Collaborative Testing Services, Inc.

Paper & Paperboard Testing Program

Summary Report #4232 - April 2023

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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 sectors: 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 CK15 Lab Mean	Sample CK15 Diff from Grand Mean	Sample CK15 CPV	Sample CK16 Lab Mean	Sample CK16 Diff from Grand Mean	Sample CK16 CPV	Instr Code
2Z4BUJ		9.674	0.163	1.37	7.799	0.109	1.12	LW
3CV4WF		9.562	0.050	0.42	7.716	0.026	0.27	XX
4TNHFC		9.617	0.105	0.88	7.778	0.088	0.91	PP
8MY2QK		9.678	0.166	1.40	7.772	0.082	0.84	EM
8W4V3X		9.593	0.081	0.68	7.788	0.098	1.01	XX
96UZA4	X	12.006	2.495	20.96	9.738	2.048	21.06	LW
9JDJ7D		9.462	-0.050	-0.42	7.680	-0.010	-0.10	OK
B3F9FD		9.471	-0.041	-0.34	7.624	-0.066	-0.68	EM
BCKFVD		9.580	0.068	0.57	7.749	0.059	0.61	LW
BRV2CH		9.423	-0.089	-0.75	7.721	0.031	0.32	LW
DJDBTA		9.396	-0.116	-0.97	7.657	-0.033	-0.34	EM
E4HCDK		9.426	-0.086	-0.72	7.600	-0.090	-0.92	LA
EN44E2		9.504	-0.008	-0.06	7.610	-0.080	-0.82	XX
EQPQ8P		9.431	-0.081	-0.68	7.592	-0.098	-1.01	XX
G92AXD		9.580	0.068	0.57	7.744	0.054	0.56	EM
GUFZX2		9.761	0.249	2.09	7.899	0.209	2.15	PP
GZ87PA		9.435	-0.077	-0.64	7.631	-0.059	-0.61	TA
HDCQNT		9.455	-0.057	-0.48	7.688	-0.002	-0.02	TM
HGA7FP	*	9.768	0.256	2.15	7.788	0.098	1.01	EM
HWMEGT		9.560	0.048	0.41	7.827	0.137	1.41	LW
K9PNWD		9.589	0.077	0.65	7.661	-0.029	-0.30	LW
KAPKNW		9.536	0.024	0.20	7.725	0.035	0.36	TA
RG2HPM		9.420	-0.092	-0.77	7.610	-0.080	-0.82	XX
RU7E9N		9.336	-0.176	-1.48	7.552	-0.138	-1.42	XX
TWCGDK		9.404	-0.108	-0.91	7.605	-0.085	-0.87	XX
U47NRJ		9.471	-0.041	-0.34	7.665	-0.025	-0.26	LW
VP4RQW		9.487	-0.025	-0.21	7.647	-0.043	-0.44	EM
W6T29T		9.228	-0.284	-2.38	7.453	-0.237	-2.44	XX
WEXE2F		9.486	-0.026	-0.22	7.688	-0.002	-0.02	LA
XQ88CT		9.584	0.073	0.61	7.817	0.127	1.30	LW
YB64ZD		9.579	0.067	0.56	7.677	-0.013	-0.13	LW
YE69W7		9.350	-0.162	-1.36	7.530	-0.160	-1.64	XX
ZRCB3L		9.530	0.018	0.15	7.785	0.095	0.98	LB

Summary Statistics	Sample CK15	Sample CK16
Grand Means	9.51 mils	7.69 mils
Stnd Dev Btwn Labs	0.12 mils	0.10 mils

Statistics based on 32 of 33 reporting participants.

Comments on Assigned Data Flags for Test #3501

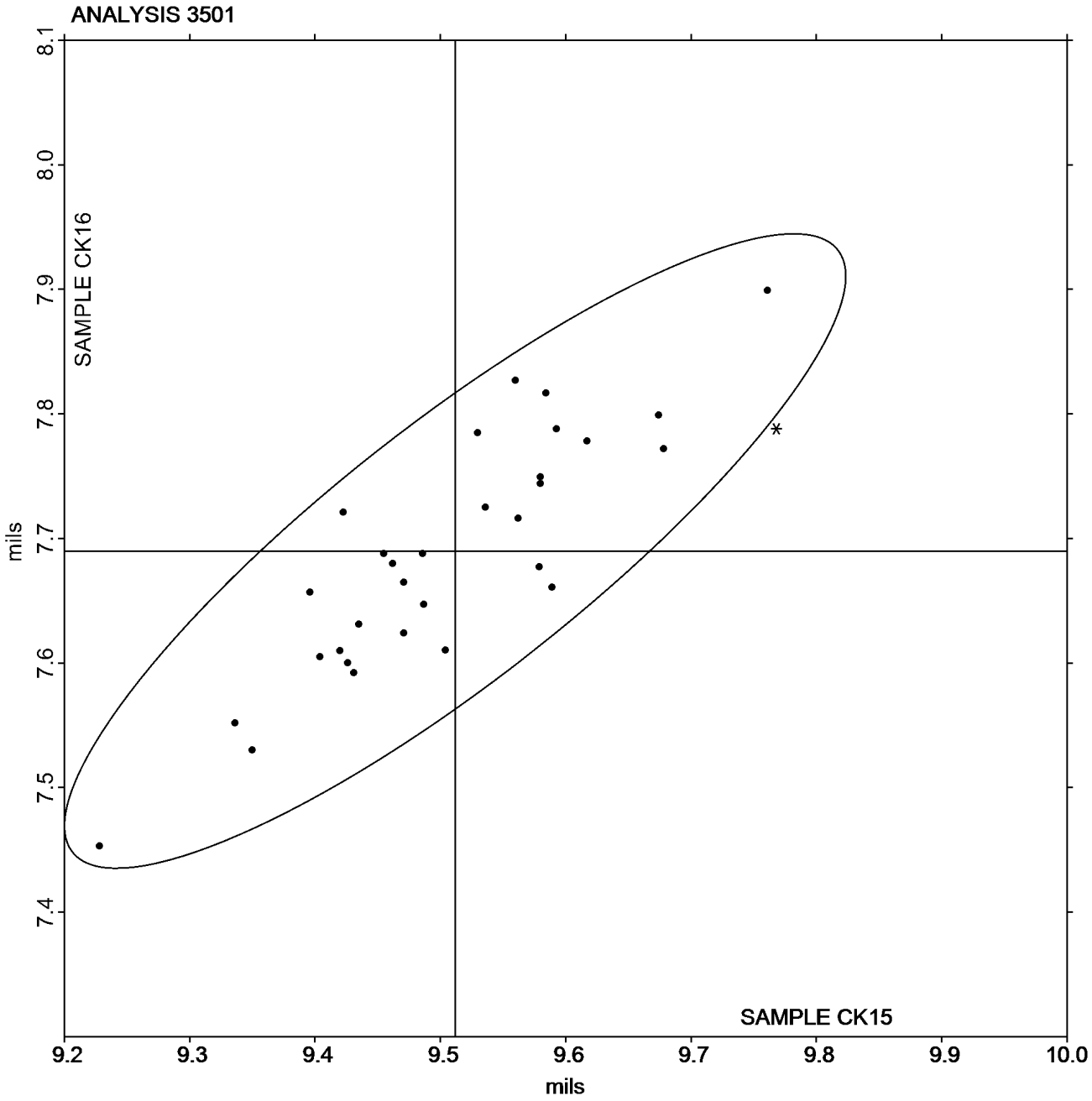
96UZA4 (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

EM	Emveco	LA	L & W Autoline
LB	L & W Autoline 600	LW	L & W
OK	Oakland	PP	Technidyne Profile/Plus
TA	Thwing-Albert	TM	TMI
XX	Instrument make/model not specified by lab		

Grand Mean Sample CK15 = 9.5117 mils

Grand Mean Sample CK16 = 7.6900 mils



Paper & Paperboard Interlaboratory Testing Program

Analysis 3511

Bursting Strength - Packaging Papers

TAPPI Official Test Method T403

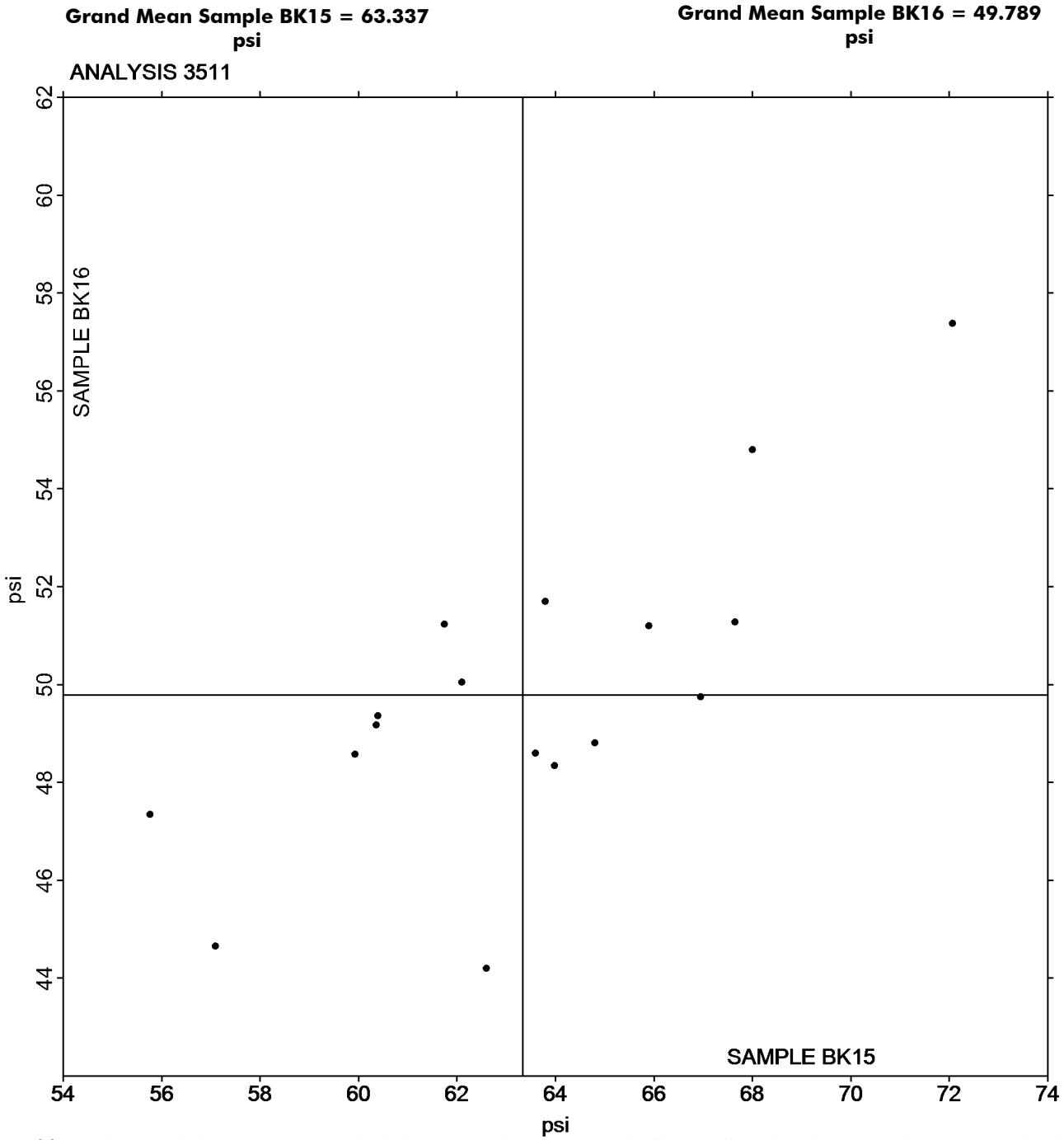
WebCode	Data Flag	Sample BK15 Lab Mean	Sample BK15 Diff from Grand Mean	Sample BK15 CPV	Sample BK16 Lab Mean	Sample BK16 Diff from Grand Mean	Sample BK16 CPV	Instr Code
2Z4BUJ		57.09	-6.25	-1.52	44.65	-5.14	-1.61	ZZ
7P69DJ		62.10	-1.24	-0.30	50.05	0.26	0.08	ZZ
8LEKXB		60.39	-2.94	-0.72	49.36	-0.43	-0.14	ZZ
8W4V3X		59.93	-3.41	-0.83	48.57	-1.21	-0.38	ZZ
96UZA4		61.75	-1.59	-0.39	51.23	1.44	0.45	ZZ
9JDJ7D		65.90	2.56	0.62	51.20	1.41	0.44	ZZ
BCKFVD		64.80	1.46	0.36	48.80	-0.99	-0.31	ZZ
BRV2CH		62.60	-0.74	-0.18	44.20	-5.59	-1.75	ZZ
E2TV6X		63.98	0.64	0.16	48.34	-1.45	-0.45	ZZ
GL9693		60.37	-2.97	-0.72	49.17	-0.62	-0.19	ZZ
GZ87PA		66.95	3.61	0.88	49.75	-0.04	-0.01	ZZ
QG4NTC		55.76	-7.57	-1.85	47.34	-2.45	-0.77	ZZ
RE8PU4		72.07	8.73	2.13	57.38	7.59	2.38	ZZ
VWZPFK		68.00	4.66	1.14	54.80	5.01	1.57	ZZ
XDJ8FY		63.60	0.26	0.06	48.60	-1.19	-0.37	ZZ
XQ88CT		63.79	0.46	0.11	51.70	1.91	0.60	ZZ
YB64ZD		67.65	4.31	1.05	51.27	1.48	0.46	ZZ

Summary Statistics	Sample BK15	Sample BK16
Grand Means	63.34 psi	49.79 psi
Stnd Dev Btwn Labs	4.10 psi	3.19 psi

Statistics based on 17 of 17 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 3513

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample RK15 Lab Mean	Sample RK15 Diff from Grand Mean	Sample RK15 CPV	Sample RK16 Lab Mean	Sample RK16 Diff from Grand Mean	Sample RK16 CPV	Instr Code
2G63N9	*	103.1	-30.1	-2.76	105.3	-26.1	-2.71	ZZ
3A6XHA		133.6	0.4	0.03	132.3	1.0	0.10	ZZ
3CV4WF		147.6	14.4	1.32	147.2	15.8	1.64	ZZ
6QK784		155.7	22.5	2.06	151.5	20.2	2.10	ZZ
8MY2QK	X	114.1	-19.1	-1.75	135.0	3.6	0.38	ZZ
8UEMX3		125.9	-7.3	-0.67	125.8	-5.5	-0.57	ZZ
8W4V3X		144.3	11.1	1.01	134.5	3.1	0.32	ZZ
96UZA4		134.6	1.4	0.13	134.2	2.9	0.30	ZZ
9JDJ7D		136.5	3.2	0.30	131.4	0.0	0.00	ZZ
B2J2LZ		147.7	14.5	1.33	147.2	15.9	1.65	ZZ
B3F9FD		153.5	20.3	1.86	144.4	13.0	1.35	ZZ
BCKFVD		122.3	-11.0	-1.00	124.1	-7.2	-0.75	ZZ
BRV2CH		128.4	-4.8	-0.44	126.4	-5.0	-0.52	ZZ
DKAHEZ		125.2	-8.0	-0.74	124.4	-7.0	-0.72	ZZ
E4HCDK		129.7	-3.5	-0.32	133.8	2.5	0.26	ZZ
EN44E2		135.1	1.9	0.17	125.3	-6.1	-0.63	ZZ
EQPQ8P	X	3.3	-130.0	-11.90	3.5	-127.9	-13.29	ZZ
G92AXD	X	590.4	457.2	41.88	588.8	457.4	47.53	ZZ
HGA7FP		123.4	-9.9	-0.90	127.0	-4.4	-0.46	ZZ
HWMEGT		130.2	-3.0	-0.28	133.1	1.7	0.18	ZZ
JCZA9U		132.5	-0.7	-0.06	129.1	-2.3	-0.24	ZZ
K9PNWD		130.0	-3.2	-0.29	127.8	-3.6	-0.37	ZZ
KAPKNW		125.3	-7.9	-0.72	124.1	-7.3	-0.75	ZZ
QG4NTC		124.8	-8.4	-0.77	123.0	-8.4	-0.87	ZZ
RTQC42		142.0	8.8	0.81	142.0	10.6	1.11	ZZ
TX2PJE		128.5	-4.7	-0.43	128.3	-3.1	-0.32	ZZ
VWZPFK		127.1	-6.1	-0.56	120.7	-10.6	-1.11	ZZ
XQ88CT		133.3	0.1	0.01	133.6	2.3	0.24	ZZ
YD2BTQ		136.5	3.3	0.30	135.4	4.0	0.42	ZZ
YE69W7		140.0	6.8	0.62	134.8	3.4	0.36	ZZ

Summary Statistics	Sample RK15	Sample RK16
Grand Means	133.21 Grams	131.36 Grams
Stnd Dev Btwn Labs	10.92 Grams	9.63 Grams

Statistics based on 27 of 30 reporting participants.

Comments on Assigned Data Flags for Test #3513

G92AXD (X) - Extreme Data.

8MY2QK (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample RK15.

EQPQ8P (X) - Extreme Data.

Analysis Notes:

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

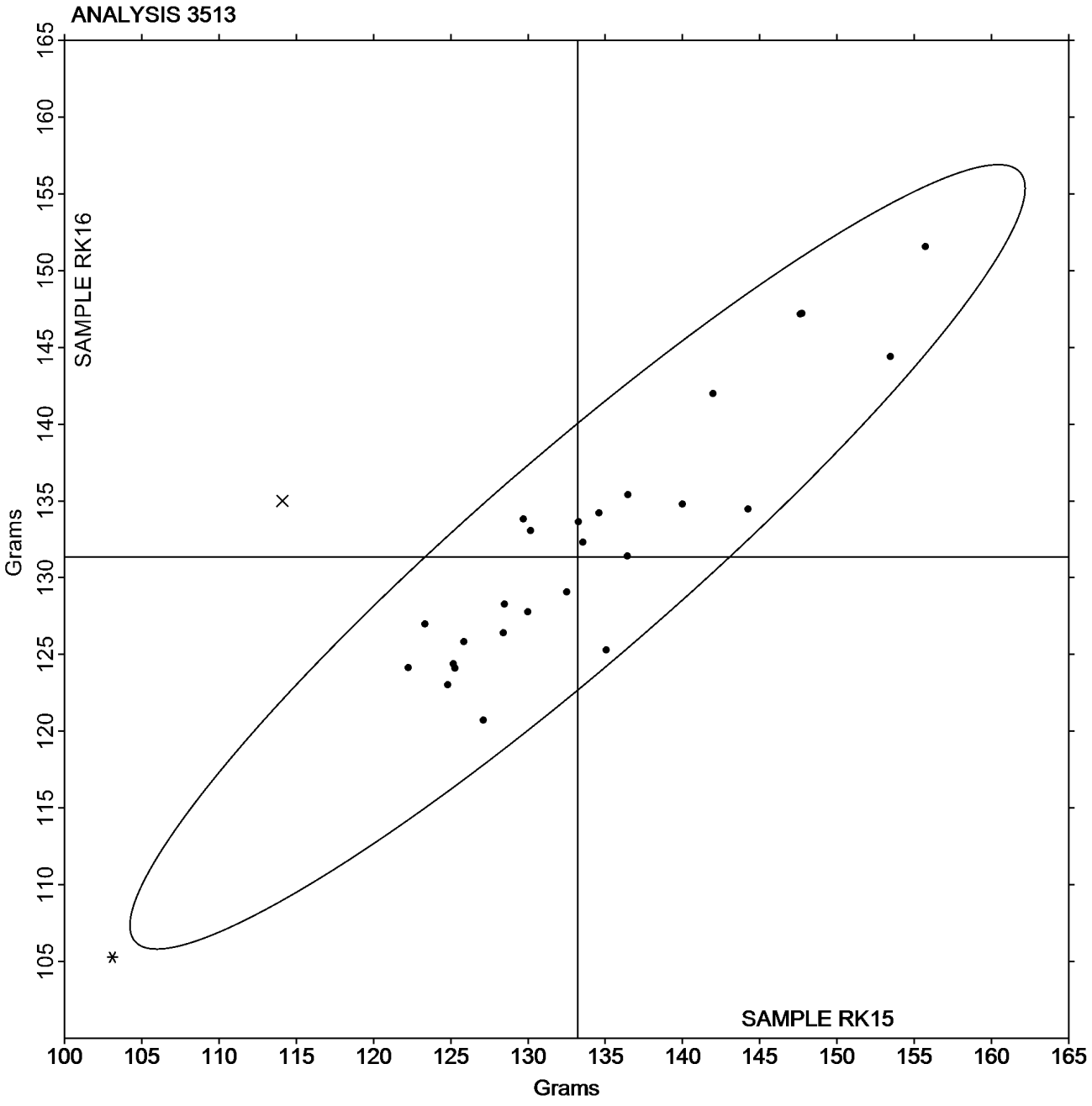
EN44E2 - Data appear to be off by a factor; data converted by CTS (x2). CTS will not correct the data going forward.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample RK15 = 133.21 Grams

Grand Mean Sample RK16 = 131.36 Grams



Paper & Paperboard Interlaboratory Testing Program

Analysis 3515

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK15 Lab Mean	Sample NK15 Diff from Grand Mean	Sample NK15 CPV	Sample NK16 Lab Mean	Sample NK16 Diff from Grand Mean	Sample NK16 CPV	Instr Code
3A6XHA		9.88	-0.76	-0.89	10.05	-0.63	-0.79	LE
3CV4WF		10.68	0.04	0.05	10.65	-0.04	-0.04	ID
4N3R44		9.84	-0.80	-0.94	9.90	-0.79	-0.98	XX
64Q4C4		11.52	0.88	1.03	11.52	0.84	1.05	DM
6FJL6B		10.44	-0.20	-0.24	10.34	-0.34	-0.42	IM
6FJMQ9		10.87	0.23	0.27	11.03	0.35	0.44	LI
6QK784		9.98	-0.66	-0.78	10.05	-0.63	-0.79	TR
8W4V3X		10.71	0.07	0.08	10.65	-0.03	-0.04	XX
96UZA4		10.79	0.15	0.18	10.69	0.00	0.00	LX
BCKFVD	*	12.53	1.89	2.22	12.68	2.00	2.50	TX
BRV2CH		11.56	0.92	1.08	11.59	0.91	1.14	LX
DKAHEZ		11.03	0.39	0.46	11.12	0.44	0.55	LW
E4HCDK	*	10.91	0.27	0.32	11.30	0.62	0.78	LA
EN44E2		9.72	-0.92	-1.09	10.00	-0.69	-0.86	IF
GZ87PA		11.98	1.34	1.58	11.76	1.08	1.35	TO
HGA7FP		10.90	0.26	0.31	10.84	0.16	0.20	TO
HWMEGT		10.51	-0.13	-0.16	10.40	-0.28	-0.36	LW
JCZA9U		10.63	-0.01	-0.01	10.59	-0.10	-0.12	LE
K9PNWD		11.07	0.43	0.51	11.12	0.43	0.54	LE
KAPKNW		10.59	-0.05	-0.06	10.73	0.05	0.06	TB
LXPHDY		11.90	1.27	1.49	11.68	1.00	1.25	LA
QEH2ZN		9.68	-0.96	-1.13	10.03	-0.65	-0.82	XX
QG4NTC		10.00	-0.64	-0.75	10.16	-0.52	-0.65	TX
RE8PU4		10.08	-0.56	-0.66	10.25	-0.44	-0.55	XX
RG2HPM	*	8.28	-2.36	-2.77	8.41	-2.28	-2.85	XX
RTQC42		11.80	1.16	1.36	11.79	1.11	1.39	LA
T47L7L		10.49	-0.15	-0.17	10.56	-0.13	-0.16	IR
TX2PJE		10.76	0.12	0.14	10.53	-0.16	-0.20	IF
U47NRJ		10.62	-0.01	-0.02	10.58	-0.11	-0.13	TH
VB3XFM		8.90	-1.74	-2.04	9.20	-1.48	-1.85	TT
VP4RQW		11.10	0.46	0.54	11.04	0.36	0.45	LE
VWZPFK		10.36	-0.28	-0.33	10.43	-0.26	-0.32	LE
W6T29T		11.04	0.40	0.47	10.98	0.30	0.38	TB
WR3CAM	X	11.36	0.72	0.85	10.78	0.09	0.12	TH
XQ88CT		10.34	-0.30	-0.35	10.39	-0.29	-0.37	LE
YD2BTQ		9.92	-0.72	-0.84	9.85	-0.83	-1.04	LH
YE69W7		11.62	0.98	1.16	11.71	1.02	1.28	XX

Paper & Paperboard Interlaboratory Testing Program

Analysis 3515

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

Summary Statistics	Sample NK15	Sample NK16
Grand Means	10.64 kN/m	10.68 kN/m
Stnd Dev Btwn Labs	0.85 kN/m	0.80 kN/m

Statistics based on 36 of 37 reporting participants.

Comments on Assigned Data Flags for Test #3515

WR3CAM (X) - Inconsistent in testing between samples. Inconsistent within the determinations of both samples.

Analysis Notes:

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

QEH2ZN - Data appear to be reported as lb/inch, not kN/m as indicated on data entry form. CTS will not correct the Units going forward.

TX2PJE - One determination removed from the Lab Mean of Sample NK16 per Grubb's Test at 1% risk (TAPPI 1205).

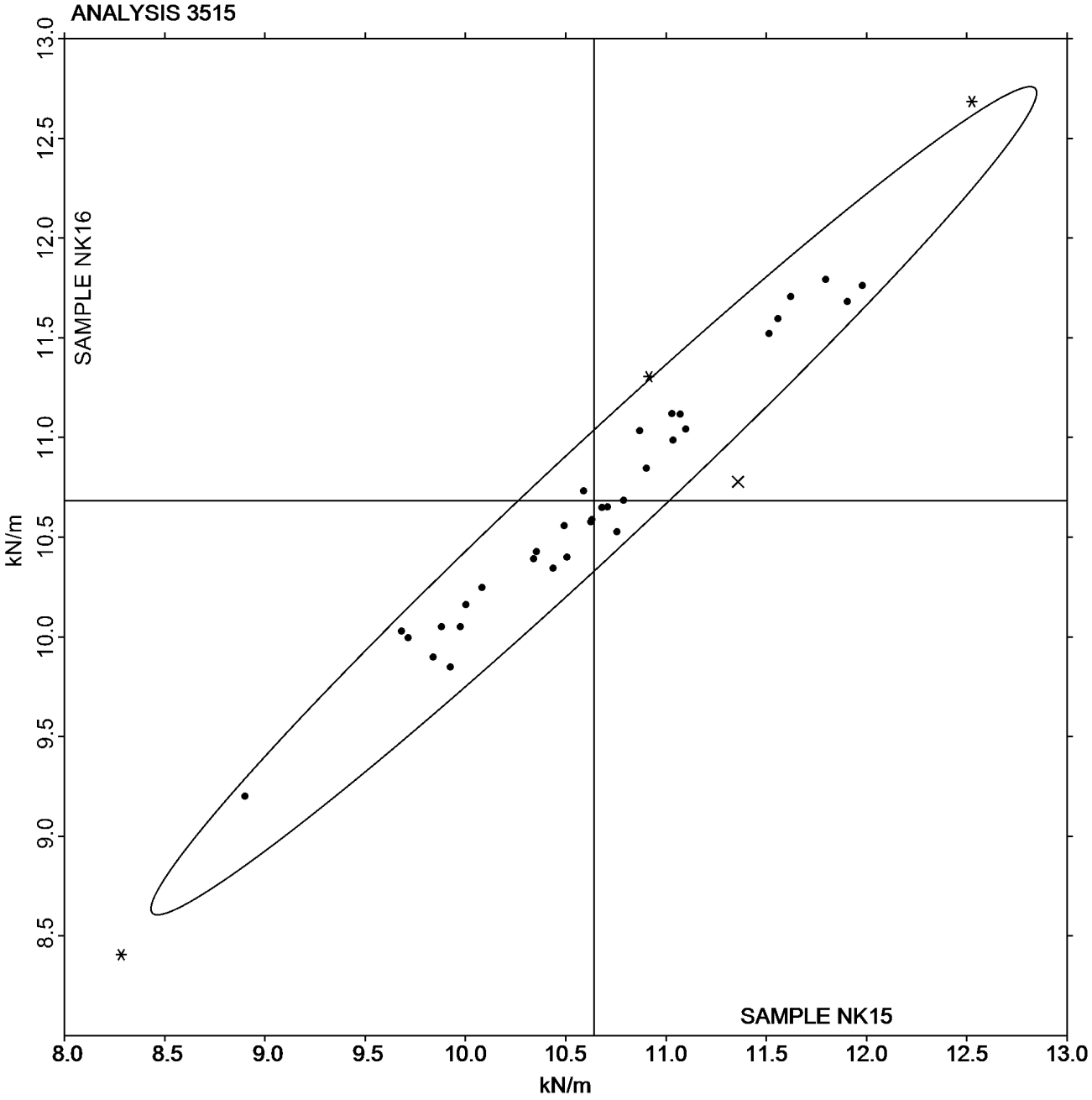
YE69W7 - Data appear to be reported as kg/15 mm, not kN/m as indicated on data entry form. CTS will not correct the Units going forward.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	ID	Instron 4200 Series
IF	Instron 3340 Series	IM	Instron 5500 Series
IR	Instron 5900 Series	LA	L & W Autoline
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LI	LLoyds Instruments	LW	L & W Tensile Tester SE062
LX	L & W (model not specified)	TB	Thwing-Albert EJA/1000
TH	Thwing-Albert QC-3A	TO	Thwing-Albert QC-1000
TR	TMI Horizontal Tensile Tester	TT	Tinius Olsen Model MHT
TX	Thwing-Albert (model not specified)	XX	Instrument make/model not specified by lab

Grand Mean Sample NK15 = 10.640 kN/m

Grand Mean Sample NK16 = 10.683 kN/m



Paper & Paperboard Interlaboratory Testing Program

Analysis 3516

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK15 Lab Mean	Sample NK15 Diff from Grand Mean	Sample NK15 CPV	Sample NK16 Lab Mean	Sample NK16 Diff from Grand Mean	Sample NK16 CPV	Instr Code
3A6XHA		161.5	-17.0	-0.85	165.2	-13.5	-0.65	LE
4N3R44		177.7	-0.8	-0.04	179.7	1.0	0.05	XX
64Q4C4	*	231.7	53.2	2.66	232.9	54.2	2.62	DM
6FJL6B		178.0	-0.5	-0.03	170.5	-8.2	-0.40	IM
6QK784		160.3	-18.2	-0.91	160.5	-18.2	-0.88	TR
8W4V3X		176.1	-2.4	-0.12	174.5	-4.2	-0.20	XX
96UZA4		178.5	-0.1	0.00	172.1	-6.6	-0.32	LX
BCKFVD		196.9	18.4	0.92	196.7	18.0	0.87	LE
BRV2CH		204.1	25.6	1.28	201.1	22.4	1.08	TH
DKAHEZ		167.3	-11.2	-0.56	166.1	-12.6	-0.61	LW
E4HCDK		199.4	20.8	1.04	213.7	34.9	1.69	LA
EN44E2		144.2	-34.3	-1.72	151.4	-27.3	-1.32	IF
GZ87PA		198.9	20.4	1.02	189.0	10.3	0.50	TO
HGA7FP		189.8	11.3	0.57	187.9	9.2	0.44	TO
HWMEGT		170.5	-8.0	-0.40	162.0	-16.8	-0.81	LW
JCZA9U		169.6	-8.9	-0.45	165.0	-13.7	-0.66	LE
K9PNWD		170.2	-8.4	-0.42	173.2	-5.5	-0.27	LE
LXPHDY		190.8	12.3	0.62	190.4	11.6	0.56	LA
QEH2ZN		173.3	-5.2	-0.26	186.1	7.4	0.36	XX
QG4NTC		193.6	15.1	0.75	193.9	15.2	0.73	TX
RE8PU4		162.9	-15.6	-0.78	169.1	-9.7	-0.47	XX
RG2HPM	X	90.6	-87.9	-4.40	92.2	-86.5	-4.17	TH
RTQC42		195.3	16.8	0.84	193.9	15.1	0.73	LC
T47L7L		171.6	-7.0	-0.35	175.8	-2.9	-0.14	IR
U47NRJ		192.7	14.2	0.71	195.0	16.3	0.78	TH
VB3XFM		150.1	-28.4	-1.42	155.7	-23.0	-1.11	XX
VP4RQW		197.4	18.9	0.95	192.6	13.9	0.67	LE
VWZPFK	*	135.7	-42.8	-2.14	125.0	-53.8	-2.59	LE
W6T29T		195.6	17.1	0.86	197.2	18.4	0.89	TB
XQ88CT		166.7	-11.8	-0.59	162.5	-16.2	-0.78	LE
YD2BTQ		158.8	-19.7	-0.99	158.6	-20.1	-0.97	LH
YE69W7		175.0	-3.6	-0.18	183.3	4.6	0.22	XX

Summary Statistics	Sample NK15	Sample NK16
Grand Means	178.52 Joules/sq m	178.73 Joules/sq m
Stnd Dev Btwn Labs	19.96 Joules/sq m	20.72 Joules/sq m

Statistics based on 31 of 32 reporting participants.

Comments on Assigned Data Flags for Test #3516

RG2HPM (X) - Data for both samples are low. Possible Systematic Error.

Analysis Notes:

HGA7FP - Data appear to be reported as inch-lb/sq inch, not J/sq m as indicated on data entry form. CTS will not correct the Units going forward.

QEH2ZN - Data appear to be reported as ft-lb/sq ft, not J/sq m as indicated on data entry form. CTS will not correct the Units going forward.

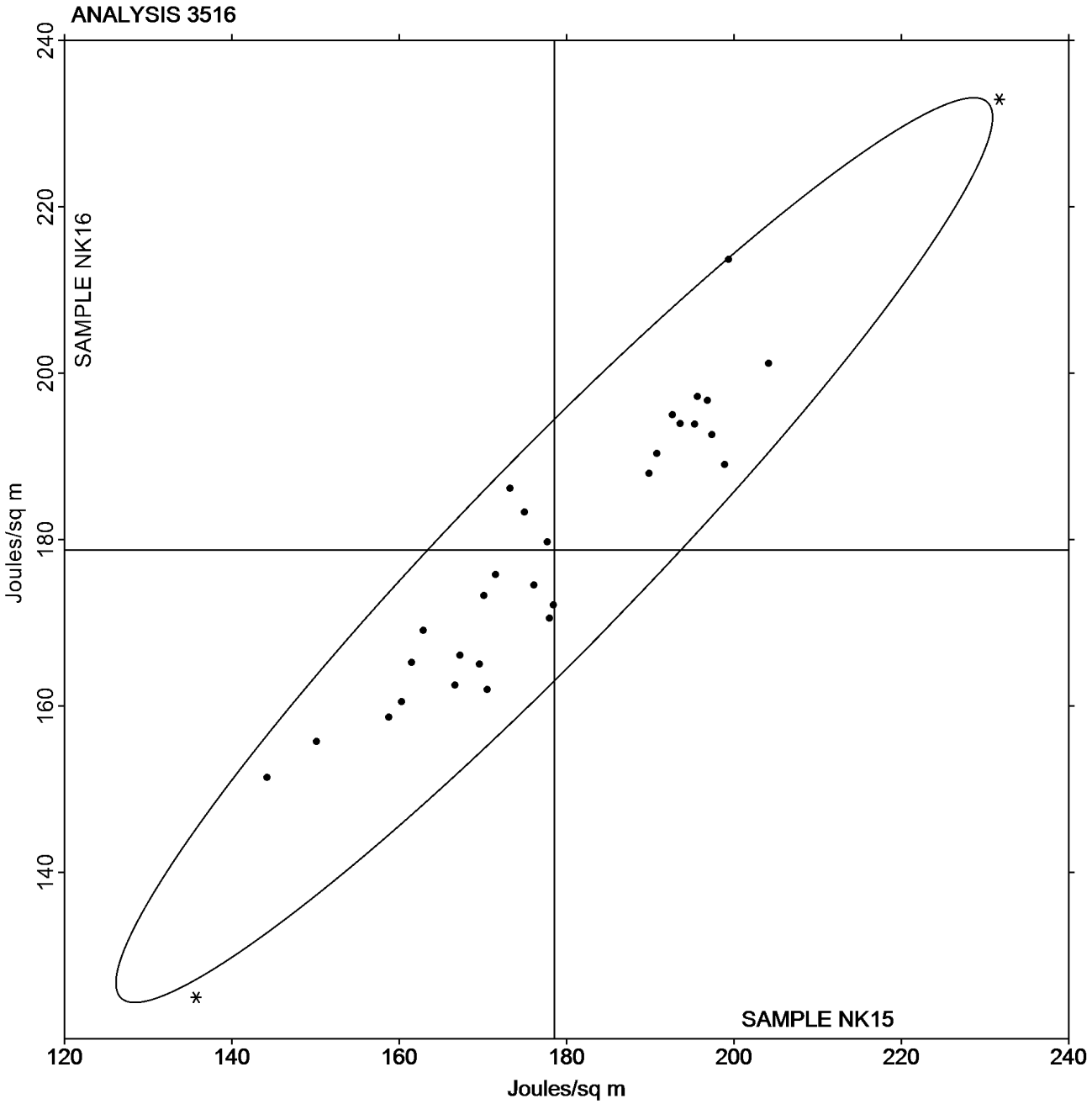
YE69W7 - Data appear to be reported as kg m/sq m, not J/sq m as indicated on data entry form. CTS will not correct the Units going forward.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	IF	Instron 3340 Series
IM	Instron 5500 Series	IR	Instron 5900 Series
LA	L & W Autoline	LC	L & W Tensile - Autoline 600
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LW	L & W Tensile Tester SE062	LX	L & W (model not specified)
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
TO	Thwing-Albert QC-1000	TR	TMI Horizontal Tensile Tester
TX	Thwing-Albert (model not specified)	XX	Instrument make/model not specified by lab

Grand Mean Sample NK15 = 178.52 Joules/sq m

Grand Mean Sample NK16 = 178.73 Joules/sq m



Paper & Paperboard Interlaboratory Testing Program

Analysis 3517

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK15 Lab Mean	Sample NK15 Diff from Grand Mean	Sample NK15 CPV	Sample NK16 Lab Mean	Sample NK16 Diff from Grand Mean	Sample NK16 CPV	Instr Code
3A6XHA		2.402	-0.068	-0.26	2.413	-0.059	-0.22	LE
3CV4WF		2.605	0.135	0.52	2.559	0.087	0.33	XX
4N3R44		2.710	0.240	0.92	2.725	0.253	0.95	XX
64Q4C4		3.066	0.596	2.27	3.062	0.590	2.21	DM
6FJL6B		2.865	0.395	1.51	2.748	0.276	1.03	IM
6QK784		2.430	-0.040	-0.15	2.467	-0.005	-0.02	TR
8W4V3X		2.400	-0.070	-0.27	2.396	-0.076	-0.28	XX
96UZA4		2.424	-0.046	-0.17	2.373	-0.099	-0.37	LX
BCKFVD	X	0.091	-2.379	-9.07	0.090	-2.381	-8.91	LE
BRV2CH	X	7.645	5.175	19.73	2.881	0.409	1.53	LX
DKAHEZ		2.263	-0.207	-0.79	2.238	-0.234	-0.87	LW
E4HCDK		2.307	-0.163	-0.62	2.415	-0.057	-0.21	LX
EN44E2		2.174	-0.296	-1.13	2.259	-0.213	-0.80	XX
GZ87PA		2.540	0.070	0.27	2.478	0.006	0.02	TO
HGA7FP		2.712	0.242	0.92	2.700	0.228	0.85	TO
HWMEGT		2.382	-0.088	-0.33	2.297	-0.175	-0.65	LW
JCZA9U		2.346	-0.124	-0.47	2.298	-0.174	-0.65	LE
K9PNWD		2.290	-0.180	-0.69	2.323	-0.149	-0.56	LE
KAPKNW		2.504	0.034	0.13	2.625	0.153	0.57	TB
LXPHDY		2.314	-0.156	-0.59	2.347	-0.125	-0.47	XX
QEH2ZN		2.666	0.196	0.75	2.750	0.278	1.04	XX
QG4NTC		2.886	0.416	1.59	2.853	0.381	1.43	TX
RE8PU4		2.563	0.093	0.36	2.611	0.139	0.52	XX
RG2HPM	*	1.720	-0.750	-2.86	1.720	-0.752	-2.81	XX
RTQC42		2.399	-0.071	-0.27	2.384	-0.088	-0.33	LC
T47L7L		2.419	-0.051	-0.19	2.457	-0.015	-0.05	XX
U47NRJ		2.717	0.247	0.94	2.764	0.292	1.09	TH
VB3XFM		2.679	0.209	0.80	2.686	0.214	0.80	XX
VP4RQW		2.617	0.147	0.56	2.575	0.103	0.39	LE
VWZPFK	*	1.996	-0.474	-1.81	1.849	-0.623	-2.33	LE
W6T29T		2.633	0.163	0.62	2.659	0.187	0.70	XX
XQ88CT		2.387	-0.083	-0.32	2.319	-0.153	-0.57	LE
YD2BTQ		2.350	-0.120	-0.46	2.367	-0.105	-0.39	LH
YE69W7		2.266	-0.204	-0.78	2.377	-0.094	-0.35	XX

Summary Statistics	Sample NK15	Sample NK16
Grand Means	2.47 Percent	2.47 Percent
Stnd Dev Btwn Labs	0.26 Percent	0.27 Percent

Statistics based on 32 of 34 reporting participants.

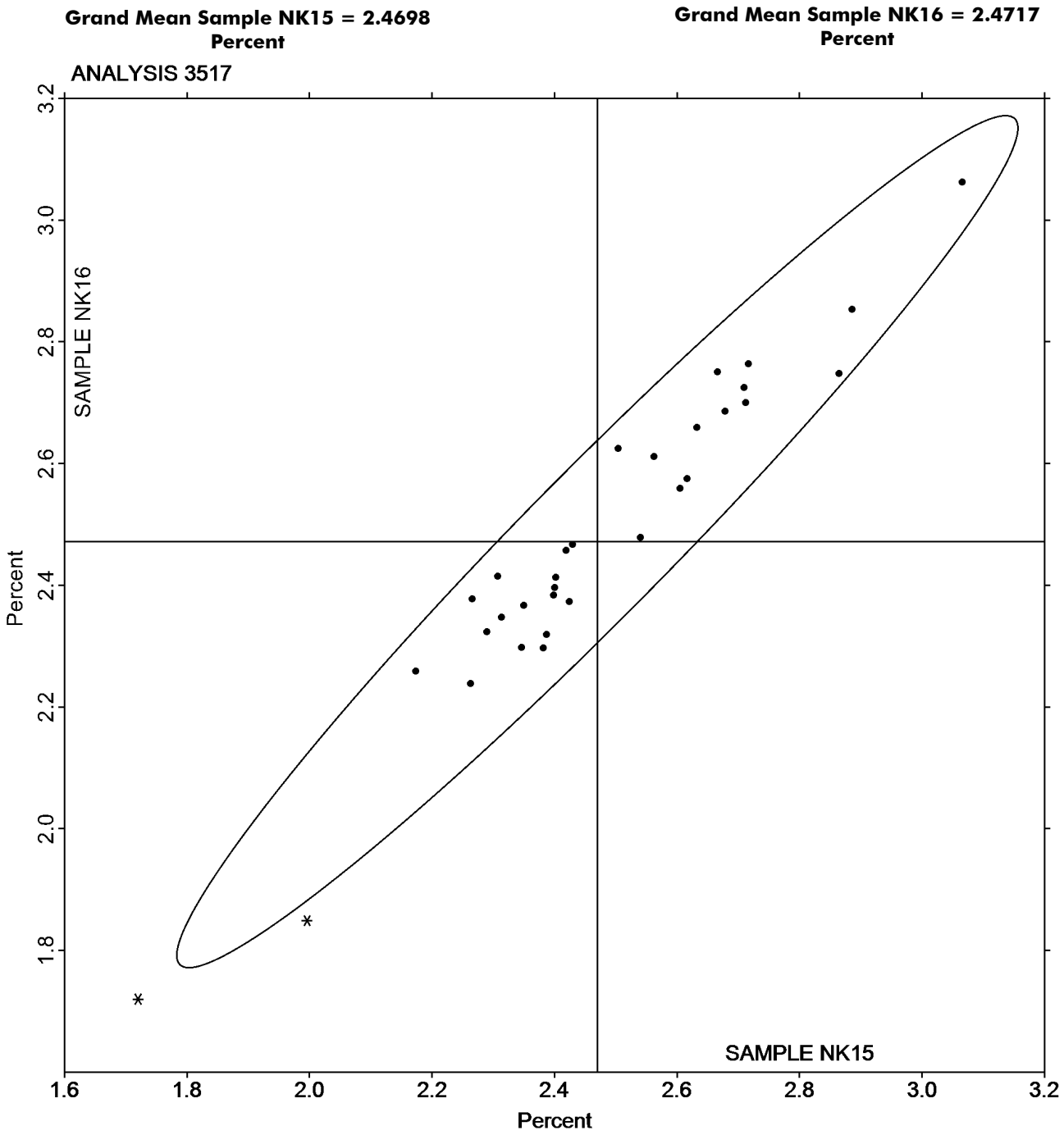
Comments on Assigned Data Flags for Test #3517

BCKFVD (X) - Extreme Data.

BRV2CH (X) - Extreme Data for Sample NK15.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	IM	Instron 5500 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
TR	TMI Horizontal Tensile Tester	TX	Thwing-Albert (model not specified)
XX	Instrument make/model not specified by lab		



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 PS15 Lab Mean	Sample PS15 Diff from Grand Mean	Sample PS15 CPV	Sample PS16 Lab Mean	Sample PS16 Diff from Grand Mean	Sample PS16 CPV	Instr Code
2UDW7C	*	1.0230	0.1549	1.55	0.9910	0.0269	0.31	ZZ
4N3R44	*	1.0140	0.1459	1.46	1.1570	0.1929	2.24	ZZ
8MY2QK		0.9590	0.0909	0.91	1.0200	0.0559	0.65	ZZ
96UZA4		0.7620	-0.1061	-1.06	0.8720	-0.0921	-1.07	ZZ
9JDJ7D		0.7820	-0.0861	-0.86	0.8680	-0.0961	-1.12	ZZ
B3F9FD		0.6790	-0.1891	-1.90	0.7890	-0.1751	-2.04	ZZ
DR8LTW		0.7900	-0.0781	-0.78	0.9070	-0.0571	-0.66	ZZ
DVT4EN		0.7390	-0.1291	-1.29	0.8680	-0.0961	-1.12	ZZ
EA3DTW		0.8820	0.0139	0.14	0.9930	0.0289	0.34	ZZ
EQPQ8P		0.8990	0.0309	0.31	0.9970	0.0329	0.38	ZZ
G92AXD		0.8670	-0.0011	-0.01	0.9230	-0.0411	-0.48	ZZ
GM86GE		0.8090	-0.0591	-0.59	0.8940	-0.0701	-0.82	ZZ
HACFWY		0.8540	-0.0141	-0.14	0.9540	-0.0101	-0.12	ZZ
HNRJC3		1.0050	0.1369	1.37	1.0420	0.0779	0.91	ZZ
KN8EX2		0.9490	0.0809	0.81	1.0440	0.0799	0.93	ZZ
U47NRJ		0.8430	-0.0251	-0.25	0.9370	-0.0271	-0.32	ZZ
UZR23K		0.8140	-0.0541	-0.54	0.9870	0.0229	0.27	ZZ
VCBBXP		0.8990	0.0309	0.31	1.0080	0.0439	0.51	ZZ
VE2ENB		0.8020	-0.0661	-0.66	0.9350	-0.0291	-0.34	ZZ
VP4RQW		0.8550	-0.0131	-0.13	0.9580	-0.0061	-0.07	ZZ
VYM9EW		1.0370	0.1689	1.69	1.1160	0.1519	1.77	ZZ
W6T29T	X	6.2920	5.4239	54.35	7.8110	6.8469	79.66	ZZ
WEXE2F		0.7430	-0.1251	-1.25	0.8550	-0.1091	-1.27	ZZ
Y3VNGK		1.0060	0.1379	1.38	1.0680	0.1039	1.21	ZZ
ZB7BNR		0.8950	0.0269	0.27	1.0070	0.0429	0.50	ZZ
ZRCB3L		0.7960	-0.0721	-0.72	0.9130	-0.0511	-0.59	ZZ

Summary Statistics	Sample PS15	Sample PS16
Grand Means	0.87 Microns	0.96 Microns
Stnd Dev Btwn Labs	0.10 Microns	0.09 Microns

Statistics based on 25 of 26 reporting participants.

Comments on Assigned Data Flags for Test #3531

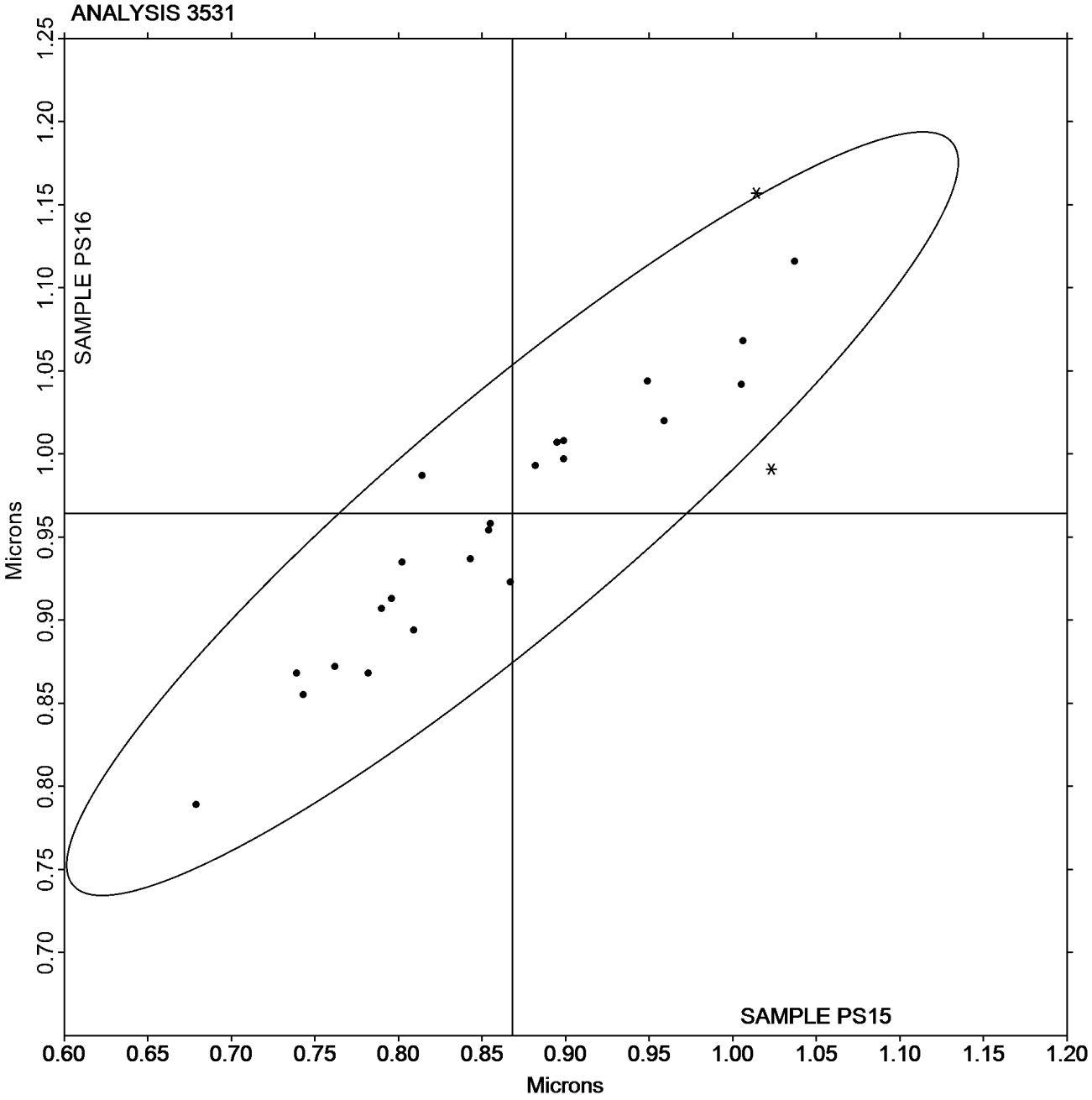
W6T29T (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample PS15 = 0.86812 Microns

Grand Mean Sample PS16 = 0.96412 Microns



Paper & Paperboard Interlaboratory Testing Program

Analysis 3545
Directional Brightness
TAPPI Official Test Method T452

WebCode	Data Flag	Sample BR15 Lab Mean	Sample BR15 Diff from Grand Mean	Sample BR15 CPV	Sample BR16 Lab Mean	Sample BR16 Diff from Grand Mean	Sample BR16 CPV	Instr Code
4N3R44		84.86	-0.70	-0.48	84.69	-0.96	-0.61	TS
78AGU7		84.73	-0.83	-0.58	84.65	-1.00	-0.64	TT
8MY2QK		84.78	-0.78	-0.54	84.77	-0.88	-0.56	HG
9JDJ7D		85.94	0.38	0.27	85.94	0.29	0.18	HG
APDF9B		84.18	-1.38	-0.96	84.56	-1.09	-0.69	XX
B3F9FD		88.55	2.99	2.07	88.66	3.01	1.92	TP
B3UX2C		87.37	1.81	1.25	87.54	1.89	1.20	TP
DR8LTW		84.60	-0.96	-0.67	84.81	-0.84	-0.54	HZ
DVT4EN		84.46	-1.10	-0.76	84.49	-1.16	-0.74	TS
EQPQ8P	X	68.25	-17.31	-12.00	68.29	-17.36	-11.06	XX
G92AXD		86.89	1.33	0.92	86.98	1.32	0.84	TP
HWMEGT		84.65	-0.91	-0.63	84.57	-1.08	-0.69	TS
KAPKNW		85.12	-0.44	-0.31	85.36	-0.30	-0.19	XC
RVGFUM		84.26	-1.30	-0.90	84.19	-1.46	-0.93	TS
TWV38V	*	88.46	2.90	2.01	89.41	3.76	2.39	XX
U47NRJ		84.15	-1.41	-0.98	84.04	-1.61	-1.03	TP
VCBBXP		84.45	-1.11	-0.77	84.73	-0.92	-0.58	PP
VP4RQW		85.22	-0.34	-0.24	85.21	-0.44	-0.28	HG
YE69W7		85.64	0.08	0.06	85.48	-0.17	-0.11	XX
ZB7BNR		87.30	1.74	1.21	87.31	1.66	1.06	TD

Summary Statistics	Sample BR15	Sample BR16
Grand Means	85.56 Percent	85.65 Percent
Stnd Dev Btwn Labs	1.44 Percent	1.57 Percent

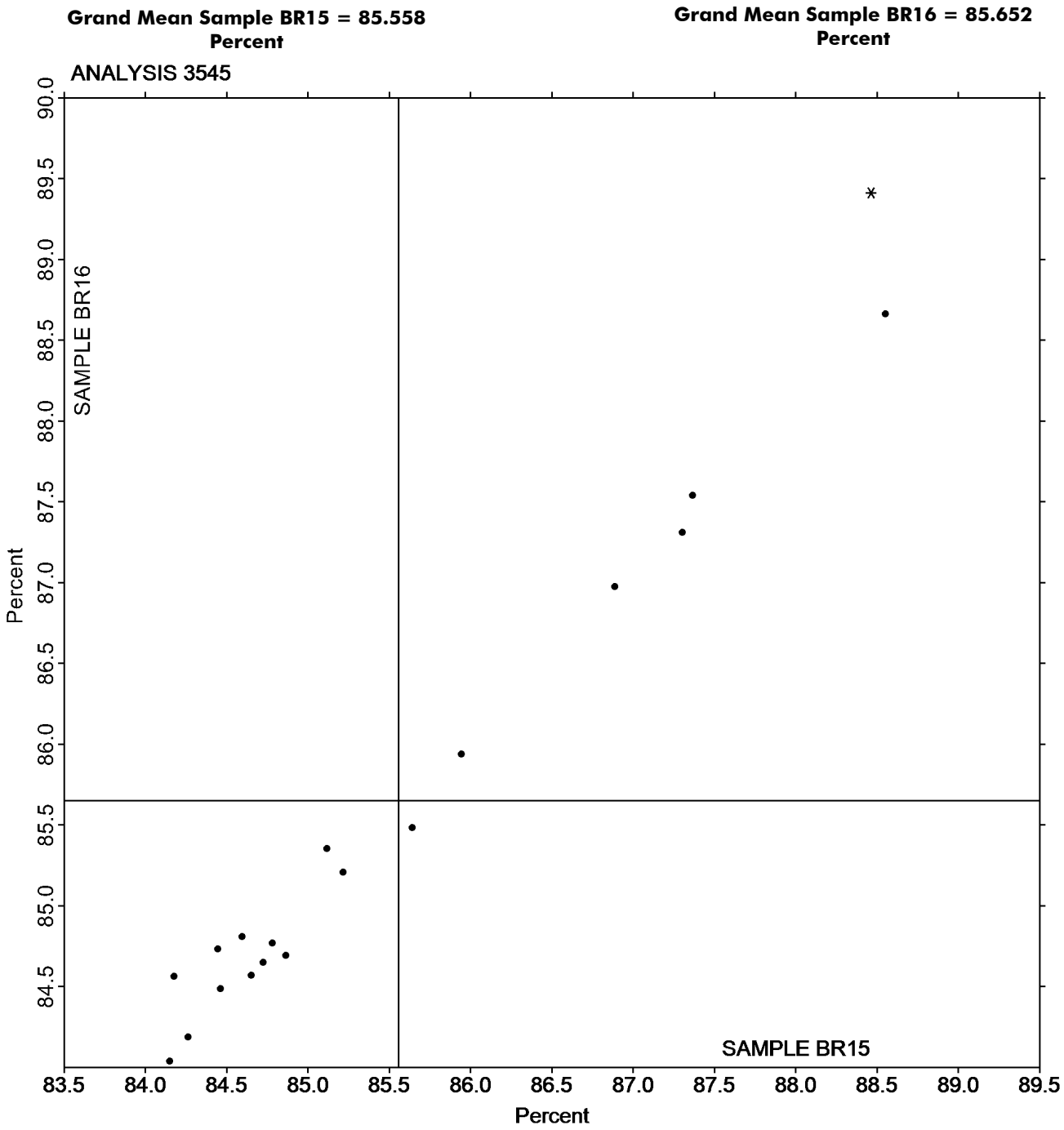
Statistics based on 19 of 20 reporting participants.

Comments on Assigned Data Flags for Test #3545

EQPQ8P (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	XC	X-Rite Color i5
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 BR15 Lab Mean	Sample BR15 Diff from Grand Mean	Sample BR15 CPV	Sample BR16 Lab Mean	Sample BR16 Diff from Grand Mean	Sample BR16 CPV	Instr Code
4N3R44	*	85.75	0.70	2.05	86.01	0.99	2.75	LT
6QK784		84.98	-0.06	-0.19	85.02	0.00	-0.01	TC
96UZA4		84.76	-0.29	-0.83	84.72	-0.30	-0.84	LT
9JDJ7D		85.68	0.64	1.85	85.38	0.36	0.99	TC
9NK9BE		85.12	0.07	0.22	85.10	0.08	0.22	TC
B3F9FD		84.80	-0.25	-0.73	84.76	-0.27	-0.74	EG
CNP3C9		85.04	0.00	-0.01	85.05	0.03	0.08	LE
DKAHEZ		84.89	-0.15	-0.45	84.89	-0.13	-0.37	LT
G92AXD		84.78	-0.27	-0.78	84.73	-0.29	-0.82	TC
GM86GE	X	68.82	-16.23	-47.30	68.17	-16.85	-46.91	TC
M9JDQK		84.70	-0.35	-1.01	84.66	-0.36	-1.01	LE
U47NRJ		84.79	-0.25	-0.74	84.83	-0.20	-0.55	LT
UZR23K		85.35	0.30	0.88	85.15	0.13	0.36	TC
XLBF6W	X	68.75	-16.30	-47.50	68.68	-16.34	-45.48	TC
YU2HMJ		85.23	0.18	0.53	85.25	0.23	0.63	XX
ZB7BNR		84.77	-0.27	-0.79	84.77	-0.25	-0.69	TC

Summary Statistics	Sample BR15	Sample BR16
Grand Means	85.05 Percent	85.02 Percent
Stnd Dev Btwn Labs	0.34 Percent	0.36 Percent

Statistics based on 14 of 16 reporting participants.

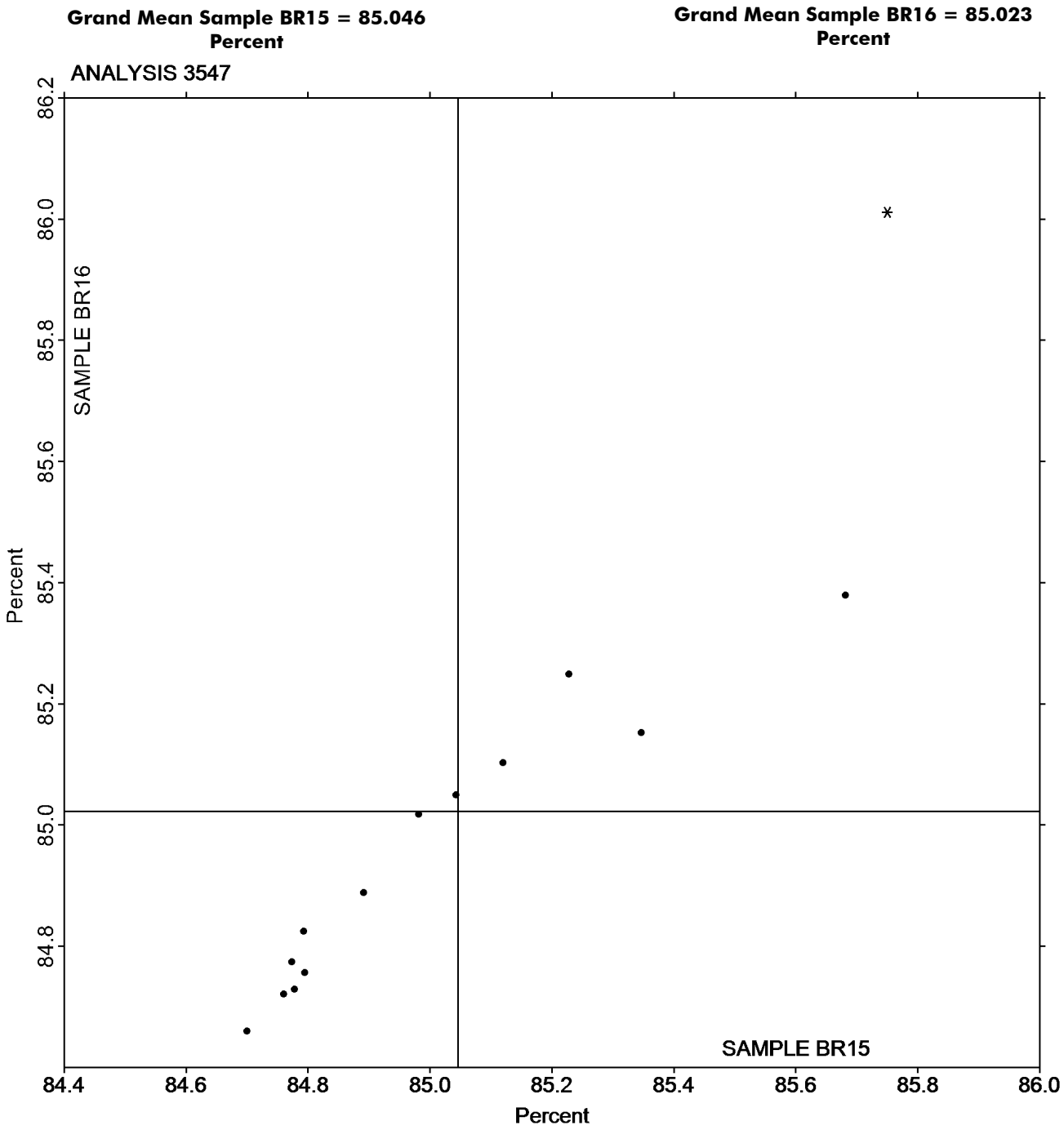
Comments on Assigned Data Flags for Test #3547

GM86GE (X) - Extreme Data.

XLBF6W (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

EG	Datacolor Elrepho 450X	LE	L & W Elrepho
LT	L & W Elrepho SE 071	TC	Technidyne Color Touch Series
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 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
2UDW7C		CA15	93.36	-0.58	1.88	0.00	0.02	-0.01	0.02	TC
		CA16	93.35	-0.56	1.87					
4N3R44	X	CA15	92.45	0.17 X	1.23	-0.22	0.16 X	-0.18 X	0.32	TS
		CA16	92.23	0.33	1.05					
7UY4GC		CA15	92.28	-0.10	1.50	0.09	0.00	0.00	0.09	TS
		CA16	92.37	-0.09	1.51					
8MY2QK		CA15	93.33	-0.58	1.67	-0.01	-0.01	-0.02	0.02	HE
		CA16	93.32	-0.59	1.65					
9JDJ7D		CA15	94.05	-0.38	1.61	-0.15	-0.01	0.21	0.25	HF
		CA16	93.90	-0.39	1.82					
DJDBTA		CA15	94.76	-0.49	1.88	0.01	0.01	-0.05	0.05	TC
		CA16	94.77	-0.47	1.83					
DVT4EN		CA15	92.50	-0.15	1.40	-0.02	-0.01	0.02	0.03	TS
		CA16	92.48	-0.17	1.42					
EQPQ8P	X	CA15	85.57 X	0.30 X	0.66	-0.53	-0.02	0.00	0.53	XX
		CA16	85.04	0.28	0.66					
G92AXD		CA15	93.29	-0.59	1.96	-0.02	-0.01	0.00	0.03	TC
		CA16	93.26	-0.61	1.96					
M9JDQK		CA15	94.71	-0.56	1.84	0.00	0.01	-0.03	0.03	LS
		CA16	94.71	-0.55	1.81					
TWV38V		CA15	92.42 *	-0.51 *	1.44	2.41 X	-0.12 X	0.19	2.42 X	XX
		CA16	94.83	-0.63	1.63					
VP4RQW		CA15	93.66	-0.57	1.56	0.03	0.01	0.05	0.06	HE
		CA16	93.69	-0.57	1.61					
YE69W7		CA15	93.87	-0.74	3.61 *	-0.01	0.03	0.08	0.09	XX
		CA16	93.86	-0.72	3.70					
YU2HMJ		CA15	94.96	-0.55	2.08	-0.01	0.01	0.01	0.02	TC
		CA16	94.96	-0.54	2.10					
ZB7BNR		CA15	93.18	-0.65	1.81	0.10	-0.01	0.05	0.11	TC
		CA16	93.28	-0.66	1.86					

Summary Statistics

Grand Means							
CA15	93.487	-0.497	1.743	0.186	-0.006	0.040	0.248
CA16	93.644	-0.503	1.765				
Stnd Dev Btwn Labs							
CA15	0.903	0.185	0.625	0.671	0.035	0.079	0.656
CA16	0.924	0.185	0.649				

Statistics based on 13 of 15 reporting participants

Comments on Assigned Data Flags for Test #3549

4N3R44 (X) - High "a" values for both samples. Inconsistent within replicate readings of "a" for Sample CA16. Large delta a. Small delta b.

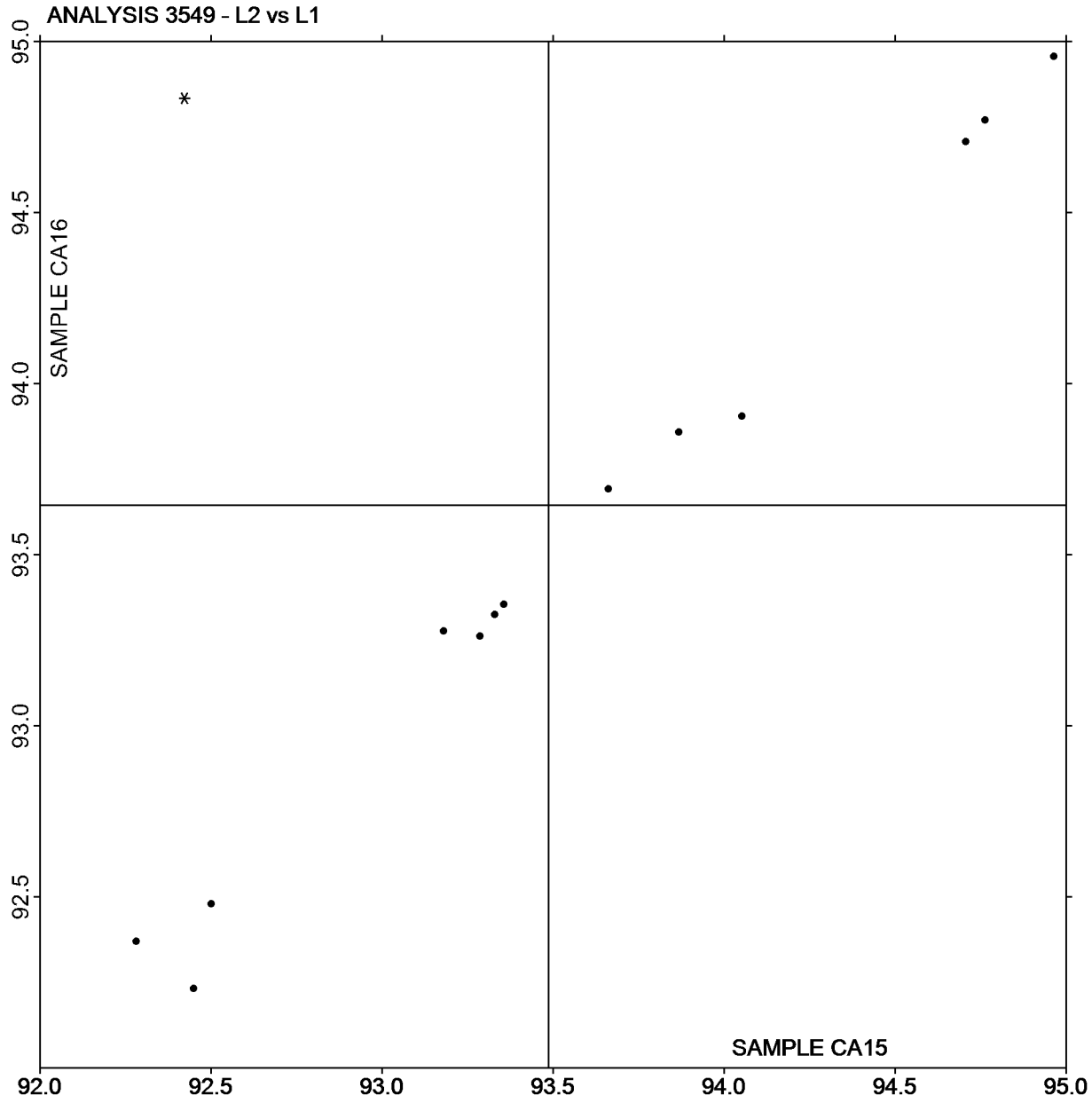
EQPQ8P (X) - Extreme data for both "L" values. Very high "a" values for both samples. Inconsistent within replicate readings of "a" for both samples.

EQPQ8P - Due to CTS graphs using Absolute Values, data Flag is located within consensus data. However, "a" data is higher than the negative Grand Mean as shown above graphs.

Key to Instrument Codes Reported by Participants

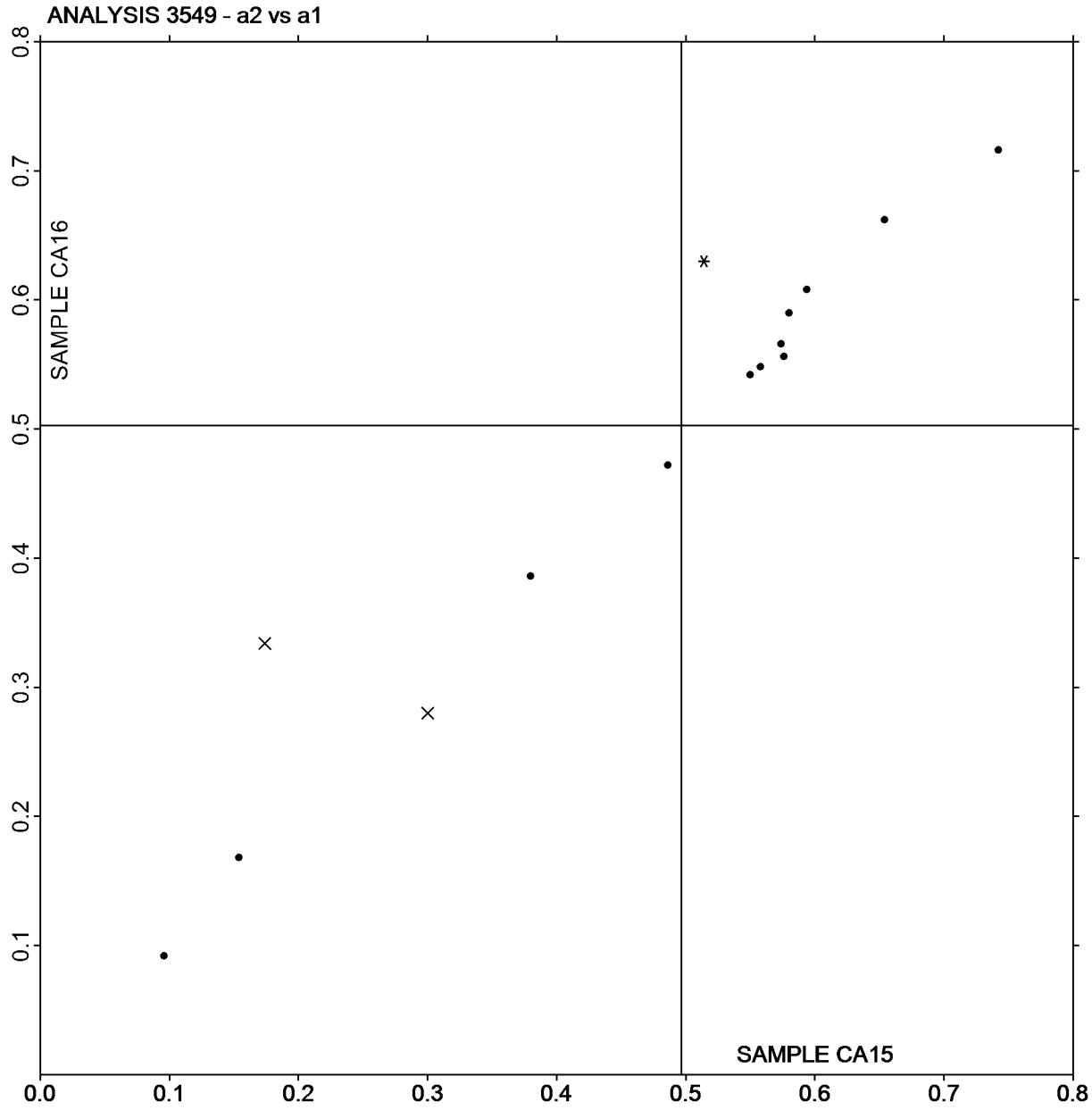
HE	Hunter LabScan	HF	Hunter LabScan II
LS	L & W Elrepho SE 070	TC	Technidyne Color Touch Series
TS	Technidyne Brightimeter Micro S-5	XX	Instrument make/model not specified by lab

Plot of L values CA16 vs L values CA15



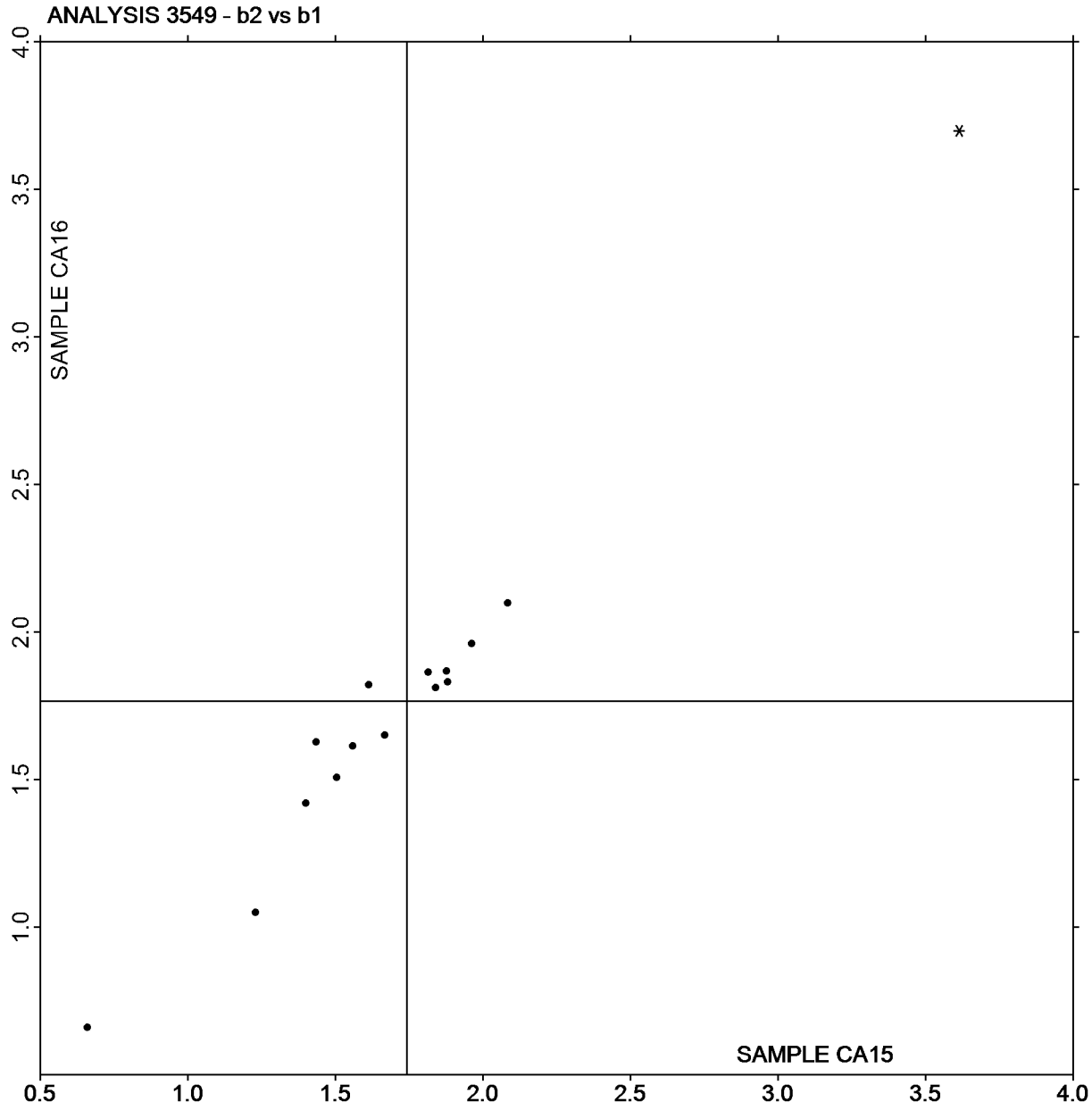
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Plot of a values CA16 vs a values CA15



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 CA16 vs b values CA15



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

Web Code	Data Flag	Samples	Hunter L, a, b Color Values L	a	b	Color Difference Values ΔL	Δa	Δb	ΔE	Instr Code
4TNHFC		CA15	94.85	-0.55	1.88	0.01	0.05	-0.20	0.20	MN
		CA16	94.86	-0.50	1.68					
78AGU7		CA15	94.81 *	-0.40	1.56	-1.08 X	0.00	0.10	1.08 X	XB
		CA16	93.73	-0.40	1.66					
8BJCRE		CA15	95.07	-0.51	1.81	0.00	0.01	-0.04	0.04	NF
		CA16	95.08	-0.51	1.77					
9JDJ7D		CA15	93.37	-0.58	1.64	0.00	-0.01	-0.01	0.02	TC
		CA16	93.36	-0.60	1.63					
APV96E		CA15	95.62	-0.54	1.24	-0.27	0.01	-0.20	0.33	XX
		CA16	95.35	-0.53	1.05					
B3F9FD		CA15	94.72	-0.53	2.00	0.01	0.01	0.02	0.02	EH
		CA16	94.73	-0.52	2.02					
CFWPEU		CA15	94.99	-0.53	1.94	-0.01	0.01	-0.02	0.02	XX
		CA16	94.98	-0.52	1.92					
DJDGYV		CA15	94.75	-0.62	1.92	-0.02	0.05	-0.21	0.22	TC
		CA16	94.73	-0.57	1.71					
DKAHEZ		CA15	94.82	-0.52	1.99	0.00	-0.01	0.01	0.02	LS
		CA16	94.82	-0.54	1.99					
H7TNGQ		CA15	95.31	-0.33	1.71	0.00	0.02	-0.02	0.02	XX
		CA16	95.31	-0.31	1.69					
HNRJC3		CA15	94.76	-0.54	1.92	0.01	-0.02	0.01	0.03	TC
		CA16	94.77	-0.56	1.93					
KFDA4Z		CA15	94.95	-0.45	2.09 *	0.03	-0.01	0.60 X	0.60	XX
		CA16	94.98	-0.46	2.69					
U47NRJ		CA15	94.79	-0.57	2.04	0.01	0.00	0.00	0.01	XX
		CA16	94.80	-0.58	2.04					
VCBBXP		CA15	93.90	-0.44	1.75	-0.07	0.00	-0.01	0.07	HE
		CA16	93.83	-0.44	1.74					
WD4GXF		CA15	94.77	-0.46	1.75	0.00	-0.01	-0.02	0.02	XC
		CA16	94.78	-0.47	1.74					
WFRW63	X	CA15	93.99	-5.23 X	7.67 X	0.03	-0.76 X	0.02	0.76	XC
		CA16	94.03	-5.99	7.70					

Summary Statistics

Grand Means							
CA15	94.717	-0.506	1.816	-0.091	0.005	0.001	0.180
CA16	94.634	-0.500	1.817				
Stnd Dev Btwn Labs							
CA15	0.547	0.077	0.219	0.282	0.022	0.188	0.299
CA16	0.578	0.075	0.340				

Statistics based on 15 of 16 reporting participants

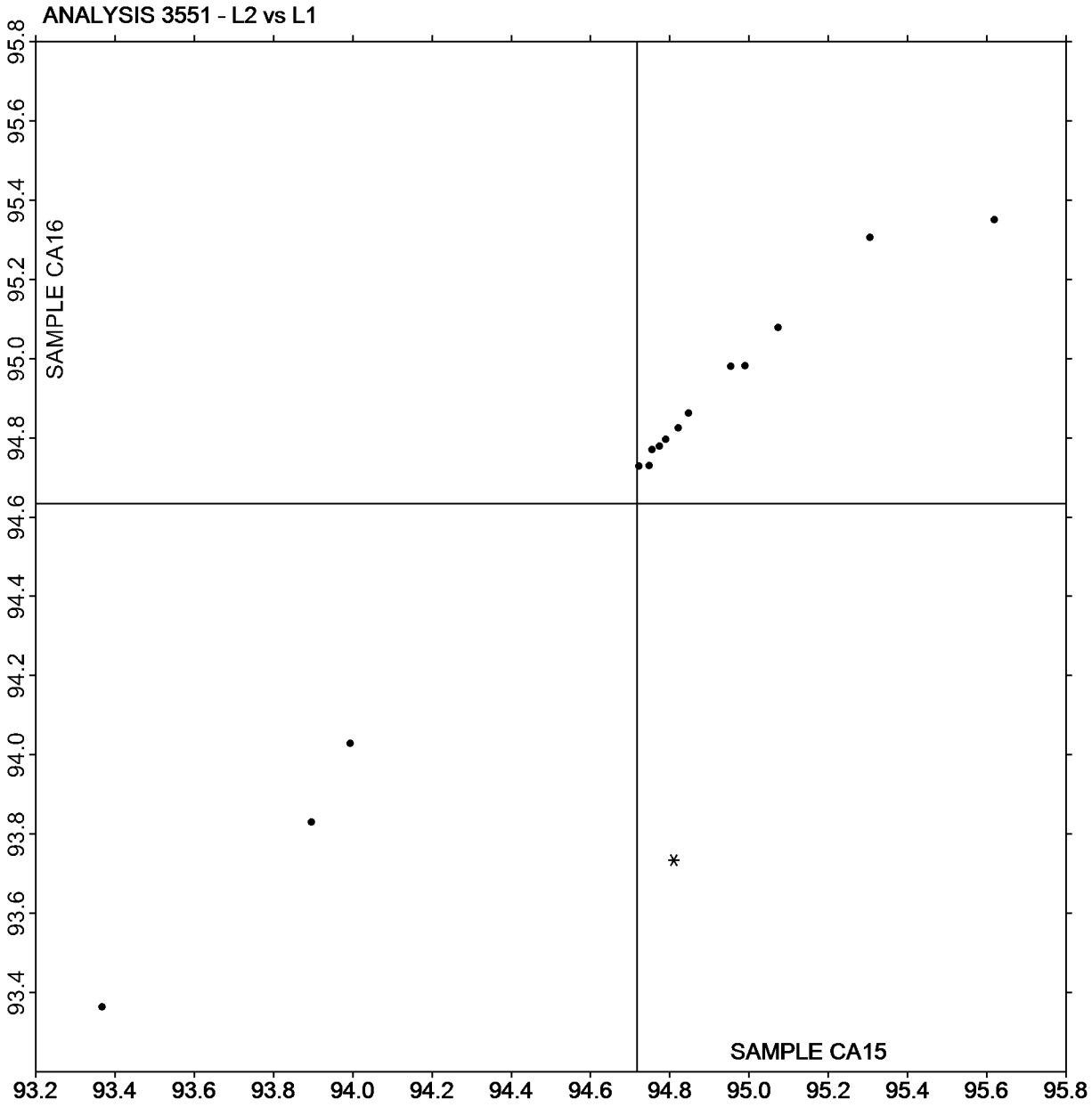
Comments on Assigned Data Flags for Test #3551

WFRW63 (X) - Extreme data for both "a" & "b" values. Small delta "a".

Key to Instrument Codes Reported by Participants

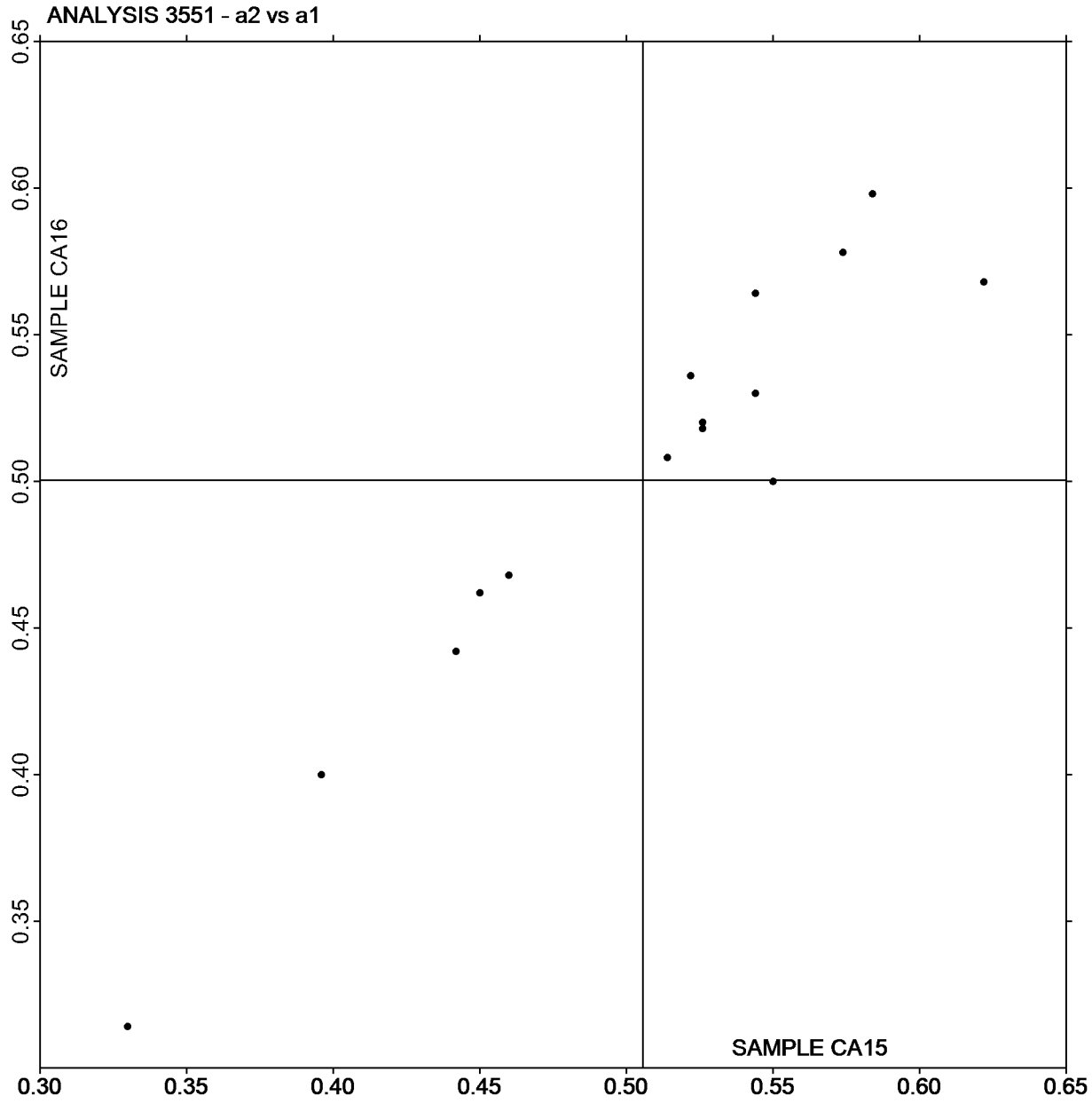
EH	Datacolor Elrepho SF450	HE	Hunter LabScan
LS	L & W Elrepho SE 070	MN	Minolta (model not specified)
NF	Minolta CM-3600d Spectrophotometer	TC	Technidyne Color Touch Series
XB	X-Rite Ci7	XC	X-Rite eXact Series
XX	Instrument make/model not specified by lab		

Plot of L values CA16 vs L values CA15



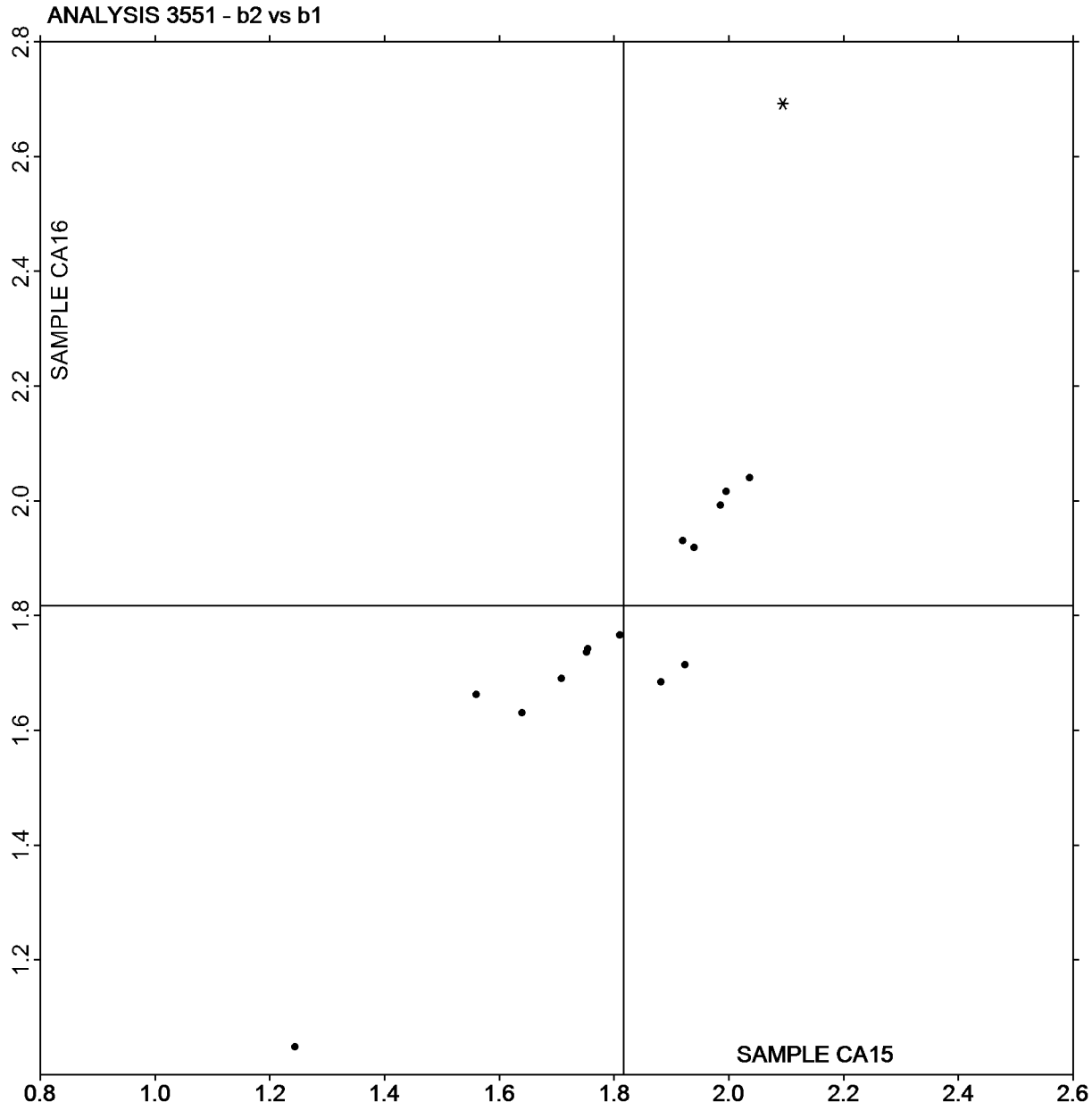
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Plot of a values CA16 vs a values CA15



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 CA16 vs b values CA15



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

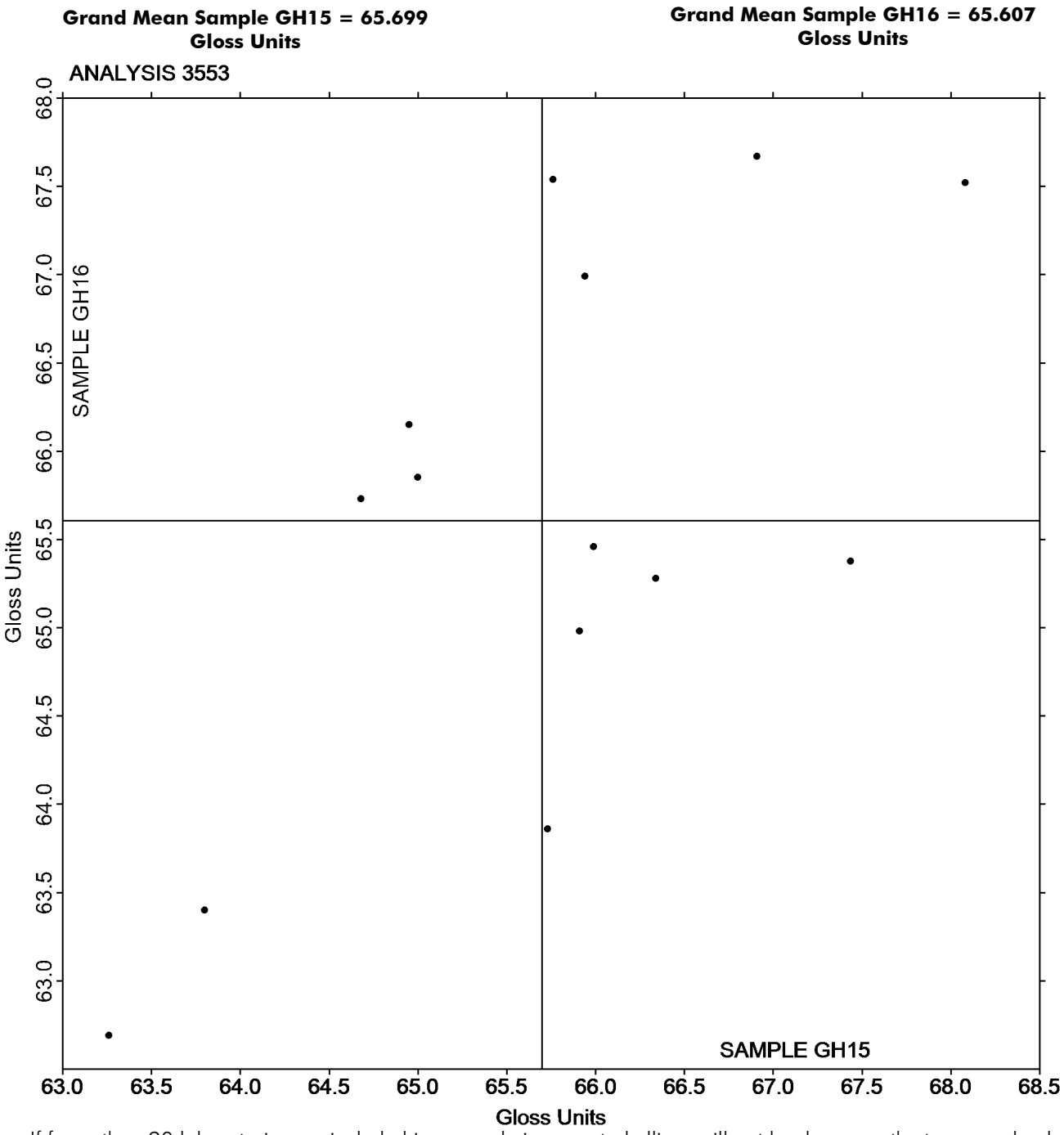
WebCode	Data Flag	Sample GH15 Lab Mean	Sample GH15 Diff from Grand Mean	Sample GH15 CPV	Sample GH16 Lab Mean	Sample GH16 Diff from Grand Mean	Sample GH16 CPV	Instr Code
2UDW7C		67.44	1.74	1.32	65.38	-0.23	-0.15	PP
8MY2QK		63.80	-1.90	-1.45	63.40	-2.21	-1.43	TP
96UZA4		66.34	0.64	0.49	65.28	-0.33	-0.21	LW
B3F9FD		65.91	0.21	0.16	64.98	-0.63	-0.41	TH
DVT4EN		63.26	-2.44	-1.86	62.69	-2.92	-1.89	LA
G92AXD		65.76	0.06	0.05	67.54	1.93	1.25	GM
HNRJC3		65.73	0.03	0.02	63.86	-1.75	-1.13	LF
U47NRJ		64.95	-0.75	-0.57	66.15	0.54	0.35	GA
VP4RQW		65.94	0.24	0.18	66.99	1.38	0.90	PP
WEXE2F		66.91	1.21	0.92	67.67	2.06	1.34	LF
WFRW63		65.00	-0.70	-0.53	65.85	0.24	0.16	GM
Y3VNGK		64.68	-1.02	-0.78	65.73	0.12	0.08	VM
ZB7BNR		68.08	2.38	1.81	67.52	1.91	1.24	XX
ZRCB3L		65.99	0.29	0.22	65.46	-0.15	-0.10	LG

Summary Statistics	Sample GH15	Sample GH16
Grand Means	65.70 Gloss Units	65.61 Gloss Units
Stnd Dev Btwn Labs	1.31 Gloss Units	1.54 Gloss Units

Statistics based on 14 of 14 reporting participants.

Key to Instrument Codes Reported by Participants

GA	BYK-Gardner (model not specified)	GM	BYK-Gardner micro-gloss
LA	L & W Gloss - Autoline 300	LF	L & W Autoline 400
LG	L & W Autoline 600	LW	L & W Gloss Tester
PP	Technidyne Profile/Plus	TH	Technidyne T480A
TP	Technidyne Profile Plus	VM	Valmet PaperLab (was Kajaani/Robotest)
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 3555

Specular Gloss at 75 Degrees - Low Range

TAPPI Official Test Method T480

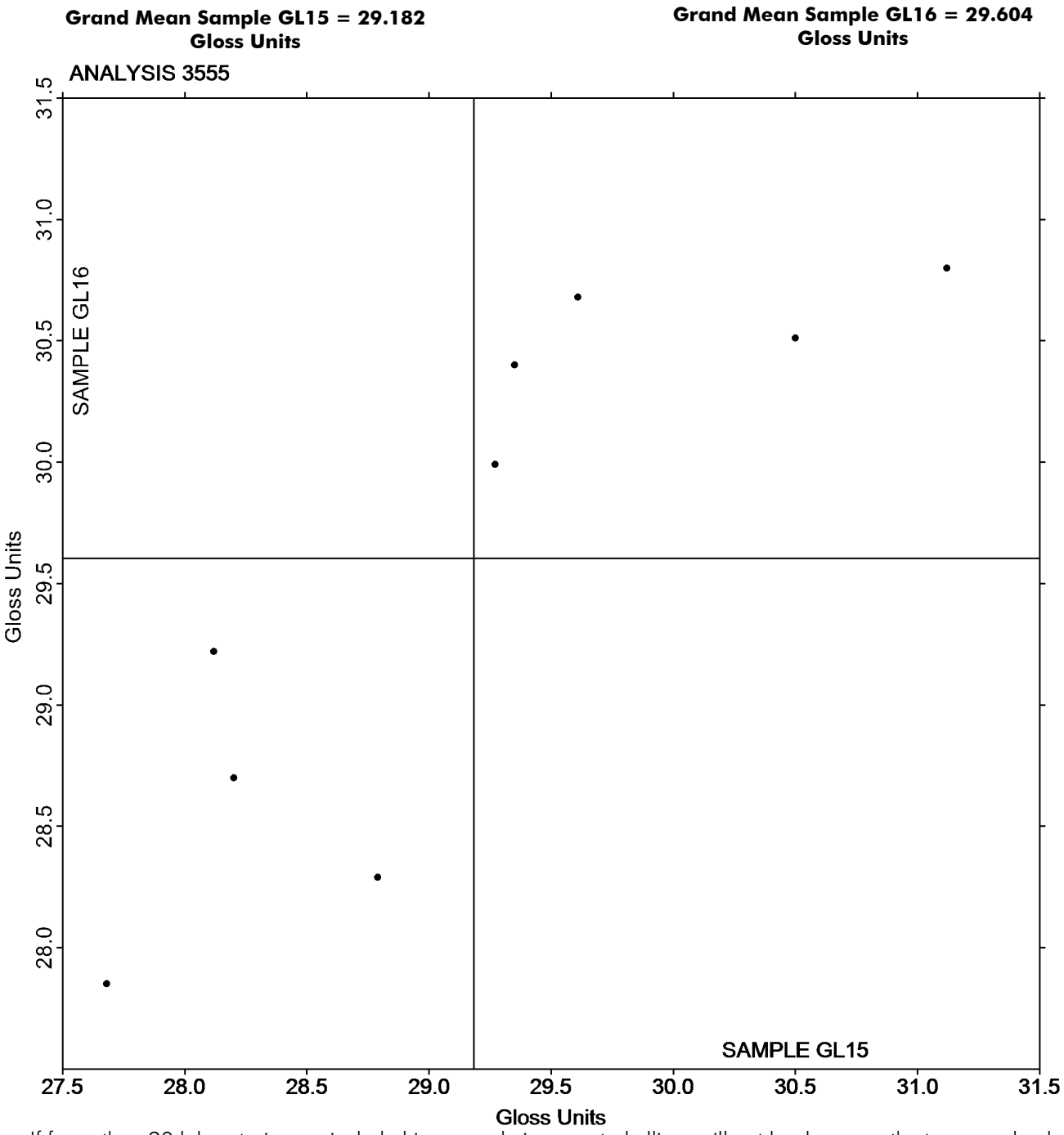
WebCode	Data Flag	Sample GL15 Lab Mean	Sample GL15 Diff from Grand Mean	Sample GL15 CPV	Sample GL16 Lab Mean	Sample GL16 Diff from Grand Mean	Sample GL16 CPV	Instr Code
78AGU7		29.35	0.17	0.15	30.40	0.80	0.71	TH
7UY4GC		30.50	1.32	1.17	30.51	0.91	0.81	TP
96UZA4		28.79	-0.39	-0.35	28.29	-1.31	-1.18	LW
9JDJ7D		31.12	1.94	1.71	30.80	1.20	1.07	PP
DR8LTW		27.68	-1.50	-1.33	27.85	-1.75	-1.57	GS
EA3DTW		28.12	-1.06	-0.94	29.22	-0.38	-0.34	WJ
K9PNWD		28.20	-0.98	-0.87	28.70	-0.90	-0.81	GM
KAPKNW		29.61	0.43	0.38	30.68	1.08	0.96	TH
ZB7BNR		29.27	0.09	0.08	29.99	0.39	0.35	XX

Summary Statistics	Sample GL15	Sample GL16
Grand Means	29.18 Gloss Units	29.60 Gloss Units
Stnd Dev Btwn Labs	1.13 Gloss Units	1.12 Gloss Units

Statistics based on 9 of 9 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
TH	Technidyne T480A	TP	Technidyne Profile Plus
WJ	Zehntner ZLR 1020	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 3601

Folding Endurance (MIT) - Double Folds

TAPPI Official Test Method T511

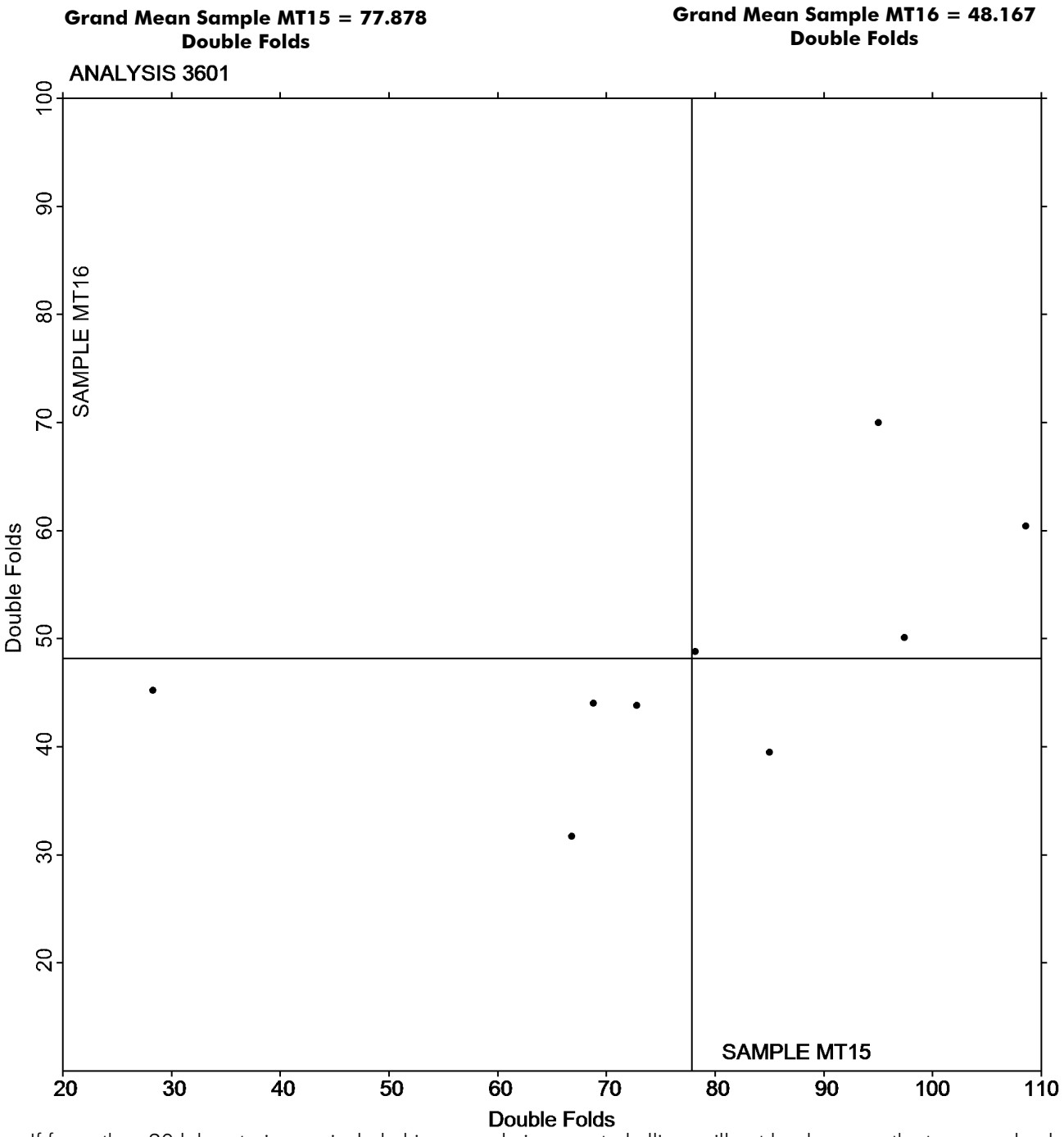
WebCode	Data Flag	Sample MT15 Lab Mean	Sample MT15 Diff from Grand Mean	Sample MT15 CPV	Sample MT16 Lab Mean	Sample MT16 Diff from Grand Mean	Sample MT16 CPV	Instr Code
78AGU7		68.80	-9.08	-0.39	44.00	-4.17	-0.37	MT
CFWPEU		85.00	7.12	0.31	39.50	-8.67	-0.77	XX
KAPKNW		66.80	-11.08	-0.47	31.70	-16.47	-1.46	MT
KQEUBY		97.40	19.52	0.84	50.10	1.93	0.17	XX
U47NRJ		28.30	-49.58	-2.12	45.20	-2.97	-0.26	MT
VE2ENB		108.60	30.72	1.32	60.40	12.23	1.08	MT
VGHZ2Q		72.80	-5.08	-0.22	43.80	-4.37	-0.39	XX
Y3VNGK		78.20	0.32	0.01	48.80	0.63	0.06	MT
ZL3FWR		95.00	17.12	0.73	70.00	21.83	1.93	MT

Summary Statistics	Sample MT15	Sample MT16
Grand Means	77.88 Double Folds	48.17 Double Folds
Stnd Dev Btwn Labs	23.34 Double Folds	11.30 Double Folds

Statistics based on 9 of 9 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

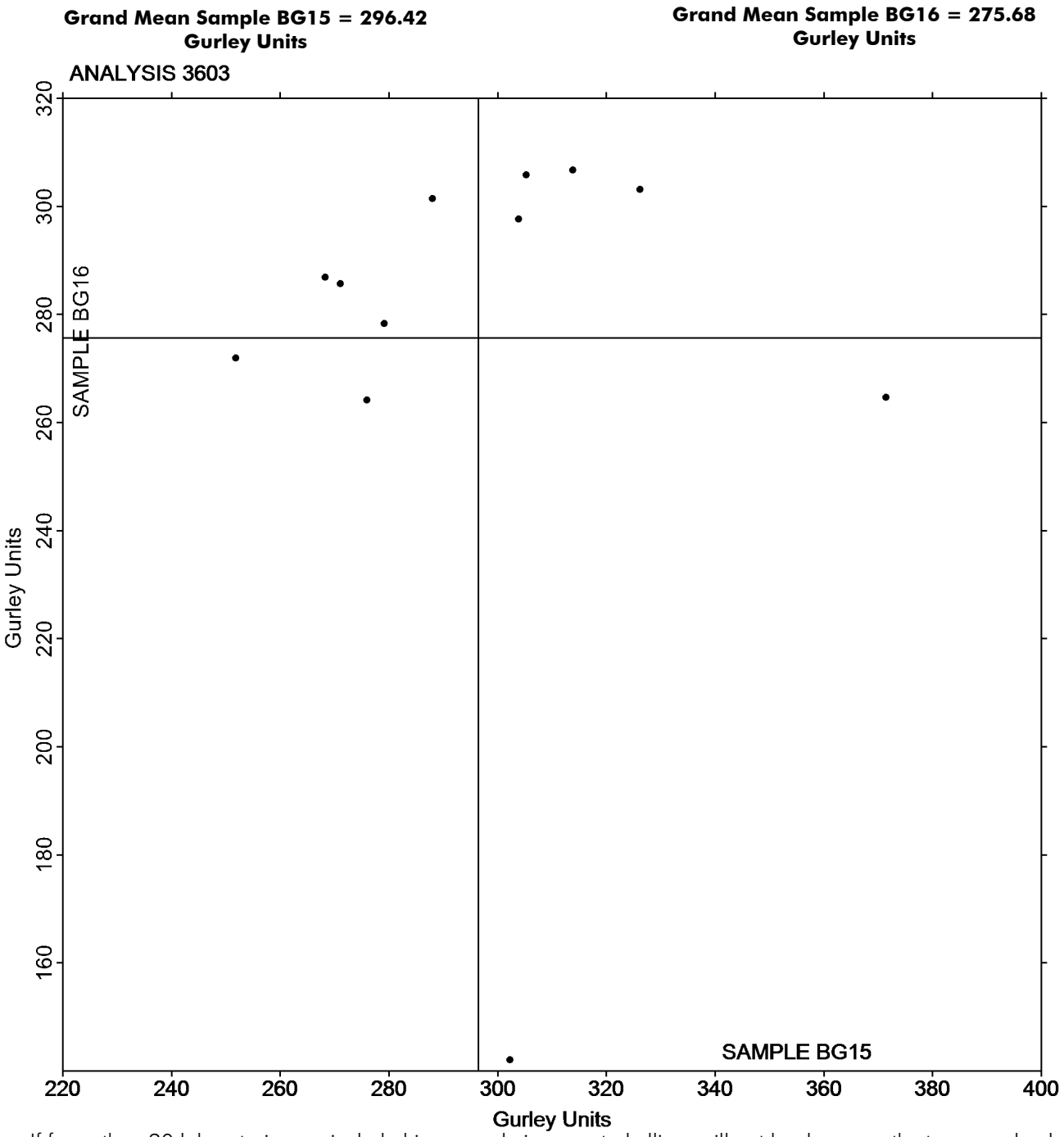
WebCode	Data Flag	Sample BG15 Lab Mean	Sample BG15 Diff from Grand Mean	Sample BG15 CPV	Sample BG16 Lab Mean	Sample BG16 Diff from Grand Mean	Sample BG16 CPV	Instr Code
4TNHFC		326.2	29.8	0.93	303.1	27.4	0.61	ZZ
78AGU7		302.3	5.9	0.18	142.1	-133.6	-2.98	ZZ
8LKG42		279.1	-17.3	-0.54	278.3	2.6	0.06	ZZ
APDF9B		305.2	8.8	0.28	305.8	30.1	0.67	ZZ
DMYYLM		268.3	-28.2	-0.88	286.9	11.2	0.25	ZZ
KAPKNW		251.8	-44.6	-1.40	271.9	-3.8	-0.08	ZZ
RTCN4V		271.1	-25.4	-0.79	285.7	10.0	0.22	ZZ
UZR23K		313.8	17.4	0.55	306.7	31.0	0.69	ZZ
VCBBXP		288.0	-8.4	-0.26	301.4	25.7	0.57	ZZ
VE2ENB		275.9	-20.5	-0.64	264.2	-11.5	-0.26	ZZ
WD4GXF		303.9	7.5	0.23	297.6	21.9	0.49	ZZ
Y3VNGK		371.4	75.0	2.35	264.6	-11.1	-0.25	ZZ

Summary Statistics	Sample BG15	Sample BG16
Grand Means	296.42 Gurley Units	275.68 Gurley Units
Stnd Dev Btwn Labs	31.90 Gurley Units	44.83 Gurley Units

Statistics based on 12 of 12 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 3611

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

TAPPI Official Test Method T549

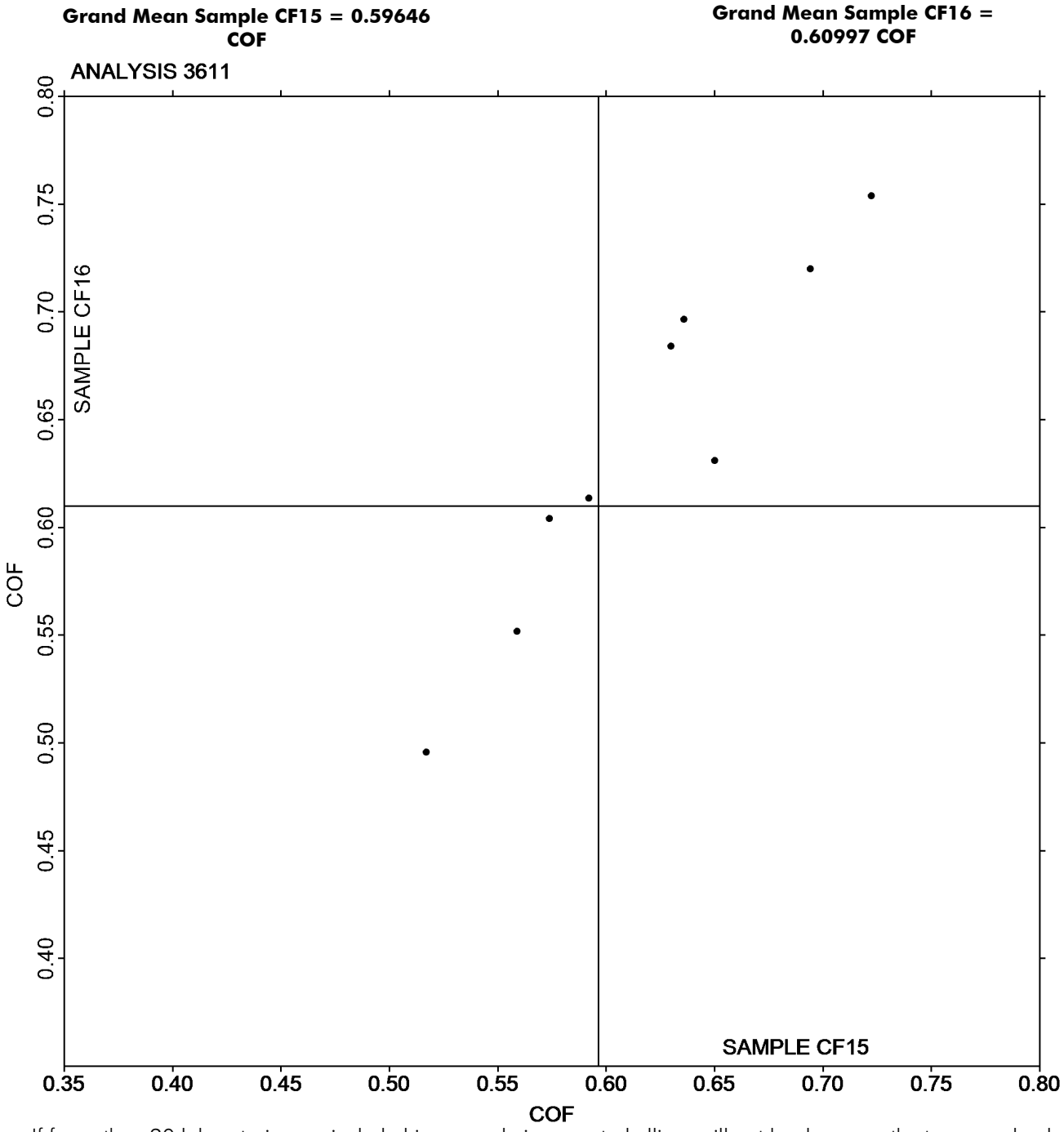
WebCode	Data Flag	Sample CF15 Lab Mean	Sample CF15 Diff from Grand Mean	Sample CF15 CPV	Sample CF16 Lab Mean	Sample CF16 Diff from Grand Mean	Sample CF16 CPV	Instr Code
4N3R44		0.6942	0.0977	1.02	0.7200	0.1100	0.91	TA
4TNHFC		0.5740	-0.0225	-0.24	0.6040	-0.0060	-0.05	TP
7UY4GC		0.6500	0.0535	0.56	0.6310	0.0210	0.17	TA
8LKG42		0.6300	0.0335	0.35	0.6840	0.0740	0.62	TA
KN8EX2		0.7224	0.1260	1.32	0.7537	0.1437	1.19	TN
RTQC42		0.5920	-0.0045	-0.05	0.6134	0.0034	0.03	TA
VCBBXP		0.5170	-0.0795	-0.83	0.4956	-0.1144	-0.95	TA
VE2ENB		0.6360	0.0395	0.41	0.6964	0.0864	0.72	XX
WX7ANT		0.3900	-0.2065	-2.17	0.3500	-0.2600	-2.16	XX
YE69W7		0.5590	-0.0375	-0.39	0.5516	-0.0584	-0.49	XX

Summary Statistics	Sample CF15	Sample CF16
Grand Means	0.60 COF	0.61 COF
Stnd Dev Btwn Labs	0.10 COF	0.12 COF

Statistics based on 10 of 10 reporting participants.

Key to Instrument Codes Reported by Participants

TA	Thwing-Albert Friction Tester	TN	TMI 32-07 Monitor/Slip and Friction
TP	TMI 32-25 COF Tester (Inclined Plane)	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

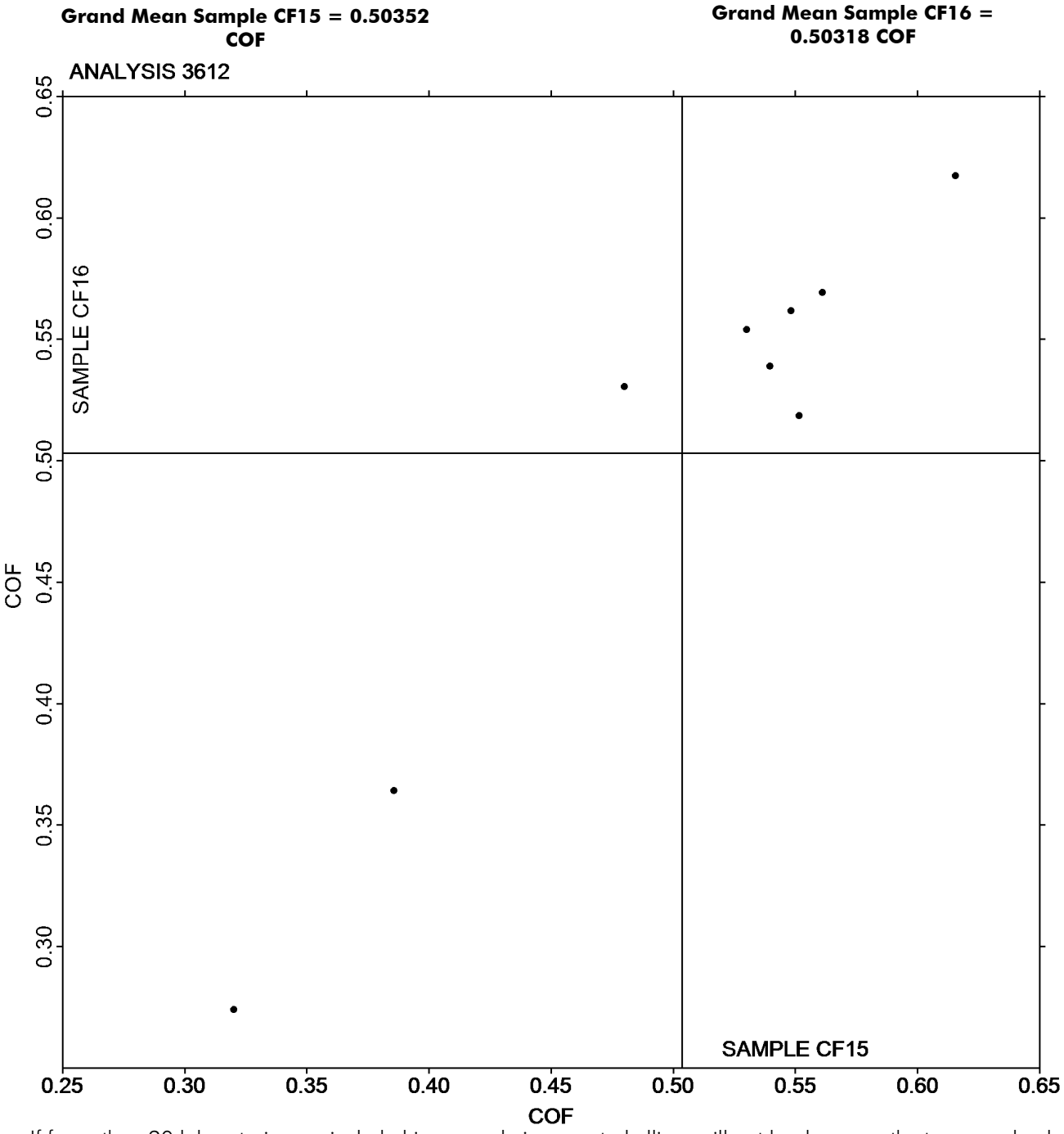
WebCode	Data Flag	Sample CF15 Lab Mean	Sample CF15 Diff from Grand Mean	Sample CF15 CPV	Sample CF16 Lab Mean	Sample CF16 Diff from Grand Mean	Sample CF16 CPV	Instr Code
4N3R44		0.6156	0.1121	1.20	0.6174	0.1142	1.03	TA
7UY4GC		0.5396	0.0361	0.38	0.5390	0.0358	0.32	TA
8LKG42		0.5300	0.0265	0.28	0.5540	0.0508	0.46	TA
KN8EX2		0.5610	0.0575	0.61	0.5692	0.0660	0.60	TN
RTQC42		0.5482	0.0447	0.48	0.5618	0.0586	0.53	TA
VCBBXP		0.3856	-0.1179	-1.26	0.3642	-0.1390	-1.26	TA
VE2ENB		0.4800	-0.0235	-0.25	0.5304	0.0272	0.25	XX
WX7ANT		0.3200	-0.1835	-1.96	0.2740	-0.2292	-2.08	XX
YE69W7		0.5516	0.0481	0.51	0.5186	0.0154	0.14	XX

Summary Statistics	Sample CF15	Sample CF16
Grand Means	0.50 COF	0.50 COF
Stnd Dev Btwn Labs	0.09 COF	0.11 COF

Statistics based on 9 of 9 reporting participants.

Key to Instrument Codes Reported by Participants

TA	Thwing-Albert Friction Tester	TN	TMI 32-07 Monitor/Slip and Friction
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 MC15 Lab Mean	Sample MC15 Diff from Grand Mean	Sample MC15 CPV	Sample MC16 Lab Mean	Sample MC16 Diff from Grand Mean	Sample MC16 CPV	Instr Code
3CV4WF		4.359	-0.003	-0.01	4.392	0.062	0.14	ZZ
8LKG42		4.484	0.122	0.26	4.499	0.169	0.37	ZZ
9NK9BE		4.641	0.279	0.61	4.827	0.497	1.08	ZZ
BAN3UD		4.287	-0.075	-0.16	4.288	-0.042	-0.09	ZZ
EA3DTW		4.049	-0.312	-0.68	3.965	-0.365	-0.80	ZZ
H7TNGQ		4.220	-0.142	-0.31	4.280	-0.050	-0.11	ZZ
JCZA9U		5.050	0.688	1.49	4.960	0.630	1.37	ZZ
K829NQ		4.296	-0.066	-0.14	4.437	0.107	0.23	ZZ
KPEYJF	M	4.046	-0.316	-0.69	No data reported for this sample			ZZ
M9JDQK		3.420	-0.942	-2.04	3.214	-1.116	-2.43	ZZ
P3KLRM		4.015	-0.347	-0.75	4.000	-0.330	-0.72	ZZ
QYNC37		4.360	-0.002	0.00	4.410	0.080	0.17	ZZ
VB3XFM		5.159	0.798	1.73	4.687	0.357	0.78	ZZ

Summary Statistics	Sample MC15	Sample MC16
Grand Means	4.36 Percent	4.33 Percent
Stnd Dev Btwn Labs	0.46 Percent	0.46 Percent

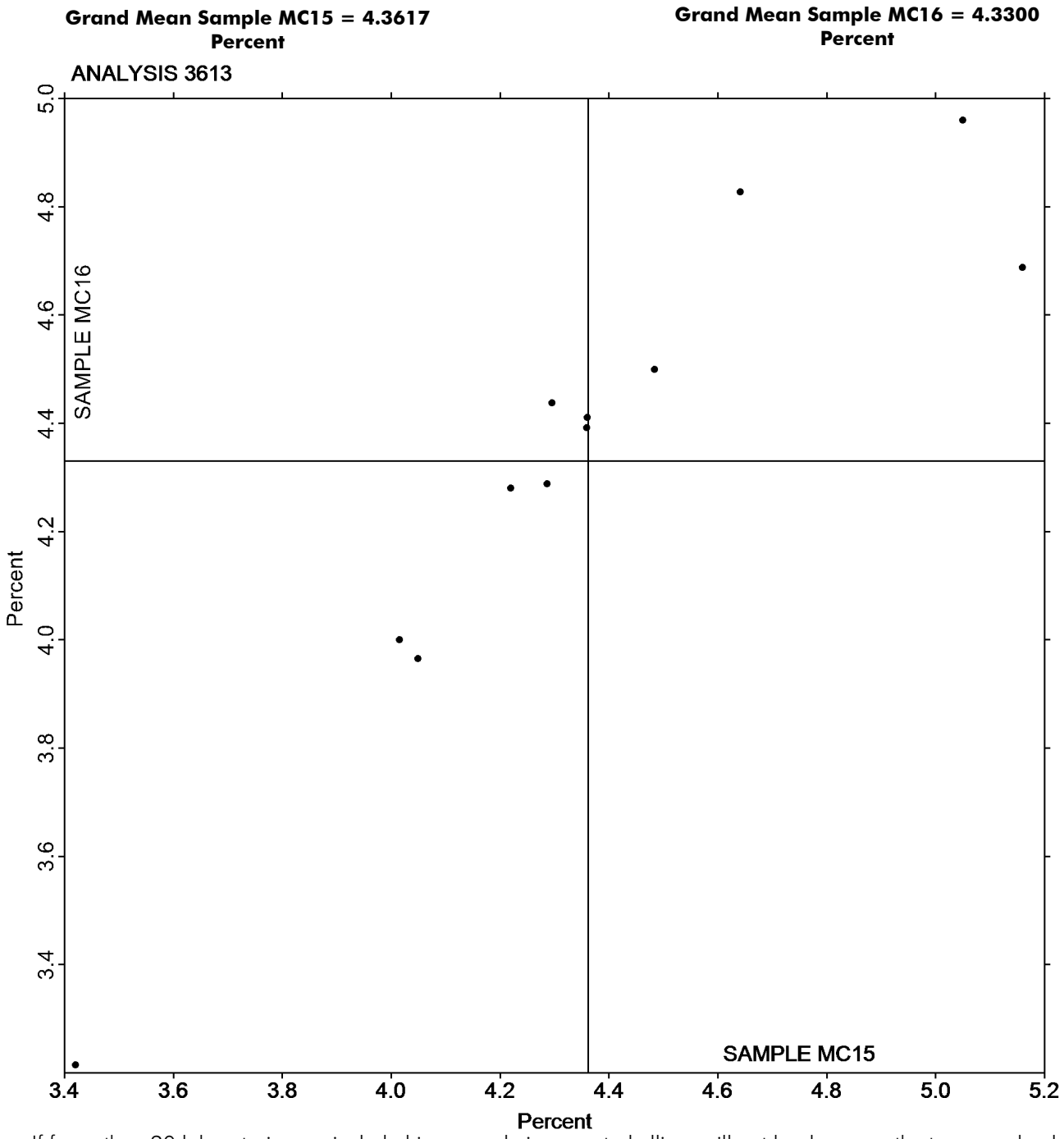
Statistics based on 12 of 13 reporting participants.

Comments on Assigned Data Flags for Test #3613

KPEYJF (M) - Participant did not submit data for sample MC16.

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 3615
Sizing Test (Hercules Type)
TAPPI Official Test Method T530

WebCode	Data Flag	Sample HS15 Lab Mean	Sample HS15 Diff from Grand Mean	Sample HS15 CPV	Sample HS16 Lab Mean	Sample HS16 Diff from Grand Mean	Sample HS16 CPV	Instr Code
4N3R44		56.11	-28.68	-0.89	67.40	-11.33	-0.38	HE
4TNHFC		28.12	-56.67	-1.76	27.07	-51.66	-1.74	HE
7UY4GC		78.18	-6.61	-0.21	94.87	16.14	0.54	HE
8LKG42		79.00	-5.79	-0.18	75.32	-3.41	-0.11	HE
APDF9B		113.59	28.80	0.90	95.01	16.28	0.55	XX
APV96E		146.42	61.63	1.92	102.95	24.22	0.82	XX
BPQ8Y7		52.40	-32.39	-1.01	46.60	-32.13	-1.08	HE
DJDBTA		83.69	-1.10	-0.03	68.31	-10.42	-0.35	HE
DJDGYV	*	111.78	26.99	0.84	58.33	-20.40	-0.69	HE
E4HCDK	*	166.70	81.91	2.55	173.80	95.07	3.20	HE
EN44E2		30.41	-54.38	-1.69	30.97	-47.76	-1.61	XX
GZ87PA		79.96	-4.83	-0.15	79.08	0.35	0.01	HE
HGA7FP	X	210.99	126.21	3.92	227.77	149.04	5.02	HE
HNRJC3		101.88	17.09	0.53	89.58	10.85	0.37	HE
K9PNWD		86.60	1.81	0.06	87.10	8.37	0.28	HE
KN8EX2		96.29	11.50	0.36	94.44	15.71	0.53	HE
RVGFUM		83.13	-1.66	-0.05	69.83	-8.90	-0.30	HE
TWV38V		63.44	-21.35	-0.66	59.17	-19.56	-0.66	XX
UZR23K		100.01	15.22	0.47	102.46	23.73	0.80	HE
VCBBXP		109.94	25.15	0.78	106.30	27.57	0.93	HE
VWZPFK		61.54	-23.25	-0.72	64.87	-13.86	-0.47	HE
WD4GXF		62.10	-22.69	-0.71	56.40	-22.33	-0.75	HE
WX7ANT		63.91	-20.88	-0.65	62.85	-15.88	-0.54	XX
Y3VNGK		101.70	16.91	0.53	95.60	16.87	0.57	HE
YE69W7		77.99	-6.80	-0.21	81.19	2.46	0.08	XX

Summary Statistics	Sample HS15	Sample HS16
Grand Means	84.79 Seconds	78.73 Seconds
Stnd Dev Btwn Labs	32.16 Seconds	29.67 Seconds

Statistics based on 24 of 25 reporting participants.

Comments on Assigned Data Flags for Test #3615

HGA7FP (X) - Data for both samples are high. Possible Systematic Error. Inconsistent within the determinations of both samples.

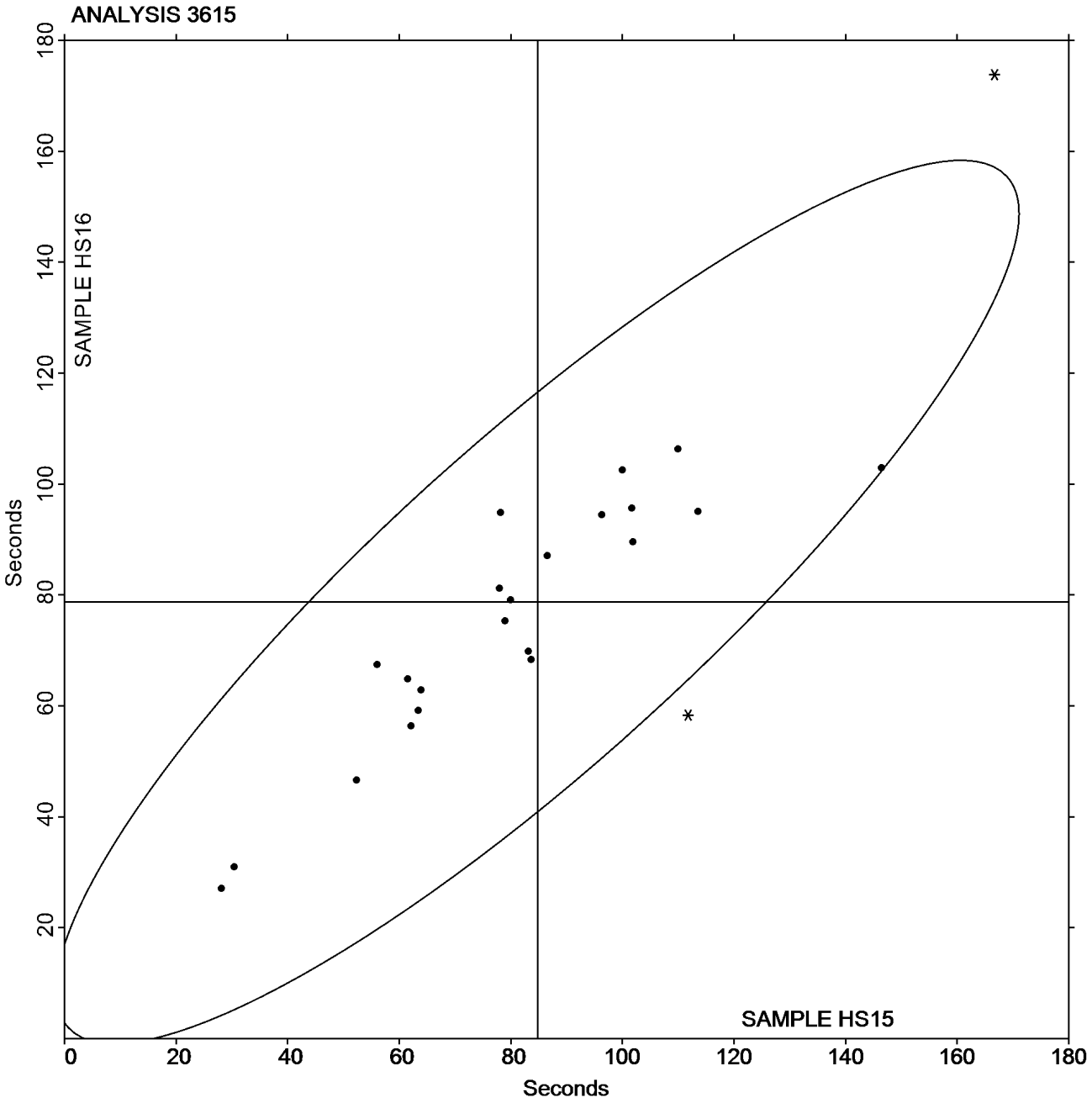
Key to Instrument Codes Reported by Participants

HE Hercules Sizing Tester

XX Instrument make/model not specified by lab

Grand Mean Sample HS15 = 84.787 Seconds

Grand Mean Sample HS16 = 78.729 Seconds



-End of Report-