Collaborative Testing Services, Inc.

Paper & Paperboard Testing Program

Summary Report #4322 - October 2024

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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.

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

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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 3501
Thickness (Caliper), Packaging papers
TAPPI Official Test Method T411

WebCode	Data Flag	Sample CK33 Lab Mean	Sample CK33 Diff from Grand Mean	Sample CK33 CPV	Sample CK34 Lab Mean	Sample CK34 Diff from Grand Mean	Sample CK34 CPV	Instr Code
2JPLEG	X	13.650	3.678	36.89	13.48	-0.41	-2.37	LW
2MPWBF		10.037	0.065	0.65	13.83	-0.05	-0.31	LW
2VEK4X		10.017	0.045	0.45	14.01	0.12	0.70	XX
3YDF3Q		10.088	0.116	1.16	14.05	0.17	0.99	LW
4T4G9D		9.881	-0.091	-0.91	13.67	-0.22	-1.27	XX
4TPXLU		9.860	-0.112	-1.12	13.64	-0.25	-1.43	XX
6JTEMC		10.000	0.028	0.28	14.03	0.15	0.86	PP
7WF9AP		9.965	-0.006	-0.06	13.82	-0.07	-0.41	LB
7WV63P		9.991	0.019	0.19	13.98	0.09	0.54	TA
8FL4GL	X	2.792	-7.180	-72.02	2.02	-11.86	-69.37	LW
8LCDQK		10.047	0.075	0.76	14.15	0.26	1.52	MS
8MJQB8		9.811	-0.161	-1.61	13.60	-0.29	-1.68	PP
8ZRDLP		10.044	0.072	0.72	14.06	0.17	1.01	EM
EBA8VY		9.913	-0.058	-0.59	13.80	-0.09	-0.53	LW
F3CTRD		9.984	0.012	0.12	13.91	0.03	0.16	LW
F88MPE		10.070	0.098	0.98	13.97	0.08	0.47	XX
FUF6RZ		10.071	0.099	0.99	14.10	0.21	1.23	PP
GA7KDC		9.968	-0.003	-0.03	13.81	-0.07	-0.43	LC
HZCWUE		9.945	-0.027	-0.27	13.95	0.07	0.38	EM
K96NFD		10.204	0.232	2.33	14.24	0.35	2.07	LC
LNQRDT		10.000	0.028	0.28	13.79	-0.10	-0.56	LW
LX2TYT		9.950	-0.022	-0.22	13.86	-0.03	-0.15	XX
LY97GV		9.873	-0.099	-0.99	13.86	-0.02	-0.13	TA
NZVN97	*	9.702	-0.270	-2.71	13.53	-0.35	-2.07	EM
PXNQEP		9.950	-0.022	-0.22	13.85	-0.04	-0.21	LC
QBNRP7		10.010	0.038	0.38	14.04	0.15	0.90	TM
R433MM		10.032	0.060	0.60	13.97	0.08	0.48	PP
TK3MJ3		10.079	0.107	1.07	14.07	0.18	1.07	LW
UYZZBJ		9.849	-0.123	-1.23	13.82	-0.07	-0.41	LA
VM638J		9.815	-0.157	-1.57	13.52	-0.37	-2.15	XX
XMGL32		9.958	-0.014	-0.14	13.85	-0.03	-0.20	OK
YHHL6G		9.952	-0.020	-0.20	13.85	-0.03	-0.19	OK
ZEF8VW		9.956	-0.016	-0.16	13.85	-0.04	-0.22	EM
ZRL4EY		10.076	0.104	1.04	13.88	-0.01	-0.04	LW

Summary Statistics	Sample CK33	Sample CK34
Grand Means	9.97 mils	13.89 mils
Stnd Dev Btwn Labs	0.10 mils	0.17 mils

Statistics based on 32 of 34 reporting participants.

Comments on Assigned Data Flags for Test #3501

8FL4GL (X) - Extreme Data.

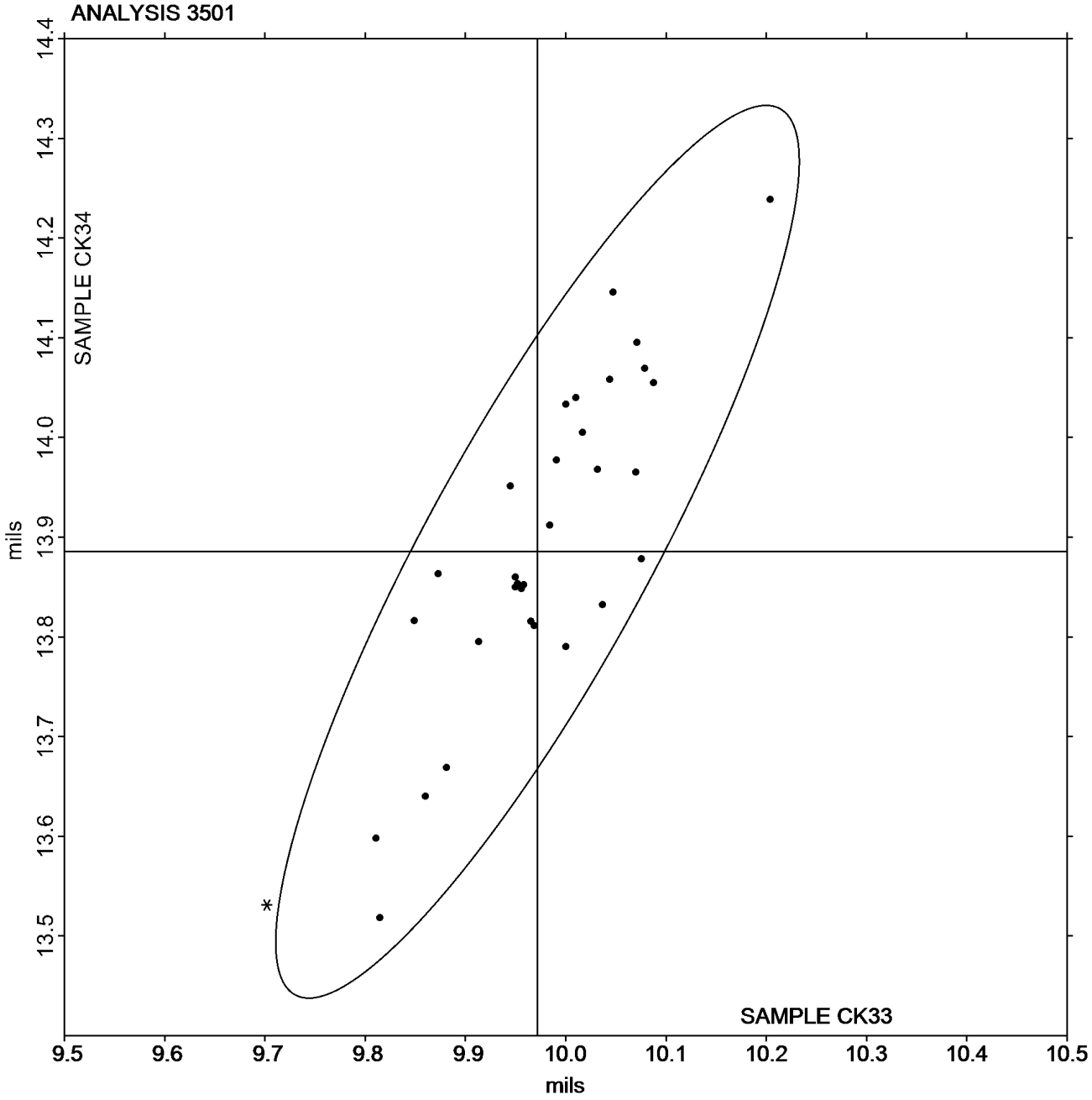
2JPLEG (X) - Extreme Data for Sample CK33.

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
OK	Oakland	PP	Technidyne Profile/Plus
TA	Thwing-Albert	TM	TMI
XX	Instrument make/model not specified by lab		

Grand Mean Sample CK33 = 9.9718 mils

Grand Mean Sample CK34 = 13.885 mils



Paper & Paperboard Interlaboratory Testing Program

Report #4322, October 2024

Analysis 3511

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

WebCode	Data Flag	Sample BK33 Lab Mean	Sample BK33 Diff from Grand Mean	Sample BK33 CPV	Sample BK34 Lab Mean	Sample BK34 Diff from Grand Mean	Sample BK34 CPV	Instr Code
2JPLEG	*	102.5	-3.5	-0.38	44.30	-21.53	-2.15	ZZ
3YDF3Q		107.2	1.2	0.12	68.32	2.48	0.25	ZZ
8X6UFL		100.4	-5.6	-0.61	65.20	-0.63	-0.06	ZZ
BWZEX6		129.6	23.6	2.55	88.70	22.87	2.28	ZZ
EBA8VY		115.8	9.8	1.06	70.43	4.60	0.46	ZZ
HKMLAX		103.4	-2.6	-0.28	65.86	0.03	0.00	ZZ
KYWC2V		114.4	8.4	0.91	77.30	11.47	1.14	ZZ
LFXF2C		98.3	-7.8	-0.84	59.13	-6.70	-0.67	ZZ
LY97GV		108.8	2.8	0.30	68.20	2.37	0.24	ZZ
TK3MJ3		93.5	-12.6	-1.36	56.18	-9.66	-0.96	ZZ
X2WJ82		99.2	-6.8	-0.74	61.30	-4.53	-0.45	ZZ
Y9WHXG		114.0	8.0	0.86	72.70	6.87	0.69	ZZ
YHHL6G		100.6	-5.4	-0.59	67.59	1.75	0.18	ZZ
ZJQ3TE		98.8	-7.2	-0.78	60.79	-5.05	-0.50	ZZ
ZRL4EY		104.1	-1.9	-0.21	61.52	-4.31	-0.43	ZZ

Summary Statistics	Sample BK33	Sample BK34
Grand Means	106.03 psi	65.83 psi
Stnd Dev Btwn Labs	9.24 psi	10.02 psi

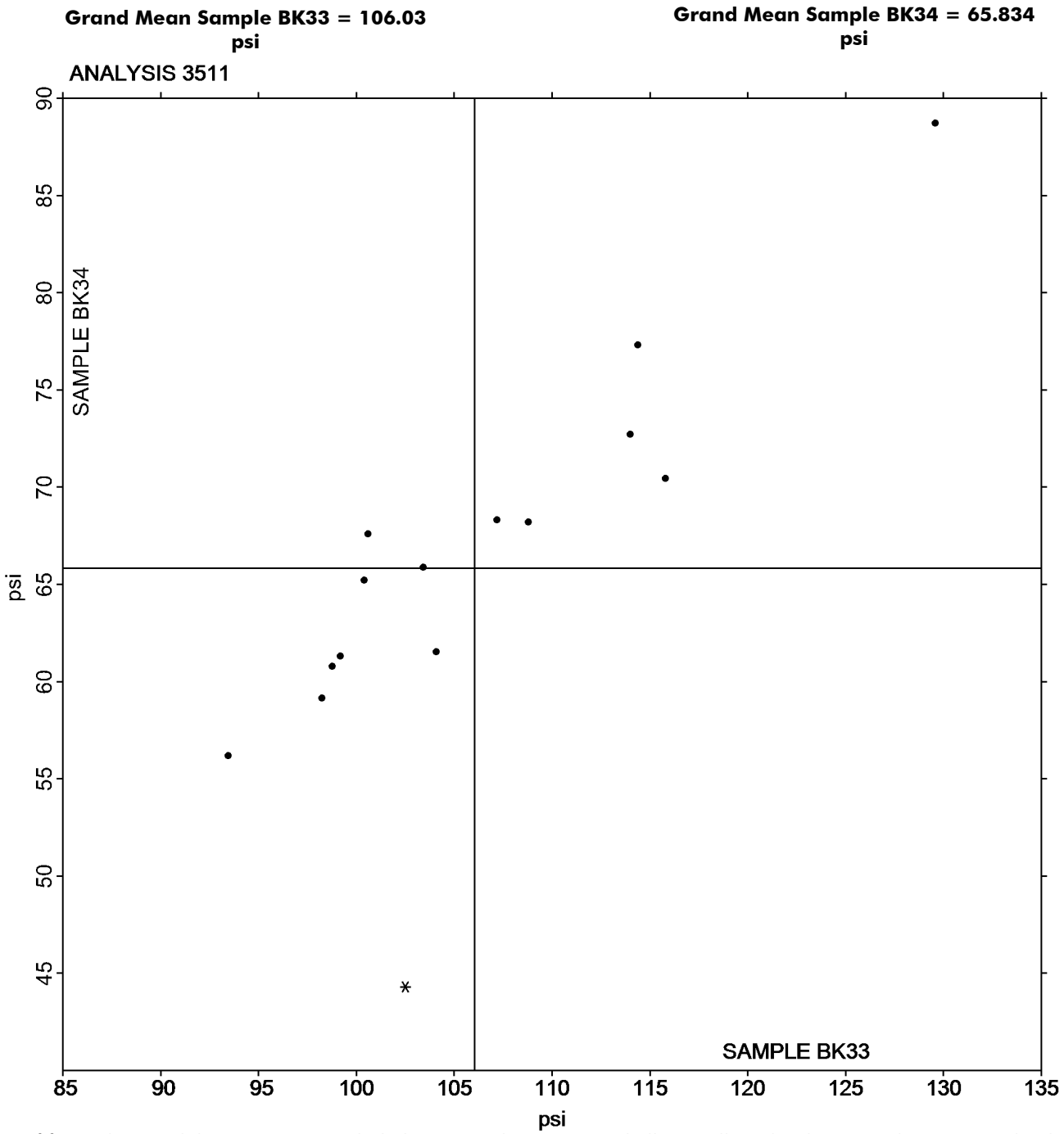
Statistics based on 15 of 15 reporting participants.

Analysis Notes:

2JPLEG - Data appears to be transposed between samples. CTS will not correct 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 3513

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample RK33 Lab Mean	Sample RK33 Diff from Grand Mean	Sample RK33 CPV	Sample RK34 Lab Mean	Sample RK34 Diff from Grand Mean	Sample RK34 CPV	Instr Code
2JPLEG		171.6	12.8	0.92	200.8	-17.5	-0.87	ZZ
2MPWBF		152.0	-6.8	-0.49	220.5	2.2	0.11	ZZ
2VEK4X		187.4	28.6	2.06	243.7	25.4	1.26	ZZ
32ZZ8V	X	40.1	-118.7	-8.52	53.9	-164.4	-8.18	ZZ
3YDF3Q		161.0	2.2	0.16	230.2	11.9	0.59	ZZ
4TPXLU	*	177.6	18.8	1.35	276.8	58.5	2.91	ZZ
7WV63P		157.8	-1.0	-0.07	218.0	-0.3	-0.02	ZZ
8FL4GL		156.8	-1.9	-0.14	213.5	-4.8	-0.24	ZZ
8X6UFL		154.7	-4.1	-0.29	206.4	-11.9	-0.59	ZZ
BGPWNH		174.8	16.0	1.15	235.2	16.9	0.84	ZZ
BPZYAH		153.1	-5.6	-0.41	215.1	-3.2	-0.16	ZZ
EWPTRZ		152.6	-6.1	-0.44	227.8	9.5	0.48	ZZ
F3CTRD		155.6	-3.2	-0.23	207.6	-10.7	-0.53	ZZ
F7C4MD		160.1	1.4	0.10	204.6	-13.7	-0.68	ZZ
GA7KDC		154.1	-4.7	-0.34	223.7	5.4	0.27	ZZ
HZCWUE		163.7	4.9	0.35	218.2	-0.1	-0.01	ZZ
LFXF2C		154.6	-4.2	-0.30	216.6	-1.7	-0.08	ZZ
M2TGT7		155.9	-2.9	-0.21	226.5	8.2	0.41	ZZ
M9EG3Q		131.7	-27.1	-1.94	188.6	-29.7	-1.48	ZZ
NZVN97	*	183.3	24.5	1.76	214.1	-4.2	-0.21	ZZ
RW6NJ2		160.8	2.0	0.15	221.5	3.2	0.16	ZZ
TK3MJ3		164.6	5.9	0.42	236.5	18.2	0.90	ZZ
UCRKX2		173.7	15.0	1.07	247.6	29.3	1.46	ZZ
UYZZBJ		151.3	-7.4	-0.53	212.2	-6.1	-0.30	ZZ
X2WJ82	*	123.7	-35.1	-2.52	170.1	-48.2	-2.40	ZZ
XMGL32		136.9	-21.9	-1.57	204.1	-14.2	-0.71	ZZ
YHHL6G		158.6	-0.1	-0.01	223.9	5.6	0.28	ZZ
ZEF8VW		153.4	-5.4	-0.39	191.2	-27.2	-1.35	ZZ
ZRL4EY		164.2	5.4	0.39	217.6	-0.7	-0.03	ZZ

Summary Statistics	Sample RK33	Sample RK34
Grand Means	158.78 Grams	218.30 Grams
Stnd Dev Btwn Labs	13.93 Grams	20.09 Grams

Statistics based on 28 of 29 reporting participants.

Comments on Assigned Data Flags for Test #3513

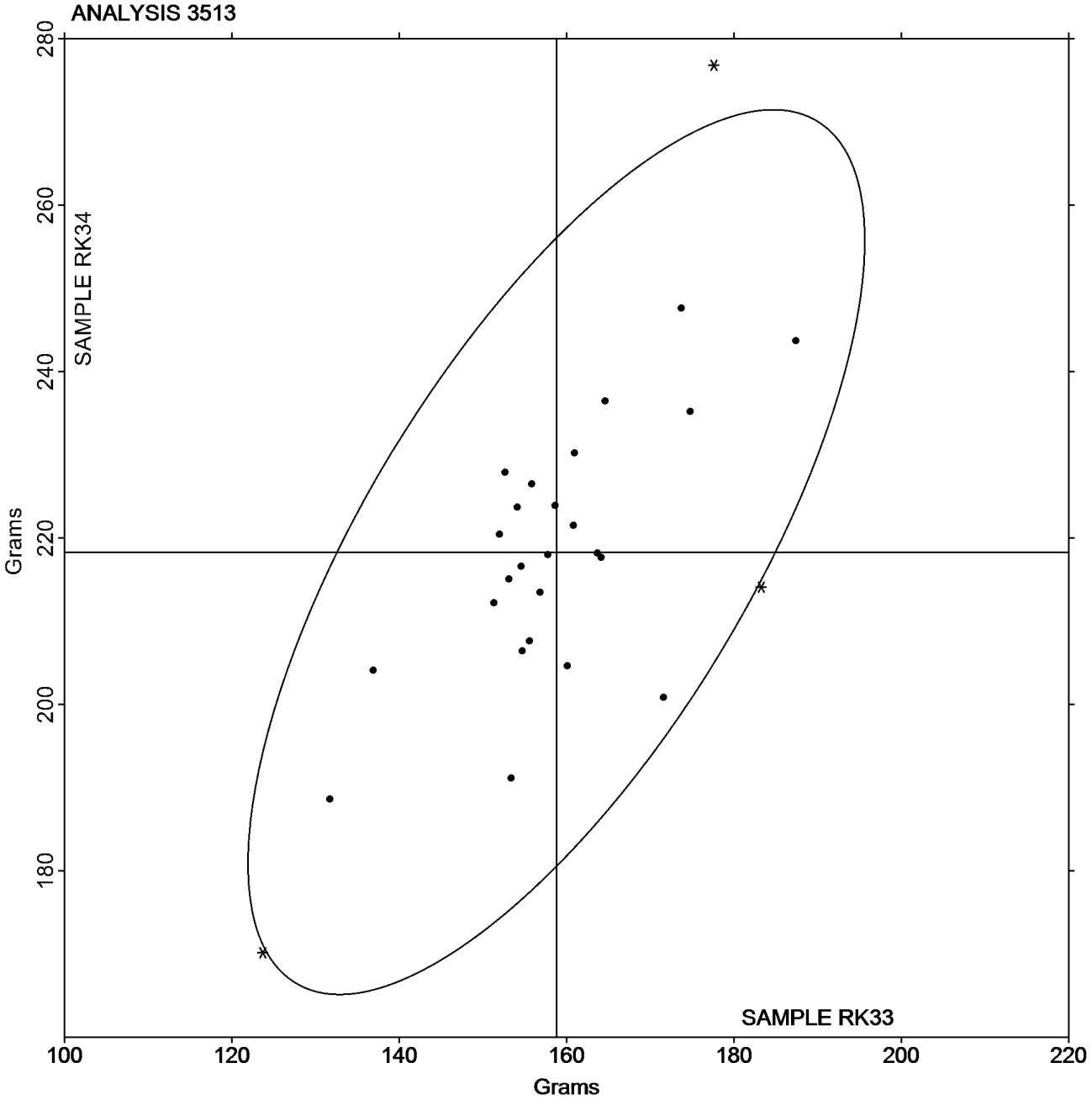
32ZZ8V (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample RK33 = 158.78 Grams

Grand Mean Sample RK34 = 218.30 Grams



Paper & Paperboard Interlaboratory Testing Program

Analysis 3515

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK33 Lab Mean	Sample NK33 Diff from Grand Mean	Sample NK33 CPV	Sample NK34 Lab Mean	Sample NK34 Diff from Grand Mean	Sample NK34 CPV	Instr Code
2FQAJG		14.76	1.02	1.07	11.04	0.46	0.63	LA
2JPLEG	X	1.55	-12.19	-12.71	2.54	-8.04	-10.99	LX
2MPWBF		13.86	0.12	0.13	10.69	0.11	0.15	LE
2VEK4X		13.29	-0.45	-0.47	10.65	0.07	0.10	ID
32ZZ8V		14.40	0.66	0.69	10.30	-0.28	-0.39	XX
3YDF3Q		13.02	-0.73	-0.76	9.81	-0.77	-1.05	IM
4T4G9D		13.53	-0.22	-0.22	10.39	-0.19	-0.27	TB
4TPXLU		13.71	-0.03	-0.03	10.77	0.19	0.25	XX
7WF9AP		15.68	1.94	2.02	11.80	1.22	1.67	LC
7WV63P		13.08	-0.66	-0.69	10.15	-0.43	-0.59	TB
8FL4GL		13.67	-0.07	-0.07	10.23	-0.35	-0.48	LW
8ZRDLP		14.64	0.90	0.94	11.58	1.00	1.36	LE
BPZYAH		13.82	0.07	0.08	10.61	0.02	0.03	LE
CVKLC2		15.46	1.72	1.79	11.92	1.34	1.83	LE
F3CTRD		13.30	-0.44	-0.46	10.26	-0.32	-0.44	LW
FNRDND		12.68	-1.06	-1.10	9.56	-1.02	-1.40	IM
GA7KDC		13.25	-0.49	-0.51	10.81	0.23	0.31	IN
LFXF2C		13.02	-0.72	-0.75	10.21	-0.37	-0.50	TX
LNQRDT		13.40	-0.35	-0.36	10.32	-0.26	-0.35	TH
LX2TYT		13.67	-0.07	-0.07	10.56	-0.02	-0.03	XX
LY97GV		13.94	0.19	0.20	10.76	0.18	0.25	TV
M2TGT7		13.20	-0.55	-0.57	9.70	-0.89	-1.21	XX
NZG3Y6		13.31	-0.43	-0.45	10.34	-0.24	-0.33	IR
NZVN97		13.52	-0.23	-0.24	10.19	-0.39	-0.54	LW
PE9GEP		14.70	0.96	1.00	11.75	1.17	1.60	LI
QHRVHP		11.90	-1.84	-1.92	9.36	-1.22	-1.67	TT
R3T9QM		15.62	1.88	1.96	12.33	1.74	2.39	LA
RW6NJ2		12.83	-0.91	-0.95	10.15	-0.43	-0.59	LE
TK3MJ3		12.97	-0.77	-0.80	9.99	-0.60	-0.81	LE
UCRKX2		12.73	-1.01	-1.05	9.42	-1.17	-1.59	LH
UYZZBJ		14.26	0.52	0.54	11.06	0.48	0.66	LA
WZ9TMW		13.21	-0.53	-0.55	9.77	-0.82	-1.12	TS
X2WJ82	X	87.41	73.67	76.81	62.00	51.42	70.34	TO
ZB2DEY	*	15.85	2.11	2.20	11.15	0.56	0.77	DM
ZJQ3TE		14.45	0.71	0.74	11.33	0.75	1.03	LW
ZRL4EY	*	12.49	-1.25	-1.30	10.83	0.24	0.33	LH

Paper & Paperboard Interlaboratory Testing Program

Analysis 3515

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

Summary Statistics	Sample NK33	Sample NK34
Grand Means	13.74 kN/m	10.58 kN/m
Stnd Dev Btwn Labs	0.96 kN/m	0.73 kN/m

Statistics based on 34 of 36 reporting participants.

Comments on Assigned Data Flags for Test #3515

X2WJ82 (X) - Extreme Data.

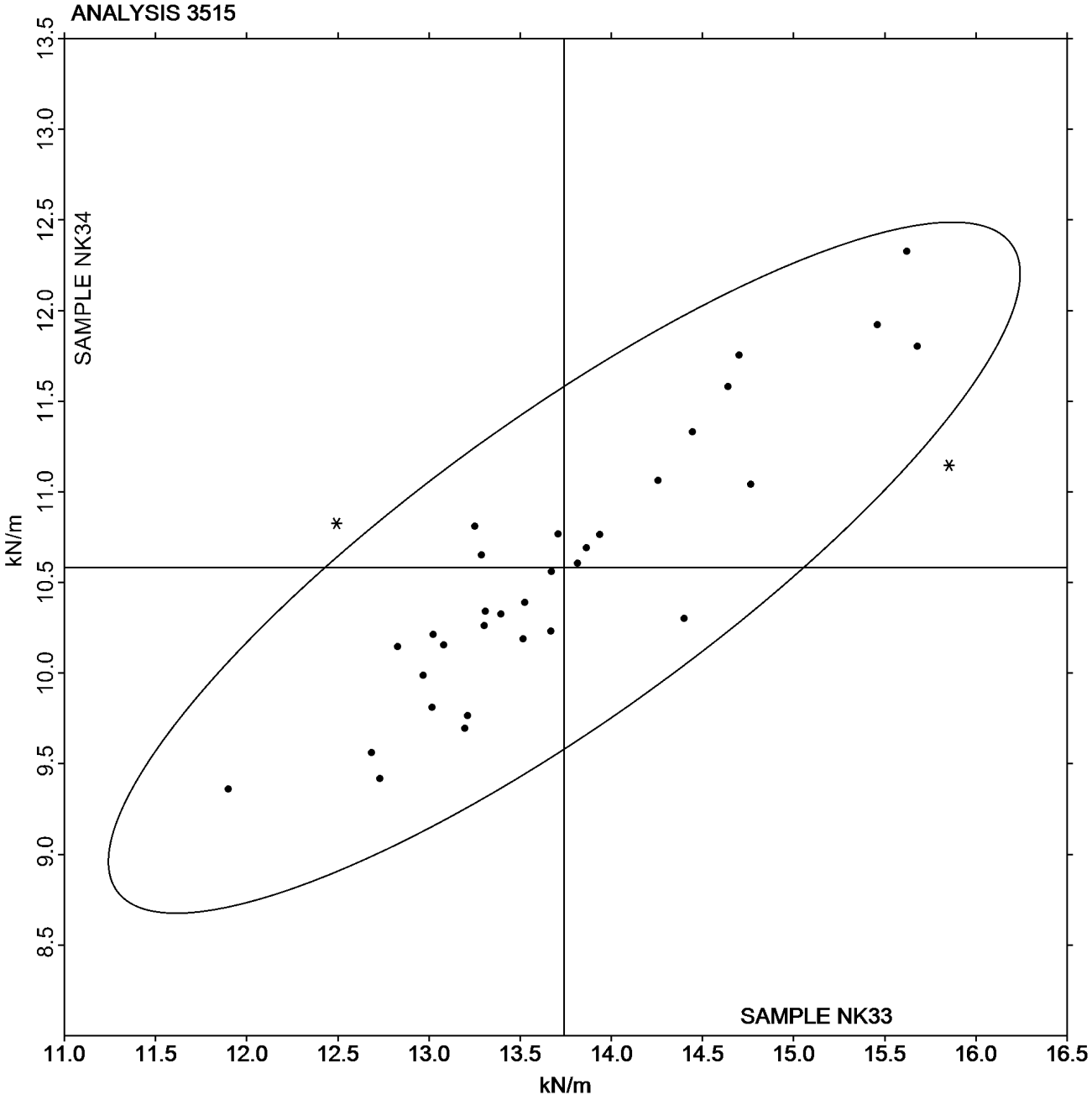
2JPLEG (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	ID	Instron 4200 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	LI	LLoyds Instruments
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	TS	TMI Horizontal Tensile Tester 84-58
TT	Tinius Olsen Model MHT	TV	Thwing-Albert Vantage NX
TX	Thwing-Albert (model not specified)	XX	Instrument make/model not specified by lab

Grand Mean Sample NK33 = 13.742 kN/m

Grand Mean Sample NK34 = 10.582 kN/m



Paper & Paperboard Interlaboratory Testing Program

Analysis 3516

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK33 Lab Mean	Sample NK33 Diff from Grand Mean	Sample NK33 CPV	Sample NK34 Lab Mean	Sample NK34 Diff from Grand Mean	Sample NK34 CPV	Instr Code
2FQAJG		201.6	18.5	0.84	139.0	10.4	0.66	LC
2MPWBF		172.1	-11.0	-0.50	122.2	-6.4	-0.40	LE
32ZZ8V		205.4	22.3	1.02	156.6	28.0	1.76	XX
3YDF3Q		194.8	11.6	0.53	129.8	1.2	0.08	IM
4T4G9D		181.7	-1.4	-0.06	130.9	2.3	0.15	TB
4TPXLU		224.7	41.5	1.90	163.1	34.5	2.17	XX
7WF9AP		205.4	22.2	1.01	139.5	10.9	0.69	LC
8FL4GL		172.2	-11.0	-0.50	109.2	-19.4	-1.22	LE
8ZRDLP		212.4	29.2	1.33	148.6	20.0	1.26	LE
BPZYAH		174.4	-8.8	-0.40	120.0	-8.6	-0.54	LE
CVKLC2		200.8	17.6	0.81	139.4	10.8	0.68	LE
F3CTRD		169.3	-13.9	-0.63	113.8	-14.8	-0.93	LW
FNRDND		151.8	-31.4	-1.43	104.5	-24.1	-1.51	IM
GA7KDC		166.7	-16.5	-0.75	130.3	1.7	0.11	IN
LFXF2C		193.0	9.8	0.45	138.6	10.0	0.63	TX
LNQRDT		195.5	12.4	0.56	135.6	7.0	0.44	TH
LX2TYT		134.1	-49.1	-2.24	97.9	-30.7	-1.93	TH
LY97GV		216.5	33.4	1.52	144.9	16.3	1.02	TV
M2TGT7		188.4	5.2	0.24	121.1	-7.5	-0.47	XX
NZG3Y6		168.6	-14.6	-0.67	121.1	-7.5	-0.47	IR
NZVN97		171.5	-11.6	-0.53	113.4	-15.2	-0.96	LW
QHRVHP		150.1	-33.1	-1.51	112.5	-16.1	-1.01	TT
R3T9QM		210.6	27.5	1.25	148.0	19.4	1.22	LA
RW6NJ2		162.3	-20.9	-0.95	119.4	-9.2	-0.58	LE
TK3MJ3		167.8	-15.4	-0.70	117.9	-10.7	-0.67	LE
UCRKX2		167.8	-15.3	-0.70	110.6	-18.0	-1.13	LH
UYZZBJ		198.6	15.5	0.71	146.8	18.2	1.15	LA
WZ9TMW		191.3	8.2	0.37	130.8	2.2	0.14	TS
ZB2DEY	X	312.6	129.5	5.91	184.5	55.9	3.52	DM
ZJQ3TE		186.2	3.0	0.14	133.3	4.7	0.29	LW
ZRL4EY		158.9	-24.2	-1.11	119.1	-9.5	-0.60	LH

Summary Statistics	Sample NK33	Sample NK34
Grand Means	183.15 Joules/sq m	128.60 Joules/sq m
Stnd Dev Btwn Labs	21.92 Joules/sq m	15.90 Joules/sq m

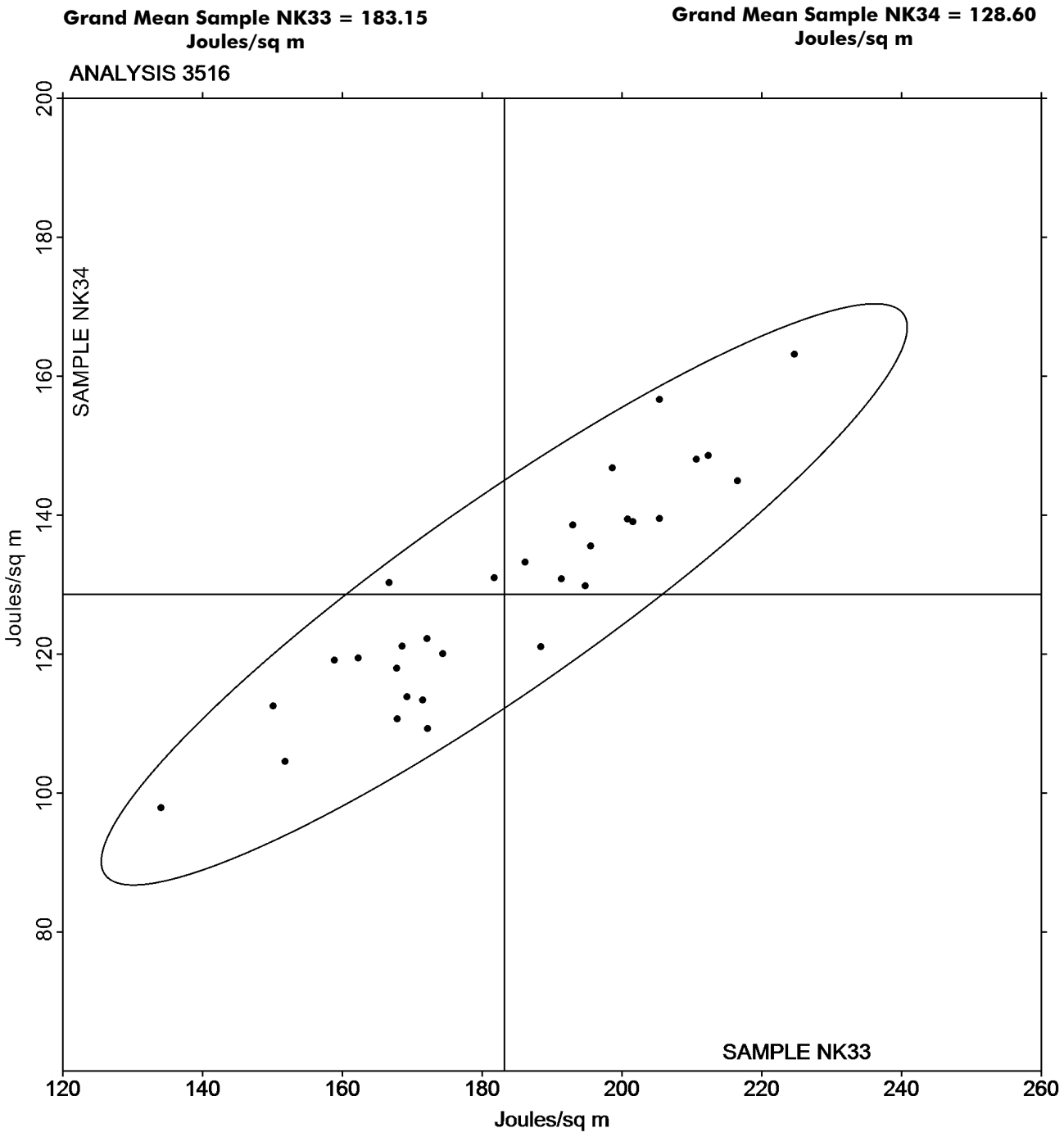
Statistics based on 30 of 31 reporting participants.

Comments on Assigned Data Flags for Test #3516

ZB2DEY (X) - Data for both samples are high.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	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	TB	Thwing-Albert EJA/1000
TH	Thwing-Albert QC-3A	TS	TMI Horizontal Tensile Tester 84-58
TT	Tinius Olsen Model MHT	TV	Thwing-Albert Vantage NX
TX	Thwing-Albert (model not specified)	XX	Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Analysis 3517

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK33 Lab Mean	Sample NK33 Diff from Grand Mean	Sample NK33 CPV	Sample NK34 Lab Mean	Sample NK34 Diff from Grand Mean	Sample NK34 CPV	Instr Code
2FQAJG		2.028	-0.036	-0.20	1.800	-0.076	-0.51	LC
2JPLEG	X	2.240	0.176	0.98	3.200	1.324	8.91	LX
2MPWBF		1.925	-0.139	-0.78	1.771	-0.105	-0.71	LE
2VEK4X		2.199	0.135	0.75	1.995	0.119	0.80	XX
32ZZ8V	*	2.176	0.112	0.63	1.765	-0.111	-0.75	XX
3YDF3Q		2.341	0.276	1.55	2.076	0.200	1.35	IM
4T4G9D		2.119	0.055	0.31	1.983	0.107	0.72	XX
4TPXLU		1.805	-0.259	-1.45	1.772	-0.104	-0.70	XX
7WF9AP		1.885	-0.179	-1.01	1.716	-0.160	-1.08	LC
7WV63P		2.020	-0.044	-0.25	1.810	-0.066	-0.44	TB
8FL4GL		1.940	-0.124	-0.70	1.669	-0.207	-1.39	LW
8ZRDLP		2.236	0.172	0.96	1.980	0.104	0.70	LE
BPZYAH		1.945	-0.119	-0.67	1.742	-0.134	-0.90	LE
CVKLC2		1.931	-0.133	-0.75	1.845	-0.031	-0.21	LE
F3CTRD		1.955	-0.109	-0.61	1.715	-0.161	-1.08	LW
FNRDND		2.194	0.130	0.73	1.963	0.087	0.59	IM
GA7KDC		1.998	-0.066	-0.37	1.894	0.018	0.12	IN
LFXF2C		2.304	0.240	1.34	2.102	0.226	1.52	TX
LNQRDT		2.285	0.221	1.24	2.118	0.242	1.63	TH
LX2TYT		1.700	-0.364	-2.04	1.601	-0.275	-1.85	XX
LY97GV		2.507	0.443	2.48	2.207	0.331	2.23	TV
M2TGT7		2.248	0.184	1.03	1.973	0.097	0.65	XX
NZG3Y6		1.968	-0.096	-0.54	1.797	-0.079	-0.53	XX
NZVN97		1.991	-0.073	-0.41	1.755	-0.121	-0.81	LW
QHRVHP		2.117	0.053	0.30	2.009	0.133	0.90	TT
R3T9QM		2.007	-0.057	-0.32	1.820	-0.056	-0.38	XX
RW6NJ2		1.920	-0.144	-0.81	1.809	-0.067	-0.45	LE
TK3MJ3		1.995	-0.069	-0.39	1.811	-0.065	-0.44	LE
UCRKX2		2.010	-0.054	-0.30	1.790	-0.086	-0.58	LH
UYZZBJ		2.180	0.116	0.65	1.981	0.105	0.71	LX
WZ9TMW		2.298	0.234	1.31	2.126	0.250	1.68	TS
X2WJ82	X	0.114	-1.951	-10.94	0.098	-1.778	-11.96	TO
ZB2DEY	X	3.071	1.007	5.64	2.617	0.741	4.99	DM
ZJQ3TE		2.002	-0.062	-0.35	1.831	-0.045	-0.30	LW
ZRL4EY		1.831	-0.233	-1.31	1.804	-0.072	-0.48	LX

Paper & Paperboard Interlaboratory Testing Program

Analysis 3517

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

Summary Statistics	Sample NK33	Sample NK34
Grand Means	2.06 Percent	1.88 Percent
Stnd Dev Btwn Labs	0.18 Percent	0.15 Percent

Statistics based on 32 of 35 reporting participants.

Comments on Assigned Data Flags for Test #3517

X2WJ82 (X) - Extreme Data.

ZB2DEY (X) - Data for both samples are high. Possible Systematic Error.

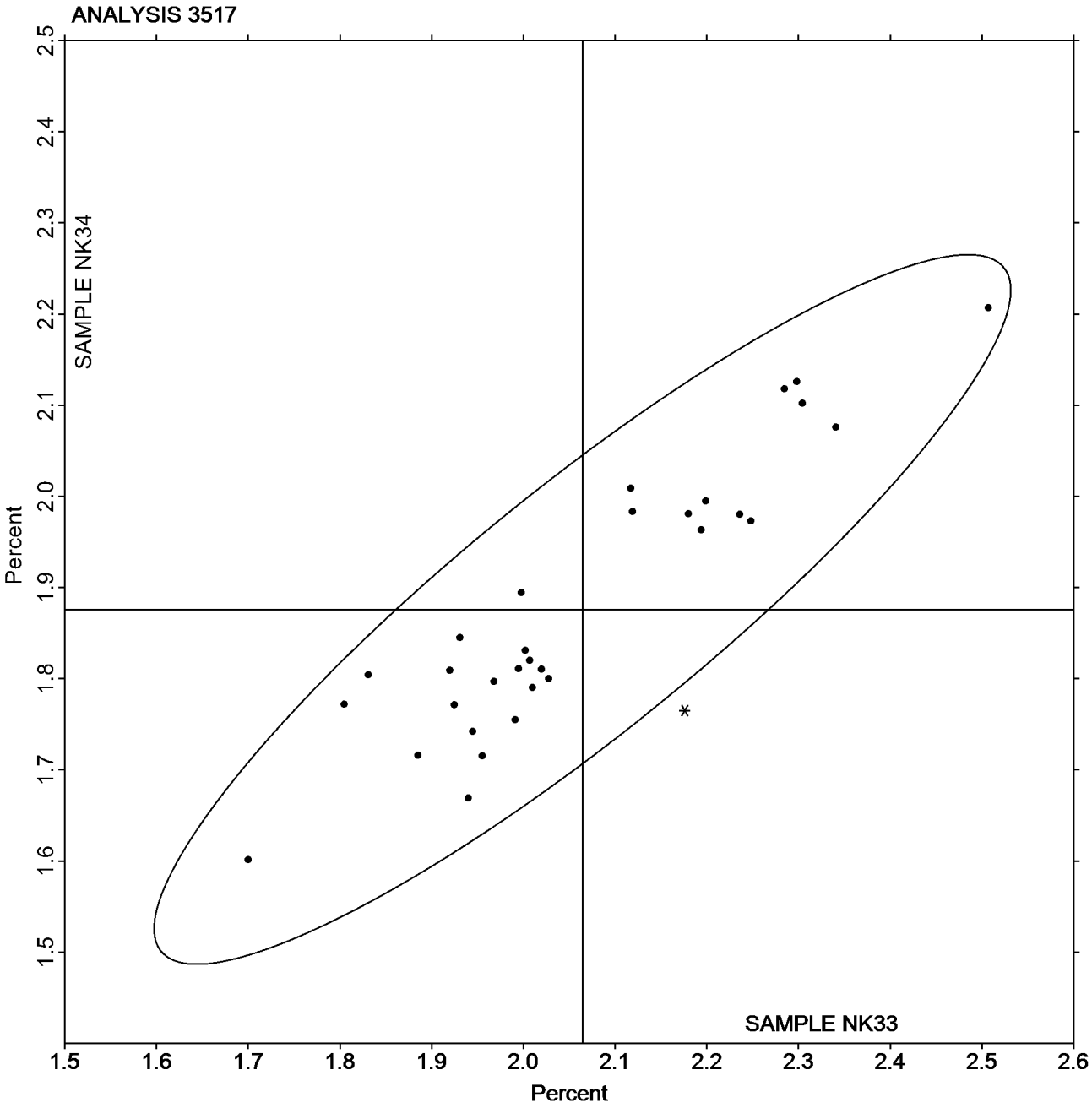
2JPLEG (X) - Extreme Data for Sample NK34.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	IM	Instron 5500 Series
IN	Instron 3360 Series	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	TS	TMI Horizontal Tensile Tester 84-58
TT	Tinius Olsen Model MHT	TV	Thwing-Albert Vantage NX
TX	Thwing-Albert (model not specified)	XX	Instrument make/model not specified by lab

Grand Mean Sample NK33 = 2.0644
Percent

Grand Mean Sample NK34 = 1.8759
Percent



Paper & Paperboard Interlaboratory Testing Program

Analysis 3531

Roughness - Print Surf Method - 0.5 to 4.0 Microns

TAPPI Official Test Method T555

WebCode	Data Flag	Sample PS33 Lab Mean	Sample PS33 Diff from Grand Mean	Sample PS33 CPV	Sample PS34 Lab Mean	Sample PS34 Diff from Grand Mean	Sample PS34 CPV	Instr Code
3KDGGF		2.215	-0.082	-0.40	2.140	-0.148	-0.73	ZZ
4T4G9D		2.434	0.137	0.67	2.257	-0.031	-0.15	ZZ
7WF9AP		2.167	-0.130	-0.63	2.164	-0.124	-0.61	ZZ
8Y2CHM		2.262	-0.035	-0.17	2.462	0.174	0.85	ZZ
8ZRDLP		2.305	0.008	0.04	2.260	-0.028	-0.14	ZZ
AW2VC4	*	1.669	-0.628	-3.07	1.719	-0.569	-2.79	ZZ
B4L7A6		2.351	0.054	0.26	2.379	0.091	0.45	ZZ
CR49FK		2.126	-0.171	-0.84	1.998	-0.290	-1.42	ZZ
F6WZQZ		2.116	-0.181	-0.88	2.114	-0.174	-0.86	ZZ
HZCWUE		2.377	0.080	0.39	2.395	0.107	0.52	ZZ
KRFEVW		2.284	-0.013	-0.06	2.226	-0.062	-0.31	ZZ
KZAJPX		2.540	0.243	1.19	2.477	0.189	0.93	ZZ
LNQRDT		2.413	0.116	0.57	2.225	-0.063	-0.31	ZZ
N2CK27		2.308	0.011	0.05	2.230	-0.058	-0.29	ZZ
NZVN97		2.041	-0.256	-1.25	2.148	-0.140	-0.69	ZZ
PXNQEP		2.158	-0.139	-0.68	2.167	-0.121	-0.60	ZZ
U4XF4Z	*	2.360	0.063	0.31	2.651	0.363	1.78	ZZ
W2HXZK		2.536	0.239	1.17	2.495	0.207	1.01	ZZ
WZ9TMW		2.471	0.174	0.85	2.442	0.154	0.75	ZZ
XMGL32		2.559	0.262	1.28	2.380	0.092	0.45	ZZ
YHHL6G		2.519	0.222	1.09	2.527	0.239	1.17	ZZ
ZEF8VW		2.458	0.161	0.79	2.491	0.203	0.99	ZZ
ZRL4EY		2.160	-0.137	-0.67	2.283	-0.005	-0.03	ZZ

Summary Statistics	Sample PS33	Sample PS34
Grand Means	2.30 Microns	2.29 Microns
Stnd Dev Btwn Labs	0.20 Microns	0.20 Microns

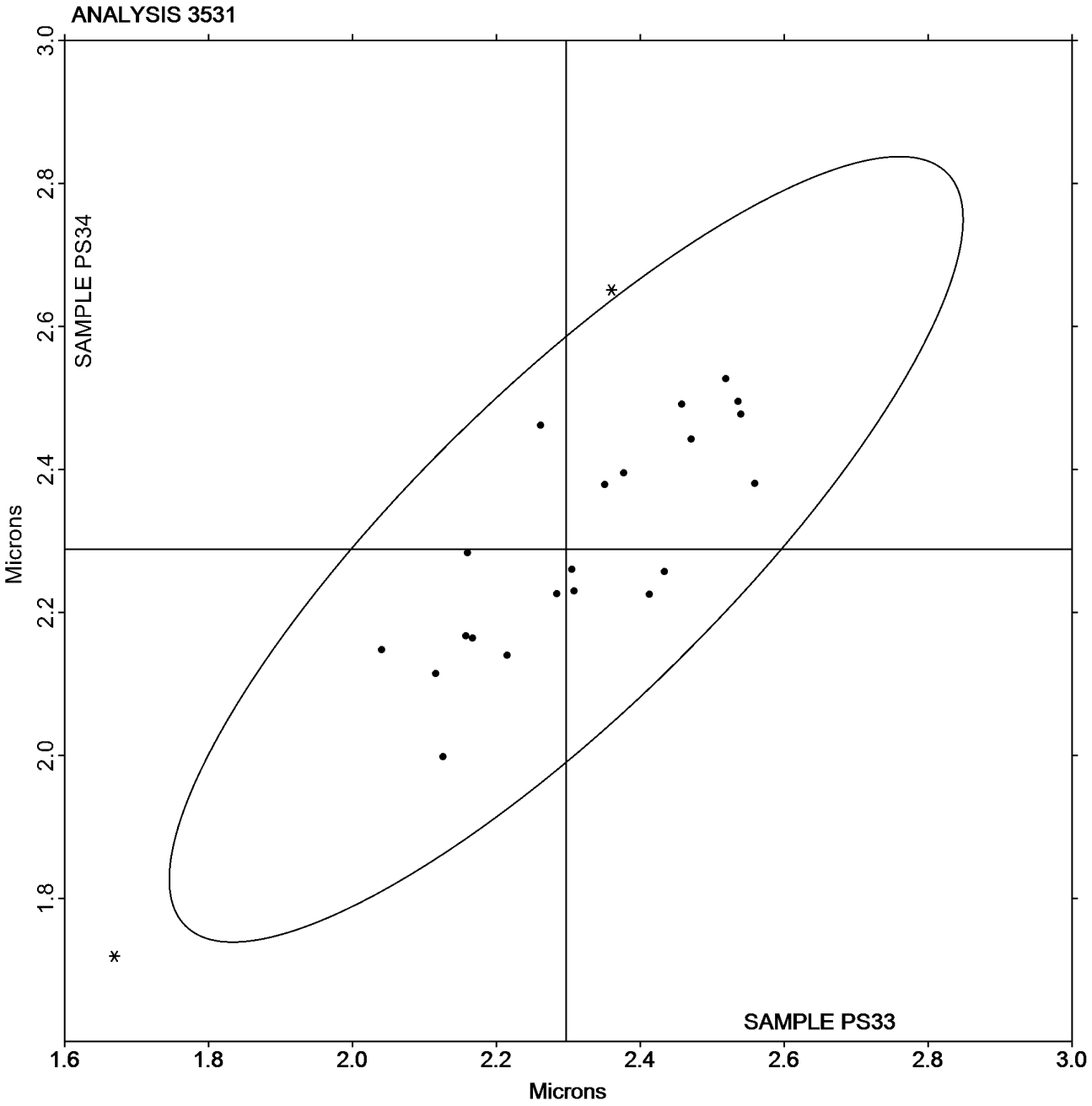
Statistics based on 23 of 23 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample PS33 = 2.2969 Microns

Grand Mean Sample PS34 = 2.2883 Microns



Paper & Paperboard Interlaboratory Testing Program

Analysis 3545
Directional Brightness
TAPPI Official Test Method T452

WebCode	Data Flag	Sample BR33 Lab Mean	Sample BR33 Diff from Grand Mean	Sample BR33 CPV	Sample BR34 Lab Mean	Sample BR34 Diff from Grand Mean	Sample BR34 CPV	Instr Code
4FXDYC		79.08	1.92	1.20	79.28	2.00	1.27	TP
4TPXLU		78.24	1.08	0.67	78.44	1.16	0.73	XX
7WV63P	*	76.77	-0.39	-0.25	78.04	0.76	0.48	XD
8CLRKM		76.35	-0.82	-0.51	75.96	-1.32	-0.84	XX
8MJQB8		74.09	-3.07	-1.92	74.43	-2.85	-1.80	TP
8ZRDLP		80.09	2.93	1.83	79.96	2.68	1.69	HG
9LQ2PQ		74.95	-2.22	-1.39	75.03	-2.25	-1.43	TS
AW2VC4		76.55	-0.62	-0.39	76.55	-0.73	-0.46	HZ
BGPWNH	X	92.04	14.88	9.31	87.49	10.21	6.46	HG
F3CTRD		76.85	-0.32	-0.20	77.04	-0.24	-0.15	TS
HZCWUE		79.85	2.68	1.68	79.73	2.45	1.55	HG
KRFEVW		76.15	-1.02	-0.64	76.10	-1.18	-0.75	TP
LNQRDT		76.25	-0.92	-0.57	76.11	-1.17	-0.74	TP
NZVN97		77.83	0.66	0.41	78.26	0.98	0.62	TP
U4XF4Z		75.76	-1.40	-0.88	75.82	-1.46	-0.92	PP
VQ3L8W		76.26	-0.90	-0.57	76.29	-0.99	-0.63	TT
W2HXZK		78.63	1.47	0.92	78.40	1.12	0.71	TD
WZ9TMW		76.35	-0.82	-0.51	76.49	-0.79	-0.50	TS
XMGL32	X	70.70	-6.46	-4.05	64.40	-12.88	-8.15	TS
YHHL6G		77.76	0.59	0.37	78.10	0.82	0.52	HG
ZEF8VW		78.34	1.17	0.73	78.29	1.01	0.64	TP

Summary Statistics	Sample BR33	Sample BR34
Grand Means	77.17 Percent	77.28 Percent
Stnd Dev Btwn Labs	1.60 Percent	1.58 Percent

Statistics based on 19 of 21 reporting participants.

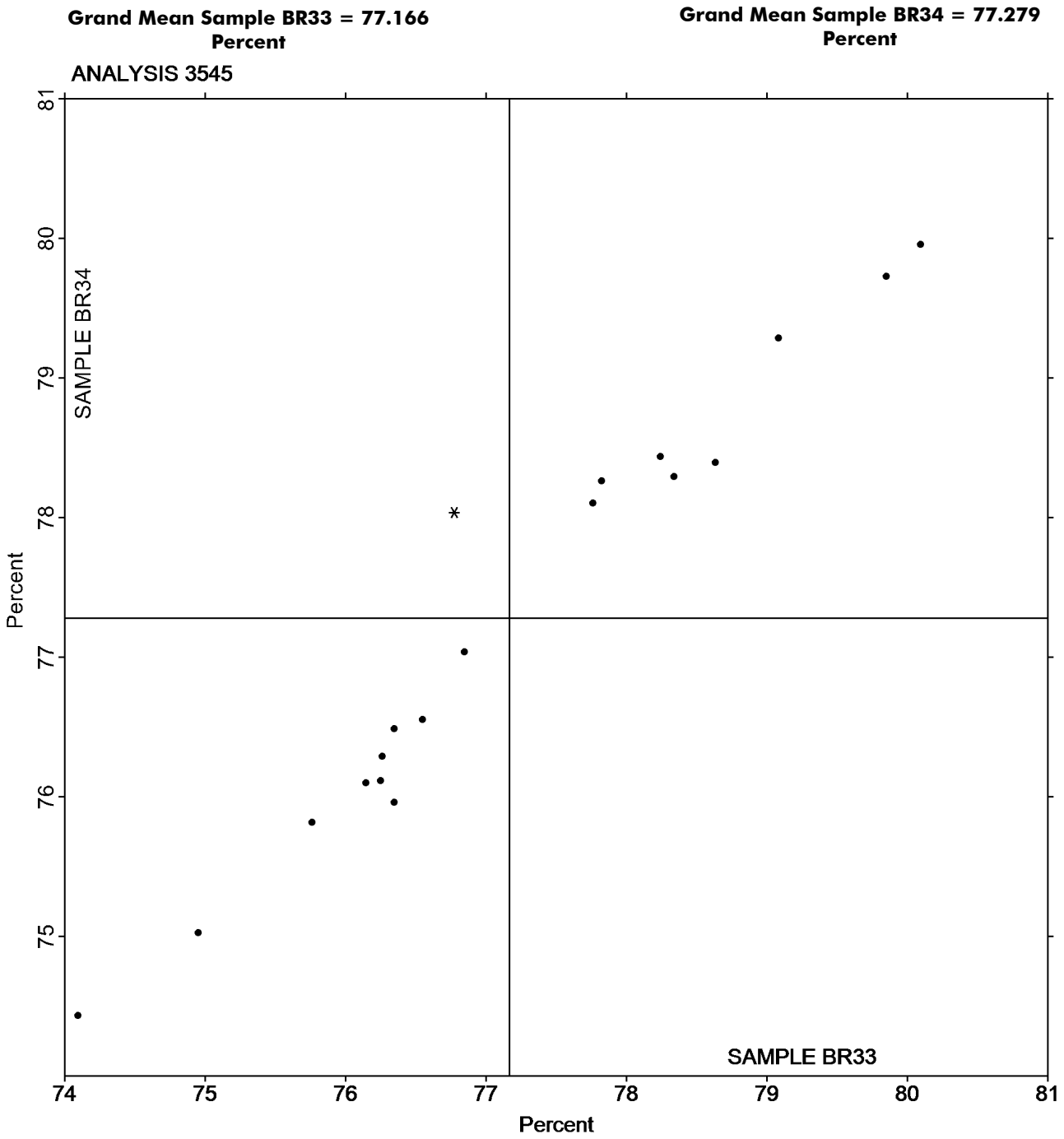
Comments on Assigned Data Flags for Test #3545

BGPWNH (X) - Extreme Data.

XMGL32 (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

HG	Hunter Labscan / XE	HZ	Hunter Lab ColorFlex EZ Series
PP	Technidyne Profile/Plus	TD	Technidyne Color Touch 45X
TP	Technidyne Test/Plus	TS	Technidyne Brightimeter Micro S-5
TT	Technidyne Brightimeter Micro S4-M	XD	X-Rite Color Ci7600
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 3547
Diffuse Brightness
TAPPI Official Test Method T525

WebCode	Data Flag	Sample BR33 Lab Mean	Sample BR33 Diff from Grand Mean	Sample BR33 CPV	Sample BR34 Lab Mean	Sample BR34 Diff from Grand Mean	Sample BR34 CPV	Instr Code
8FL4GL		76.87	0.06	0.35	76.82	-0.01	-0.03	LT
EQ6KE2		77.04	0.23	1.26	76.98	0.15	0.65	LE
GMGTDH		76.52	-0.29	-1.61	76.55	-0.28	-1.20	LE
K96NFD		76.83	0.01	0.08	76.82	-0.01	-0.04	LA
LNQRDT		76.83	0.01	0.08	76.78	-0.05	-0.22	LT
N2CK27		76.81	0.00	-0.01	76.84	0.01	0.04	TC
NC9TJ9		76.99	0.18	0.98	77.01	0.19	0.81	TP
NZVN97		76.67	-0.14	-0.77	76.52	-0.31	-1.35	EA
QBNRP7	X	64.44	-12.37	-68.86	64.43	-12.40	-54.14	TM
W2HXZK		76.90	0.09	0.51	76.75	-0.08	-0.34	TD
WZ9TMW		77.13	0.32	1.79	77.38	0.55	2.40	LT
YHHL6G		76.70	-0.11	-0.60	77.00	0.17	0.76	TC
ZEF8VW		76.68	-0.13	-0.72	76.69	-0.13	-0.58	TC
ZRL4EY		76.57	-0.24	-1.34	76.62	-0.21	-0.90	LT

Summary Statistics	Sample BR33	Sample BR34
Grand Means	76.81 Percent	76.83 Percent
Stnd Dev Btwn Labs	0.18 Percent	0.23 Percent

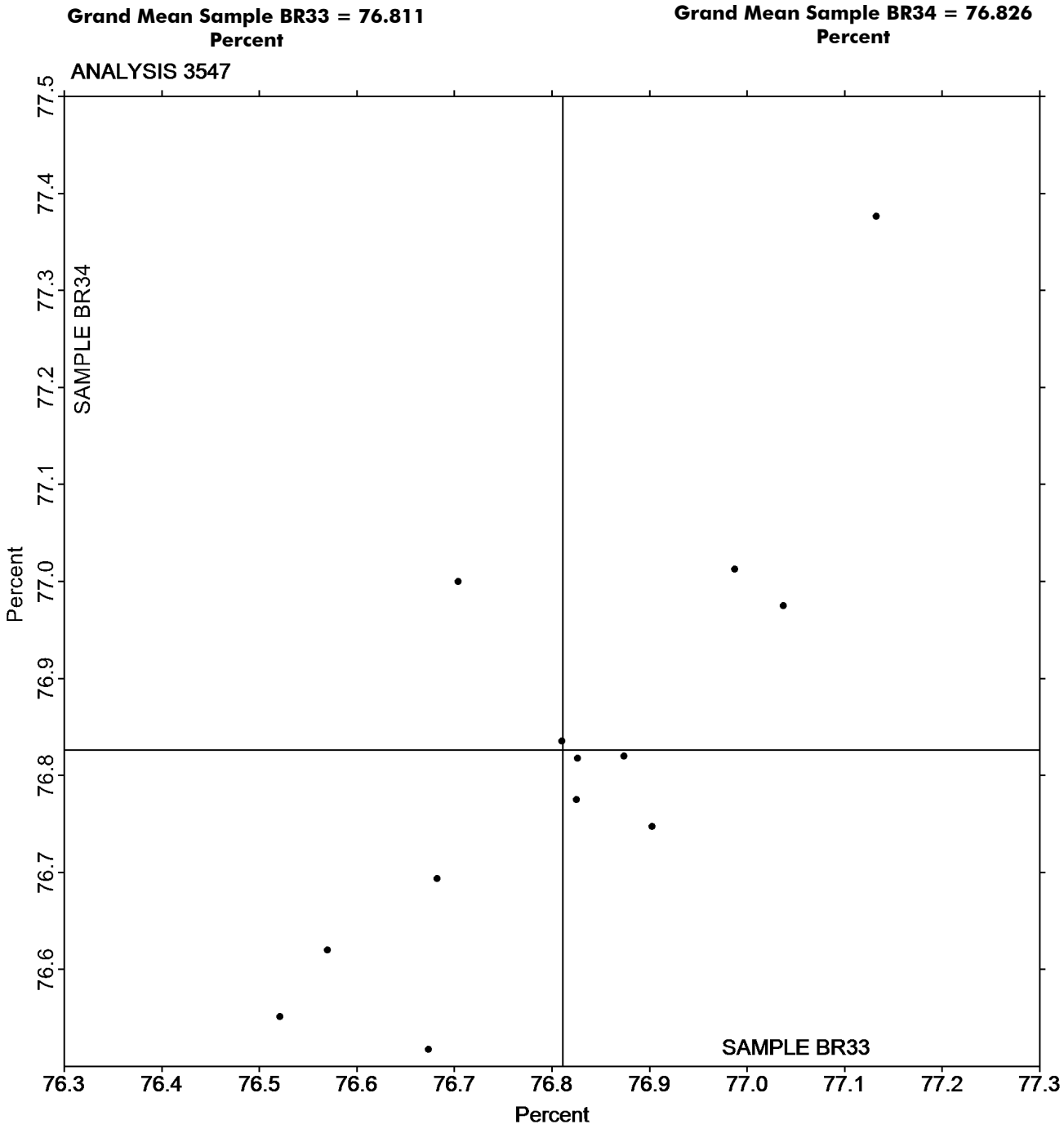
Statistics based on 13 of 14 reporting participants.

Comments on Assigned Data Flags for Test #3547

QBNRP7 (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

EA	Datacolor Elrepho	LA	L & W Elrepho - Autoline
LE	L & W Elrepho	LT	L & W Elrepho SE 071
TC	Technidyne Color Touch Series	TD	Technidyne Color Touch X
TM	Technidyne Technibrite Micro TB-1C	TP	Technidyne Test/Plus



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

Paper & Paperboard Interlaboratory Testing Program

Report #4322, October 2024

Analysis 3549

Color & Color Difference - Near White Papers - C/2deg obs

Hunter L,a,b - Illuminant C - 2 Degree Observer

Web Code	Data Flag	Samples	Hunter L, a, b Color Values L	a	b	Color Difference Values ΔL	Δa	Δb	ΔE	Instr Code
3KDGGF		CA33	88.52	0.86	-1.19	0.27	0.14	-0.04	0.30	TC
		CA34	88.79	1.00	-1.23					
4TPXLU		CA33	90.30	0.33	-0.77	-0.19	0.04	0.12	0.23	XX
		CA34	90.11	0.37	-0.65					
6RNKER		CA33	89.70	-0.41	-0.17	-0.04	0.02	-0.11	0.12	NH
		CA34	89.66	-0.38	-0.28					
8ZRDLP		CA33	87.50	0.81	-0.92	-0.14	0.04	-0.16	0.21	HK
		CA34	87.36	0.84	-1.07					
AJEJ7L		CA33	86.41	1.02	-0.58	-0.23	-0.15	-0.08	0.29	TS
		CA34	86.17	0.87	-0.66					
B4L7A6		CA33	89.65	0.39	-0.63	0.15	0.02	0.15	0.21	TC
		CA34	89.80	0.40	-0.48					
GMGTDH		CA33	89.41	0.38	-0.71	0.12	-0.03	0.18	0.22	LS
		CA34	89.52	0.36	-0.53					
HZCWUE		CA33	86.86	0.72	-0.80	0.00	0.00	0.00	0.00	HK
		CA34	86.86	0.72	-0.80					
K96NFD		CA33	86.71	0.68	-1.02	0.12	-0.06	0.19	0.24	LA
		CA34	86.83	0.62	-0.83					
U4XF4Z		CA33	86.84	0.27	-0.45	0.06	-0.01	0.00	0.06	TC
		CA34	86.90	0.26	-0.46					
W2HXZK		CA33	86.77	0.32	-0.52	0.17	-0.07	0.20	0.27	TC
		CA34	86.93	0.25	-0.32					
WZ9TMW		CA33	85.95	1.51	-1.29	-0.04	0.12	-0.35	0.37	TS
		CA34	85.90	1.63	-1.64					
XMGL32		CA33	79.49 *	0.47	-1.20	0.30	0.03	0.01	0.30	TS
		CA34	79.80	0.50	-1.19					
YHHL6G		CA33	87.48	0.84	-0.72	-0.09	0.13	-0.20	0.25	HF
		CA34	87.38	0.96	-0.92					
ZEF8VW		CA33	86.53	0.39	-0.87	0.31	-0.13	0.39	0.52	TC
		CA34	86.84	0.26	-0.47					

Summary Statistics

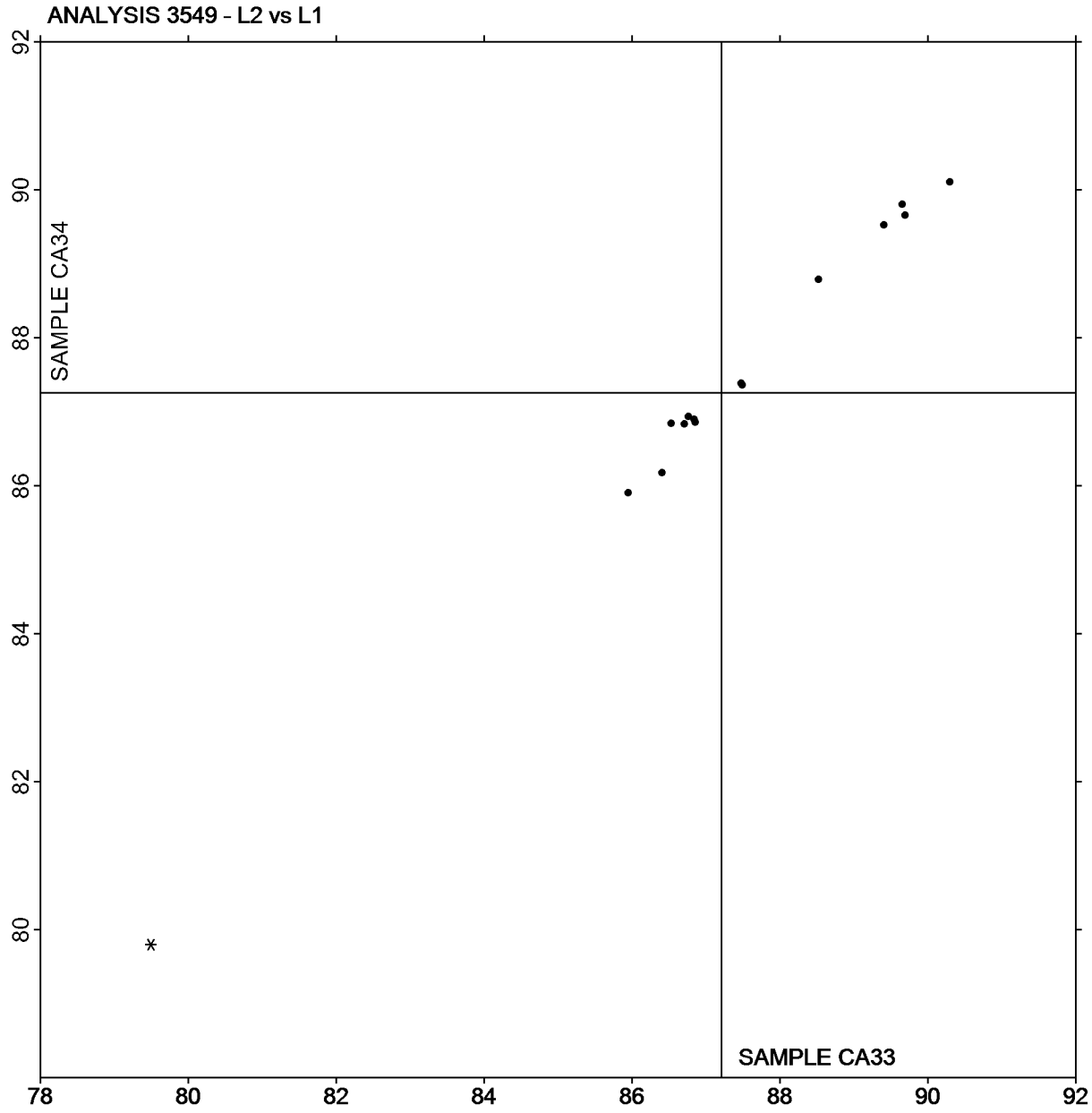
Grand Means							
CA33	87.207	0.572	-0.791	0.050	0.006	0.021	0.239
CA34	87.257	0.578	-0.770				
Stnd Dev Btwn Labs							
CA33	2.554	0.431	0.305	0.174	0.085	0.189	0.124
CA34	2.497	0.462	0.384				

Statistics based on 15 of 15 reporting participants

Key to Instrument Codes Reported by Participants

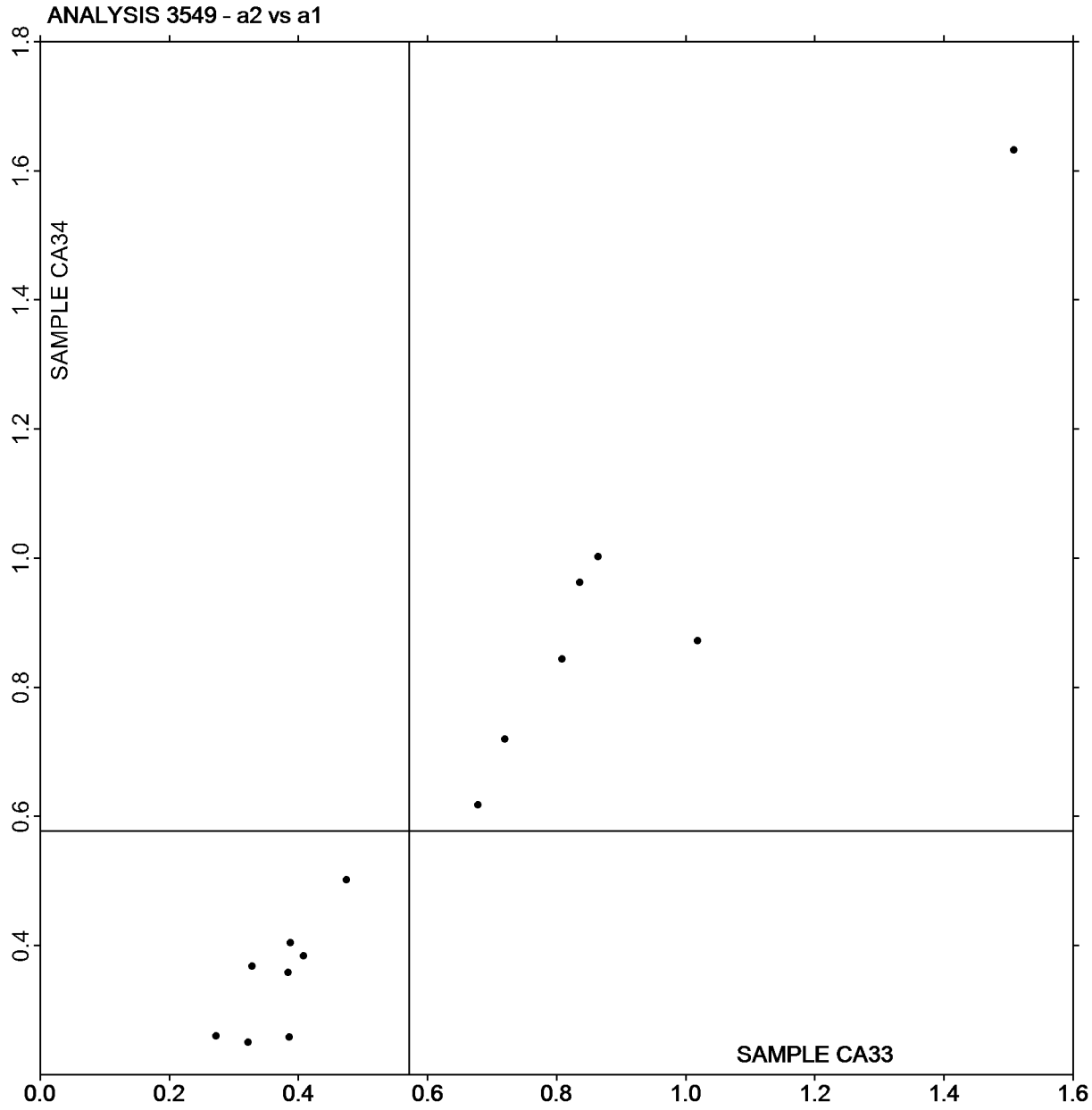
HF	Hunter LabScan II	HK	Hunter LabScan XE
LA	L & W Elrepho AL300	LS	L & W Elrepho SE 070
NH	Minolta CM-3700A Spectrophotometer	TC	Technidyne Color Touch Series
TS	Technidyne Brightimeter Micro S-5	XX	Instrument make/model not specified by lab

Plot of L values CA34 vs L values CA33



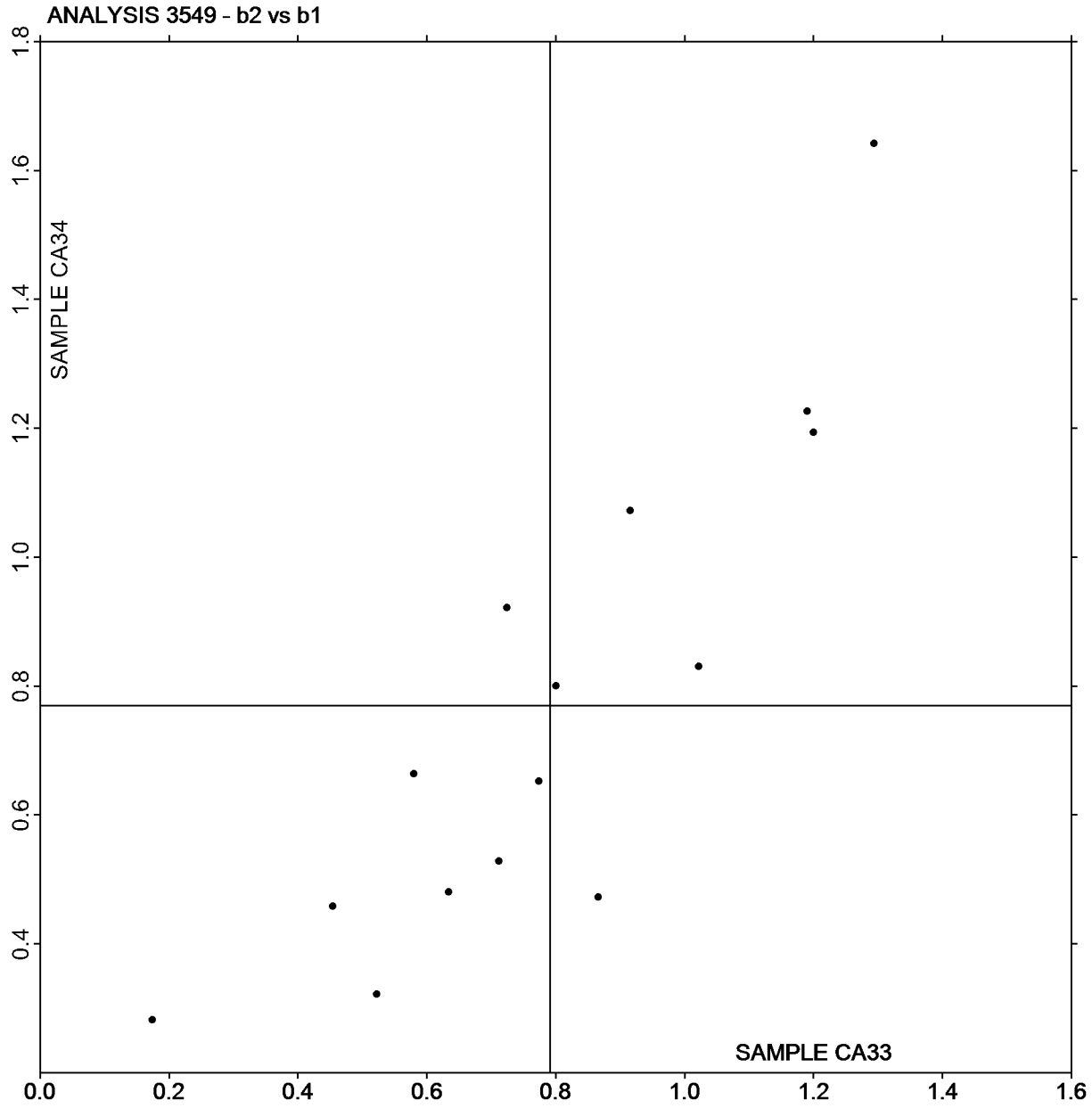
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Plot of a values CA34 vs a values CA33



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

Plot of b values CA34 vs b values CA33



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 3551

Color & Color Difference - Near White Papers - D65/10deg obs

Hunter L,a,b - Illuminant D65 - 10 Degree Observer

Report #4322, October 2024

Web Code	Data Flag	Samples	Hunter L, a, b Color Values L	a	b	Color Difference Values ΔL	Δa	Δb	ΔE	Instr Code
8FL4GL		**CA33**	89.73	-0.56	-0.39	0.01	-0.02	0.15	0.15	LS
		CA34	89.73	-0.59	-0.24					
8J8MLQ		**CA33**	89.57	-0.51	-0.29	0.12	-0.04	0.17	0.21	XX
		CA34	89.69	-0.54	-0.12					
9RVVL8		**CA33**	89.72	-0.59	-0.33	0.12	0.00	0.19	0.22	XX
		CA34	89.84	-0.59	-0.14					
FH3ZGX		**CA33**	89.68	-0.51	-0.05	-0.05	0.10	-0.27	0.29	TC
		CA34	89.63	-0.41	-0.31					
FUF6RZ		**CA33**	89.79	-0.43	0.13	-0.05	-0.01	-0.02	0.05	NH
		CA34	89.75	-0.44	0.11					
KRFEVW		**CA33**	87.68	-0.52	-0.30	0.07	-0.01	0.04	0.08	HL
		CA34	87.74	-0.53	-0.26					
LNQRDT		**CA33**	89.62	-0.49	-0.04	-0.08	0.02	-0.14	0.16	LT
		CA34	89.53	-0.47	-0.18					
NZVN97		**CA33**	89.62	-0.56	0.02	-0.08	0.03	-0.19	0.20	EG
		CA34	89.54	-0.53	-0.16					
QGE2Z4		**CA33**	88.98	-0.62	-0.21	-0.16	0.01	-0.10	0.19	XC
		CA34	88.82	-0.60	-0.31					
TNP8N7		**CA33**	89.71	-0.32	-0.68	0.45 X	-0.10	0.19	0.50 X	NF
		CA34	90.15	-0.42	-0.49					
VQ3L8W		**CA33**	87.34	-0.23	-0.39	0.15	-0.05	0.21	0.26	XB
		CA34	87.49	-0.28	-0.18					
YHHL6G		**CA33**	86.83	0.32	-0.54	-0.03	0.10	-0.21	0.23	TC
		CA34	86.80	0.42	-0.75					

Summary Statistics

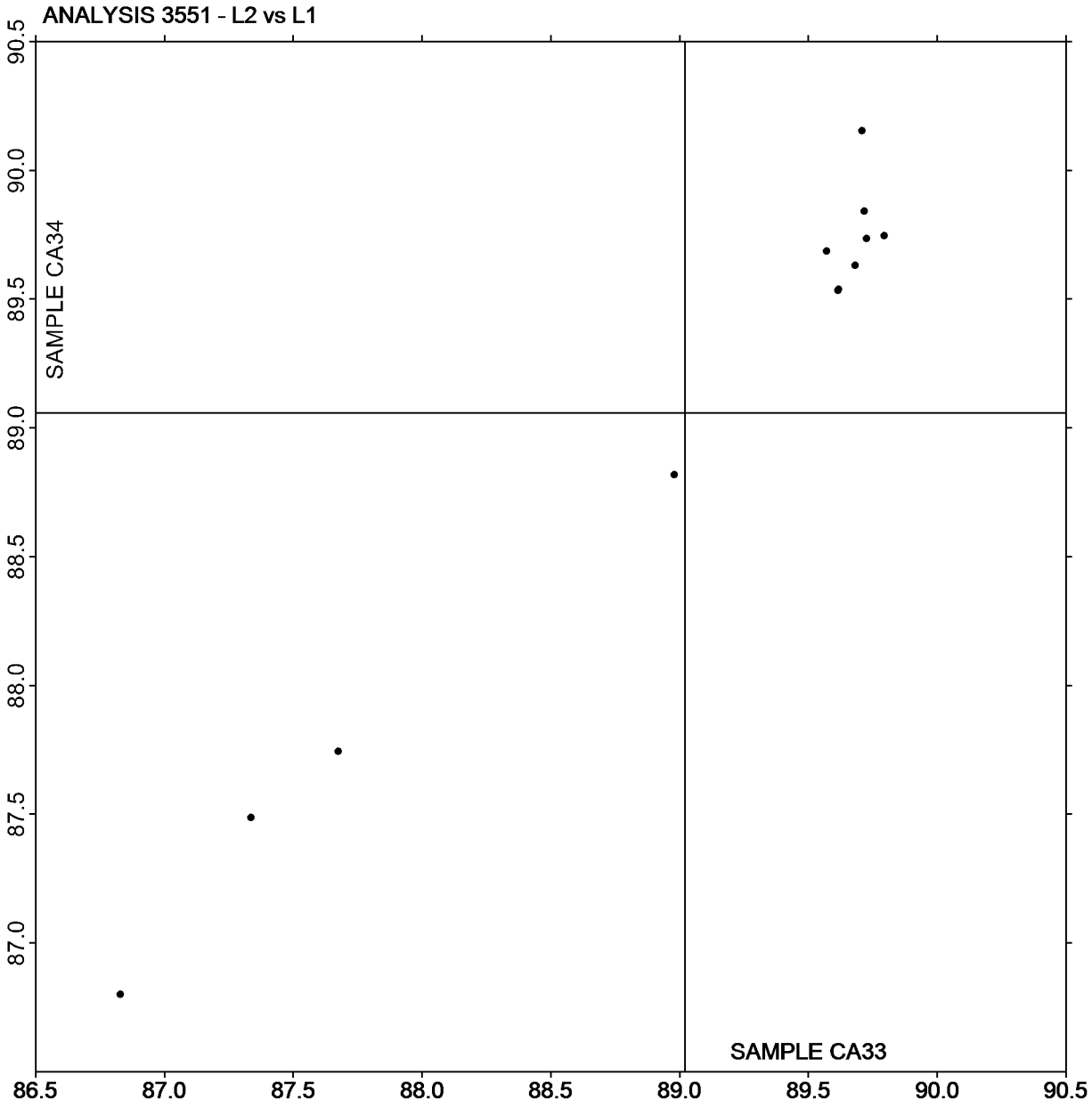
Grand Means							
CA33	89.021	-0.419	-0.255	0.038	0.003	0.002	0.214
CA34	89.059	-0.416	-0.254				
Stnd Dev Btwn Labs							
CA33	1.085	0.258	0.240	0.160	0.058	0.178	0.112
CA34	1.099	0.279	0.212				

Statistics based on 12 of 12 reporting participants

Key to Instrument Codes Reported by Participants

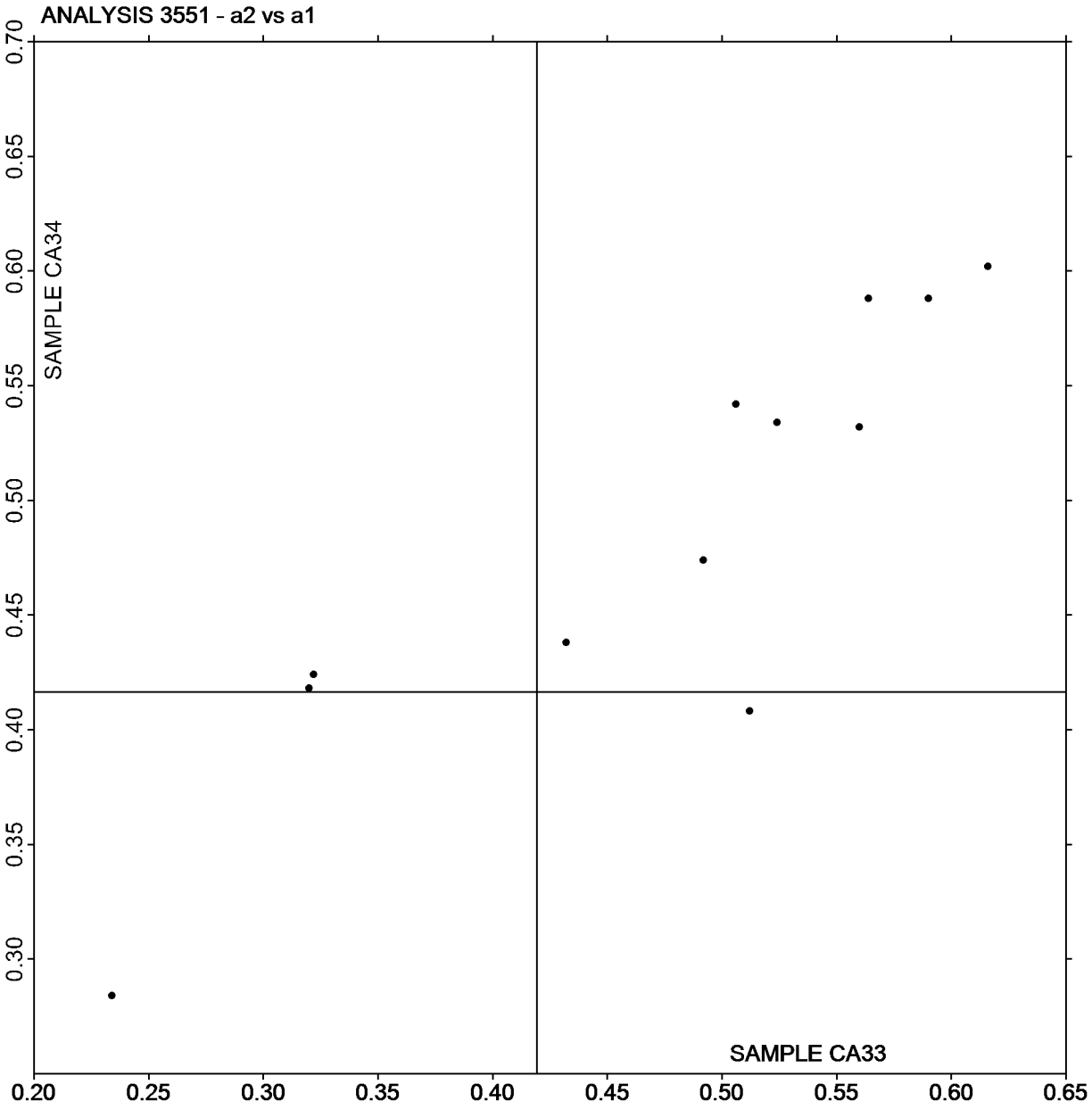
EG	Datacolor Elrepho	HL	Hunter Agera
LS	L & W Elrepho SE 070	LT	L & W Elrepho SE 071
NF	Minolta CM-3600d Spectrophotometer	NH	Minolta CM-3700A Spectrophotometer
TC	Technidyne Color Touch Series	XB	X-Rite Ci7
XC	X-Rite eXact Series	XX	Instrument make/model not specified by lab

Plot of L values CA34 vs L values CA33



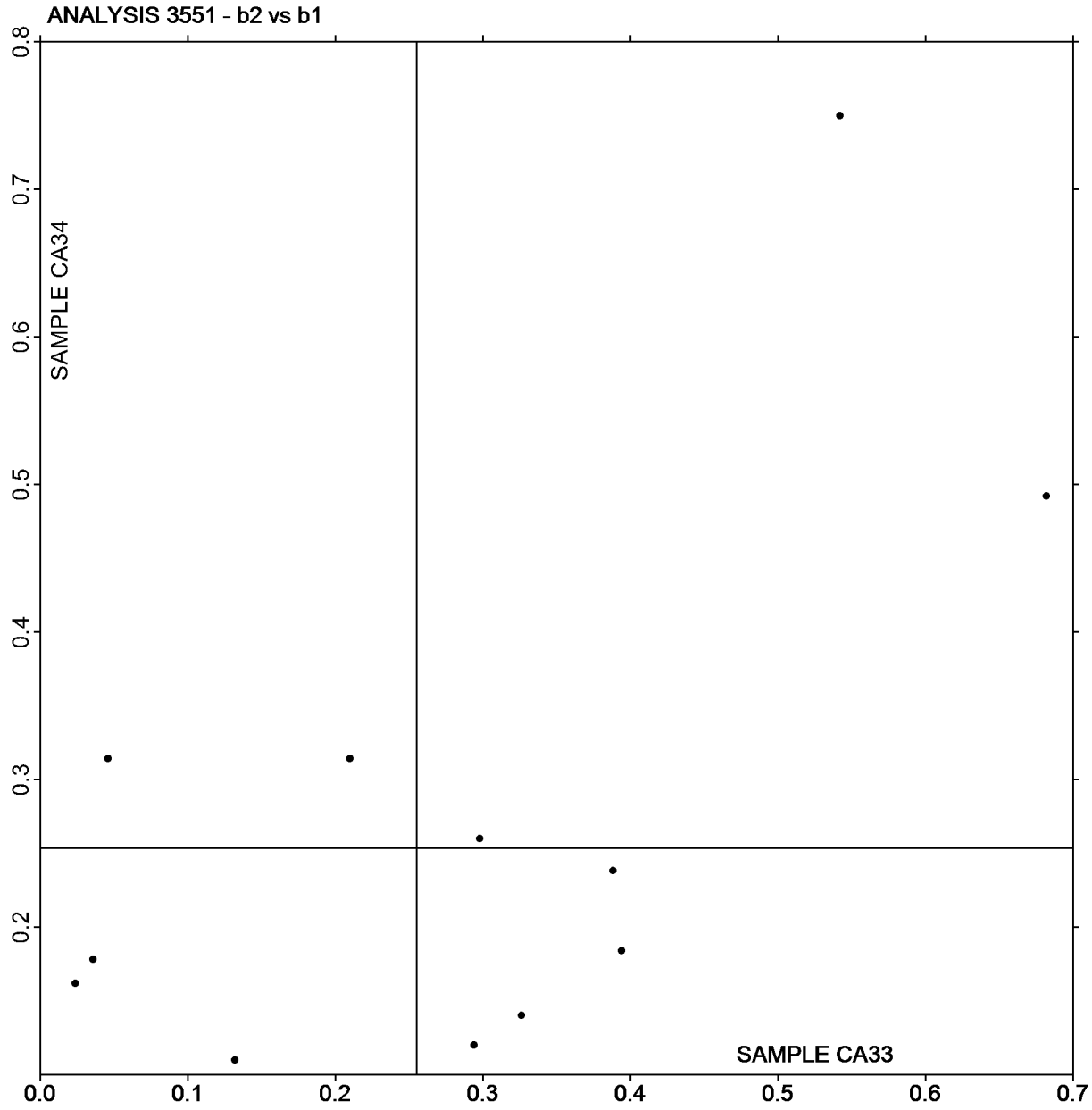
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Plot of a values CA34 vs a values CA33



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

Plot of b values CA34 vs b values CA33



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 3553

Specular Gloss at 75 Degrees - High Range

TAPPI Official Test Method T480

Report #4322, October 2024

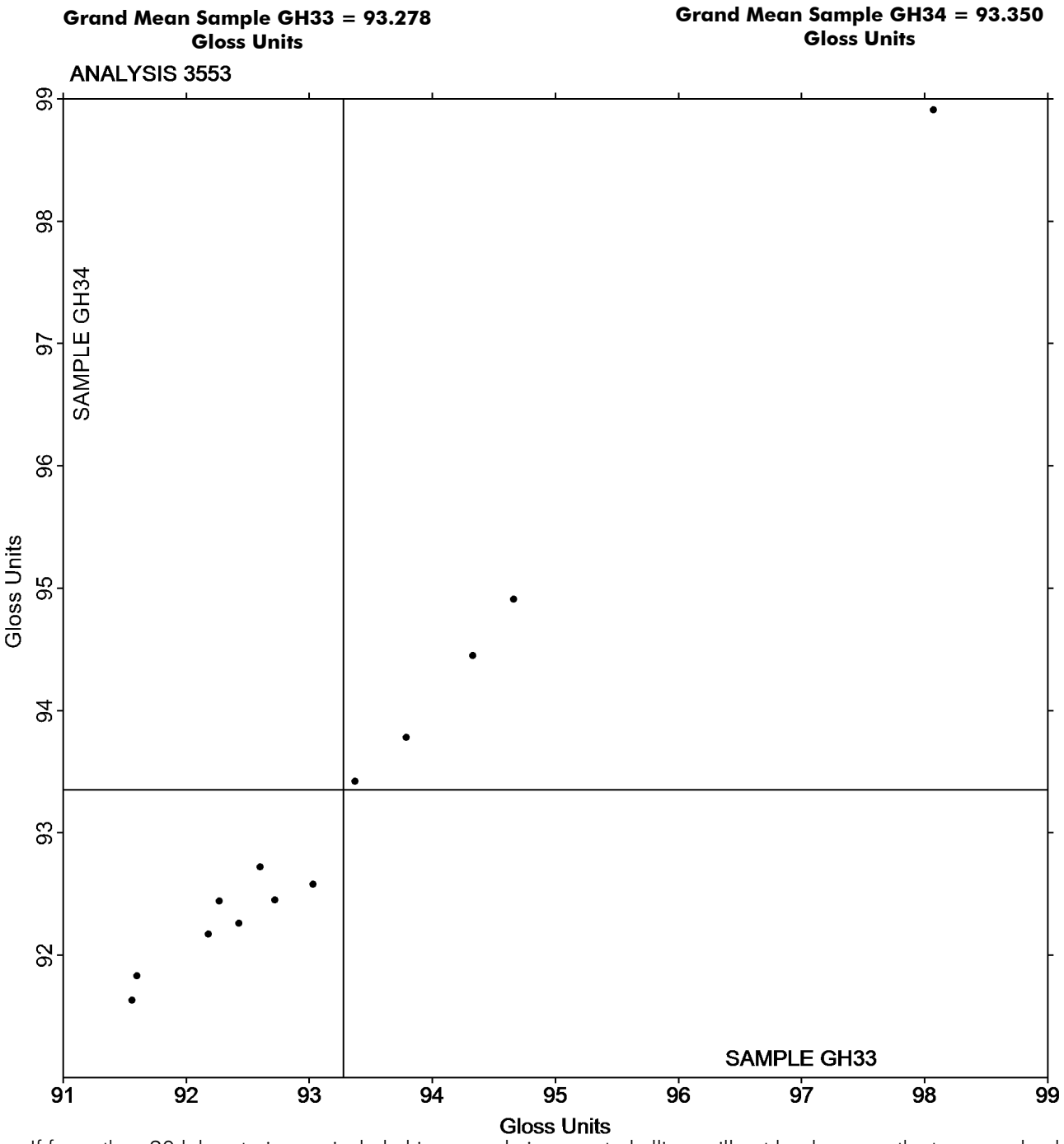
WebCode	Data Flag	Sample GH33 Lab Mean	Sample GH33 Diff from Grand Mean	Sample GH33 CPV	Sample GH34 Lab Mean	Sample GH34 Diff from Grand Mean	Sample GH34 CPV	Instr Code
7WF9AP		92.43	-0.85	-0.49	92.26	-1.09	-0.56	LG
8Y2CHM		94.33	1.05	0.61	94.45	1.10	0.57	VM
8ZRDLP		92.27	-1.01	-0.58	92.44	-0.91	-0.47	PP
B4L7A6		92.60	-0.68	-0.39	92.72	-0.63	-0.32	LF
HZCWUE		93.03	-0.25	-0.14	92.58	-0.77	-0.40	TP
LNQRDT		91.56	-1.72	-0.99	91.63	-1.72	-0.89	GA
NZVN97		92.72	-0.56	-0.32	92.45	-0.90	-0.46	TH
PXNQEP		98.07	4.79	2.77	98.91	5.56	2.86	LF
U4XF4Z		93.79	0.51	0.30	93.78	0.43	0.22	PP
VV2ZUL		91.60	-1.68	-0.97	91.83	-1.52	-0.78	GM
W2HXZK		92.18	-1.10	-0.64	92.17	-1.18	-0.61	TA
ZEF8VW		93.37	0.09	0.05	93.42	0.07	0.04	GM
ZRL4EY		94.66	1.38	0.80	94.91	1.56	0.80	LW

Summary Statistics	Sample GH33	Sample GH34
Grand Means	93.28 Gloss Units	93.35 Gloss Units
Stnd Dev Btwn Labs	1.73 Gloss Units	1.94 Gloss Units

Statistics based on 13 of 13 reporting participants.

Key to Instrument Codes Reported by Participants

GA	BYK-Gardner (model not specified)	GM	BYK-Gardner micro-gloss
LF	L & W Autoline 400	LG	L & W Autoline 600
LW	L & W Gloss Tester	PP	Technidyne Profile/Plus
TA	Technidyne Test Plus Gloss 75 degree	TH	Technidyne T480A
TP	Technidyne Profile Plus	VM	Valmet PaperLab (was Kajaani/Robotest)



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 3555

Specular Gloss at 75 Degrees - Low Range

TAPPI Official Test Method T480

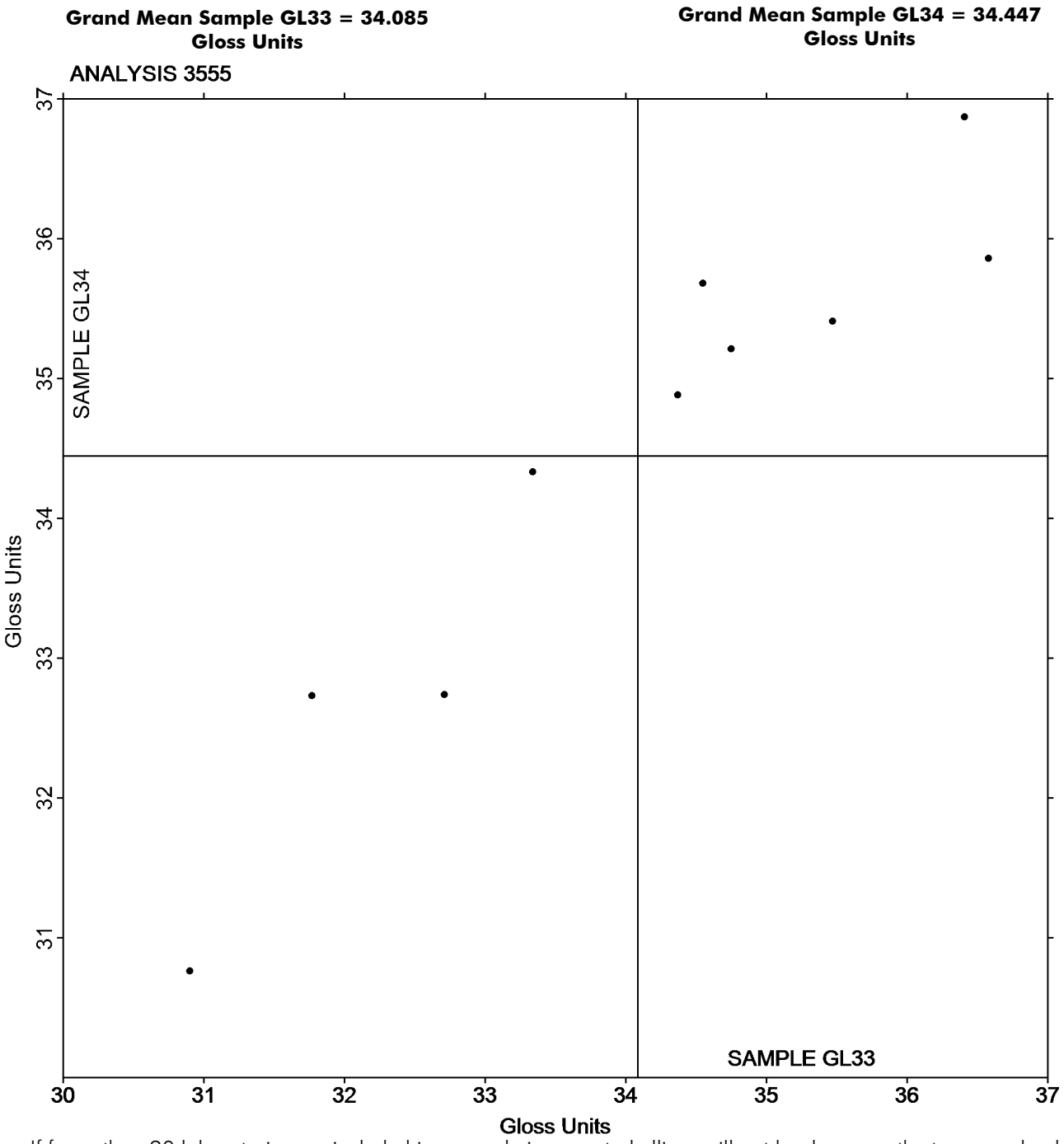
WebCode	Data Flag	Sample GL33 Lab Mean	Sample GL33 Diff from Grand Mean	Sample GL33 CPV	Sample GL34 Lab Mean	Sample GL34 Diff from Grand Mean	Sample GL34 CPV	Instr Code
2MPWBF		34.37	0.28	0.15	34.88	0.43	0.24	GM
7WV63P		32.71	-1.37	-0.73	32.74	-1.71	-0.93	TH
AJEJ7L		36.58	2.49	1.32	35.86	1.41	0.77	TP
AW2VC4		34.75	0.66	0.35	35.21	0.76	0.41	GS
CHCTT3		30.90	-3.19	-1.68	30.76	-3.69	-2.00	GM
R8KDH7		33.34	-0.75	-0.39	34.33	-0.12	-0.06	WJ
VQ3L8W		34.55	0.46	0.25	35.68	1.23	0.67	TH
W2HXZK		31.77	-2.31	-1.22	32.73	-1.72	-0.93	TA
YHHL6G		36.41	2.33	1.23	36.87	2.42	1.32	PP
ZRL4EY		35.47	1.39	0.73	35.41	0.96	0.52	LW

Summary Statistics	Sample GL33	Sample GL34
Grand Means	34.09 Gloss Units	34.45 Gloss Units
Stnd Dev Btwn Labs	1.89 Gloss Units	1.84 Gloss Units

Statistics based on 10 of 10 reporting participants.

Key to Instrument Codes Reported by Participants

GM	BYK-Gardner micro-gloss	GS	BYK-Gardner Glossgard II
LW	L & W Gloss Tester	PP	Technidyne Profile/Plus
TA	Technidyne Test Plus Gloss 75 degree	TH	Technidyne T480A
TP	Technidyne Profile Plus	WJ	Zehntner ZLR 1020



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 3601

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

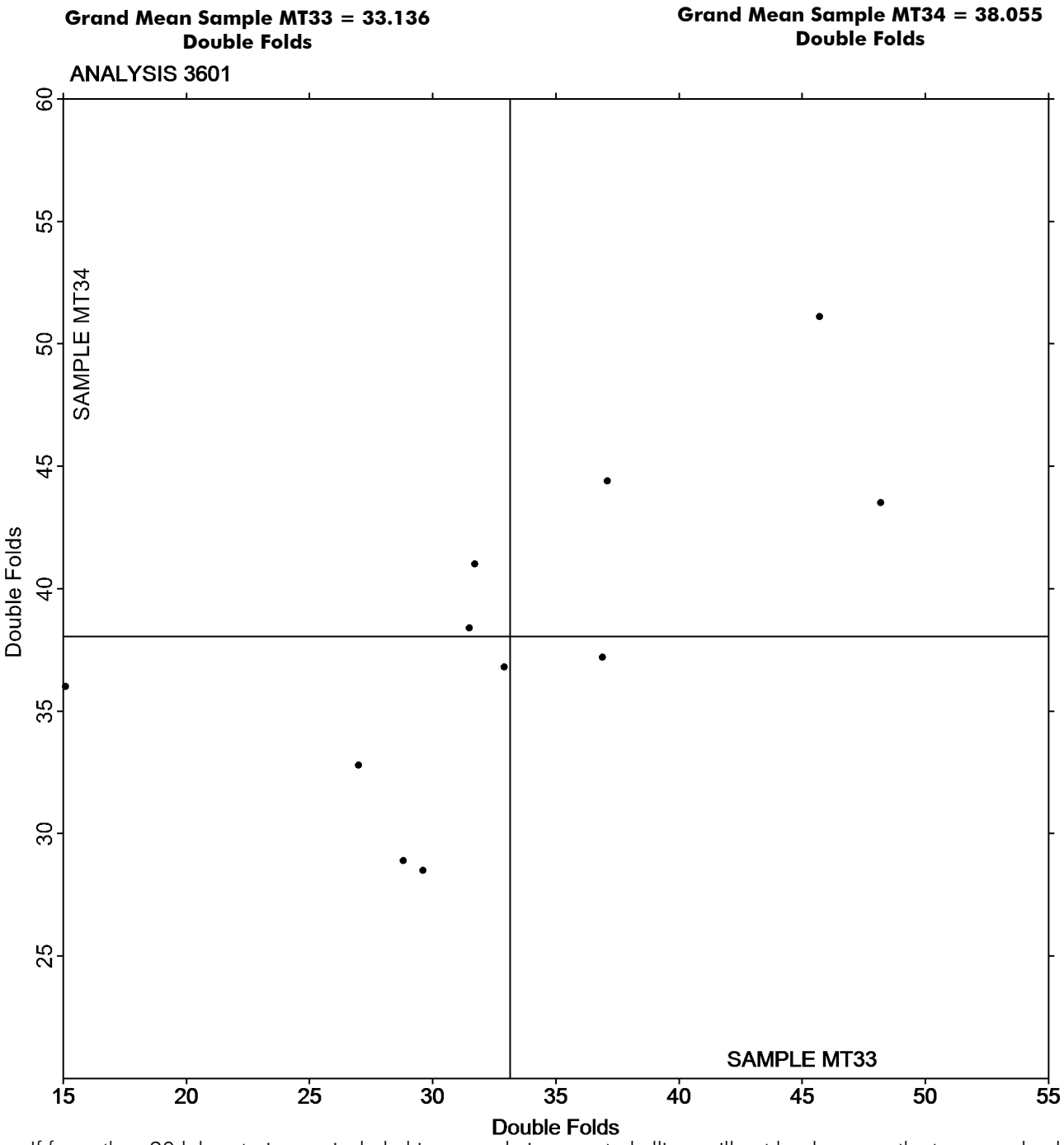
WebCode	Data Flag	Sample MT33 Lab Mean	Sample MT33 Diff from Grand Mean	Sample MT33 CPV	Sample MT34 Lab Mean	Sample MT34 Diff from Grand Mean	Sample MT34 CPV	Instr Code
3YDF3Q		27.00	-6.14	-0.68	32.80	-5.25	-0.78	MT
7WV63P		15.10	-18.04	-2.00	36.00	-2.05	-0.30	MT
8J8MLQ		31.50	-1.64	-0.18	38.40	0.35	0.05	XX
8Y2CHM		28.80	-4.34	-0.48	28.90	-9.15	-1.35	MT
CR49FK		36.90	3.76	0.42	37.20	-0.85	-0.13	MT
EVBGVF		31.70	-1.44	-0.16	41.00	2.95	0.44	XX
LNQRDT		29.60	-3.54	-0.39	28.50	-9.55	-1.41	MT
M4Y67B		45.70	12.56	1.39	51.10	13.05	1.93	MT
NZVN97		48.20	15.06	1.67	43.50	5.45	0.80	MT
VQ3L8W		32.90	-0.24	-0.03	36.80	-1.25	-0.19	MT
X3BBXX		37.10	3.96	0.44	44.40	6.35	0.94	MT

Summary Statistics	Sample MT33	Sample MT34
Grand Means	33.14 Double Folds	38.05 Double Folds
Stnd Dev Btwn Labs	9.02 Double Folds	6.77 Double Folds

Statistics based on 11 of 11 reporting participants.

Key to Instrument Codes Reported by Participants

MT	MIT - Tinius Olsen	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 3603
Bending Resistance, Gurley Type
TAPPI Official Test Method T543

WebCode	Data Flag	Sample BG33 Lab Mean	Sample BG33 Diff from Grand Mean	Sample BG33 CPV	Sample BG34 Lab Mean	Sample BG34 Diff from Grand Mean	Sample BG34 CPV	Instr Code
6JTEMC	X	283.4	168.6	4.55	261.6	141.9	3.79	ZZ
6RNKER	X	4.8	-110.0	-2.97	4.7	-115.0	-3.08	ZZ
7WV63P		70.6	-44.2	-1.19	78.6	-41.1	-1.10	ZZ
8CLRKM		135.4	20.5	0.55	135.9	16.2	0.43	ZZ
8Y2CHM		144.2	29.4	0.79	137.2	17.5	0.47	ZZ
93F8XK		142.1	27.2	0.74	141.2	21.5	0.57	ZZ
AHJ937		116.4	1.6	0.04	114.9	-4.9	-0.13	ZZ
CR49FK		122.7	7.8	0.21	128.0	8.3	0.22	ZZ
FUF6RZ		64.4	-50.4	-1.36	69.5	-50.2	-1.34	ZZ
KRFEVW		96.6	-18.3	-0.49	113.1	-6.6	-0.18	ZZ
N2CK27		89.7	-25.1	-0.68	91.5	-28.2	-0.75	ZZ
QGE2Z4		71.3	-43.5	-1.17	75.3	-44.4	-1.19	ZZ
VQ3L8W		127.9	13.0	0.35	145.2	25.5	0.68	ZZ
X3BBXX		114.1	-0.7	-0.02	117.0	-2.7	-0.07	ZZ
Z8ETAV		197.6	82.8	2.23	209.1	89.4	2.39	ZZ

Summary Statistics	Sample BG33	Sample BG34
Grand Means	114.83 Gurley Units	119.73 Gurley Units
Stnd Dev Btwn Labs	37.05 Gurley Units	37.41 Gurley Units

Statistics based on 13 of 15 reporting participants.

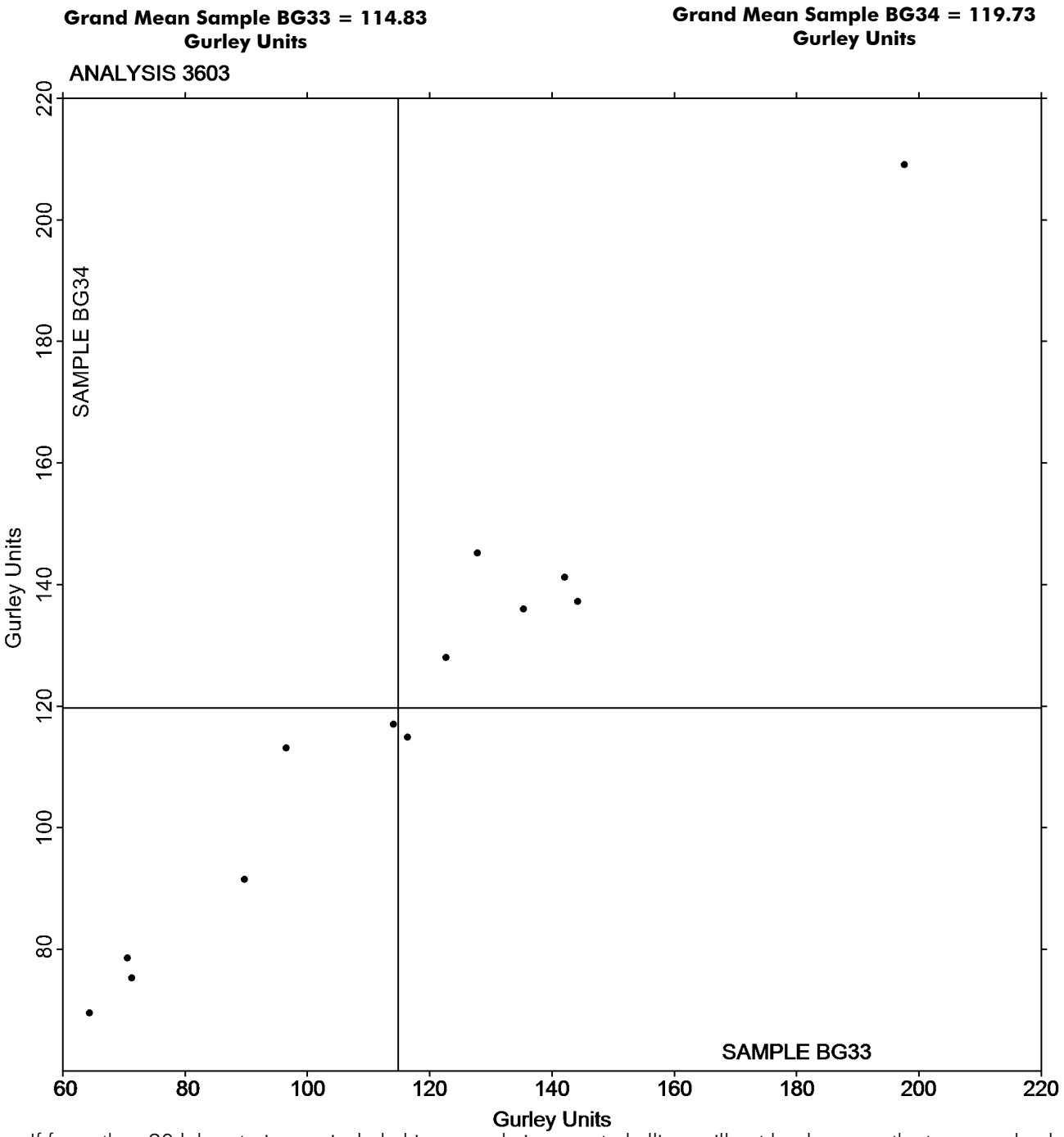
Comments on Assigned Data Flags for Test #3603

6RNKER (X) - Data for both samples are low. Possible Systematic Error.

6JTEMC (X) - Data for both samples are high. Possible Systematic Error.

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 3611

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

TAPPI Official Test Method T549

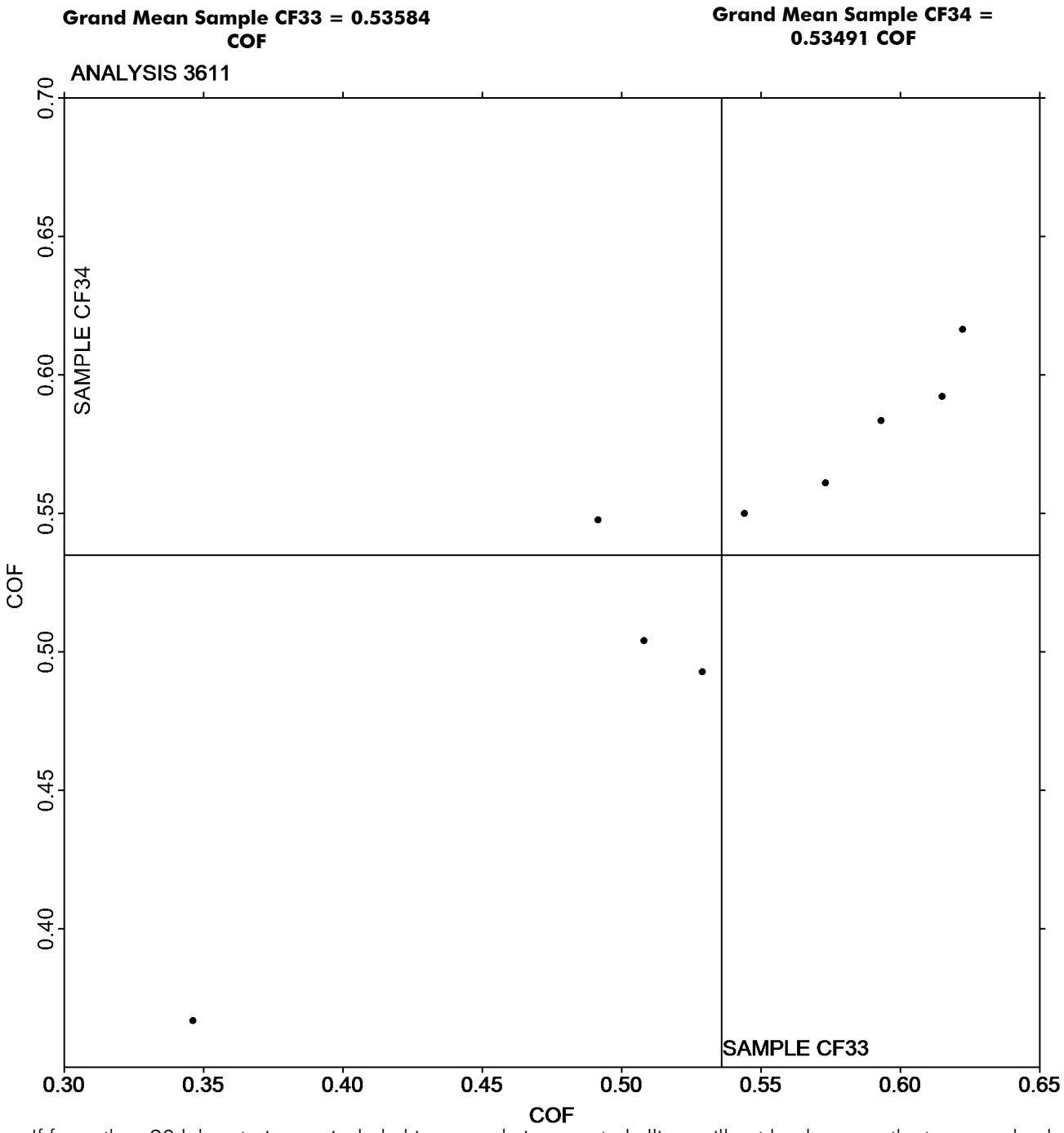
WebCode	Data Flag	Sample CF33 Lab Mean	Sample CF33 Diff from Grand Mean	Sample CF33 CPV	Sample CF34 Lab Mean	Sample CF34 Diff from Grand Mean	Sample CF34 CPV	Instr Code
2FQAJG		0.5732	0.0374	0.44	0.5610	0.0261	0.35	TA
3YDF3Q		0.6224	0.0866	1.02	0.6164	0.0815	1.09	TM
4TPXLU		0.5290	-0.0068	-0.08	0.4928	-0.0421	-0.57	XX
6RNKER		0.3462	-0.1896	-2.24	0.3668	-0.1681	-2.26	TX
93F8XK		0.5080	-0.0278	-0.33	0.5040	-0.0309	-0.42	TA
AJEJ7L		0.5932	0.0574	0.68	0.5834	0.0485	0.65	TA
CR49FK		0.6150	0.0792	0.94	0.5922	0.0573	0.77	TA
FUF6RZ		0.5440	0.0082	0.10	0.5500	0.0151	0.20	TP
WZ9TMW		0.4916	-0.0442	-0.52	0.5476	0.0127	0.17	TA

Summary Statistics	Sample CF33	Sample CF34
Grand Means	0.54 COF	0.53 COF
Stnd Dev Btwn Labs	0.08 COF	0.07 COF

Statistics based on 9 of 9 reporting participants.

Key to Instrument Codes Reported by Participants

TA	Thwing-Albert Friction Tester	TM	TMI 32-06 Monitor/Slip and Friction
TP	TMI 32-25 COF Tester (Inclined Plane)	TX	TMI (model not specified)
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 3612

Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers

TAPPI Official Test Method T549

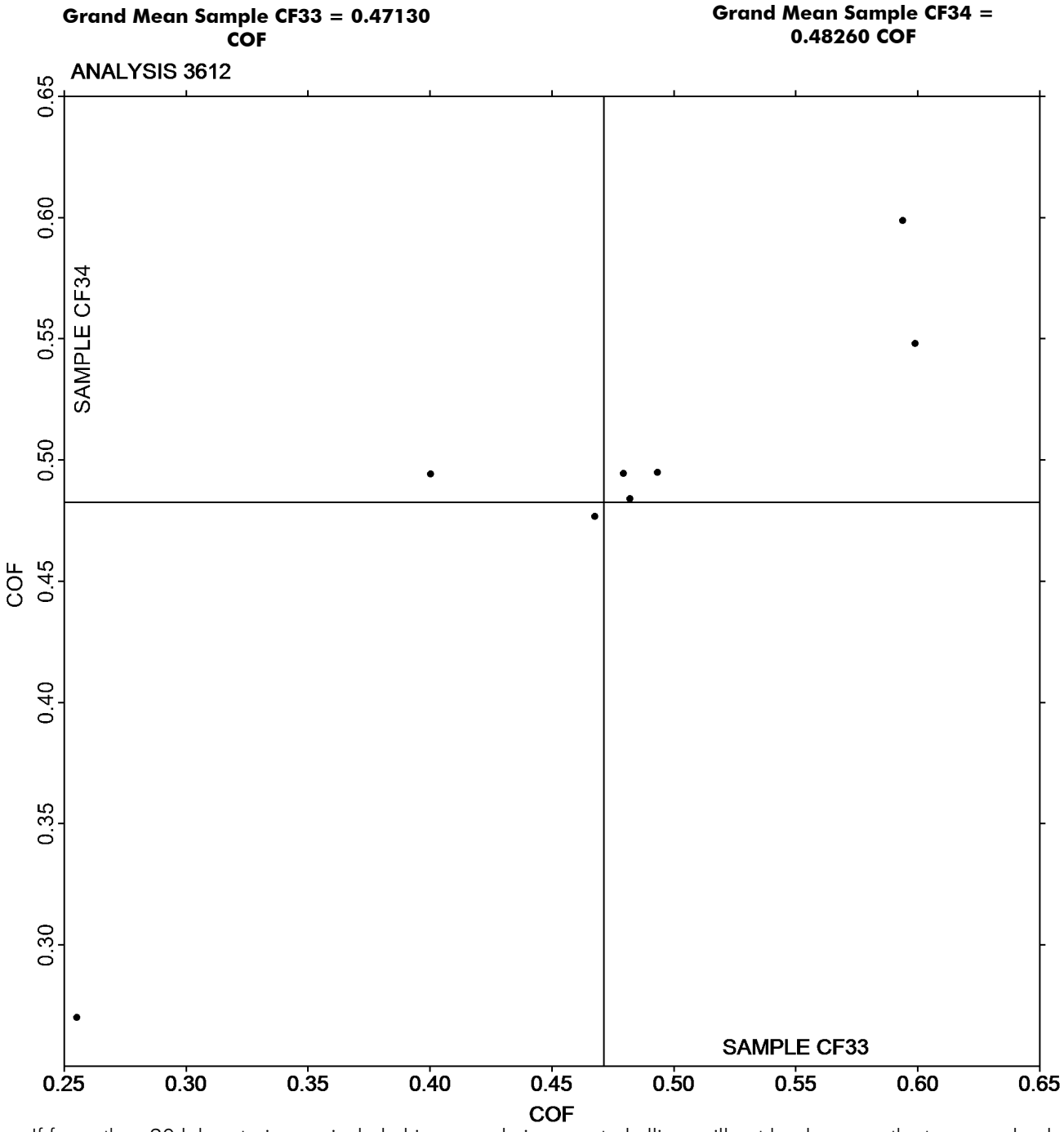
WebCode	Data Flag	Sample CF33 Lab Mean	Sample CF33 Diff from Grand Mean	Sample CF33 CPV	Sample CF34 Lab Mean	Sample CF34 Diff from Grand Mean	Sample CF34 CPV	Instr Code
2FQAJG		0.4932	0.0219	0.20	0.4948	0.0122	0.13	TA
3YDF3Q		0.5938	0.1225	1.12	0.5988	0.1162	1.22	TM
4TPXLU		0.5990	0.1277	1.17	0.5480	0.0654	0.69	XX
6RNKER		0.2552	-0.2161	-1.98	0.2700	-0.2126	-2.23	TX
93F8XK		0.4820	0.0107	0.10	0.4840	0.0014	0.01	TA
AJEJ7L		0.4794	0.0081	0.07	0.4944	0.0118	0.12	TA
CR49FK		0.4676	-0.0037	-0.03	0.4766	-0.0060	-0.06	TA
WZ9TMW		0.4002	-0.0711	-0.65	0.4942	0.0116	0.12	TA

Summary Statistics	Sample CF33	Sample CF34
Grand Means	0.47 COF	0.48 COF
Stnd Dev Btwn Labs	0.11 COF	0.10 COF

Statistics based on 8 of 8 reporting participants.

Key to Instrument Codes Reported by Participants

TA	Thwing-Albert Friction Tester	TM	TMI 32-06 Monitor/Slip and Friction
TX	TMI (model not specified)	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 3613
Moisture in Paper
TAPPI Official Test Method T412

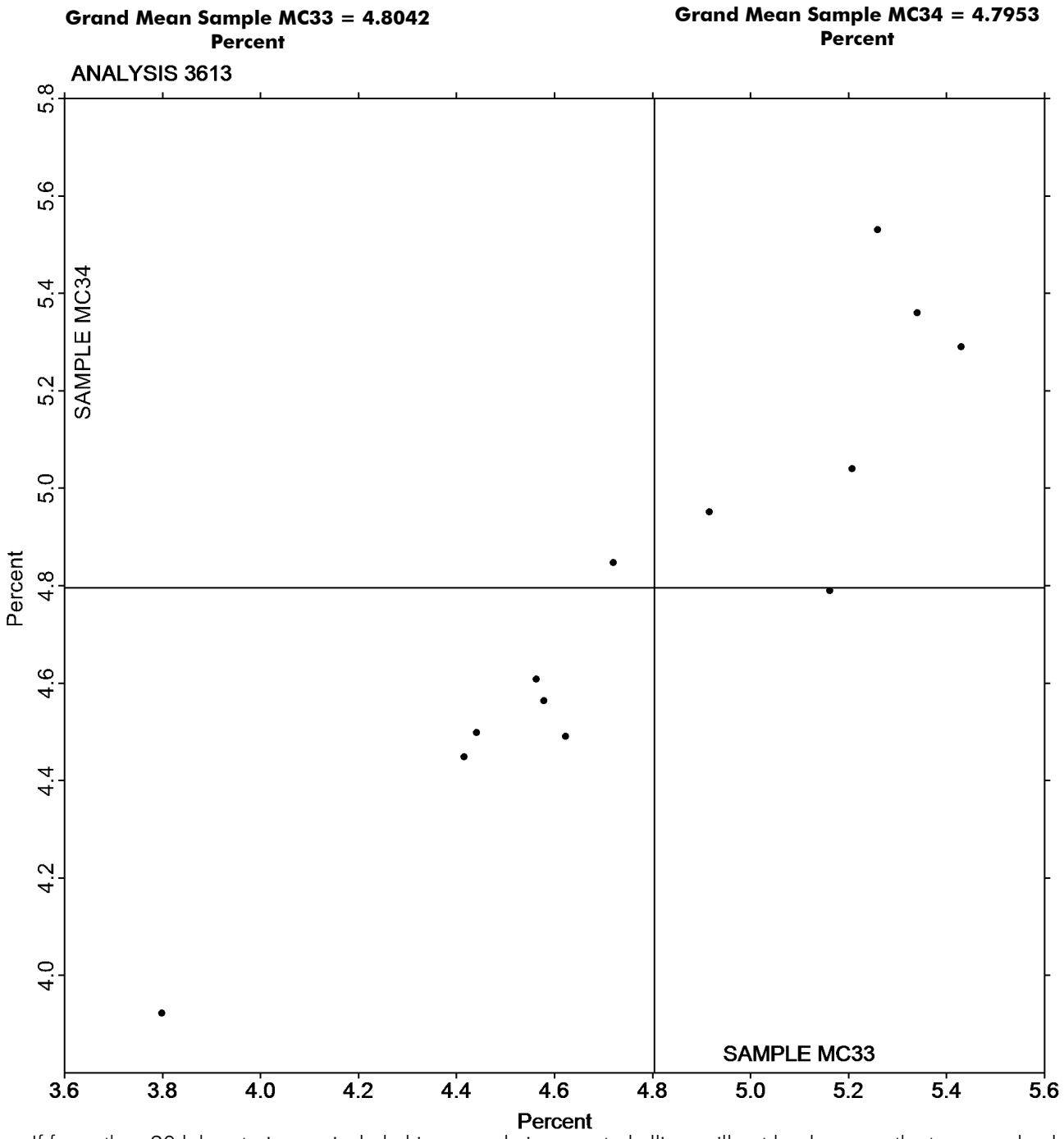
WebCode	Data Flag	Sample MC33 Lab Mean	Sample MC33 Diff from Grand Mean	Sample MC33 CPV	Sample MC34 Lab Mean	Sample MC34 Diff from Grand Mean	Sample MC34 CPV	Instr Code
2VEK4X		4.578	-0.226	-0.48	4.564	-0.231	-0.52	ZZ
7UATU7		5.430	0.626	1.34	5.290	0.495	1.12	ZZ
93F8XK		4.917	0.112	0.24	4.951	0.156	0.35	ZZ
AHJ937		4.441	-0.364	-0.78	4.498	-0.297	-0.67	ZZ
BPZYAH		5.340	0.536	1.14	5.360	0.565	1.28	ZZ
CVKLC2		4.720	-0.084	-0.18	4.847	0.052	0.12	ZZ
EEAJQY		3.799	-1.005	-2.15	3.922	-0.873	-1.98	ZZ
GMGTDH		4.416	-0.388	-0.83	4.448	-0.347	-0.79	ZZ
LP3D4U		5.162	0.358	0.76	4.790	-0.005	-0.01	ZZ
QHRVHP		4.623	-0.181	-0.39	4.491	-0.304	-0.69	ZZ
R8KDH7		4.563	-0.242	-0.52	4.608	-0.188	-0.42	ZZ
TNP8N7		5.260	0.456	0.97	5.530	0.735	1.66	ZZ
X3BBXX		5.208	0.403	0.86	5.040	0.245	0.55	ZZ

Summary Statistics	Sample MC33	Sample MC34
Grand Means	4.80 Percent	4.80 Percent
Stnd Dev Btwn Labs	0.47 Percent	0.44 Percent

Statistics based on 13 of 13 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

Report #4322, October 2024

Analysis 3615

Sizing Test (Hercules Type)

TAPPI Official Test Method T530

WebCode	Data Flag	Sample HS33 Lab Mean	Sample HS33 Diff from Grand Mean	Sample HS33 CPV	Sample HS34 Lab Mean	Sample HS34 Diff from Grand Mean	Sample HS34 CPV	Instr Code
2MPWBF		91.10	36.01	1.35	90.50	36.66	1.36	HE
6RNKER		51.40	-3.69	-0.14	53.60	-0.24	-0.01	HE
8CLRKM		100.25	45.16	1.69	93.03	39.19	1.45	XX
8X6UFL		41.87	-13.22	-0.50	37.47	-16.37	-0.61	HE
8Y2CHM		20.30	-34.79	-1.31	19.90	-33.94	-1.26	HE
93F8XK		55.37	0.28	0.01	49.06	-4.78	-0.18	HE
9LQ2PQ		48.25	-6.84	-0.26	44.84	-9.00	-0.33	HE
AJEJ7L		79.73	24.64	0.92	72.03	18.19	0.67	HE
B4L7A6		78.77	23.68	0.89	78.66	24.82	0.92	HE
BR8CRK		57.64	2.55	0.10	60.68	6.84	0.25	HE
FH3ZGX		36.61	-18.48	-0.69	32.01	-21.83	-0.81	HE
FUF6RZ		20.30	-34.79	-1.31	20.20	-33.64	-1.25	HE
GA7KDC		20.83	-34.26	-1.29	20.83	-33.01	-1.22	HE
KRFEVW		81.25	26.16	0.98	86.78	32.94	1.22	HE
N2CK27	X	126.10	71.01	2.66	69.71	15.87	0.59	HE
QGE2Z4		55.30	0.21	0.01	51.50	-2.34	-0.09	HE
UYZZBJ		79.70	24.61	0.92	87.10	33.26	1.23	HE
WZ9TMW		17.80	-37.29	-1.40	17.08	-36.76	-1.36	HE

Summary Statistics	Sample HS33	Sample HS34
Grand Means	55.09 Seconds	53.84 Seconds
Stnd Dev Btwn Labs	26.65 Seconds	26.98 Seconds

Statistics based on 17 of 18 reporting participants.

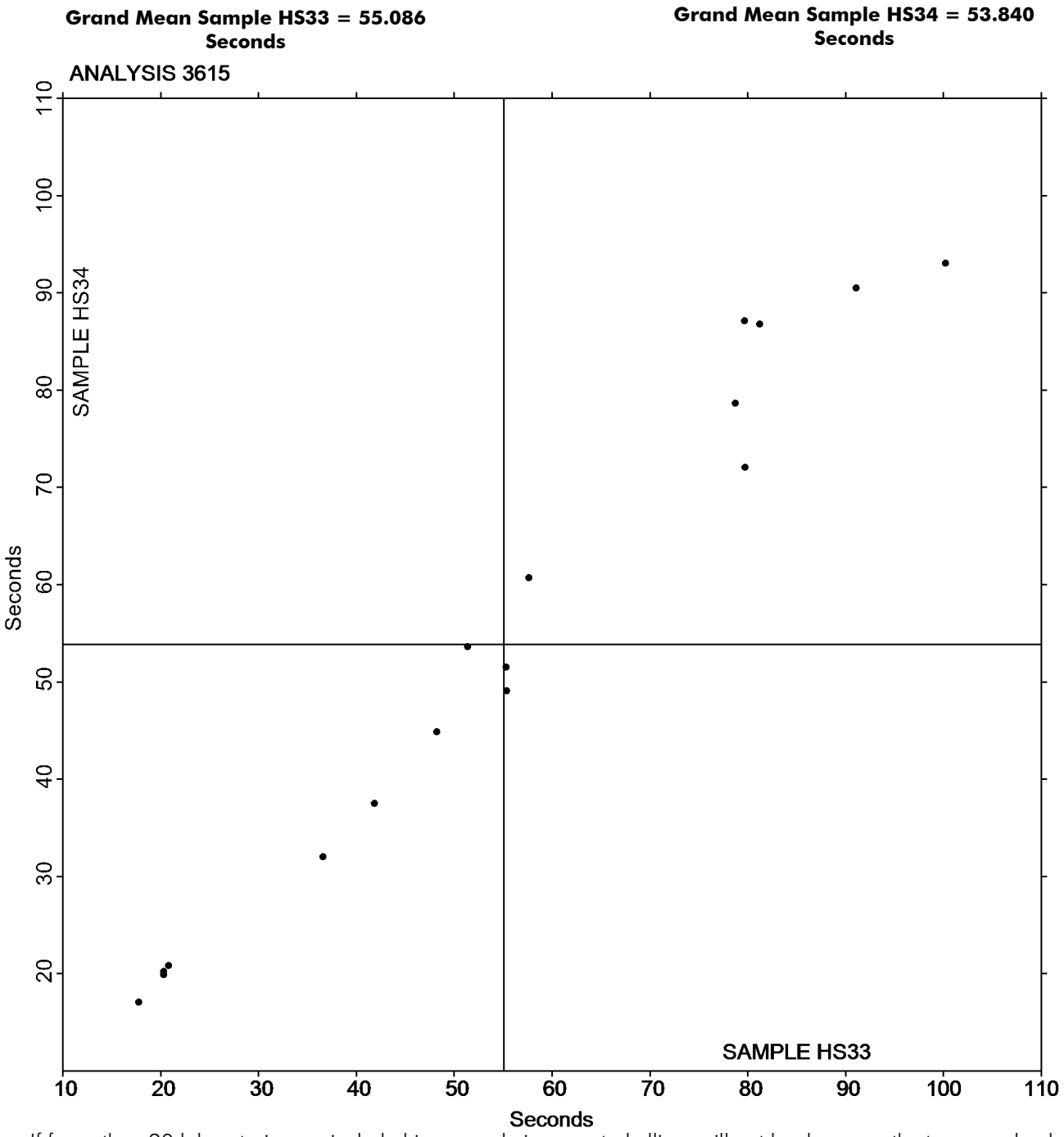
Comments on Assigned Data Flags for Test #3615

N2CK27 (X) - Data for sample HS33 are high.

Key to Instrument Codes Reported by Participants

HE Hercules Sizing 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-