

Grand Mean Sample PP50 = 10.008 sec/100 cc



Paper & Paperboard Interlaboratory Testing Program

Analysis 3131

Roughness - Print Surf Method - 2.5 to 6.0 Microns

TAPPI Official Test Method T555

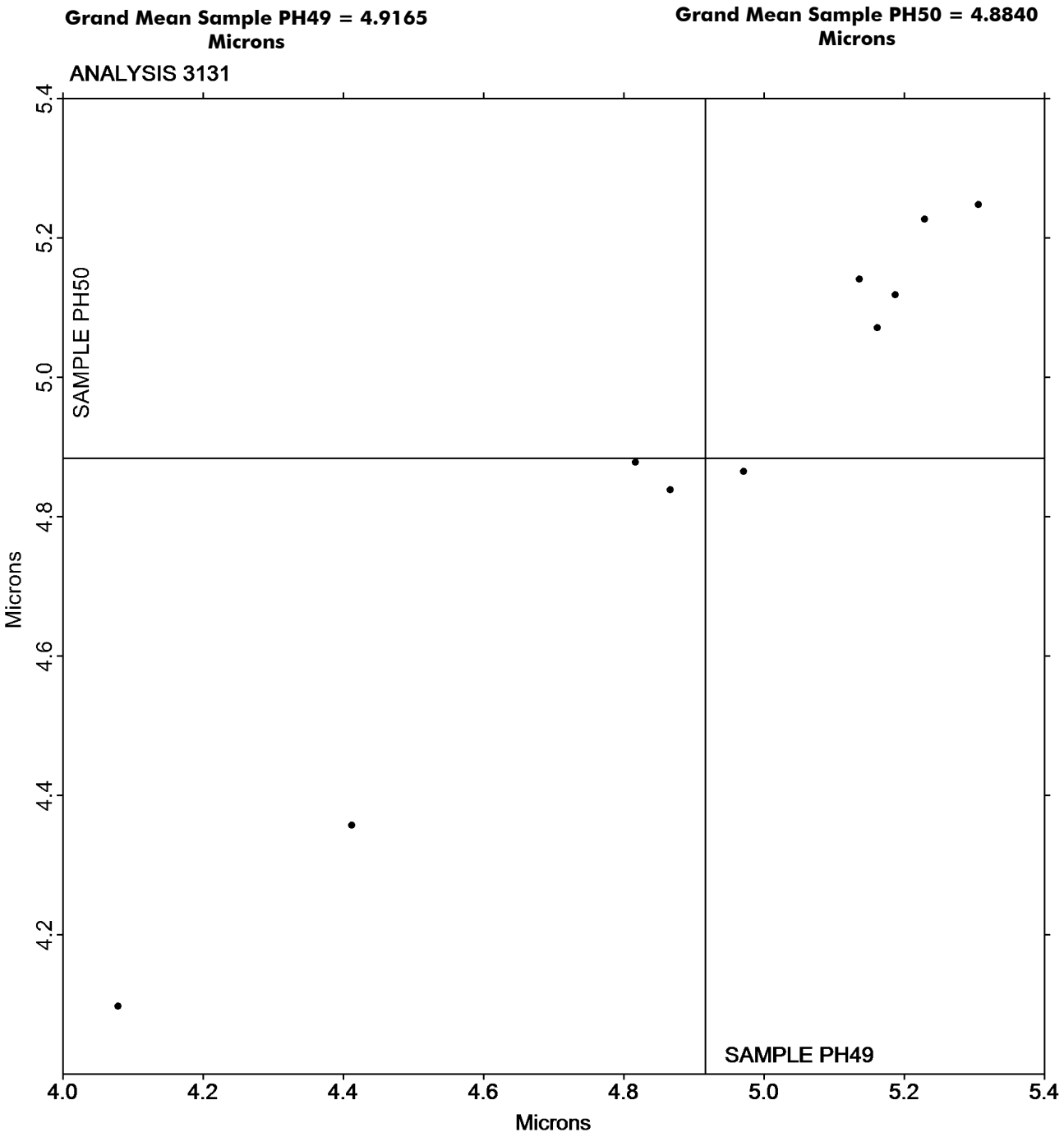
WebCode	Data Flag	Sample PH49 Lab Mean	Sample PH49 Diff from Grand Mean	Sample PH49 CPV	Sample PH50 Lab Mean	Sample PH50 Diff from Grand Mean	Sample PH50 CPV
6Z22UJ		5.187	0.270	0.69	5.118	0.234	0.61
8YEAX4		5.136	0.220	0.56	5.141	0.257	0.67
9QJUL6		5.229	0.312	0.79	5.227	0.343	0.90
CWZ938		4.866	-0.050	-0.13	4.838	-0.046	-0.12
FCZEJ8		4.971	0.055	0.14	4.865	-0.019	-0.05
FXYHMZ		4.412	-0.504	-1.28	4.357	-0.527	-1.38
H2NYP4		5.306	0.390	0.99	5.248	0.364	0.96
NNLLWZ		4.079	-0.838	-2.12	4.097	-0.787	-2.07
VVGUGT		4.817	-0.099	-0.25	4.878	-0.006	-0.02
WZ7T9T		5.162	0.245	0.62	5.071	0.187	0.49

Summary Statistics	Sample PH49	Sample PH50
Grand Means	4.92 Microns	4.88 Microns
Stnd Dev Btwn Labs	0.39 Microns	0.38 Microns

Statistics based on 10 of 10 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



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

WebCode	Data Flag	Sample SR49 Lab Mean	Sample SR49 Diff from Grand Mean	Sample SR49 CPV	Sample SR50 Lab Mean	Sample SR50 Diff from Grand Mean	Sample SR50 CPV
49XG7H		169.6	-24.3	-1.87	182.7	-12.2	-0.95
4A8LJ7		214.7	20.8	1.60	206.8	11.9	0.93
4E4BZD		195.2	1.3	0.10	193.8	-1.1	-0.09
6AB78A		175.2	-18.7	-1.44	184.7	-10.2	-0.80
6K6MWB		197.8	3.9	0.30	187.1	-7.8	-0.61
6Z22UJ		192.4	-1.5	-0.12	201.0	6.1	0.48
8GJGD7		197.0	3.1	0.24	204.3	9.4	0.73
8YEAX4		184.8	-9.1	-0.70	200.3	5.4	0.42
8ZATZ6		197.0	3.1	0.24	204.4	9.5	0.74
9QJUL6		202.8	8.9	0.69	198.7	3.8	0.30
A6VPE7	*	229.5	35.6	2.74	234.4	39.4	3.08
CMRTWY		212.4	18.5	1.42	197.1	2.1	0.17
CWZ938		203.5	9.6	0.74	213.0	18.1	1.41
CXVPF6		193.2	-0.7	-0.05	193.5	-1.4	-0.11
D8VYYY		172.2	-21.7	-1.67	177.0	-17.9	-1.40
DNHE3V		177.3	-16.6	-1.28	181.5	-13.4	-1.05
FCZEJ8		187.4	-6.5	-0.50	200.8	5.9	0.46
FXYHMZ		184.9	-9.0	-0.69	178.7	-16.2	-1.27
H2NYP4		188.9	-5.0	-0.39	174.8	-20.1	-1.57
HUTWNT	*	171.8	-22.1	-1.70	162.7	-32.3	-2.52
J9QBL2		202.2	8.3	0.64	206.9	12.0	0.94
K4663W		186.3	-7.6	-0.59	191.3	-3.6	-0.28
M9YLRV		197.2	3.3	0.25	196.1	1.2	0.09
MV9PQX		206.5	12.6	0.97	208.0	13.1	1.03
MWG28Y_AL		197.8	3.9	0.30	193.4	-1.5	-0.12
NNLLWZ		204.5	10.6	0.82	212.5	17.6	1.38
PPB83W		181.3	-12.6	-0.97	188.1	-6.9	-0.54
QAV9WV		194.6	0.7	0.05	194.0	-0.9	-0.07
QAYTKY		184.8	-9.1	-0.70	185.2	-9.7	-0.76
QH9CRB		198.7	4.8	0.37	193.9	-1.0	-0.08
QTQ2HT		208.1	14.2	1.09	204.4	9.5	0.74
QWR3HQ	X	317.7	123.8	9.54	319.1	124.2	9.71
RKUL7U		202.9	9.0	0.69	189.4	-5.5	-0.43
RZ3DBK		180.1	-13.8	-1.06	191.6	-3.3	-0.26
V3H7DP		180.4	-13.5	-1.04	180.3	-14.6	-1.14
VVGUGT		195.5	1.6	0.12	198.8	3.9	0.30
WCJT6L		198.1	4.2	0.32	198.5	3.6	0.28
WM6UMG_AL		201.8	7.9	0.61	200.8	5.9	0.46
XNBYDB		209.1	15.2	1.17	204.9	10.0	0.78
Y9D87E		184.6	-9.3	-0.72	186.3	-8.6	-0.67

Paper & Paperboard Interlaboratory Testing Program

Analysis 3133
Roughness - Sheffield Type
TAPPI Official Test Method T538

Summary Statistics	Sample SR49	Sample SR50
Grand Means	193.90 Sheffield	194.91 Sheffield
Stnd Dev Btwn Labs	12.98 Sheffield	12.79 Sheffield

Statistics based on 39 of 40 reporting participants.

Comments on Assigned Data Flags for Test #3133

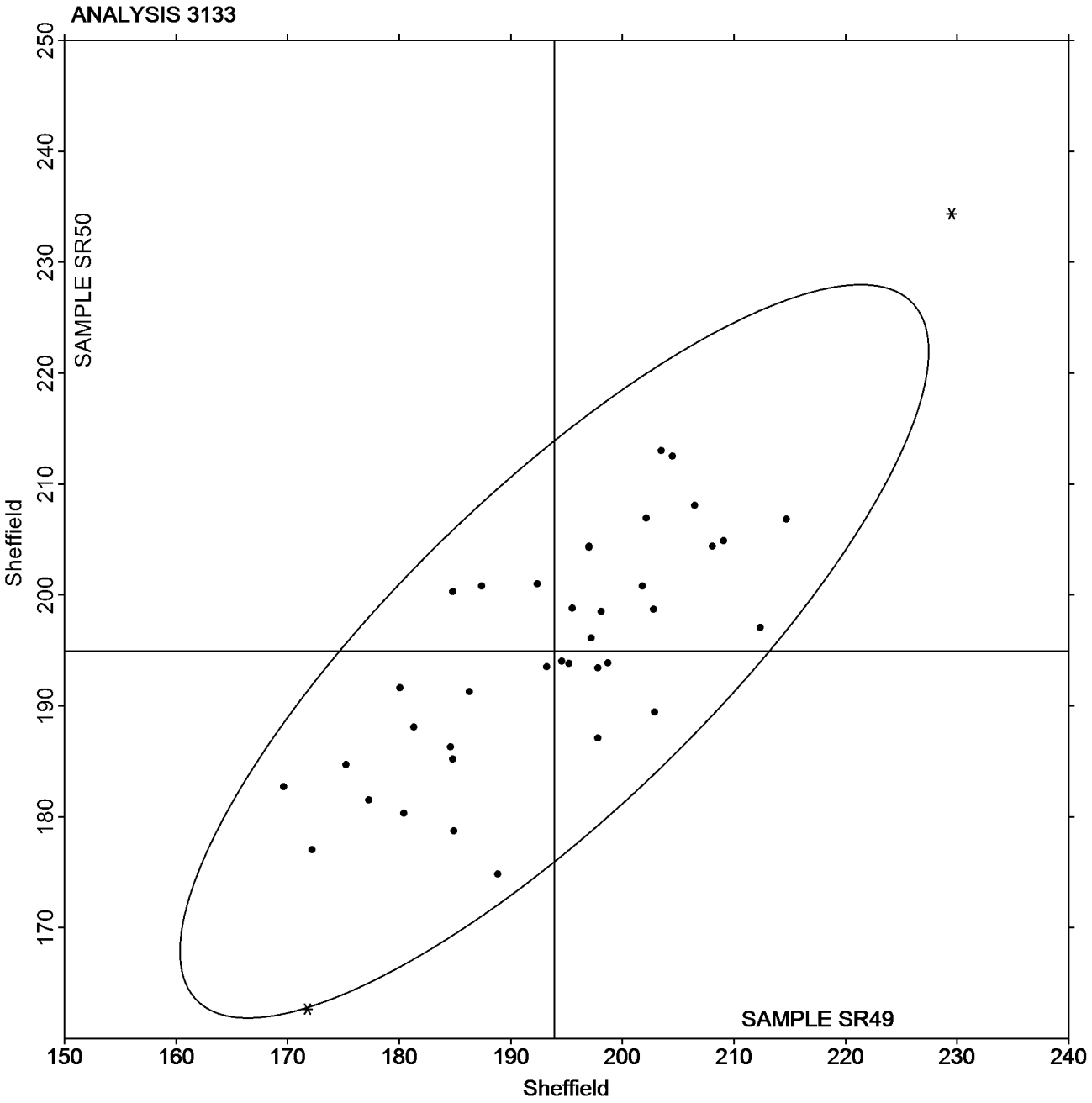
QWR3HQ (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	HM	Technidyne - Hagerty Model #538
LA	L & W Roughness Sheffield - Autoline	LB	L & W - Autoline 600
LW	L & W Roughness Tester	PG	Precision Gage Smoothcheck
PP	Technidyne Profile/Plus	SH	Sheffield (Bendix Precisionaire)
ST	Sheffield Smoothness Tester	VM	Valmet PaperLab (was Kajaani\Robotest)
XX	Instrument make/model not specified by lab		

Grand Mean Sample SR49 = 193.90
Sheffield

Grand Mean Sample SR50 = 194.91
Sheffield



Paper & Paperboard Interlaboratory Testing Program

Analysis 3135
Grammage (Mass per Unit Area)
TAPPI Official Test Method T410

WebCode	Data Flag	Sample GM49 Lab Mean	Sample GM49 Diff from Grand Mean	Sample GM49 CPV	Sample GM50 Lab Mean	Sample GM50 Diff from Grand Mean	Sample GM50 CPV
49XG7H		87.25	0.36	0.99	102.3	0.4	0.85
7LYRQA		86.96	0.07	0.19	102.2	0.3	0.56
9NFY33		86.70	-0.19	-0.52	102.0	0.1	0.12
AJG2QF		87.18	0.29	0.81	101.9	0.0	-0.10
C98ETZ		86.59	-0.30	-0.82	101.6	-0.3	-0.65
CMRTWY		87.31	0.42	1.17	101.9	0.0	0.00
F2ED2C		86.61	-0.27	-0.76	101.9	0.0	0.05
HUTWNT		87.28	0.39	1.09	102.6	0.6	1.32
JKXFCU		86.49	-0.39	-1.09	101.2	-0.7	-1.43
MWG28Y		87.25	0.36	1.00	102.6	0.6	1.32
PPB83W		86.70	-0.19	-0.52	101.7	-0.2	-0.38
QAV9WV		87.06	0.17	0.48	101.8	-0.1	-0.16
QWR3HQ		86.92	0.03	0.09	102.6	0.6	1.32
VFPWFX		86.00	-0.89	-2.45	100.7	-1.2	-2.55
VKJT6N		86.63	-0.26	-0.72	101.5	-0.5	-0.96
VLEAGL		87.45	0.56	1.55	102.2	0.3	0.58
WBNB4K		86.84	-0.05	-0.13	101.4	-0.5	-1.15
WLAEBK		86.98	0.09	0.24	102.3	0.4	0.74
XXXZUK		86.48	-0.41	-1.13	101.9	-0.1	-0.13
Y9D87E		87.08	0.19	0.53	102.2	0.3	0.63
ZEEJ2C	X	83.83	-3.06	-8.45	101.9	0.0	0.05

Summary Statistics	Sample GM49	Sample GM50
Grand Means	86.89 g/sq m	101.92 g/sq m
Stnd Dev Btwn Labs	0.36 g/sq m	0.48 g/sq m

Statistics based on 20 of 21 reporting participants.

Comments on Assigned Data Flags for Test #3135

ZEEJ2C (X) - Extreme Data for sample GM49.

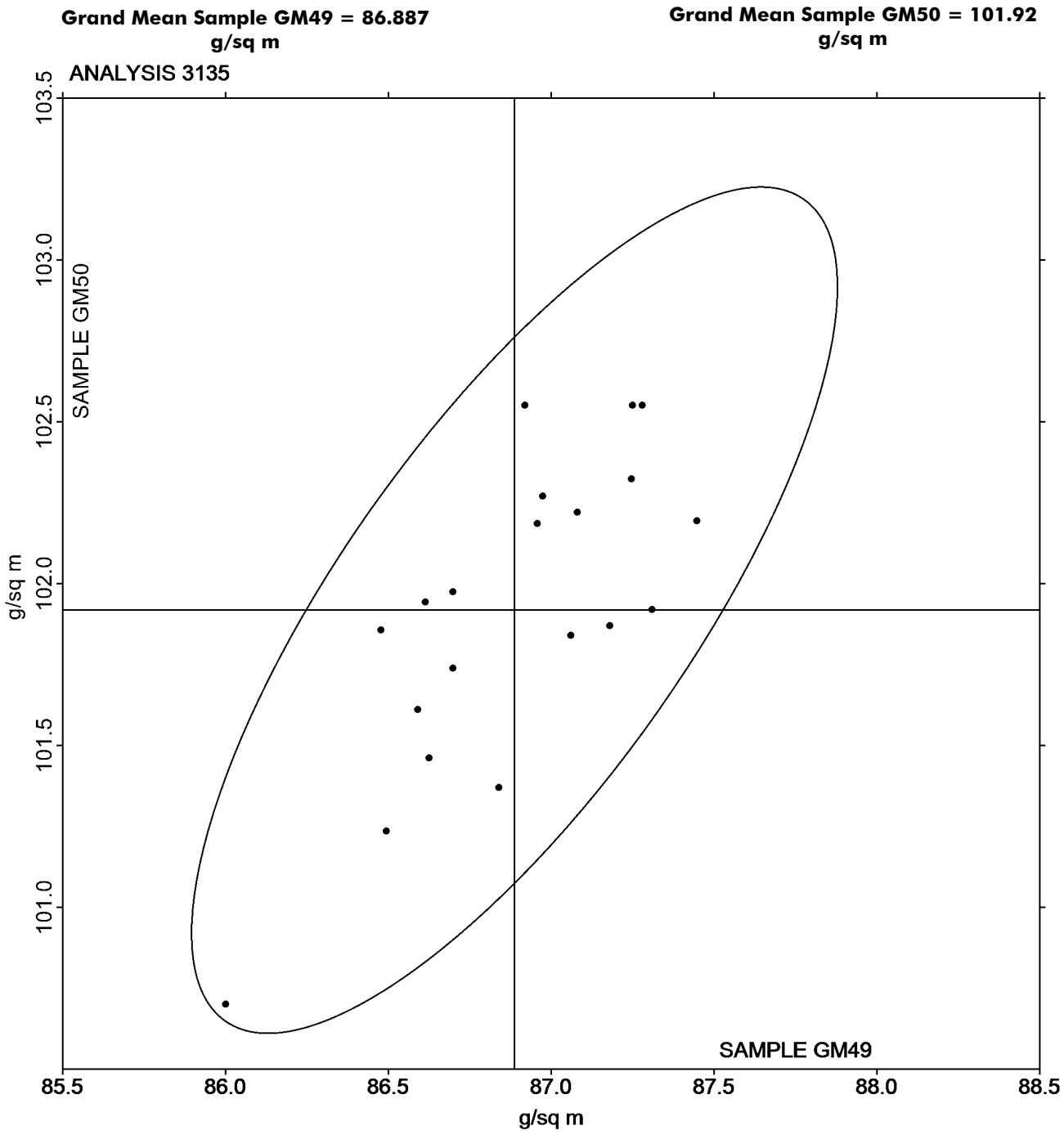
Analysis Notes:

PPB83W - Data appear to be off by a factor of 3.7597. CTS will not correct going forward.

VFPWFX - Data appear to be off by a factor of .01 (x100). CTS will not correct going forward.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Paper & Paperboard Interlaboratory Testing Program

Analysis 3141

Opacity (89% Reflectance Backing) - Fine Papers

TAPPI Official Test Method T425

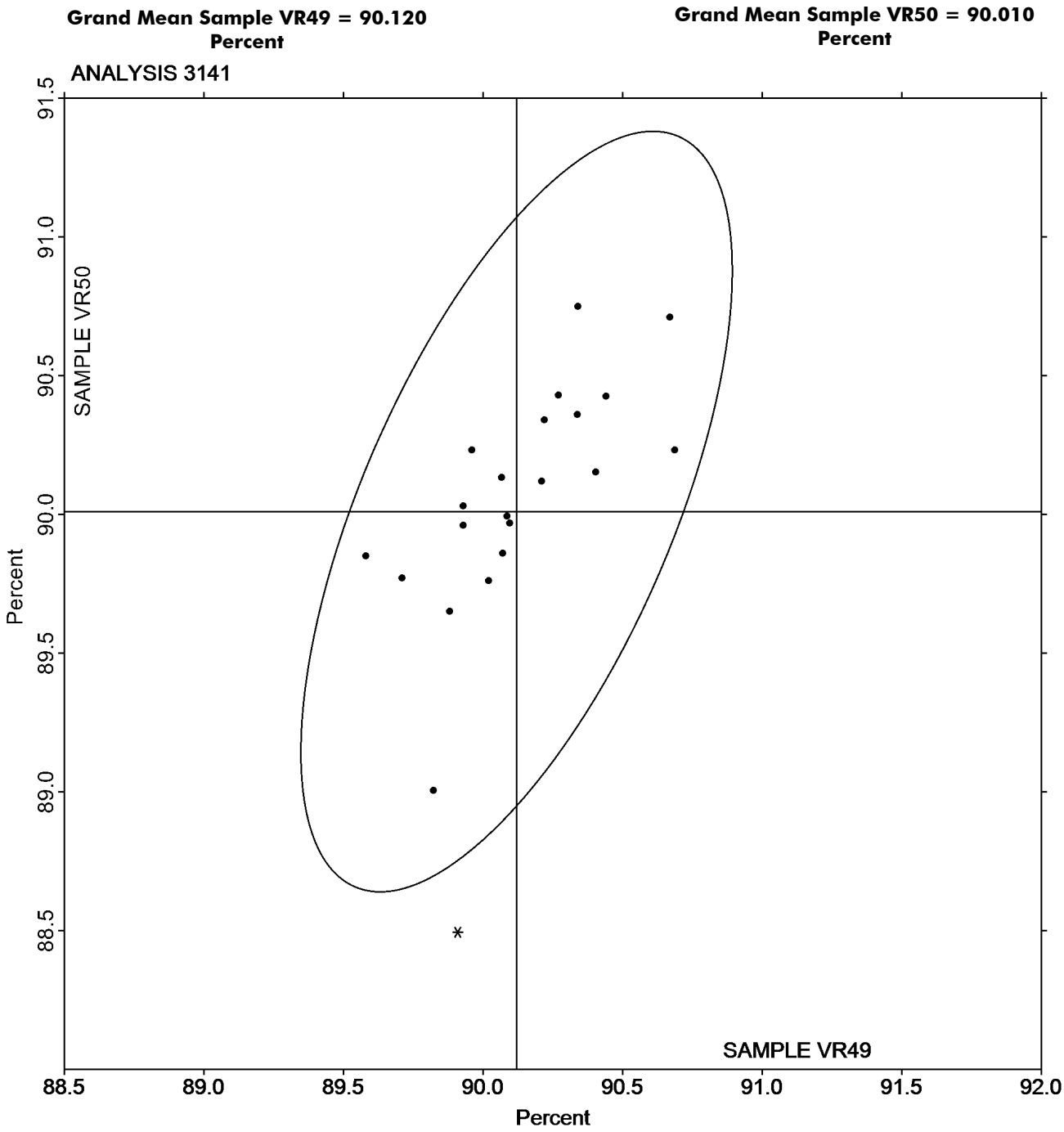
WebCode	Data Flag	Sample VR49 Lab Mean	Sample VR49 Diff from Grand Mean	Sample VR49 CPV	Sample VR50 Lab Mean	Sample VR50 Diff from Grand Mean	Sample VR50 CPV
49XG7H		90.02	-0.10	-0.35	89.76	-0.25	-0.49
4A8LJ7		90.07	-0.05	-0.18	89.86	-0.15	-0.30
6AB78A		90.07	-0.05	-0.19	90.13	0.12	0.24
6YQ3ZA		90.34	0.22	0.77	90.36	0.35	0.69
6Z22UJ		89.96	-0.16	-0.56	90.23	0.22	0.44
8YEAX4		90.69	0.57	1.99	90.23	0.22	0.44
CMRTWY		89.71	-0.41	-1.44	89.77	-0.24	-0.47
DNHE3V		90.44	0.32	1.12	90.43	0.42	0.82
EABTDB		90.40	0.28	1.00	90.15	0.14	0.28
H2NYP4		90.10	-0.02	-0.08	89.97	-0.04	-0.08
HUTWNT	*	89.91	-0.21	-0.74	88.49	-1.52	-3.00
MWG28Y		90.27	0.15	0.53	90.43	0.42	0.83
PPB83W		89.88	-0.24	-0.84	89.65	-0.36	-0.71
QAV9WV		89.93	-0.19	-0.67	89.96	-0.05	-0.10
QAYTKY		90.67	0.55	1.93	90.71	0.70	1.38
QH9CRB		90.09	-0.03	-0.12	89.99	-0.02	-0.03
RZ3DBK		89.93	-0.19	-0.67	90.03	0.02	0.04
V3H7DP		89.82	-0.30	-1.04	89.01	-1.01	-1.99
VKJT6N		90.34	0.22	0.77	90.75	0.74	1.46
WM6UMG		90.21	0.09	0.32	90.12	0.11	0.22
XNBYDB		90.22	0.10	0.35	90.34	0.33	0.65
Y9D87E		89.58	-0.54	-1.89	89.85	-0.16	-0.32

Summary Statistics	Sample VR49	Sample VR50
Grand Means	90.12 Percent	90.01 Percent
Stnd Dev Btwn Labs	0.29 Percent	0.51 Percent

Statistics based on 22 of 22 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Paper & Paperboard Interlaboratory Testing Program

Analysis 3145

Directional Brightness of Fluorescent Samples

TAPPI Official Test Method T452

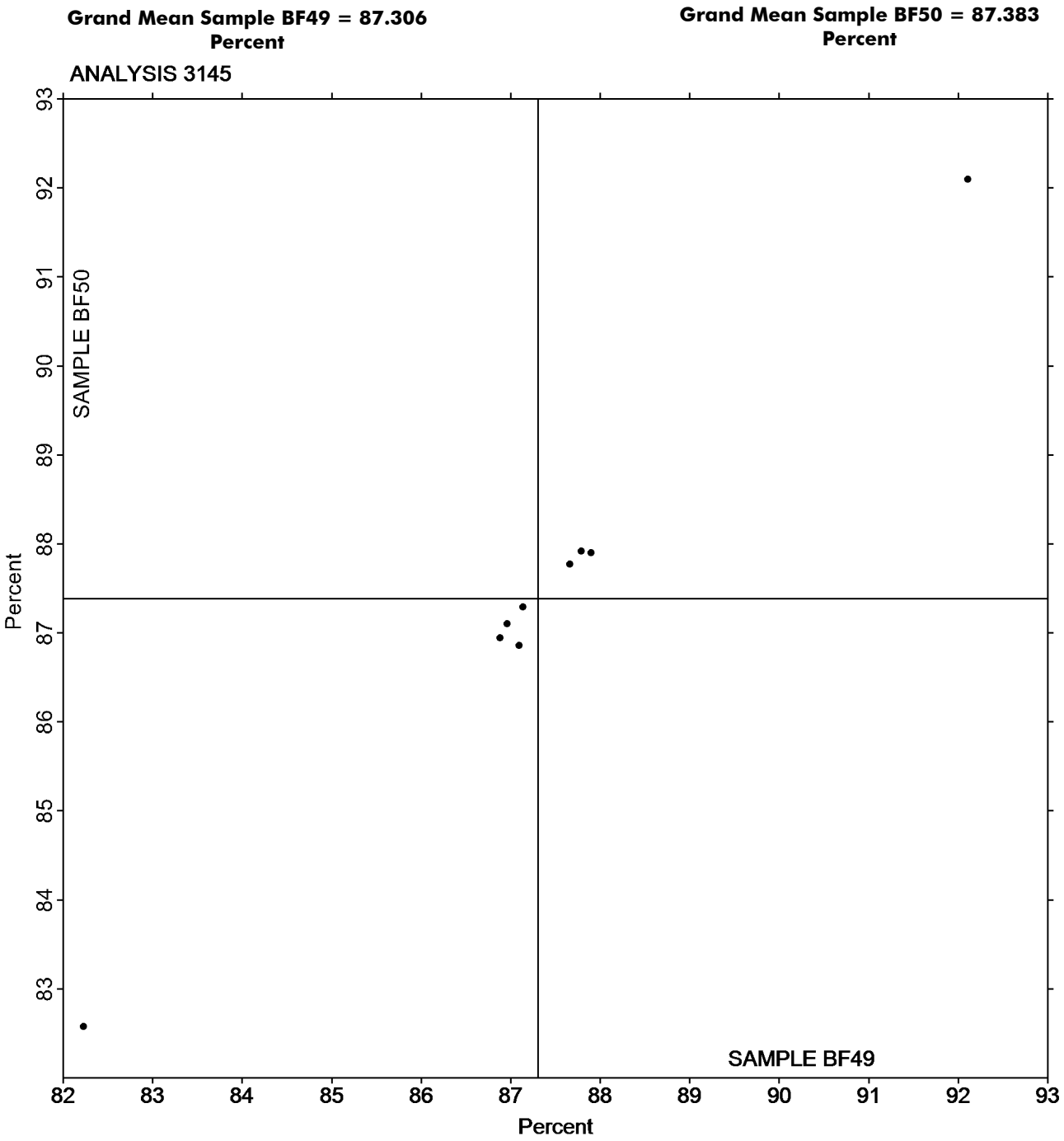
WebCode	Data Flag	Sample BF49 Lab Mean	Sample BF49 Diff from Grand Mean	Sample BF49 CPV	Sample BF50 Lab Mean	Sample BF50 Diff from Grand Mean	Sample BF50 CPV
6K6MWB		86.96	-0.35	-0.14	87.10	-0.28	-0.12
6YQ3ZA		87.14	-0.17	-0.07	87.29	-0.10	-0.04
8YEAX4		87.79	0.49	0.19	87.92	0.53	0.22
DNHE3V		82.23	-5.08	-2.03	82.58	-4.81	-1.99
EABTDB		87.10	-0.21	-0.08	86.86	-0.52	-0.22
HUTWNT		87.66	0.35	0.14	87.77	0.39	0.16
MV9PQX		92.11	4.80	1.92	92.10	4.71	1.95
QH9CRB		86.88	-0.43	-0.17	86.94	-0.44	-0.18
VKJT6N		87.90	0.59	0.24	87.90	0.51	0.21

Summary Statistics	Sample BF49	Sample BF50
Grand Means	87.31 Percent	87.38 Percent
Stnd Dev Btwn Labs	2.50 Percent	2.41 Percent

Statistics based on 9 of 9 reporting participants.

Key to Instrument Codes Reported by Participants

PP	Technidyne Profile/Plus	TC	Technidyne Color Touch Series
TD	Technidyne Color Touch X-45	TE	Technidyne TEST/Plus TAPPI Brightness
TS	Technidyne Brightimeter Micro S-5	TT	Technidyne Brightimeter Micro S4-M



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 3146

Fluorescent Component of Directional Brightness

TAPPI Official Test Method T452

WebCode	Data Flag	Sample BF49 Lab Mean	Sample BF49 Diff from Grand Mean	Sample BF49 CPV	Sample BF50 Lab Mean	Sample BF50 Diff from Grand Mean	Sample BF50 CPV
6K6MWB		4.360	-0.319	-1.26	4.500	-0.231	-1.04
6YQ3ZA		4.354	-0.325	-1.28	4.416	-0.315	-1.42
8YEAX4		4.858	0.179	0.70	4.872	0.141	0.64
DNHE3V	X	14.212	9.533	37.57	14.140	9.409	42.48
EABTDB		4.762	0.083	0.33	4.762	0.031	0.14
HUTWNT		4.902	0.223	0.88	4.954	0.223	1.01
MV9PQX	X	86.690	82.011	323.18	86.738	82.007	370.20
QH9CRB		4.840	0.161	0.63	4.880	0.149	0.67

Summary Statistics	Sample BF49	Sample BF50
Grand Means	4.68 Percent	4.73 Percent
Stnd Dev Btwn Labs	0.25 Percent	0.22 Percent

Statistics based on 6 of 8 reporting participants.

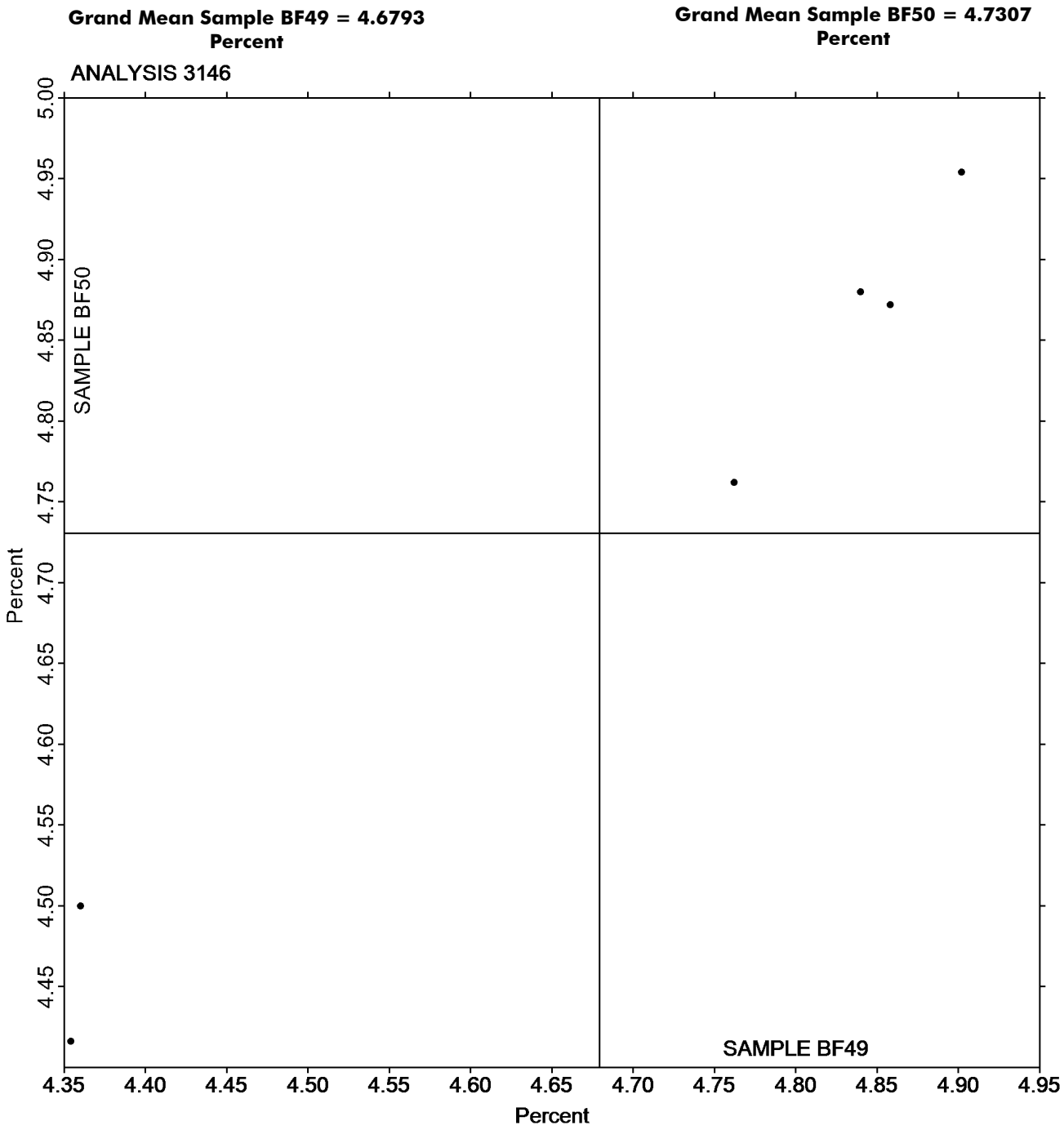
Comments on Assigned Data Flags for Test #3146

MV9PQX (X) - Extreme Data.

DNHE3V (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

PP	Technidyne Profile/Plus	TD	Technidyne Color Touch X-45
TE	Technidyne TEST/Plus TAPPI Brightness	TS	Technidyne Brightimeter Micro S-5
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 3201

Bending Resistance, Taber Type - 0 to 10 Units

TAPPI Official Test Method T566

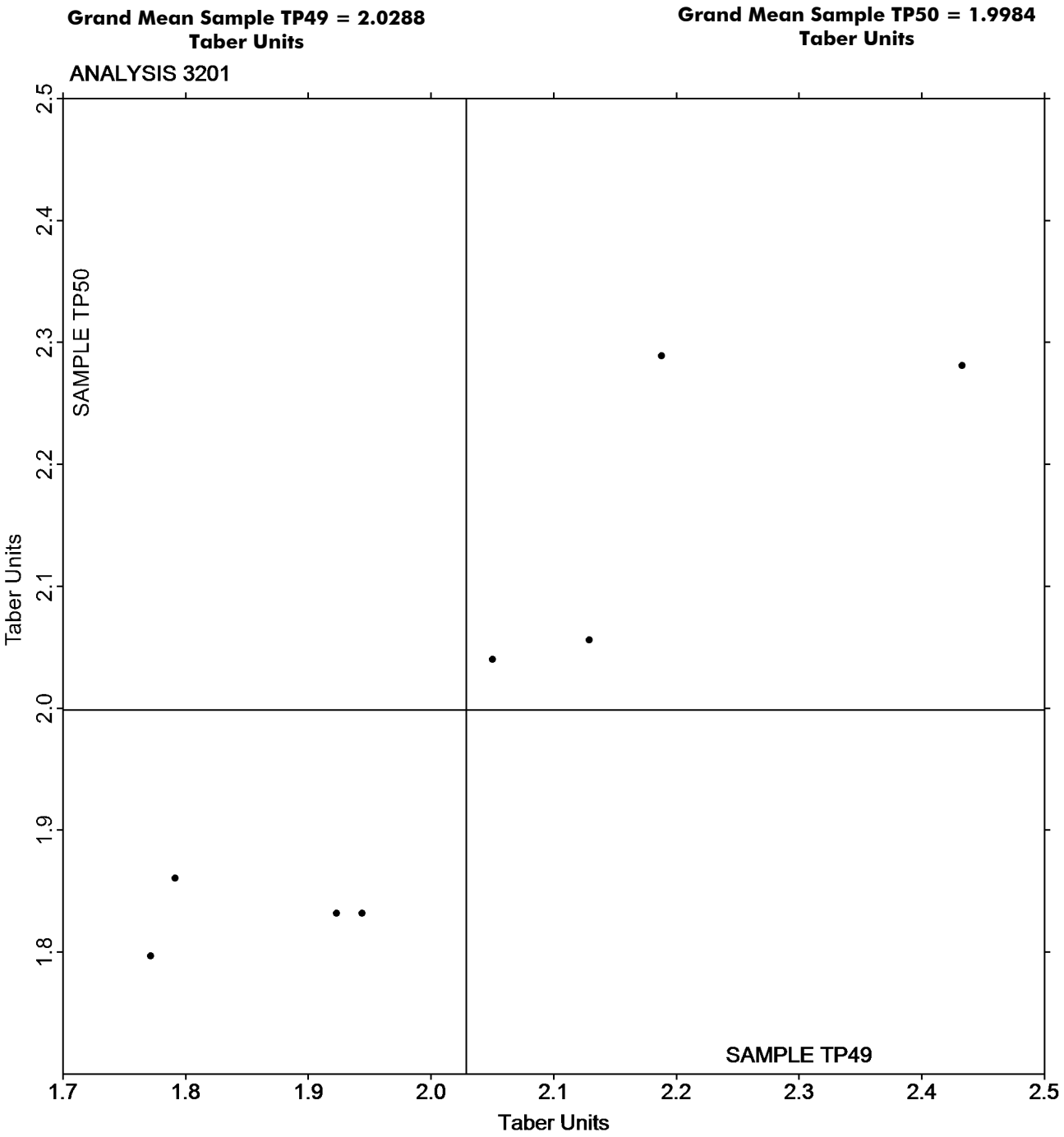
WebCode	Data Flag	Sample TP49 Lab Mean	Sample TP49 Diff from Grand Mean	Sample TP49 CPV	Sample TP50 Lab Mean	Sample TP50 Diff from Grand Mean	Sample TP50 CPV
43RNCM		2.188	0.159	0.72	2.289	0.291	1.44
6Z22UJ		1.772	-0.257	-1.17	1.797	-0.201	-1.00
CMRTWY		2.129	0.100	0.45	2.056	0.058	0.29
DNHE3V		1.923	-0.106	-0.48	1.832	-0.166	-0.83
QH9CRB		1.792	-0.237	-1.08	1.861	-0.138	-0.68
RZ3DBK		2.433	0.404	1.83	2.281	0.283	1.40
V3H7DP		2.050	0.021	0.10	2.040	0.042	0.21
XNBYDB		1.944	-0.085	-0.38	1.832	-0.166	-0.83

Summary Statistics	Sample TP49	Sample TP50
Grand Means	2.03 Taber Units	2.00 Taber Units
Stnd Dev Btwn Labs	0.22 Taber Units	0.20 Taber Units

Statistics based on 8 of 8 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



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 3203

Bending Resistance, Taber Type - 10 to 100 Taber Units

TAPPI Official Test Method T489

WebCode	Data Flag	Sample TC49 Lab Mean	Sample TC49 Diff from Grand Mean	Sample TC49 CPV	Sample TC50 Lab Mean	Sample TC50 Diff from Grand Mean	Sample TC50 CPV
49XG7H		34.54	-0.37	-0.18	34.60	-0.60	-0.34
6YQ3ZA		31.82	-3.09	-1.47	34.75	-0.45	-0.25
C373W3		33.00	-1.91	-0.91	33.50	-1.70	-0.96
CWZ938		35.30	0.39	0.18	34.77	-0.43	-0.24
FCZEJ8		34.41	-0.50	-0.24	34.84	-0.36	-0.20
J9QBL2		38.66	3.75	1.78	38.77	3.57	2.02
KWRUA6		32.31	-2.60	-1.23	32.35	-2.85	-1.61
QTQ2HT		37.80	2.89	1.37	37.11	1.91	1.08
VVGUGT		35.76	0.85	0.40	35.15	-0.05	-0.03
WZ7T9T		34.67	-0.24	-0.12	34.51	-0.69	-0.39
XNBYDB		35.77	0.86	0.41	36.81	1.61	0.91

Summary Statistics	Sample TC49	Sample TC50
Grand Means	34.91 Taber Units	35.20 Taber Units
Stnd Dev Btwn Labs	2.11 Taber Units	1.77 Taber Units

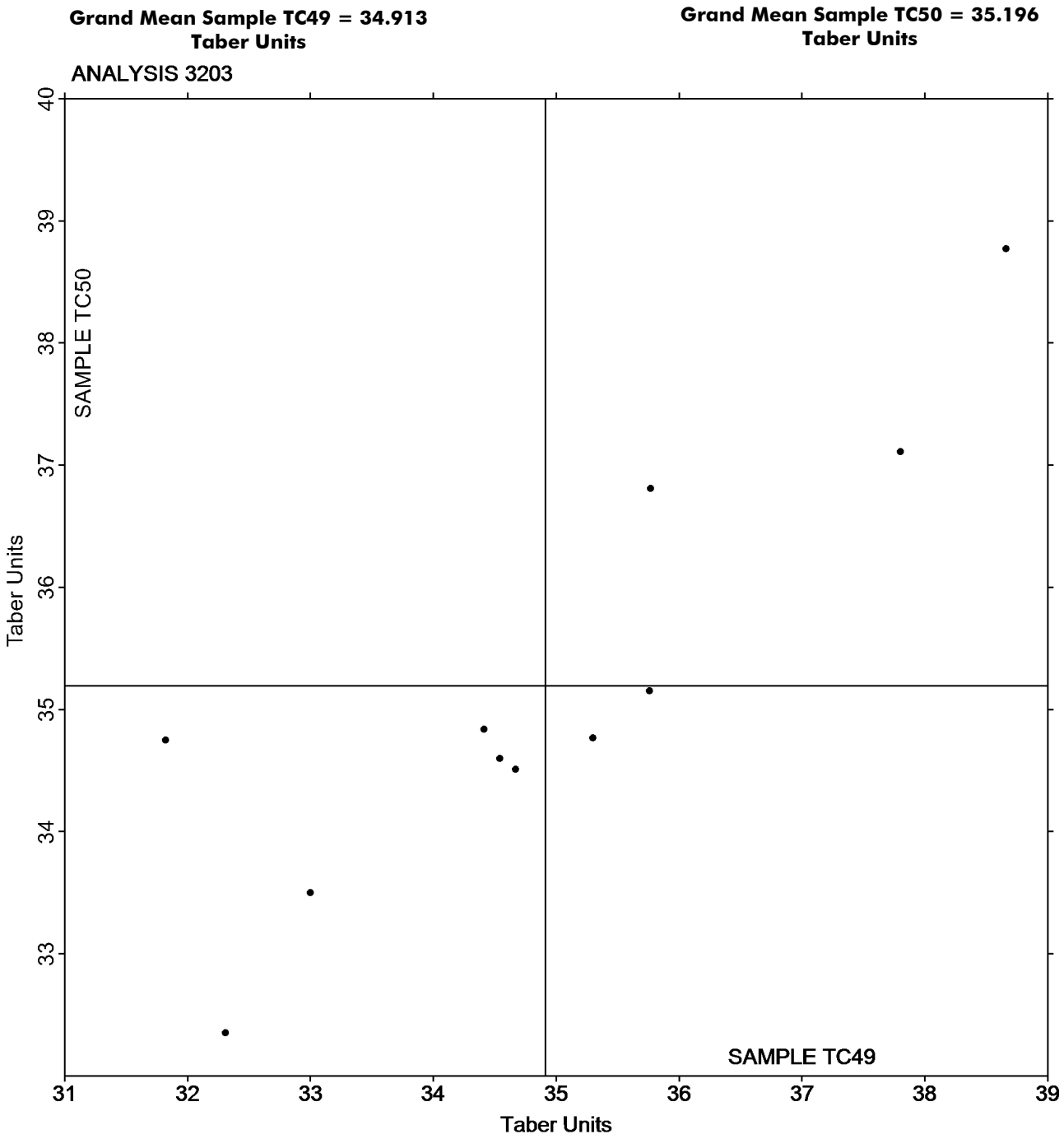
Statistics based on 11 of 11 reporting participants.

Analysis Notes:

VVGUGT - 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.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



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 3205

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

TAPPI Official Test Method T489

WebCode	Data Flag	Sample TR49 Lab Mean	Sample TR49 Diff from Grand Mean	Sample TR49 CPV	Sample TR50 Lab Mean	Sample TR50 Diff from Grand Mean	Sample TR50 CPV
28CTVR		186.7	12.2	1.59	188.7	13.6	1.75
4E4BZD		178.7	4.2	0.55	180.4	5.2	0.68
7DGJ3D		166.0	-8.5	-1.11	166.9	-8.3	-1.07
8ZATZ6		171.8	-2.7	-0.35	172.4	-2.8	-0.36
9QJUL6		173.3	-1.1	-0.15	173.0	-2.2	-0.29
CWZ938		182.2	7.8	1.01	181.2	6.0	0.78
DJ92KW		167.2	-7.3	-0.95	165.8	-9.4	-1.21
FCZEJ8		180.6	6.1	0.80	182.6	7.4	0.96
NNLLWZ		160.8	-13.7	-1.78	164.0	-11.2	-1.44
QAYTKY		175.4	1.0	0.12	175.1	-0.1	-0.01
VVGUGT		176.4	1.9	0.25	176.8	1.6	0.21

Summary Statistics	Sample TR49	Sample TR50
Grand Means	174.47 Taber Units	175.17 Taber Units
Stnd Dev Btwn Labs	7.69 Taber Units	7.74 Taber Units

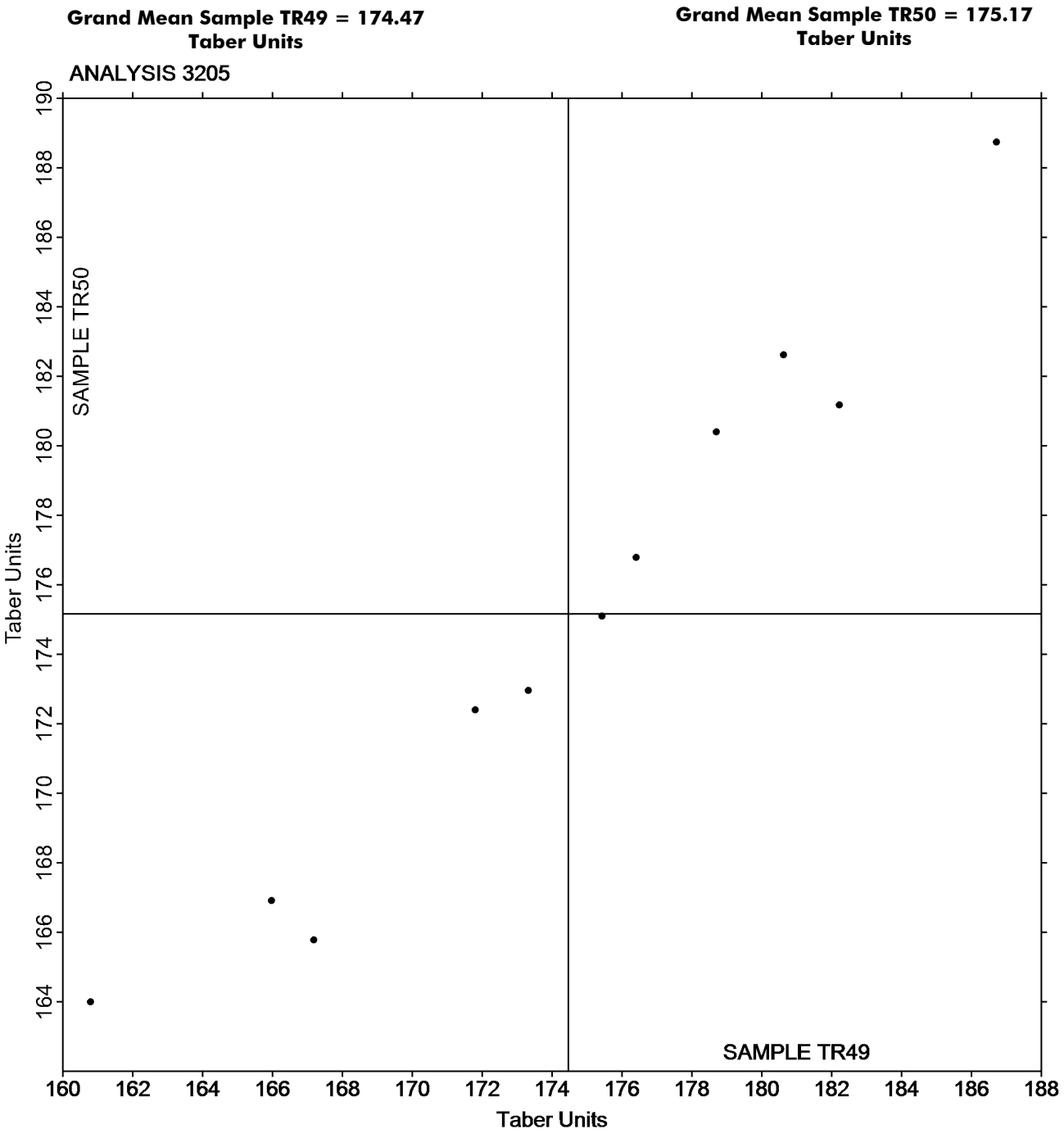
Statistics based on 11 of 11 reporting participants.

Analysis Notes:

VVGUGT - 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.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



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 3207
Z-Direction Tensile, Recycled Paperboard
TAPPI Official Test Method T541

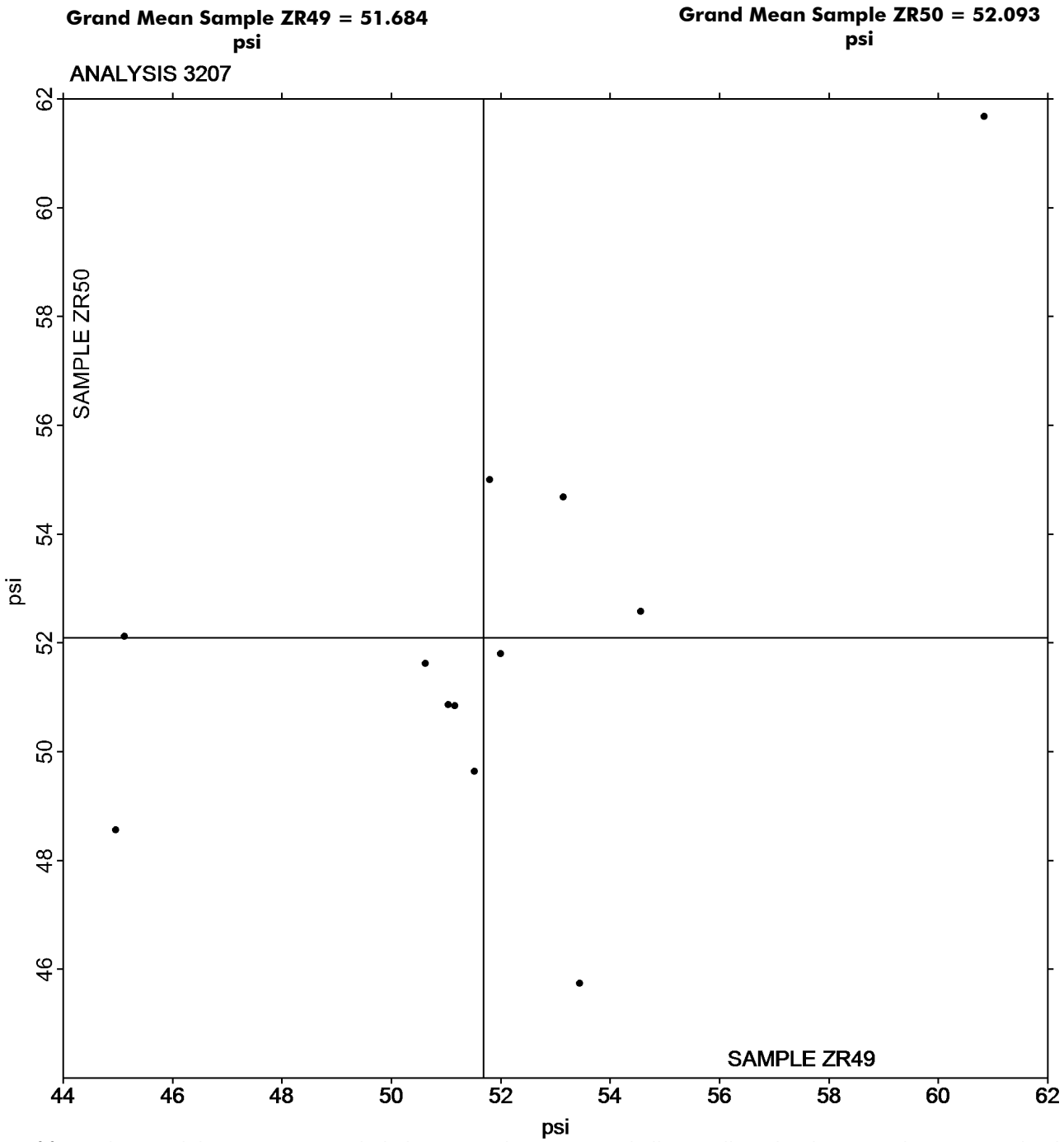
WebCode	Data Flag	Sample ZR49 Lab Mean	Sample ZR49 Diff from Grand Mean	Sample ZR49 CPV	Sample ZR50 Lab Mean	Sample ZR50 Diff from Grand Mean	Sample ZR50 CPV
6N9HFD		53.44	1.76	0.43	45.74	-6.36	-1.62
768UNE		51.04	-0.64	-0.16	50.86	-1.23	-0.31
8ZATZ6		50.62	-1.06	-0.26	51.62	-0.47	-0.12
9QJUL6		45.12	-6.56	-1.59	52.12	0.03	0.01
CWZ938		51.52	-0.16	-0.04	49.64	-2.45	-0.62
FXYHMZ		51.80	0.12	0.03	55.00	2.91	0.74
NNLLWZ		52.00	0.32	0.08	51.80	-0.29	-0.07
QAYTKY		51.16	-0.52	-0.13	50.84	-1.25	-0.32
RP7A7Q		60.84	9.16	2.22	61.68	9.59	2.44
TR8WYL		54.56	2.88	0.70	52.58	0.49	0.12
VVGUGT		53.14	1.46	0.35	54.68	2.59	0.66
WMKD6T		44.96	-6.72	-1.63	48.56	-3.53	-0.90

Summary Statistics	Sample ZR49	Sample ZR50
Grand Means	51.68 psi	52.09 psi
Stnd Dev Btwn Labs	4.13 psi	3.93 psi

Statistics based on 12 of 12 reporting participants.

Key to Instrument Codes Reported by Participants

CA	CSI CS-163	CD	CSI CS-163D
CH	Chatillon Ametek	LW	L & W ZD Tensile Tester
TA	Thwing-Albert Tensile 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 3209
Z-Direction Tensile
TAPPI Official Test Method T541

WebCode	Data Flag	Sample ZP49 Lab Mean	Sample ZP49 Diff from Grand Mean	Sample ZP49 CPV	Sample ZP50 Lab Mean	Sample ZP50 Diff from Grand Mean	Sample ZP50 CPV
4E4BZD		100.42	17.63	1.78	95.78	13.32	1.54
C373W3		81.60	-1.19	-0.12	83.00	0.54	0.06
J9QBL2		84.32	1.53	0.15	83.56	1.10	0.13
QTQ2HT		83.00	0.21	0.02	81.64	-0.82	-0.10
QWR3HQ		72.64	-10.16	-1.03	71.53	-10.93	-1.27
UBELPN		84.80	2.01	0.20	87.00	4.54	0.53
VVGUGT		88.08	5.29	0.53	87.88	5.42	0.63
WZ7T9T		67.48	-15.31	-1.55	69.32	-13.14	-1.52

Summary Statistics	Sample ZP49	Sample ZP50
Grand Means	82.79 psi	82.46 psi
Stnd Dev Btwn Labs	9.89 psi	8.63 psi

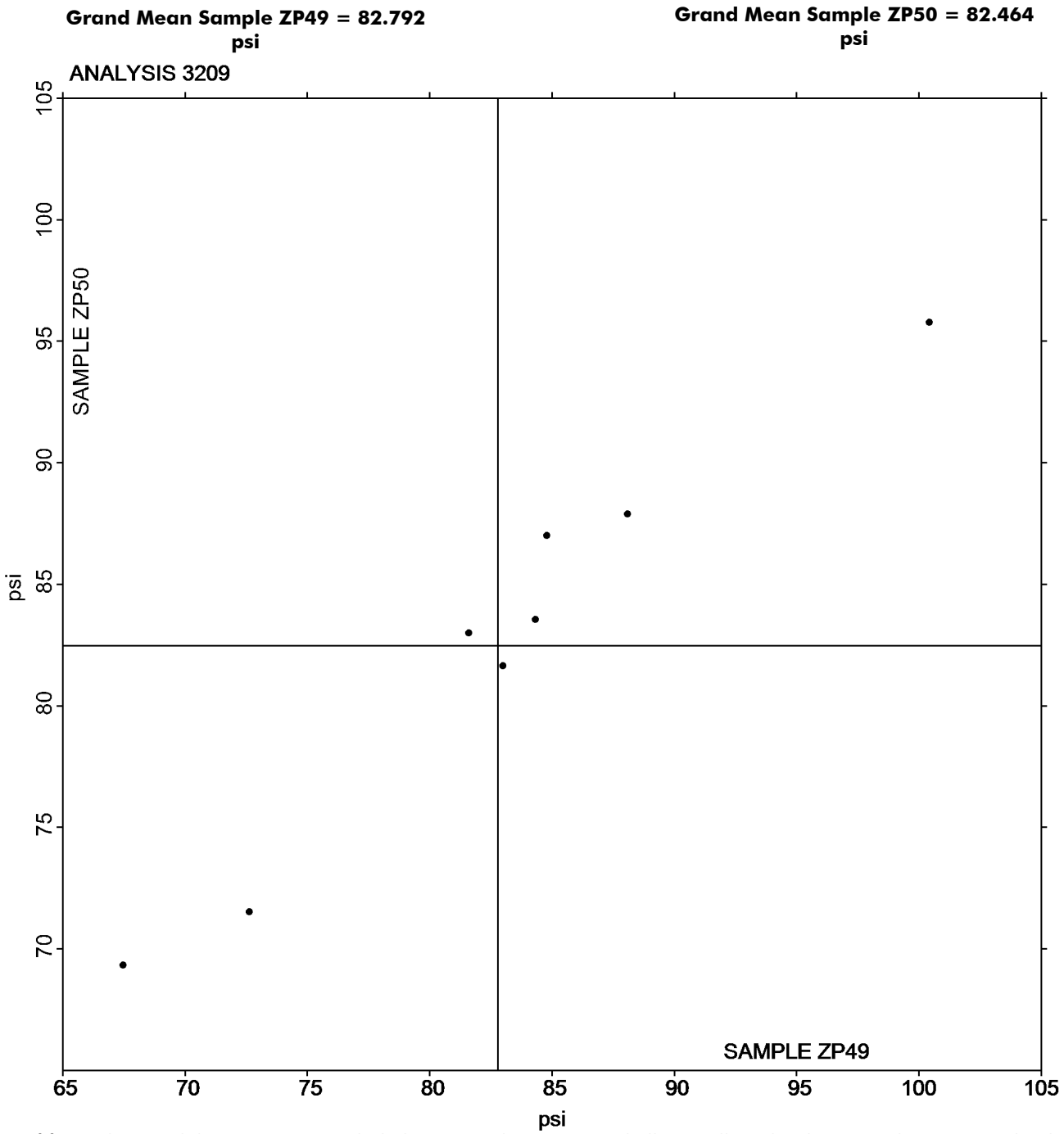
Statistics based on 8 of 8 reporting participants.

Key to Instrument Codes Reported by Participants

CD CSI CS-163D

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 3211

Internal Bond Strength - Modified Scott Mechanics

TAPPI Provisional Test Method T569

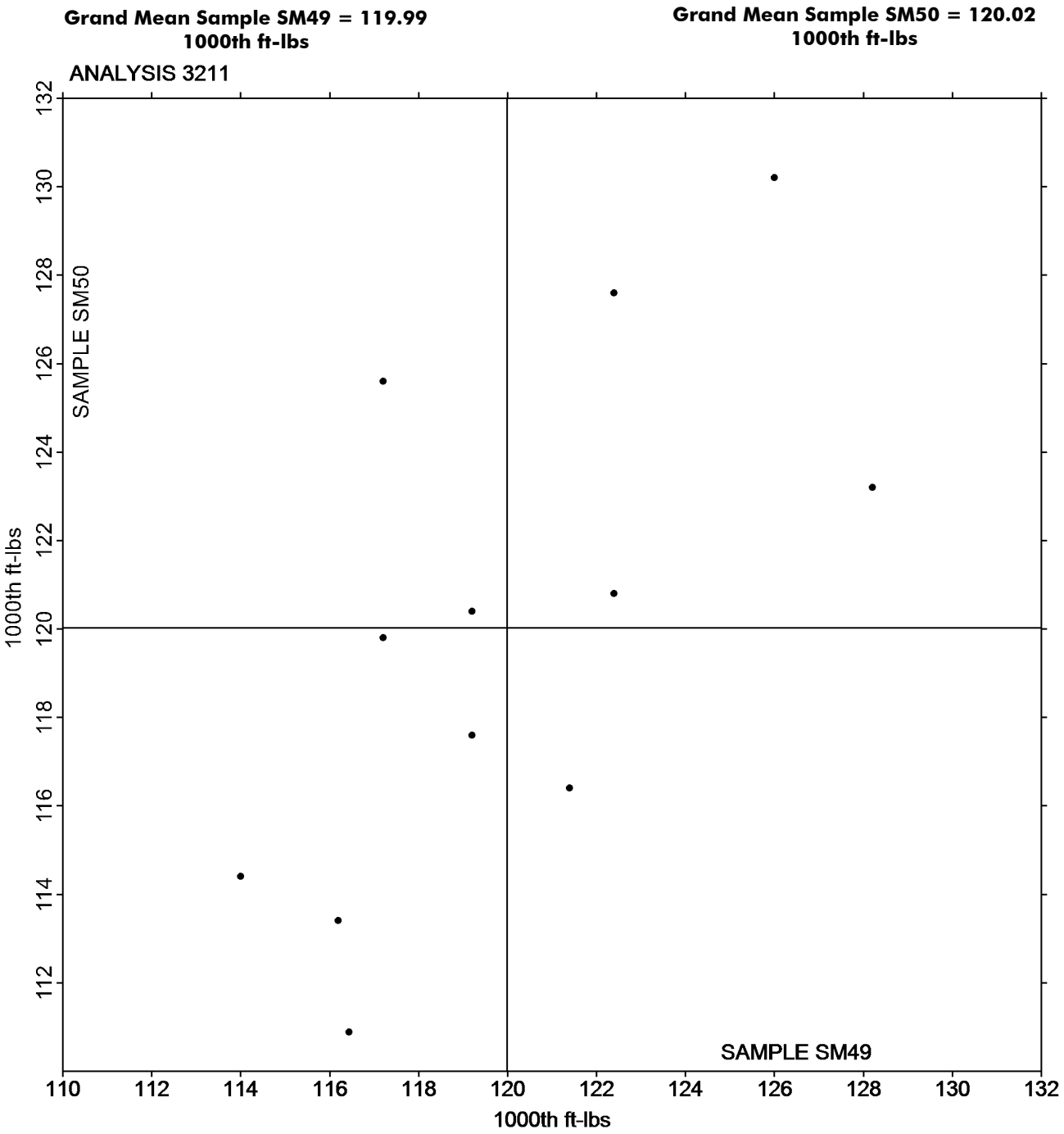
WebCode	Data Flag	Sample SM49 Lab Mean	Sample SM49 Diff from Grand Mean	Sample SM49 CPV	Sample SM50 Lab Mean	Sample SM50 Diff from Grand Mean	Sample SM50 CPV
43RNCM		116.4	-3.5	-0.84	110.9	-9.1	-1.55
4E4BZD		114.0	-6.0	-1.42	114.4	-5.6	-0.96
6AB78A		122.4	2.4	0.57	120.8	0.8	0.13
6K6MWB		119.2	-0.8	-0.19	117.6	-2.4	-0.41
9QJUL6		117.2	-2.8	-0.66	119.8	-0.2	-0.04
C373W3		126.0	6.0	1.42	130.2	10.2	1.73
HUTWNT		116.2	-3.8	-0.90	113.4	-6.6	-1.13
J9QBL2		122.4	2.4	0.57	127.6	7.6	1.29
K4663W		121.4	1.4	0.33	116.4	-3.6	-0.62
QTQ2HT		128.2	8.2	1.94	123.2	3.2	0.54
RKUL7U		119.2	-0.8	-0.19	120.4	0.4	0.06
VVGUGT		117.2	-2.8	-0.66	125.6	5.6	0.95

Summary Statistics	Sample SM49	Sample SM50
Grand Means	119.99 1000th ft-lbs	120.02 1000th ft-lbs
Stnd Dev Btwn Labs	4.23 1000th ft-lbs	5.89 1000th ft-lbs

Statistics based on 12 of 12 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 3213

Internal Bond Strength - Scott Bond Models

TAPPI Provisional Test Method T569

WebCode	Data Flag	Sample SB49 Lab Mean	Sample SB49 Diff from Grand Mean	Sample SB49 CPV	Sample SB50 Lab Mean	Sample SB50 Diff from Grand Mean	Sample SB50 CPV
2BUDH8		111.8	-0.2	-0.01	106.8	-5.2	-0.52
6AB78A		103.2	-8.8	-0.73	103.0	-8.9	-0.90
8GJGD7		129.2	17.2	1.43	129.0	17.1	1.71
D8VYYY		116.2	4.2	0.35	108.6	-3.3	-0.33
DNHE3V		96.6	-15.4	-1.28	102.0	-9.9	-1.00
E2JBY3		97.2	-14.8	-1.23	111.6	-0.3	-0.03
KWRUA6		118.4	6.4	0.53	109.2	-2.8	-0.28
WM6UMG		123.2	11.2	0.93	125.4	13.5	1.35

Summary Statistics	Sample SB49	Sample SB50
Grand Means	111.97 1000th ft-lbs	111.94 1000th ft-lbs
Stnd Dev Btwn Labs	12.03 1000th ft-lbs	9.98 1000th ft-lbs

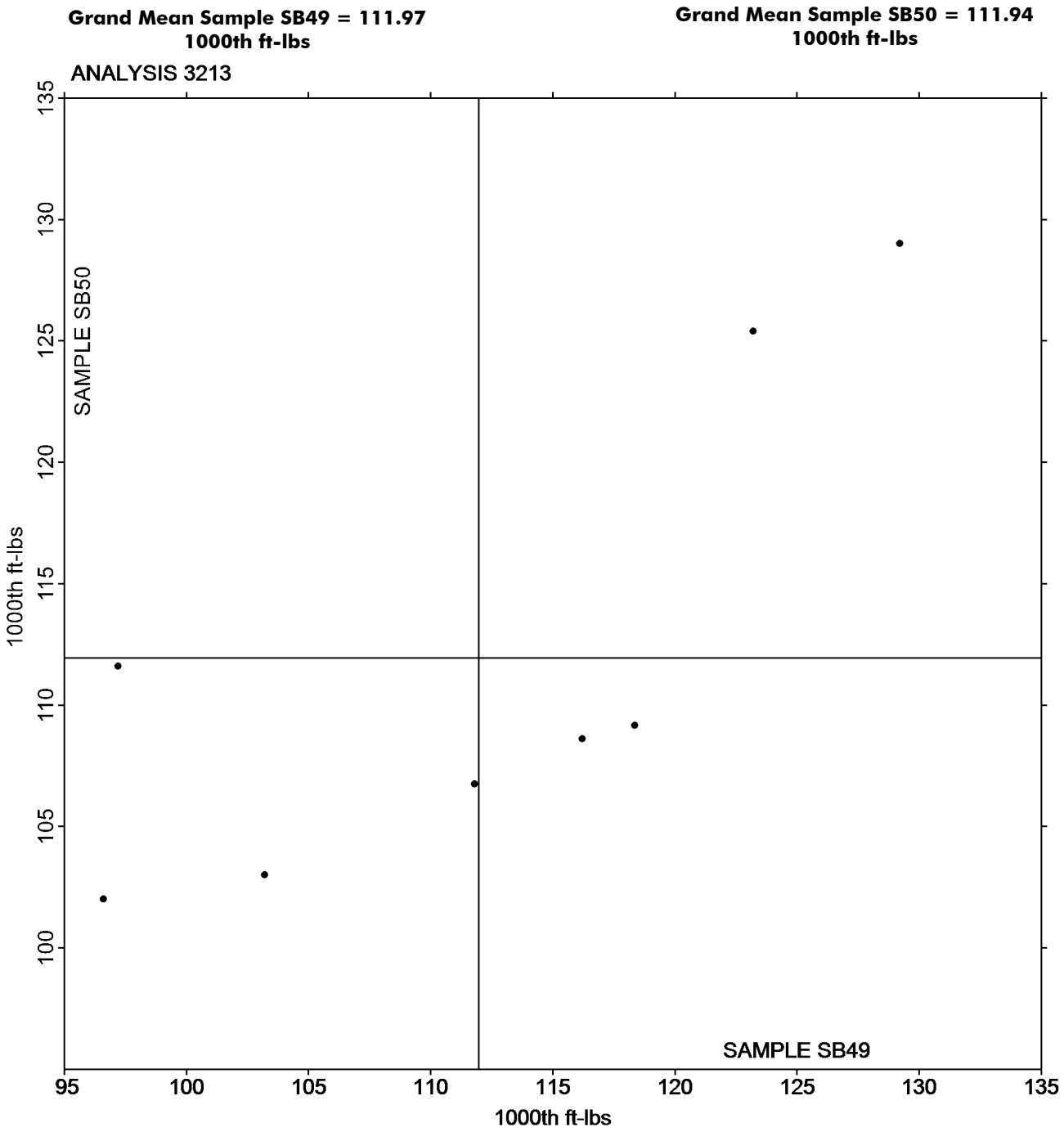
Statistics based on 8 of 8 reporting participants.

Key to Instrument Codes Reported by Participants

ID IDM Internal Bond Tester

SC Scott Internal Bond Tester (Manual)

TM TMI Monitor/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.

-End of Report-