Collaborative Testing Services, Inc.

Paper & Paperboard Testing Program

Summary Report #2922 G - February 2018

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351	Color & Color Difference - Near White Papers - D65/10deg obs
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398	Grammage (Mass per Unit Area)
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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 industrial sectors: rubber, plastics, fasteners and metals, CKPG, paper, color and wine, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality assurance objectives. Labs from the U.S., as well as more than 80 countries, currently participate in CTS programs.

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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 Web site. 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.

ΔE — The calculated total color difference between the two samples. For the Hunter L,a,b analyses it is calculated in Hunter units (ΔE). For the L*,a*,b* analyses it is calculated in CIELAB units (ΔE*).

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 350

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
2E6VMB		**GA51**	96.45	-0.72	2.87	-0.34	0.01	0.02	0.34	XS
		GA52	96.10	-0.72	2.89					
4L2AKH		**GA51**	95.06	-0.64	3.62	-0.66	-0.05	-0.06	0.66 X	HE
		GA52	94.41	-0.69	3.56					
6RXNJN		**GA51**	94.37	-0.71	4.11	-0.52	-0.02	-0.14	0.54	VM
		GA52	93.84	-0.73	3.98					
6WTFU7		**GA51**	95.58	-0.56	3.93	-0.46	-0.05	-0.23	0.52	NE
		GA52	95.11	-0.61	3.70					
6YKCGE		**GA51**	94.39	-0.98	2.95	-0.19	0.04	0.15	0.25	HE
		GA52	94.20	-0.94	3.11					
8BPC64		**GA51**	95.34	-0.81	3.74	-0.28	-0.01	0.03	0.28	LS
		GA52	95.06	-0.83	3.77					
8VWJHG		**GA51**	93.94	-0.80	3.76	-0.36	-0.02	0.03	0.36	LA
		GA52	93.58	-0.82	3.79					
92G4ZN		**GA51**	95.46	-0.68	3.59	-0.31	0.03	-0.07	0.32	TC
		GA52	95.16	-0.66	3.52					
AEU4XZ		**GA51**	95.57	-0.70	3.88	-0.29	-0.03	0.02	0.30	LS
		GA52	95.27	-0.73	3.89					
C3JZZ9		**GA51**	94.05	-0.57	3.83	-0.34	0.03	-0.02	0.34	TS
		GA52	93.71	-0.53	3.81					
C4L8UL		**GA51**	94.21	-0.81	3.64	-0.34	-0.02	0.03	0.34	XX
		GA52	93.88	-0.83	3.67					
CJ3WDG		**GA51**	93.29	-0.08	3.34	-0.22	-0.02	0.04	0.22	TS
		GA52	93.08	-0.10	3.38					
CQJGCM		**GA51**	95.37	-0.83	3.70	-0.40	0.13	0.16	0.45	EH
		GA52	94.98	-0.70	3.86					
D86FYZ		**GA51**	95.30	-0.95	2.30	0.04	-0.02	0.41	0.41	LA
		GA52	95.34	-0.96	2.71					
DMZZFN		**GA51**	94.01	-0.87	3.75	-0.35	-0.04	0.06	0.36	TC
		GA52	93.66	-0.90	3.81					
GRHFCW		**GA51**	95.36	-0.77	3.66	-0.29	-0.01	0.01	0.29	TC
		GA52	95.07	-0.79	3.66					

Paper & Paperboard Interlaboratory Testing Program

Report #2922 G, February 2018

Analysis 350

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
MDJBVL		**GA51**	94.19	-0.81	3.68	-0.37	-0.01	0.03	0.37	TC
		GA52	93.82	-0.82	3.71					
TLTQ4G		**GA51**	94.22	-1.11	3.75	-0.13	0.10	0.14	0.22	HG
		GA52	94.09	-1.01	3.88					
U969NH		**GA51**	93.11	-0.13	3.47	-0.34	0.00	0.02	0.34	TS
		GA52	92.77	-0.12	3.49					
UVHWEU		**GA51**	95.29	-0.75	3.83	-0.29	-0.01	0.01	0.29	EH
		GA52	95.01	-0.76	3.84					
XY983P		**GA51**	93.71	-0.31	3.49	-0.20	-0.01	0.00	0.20	TS
		GA52	93.52	-0.33	3.49					
Y26DWL		**GA51**	94.58	-1.05	2.96	-0.18	0.08	0.13	0.24	HE
		GA52	94.40	-0.97	3.10					
ZRXXQD		**GA51**	93.29	-0.42	3.36	-0.45	0.05	0.02	0.45	TS
		GA52	92.84	-0.37	3.39					

Summary Statistics

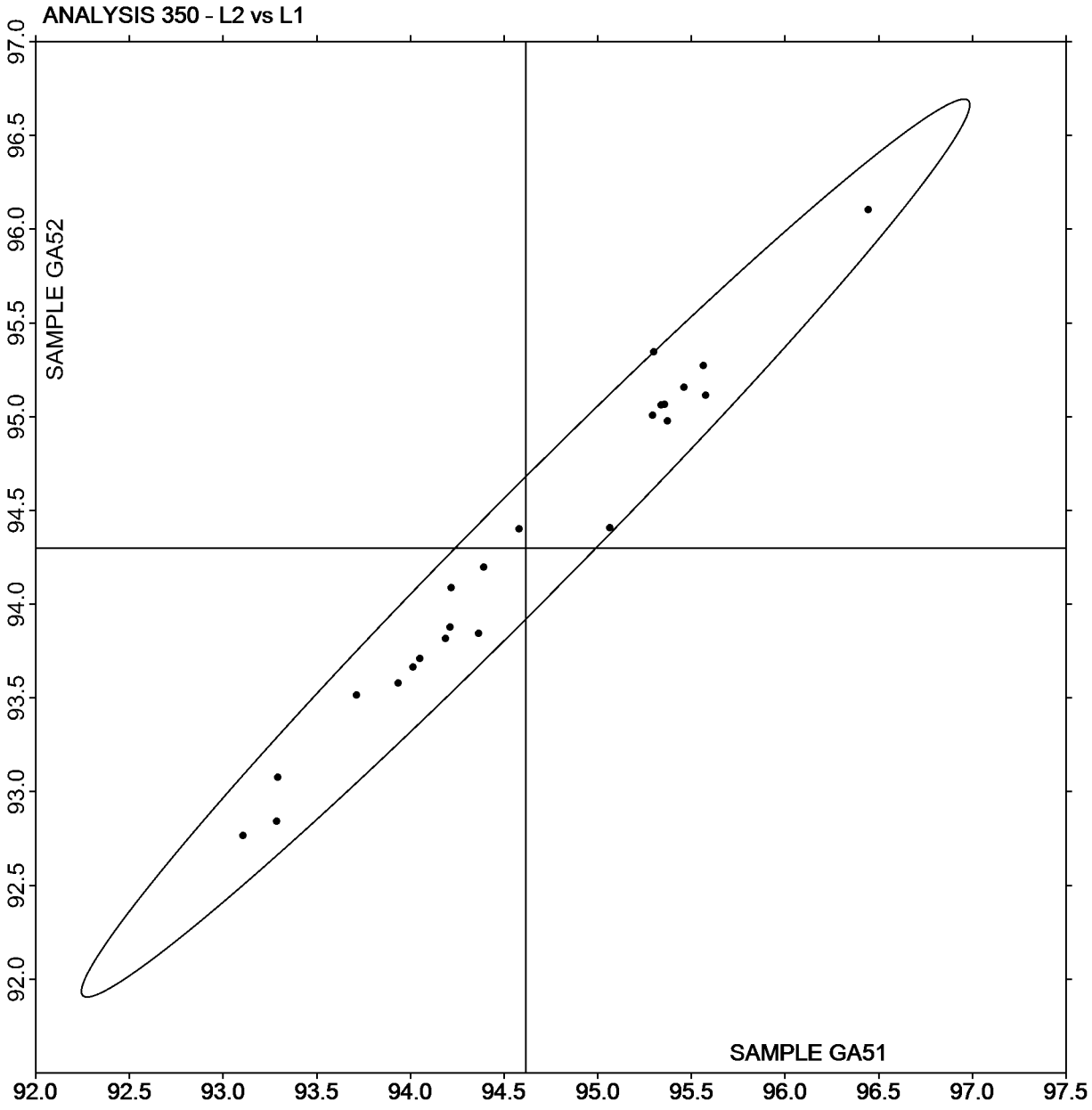
Grand Means							
GA51	94.615	-0.698	3.530	-0.316	0.006	0.035	0.351
GA52	94.299	-0.692	3.565				
Stnd Dev Btwn Labs							
GA51	0.880	0.263	0.412	0.141	0.047	0.120	0.113
GA52	0.888	0.252	0.338				

Statistics based on 23 of 23 reporting participants

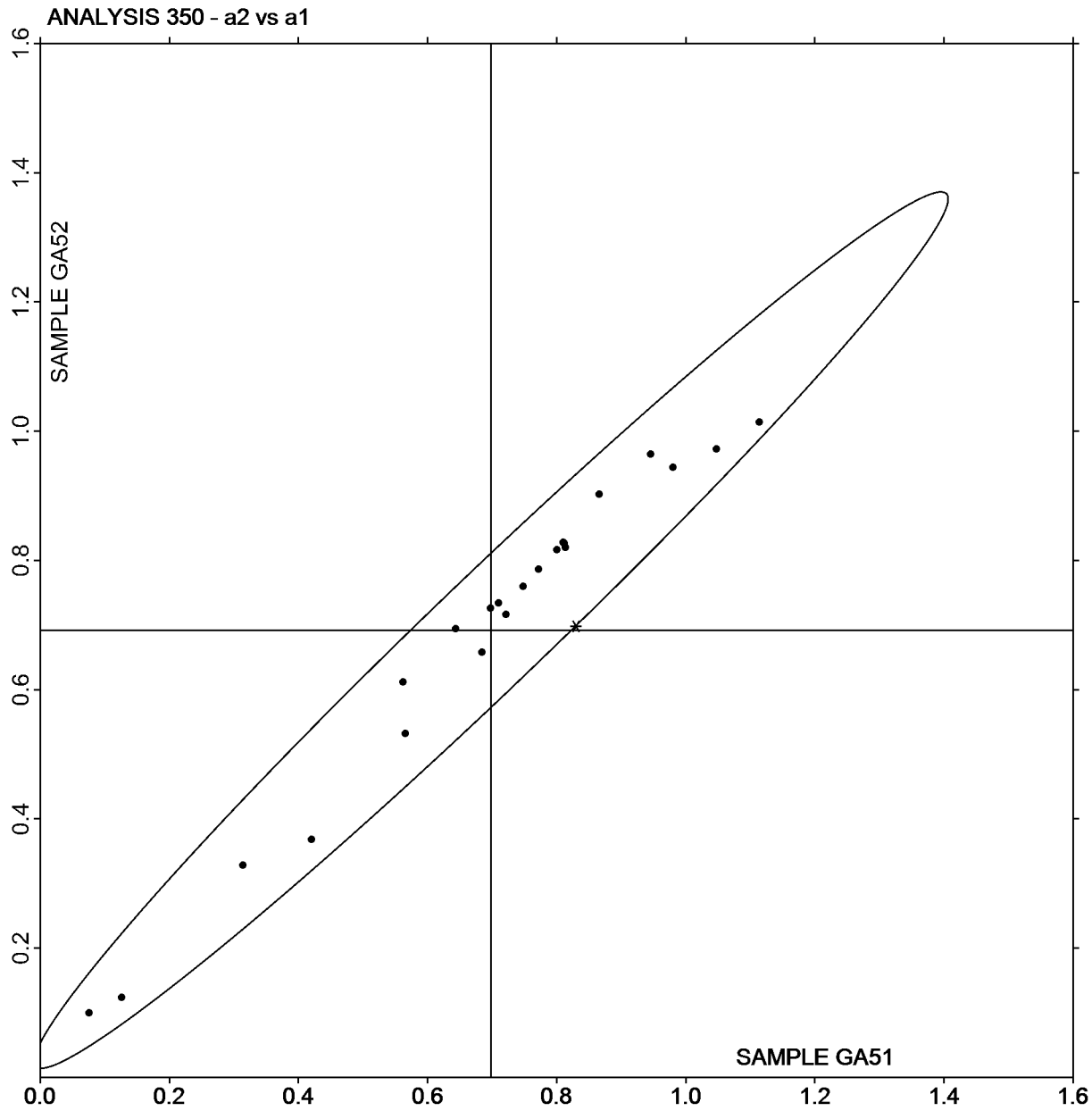
Key to Instrument Codes Reported by Participants

EH	Datacolor Elrepho SF450	HE	Hunter LabScan
HG	Hunter ColorQUEST	LA	L & W Elrepho AL300
LS	L & W Elrepho SE 070	NE	Minolta CM-3500d Spectrophotometer
TC	Technidyne Color Touch Series	TS	Technidyne Brightimeter Micro S-5
VM	Valmet PaperLab (was Kajaani/Robotest)	XS	X-Rite 938 Spectrodensitometer
XX	Instrument make/model not specified by lab		

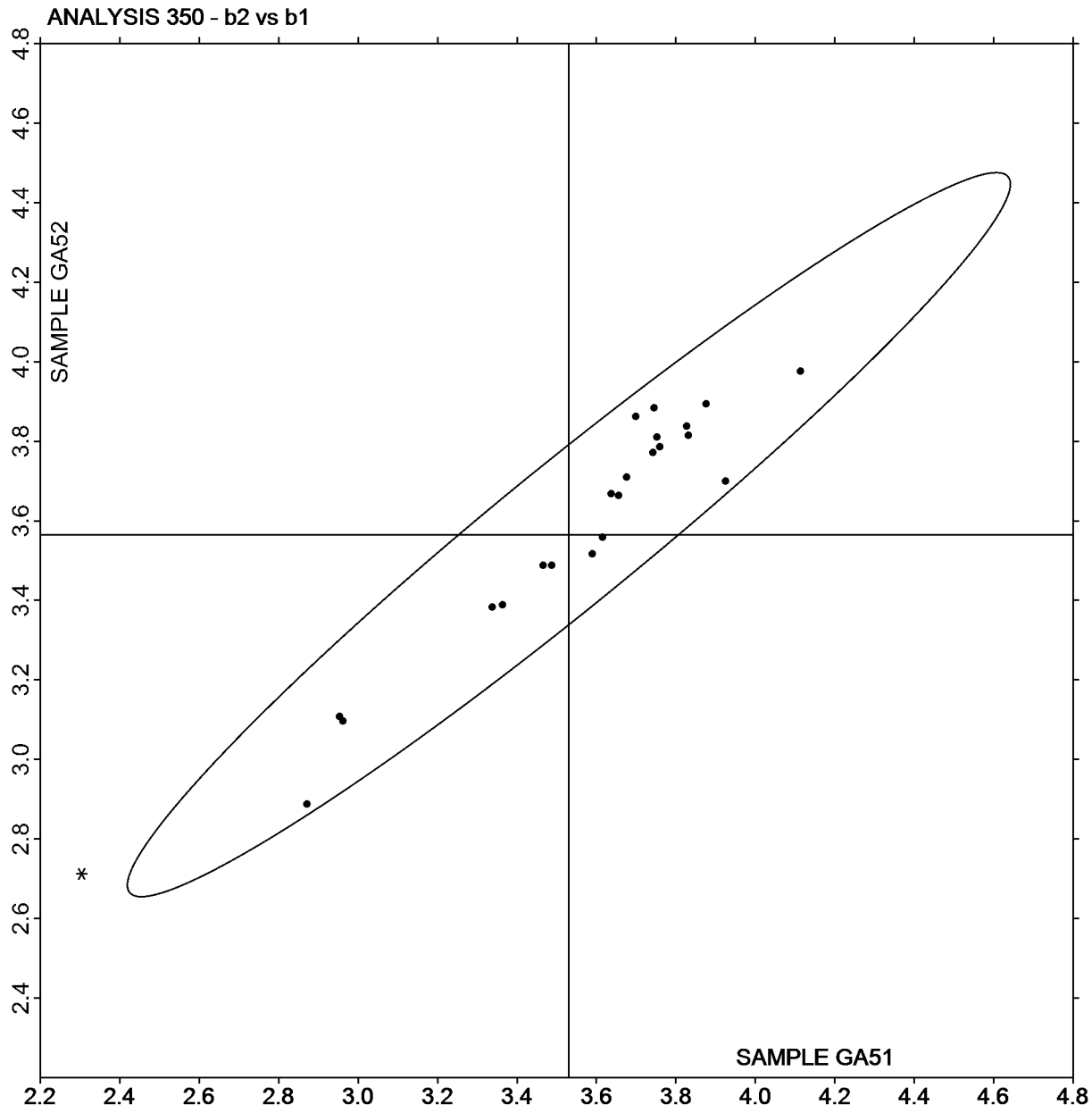
Plot of L values GA52 v L values GA51



Plot of a values GA52 v a values GA51



Plot of b values GA52 v b values GA51



Paper & Paperboard Interlaboratory Testing Program

Analysis 351

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

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

Web Code	Data Flag	Samples	CIE L* a* b* Color Values L*	a*	b*	Color Difference Values ΔL*	Δa*	Δb*	ΔE*	InstrCode
2KAL2B		**GA51**	94.03	-0.62	3.48	-0.38	-0.03	0.04	0.38	TC
		GA52	93.65	-0.64	3.52					
4L2AKH		**GA51**	94.91	-0.64	3.47	-0.47	-0.04	0.06	0.48	HE
		GA52	94.44	-0.68	3.53					
6QQCZ2		**GA51**	94.36	-0.66	3.38	-0.27	-0.04	0.02	0.27	XX
		GA52	94.09	-0.70	3.40					
86E87P		**GA51**	95.25	-0.57	4.05	-0.27	-0.04	0.05	0.27	NG
		GA52	94.98	-0.61	4.10					
88LH7Y		**GA51**	94.05	-0.60	3.57	-0.34	-0.03	0.00	0.34	TC
		GA52	93.71	-0.63	3.57					
AEU4XZ		**GA51**	95.62	-0.71	3.85	-0.38	-0.02	0.02	0.38	LS
		GA52	95.24	-0.73	3.87					
BFM6MN		**GA51**	95.25	-0.70	3.96	-0.28	-0.02	0.05	0.29	EH
		GA52	94.97	-0.72	4.01					
JCGAJD		**GA51**	95.40	-0.70	3.78	-0.28	0.00	-0.02	0.28	EF
		GA52	95.12	-0.70	3.76					
NJ28QM		**GA51**	95.57	-0.63	3.96	-0.26	-0.04	-0.05	0.27	HT
		GA52	95.31	-0.67	3.91					
P9YZYU		**GA51**	95.82	-0.62	3.67	-0.38	-0.06	0.03	0.38	HE
		GA52	95.45	-0.68	3.70					
PDADE8		**GA51**	95.63	-0.52	3.72	-0.32	-0.03	0.11	0.33	XM
		GA52	95.32	-0.55	3.82					
QZXEXK		**GA51**	94.86	-0.53	3.55	-0.60	-0.04	-0.02	0.60 X	HV
		GA52	94.27	-0.57	3.53					
T96LY7		**GA51**	95.53	-0.53	3.82	-0.25	-0.04	0.03	0.25	NF
		GA52	95.28	-0.57	3.85					
XN3CXY		**GA51**	95.47	-0.58	4.01	-0.26	-0.04	0.04	0.27	NG
		GA52	95.21	-0.62	4.05					
Y4WCBJ		**GA51**	95.20	-0.59	3.88	-0.27	-0.05	0.07	0.28	LS
		GA52	94.93	-0.64	3.95					
Y7JZKY	X	**GA51**	97.10	-0.51	3.16	-0.10	0.01	0.18	0.21	XP
		GA52	97.00	-0.50	3.34					

Paper & Paperboard Interlaboratory Testing Program

Analysis 351

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

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

Web Code	Data Flag	Samples	CIE L* a* b* Color Values L*	a*	b*	Color Difference Values ΔL*	Δa*	Δb*	ΔE*	InstrCode
YGKDQQ		GA51	95.45	-0.59	3.93	-0.28	-0.04	-0.10	0.30	HT
		GA52	95.17	-0.64	3.83					
ZLAATM		GA51	95.49	-0.58	4.17	-0.23	-0.03	-0.04	0.23	NG
		GA52	95.26	-0.61	4.14					

Summary Statistics

Grand Means							
GA51	95.170	-0.605	3.744	-0.323	-0.034	0.017	0.330
GA52	94.847	-0.637	3.770				
Stnd Dev Btwn Labs							
GA51	0.551	0.062	0.267	0.095	0.013	0.051	0.093
GA52	0.584	0.063	0.243				

Statistics based on 17 of 18 reporting participants

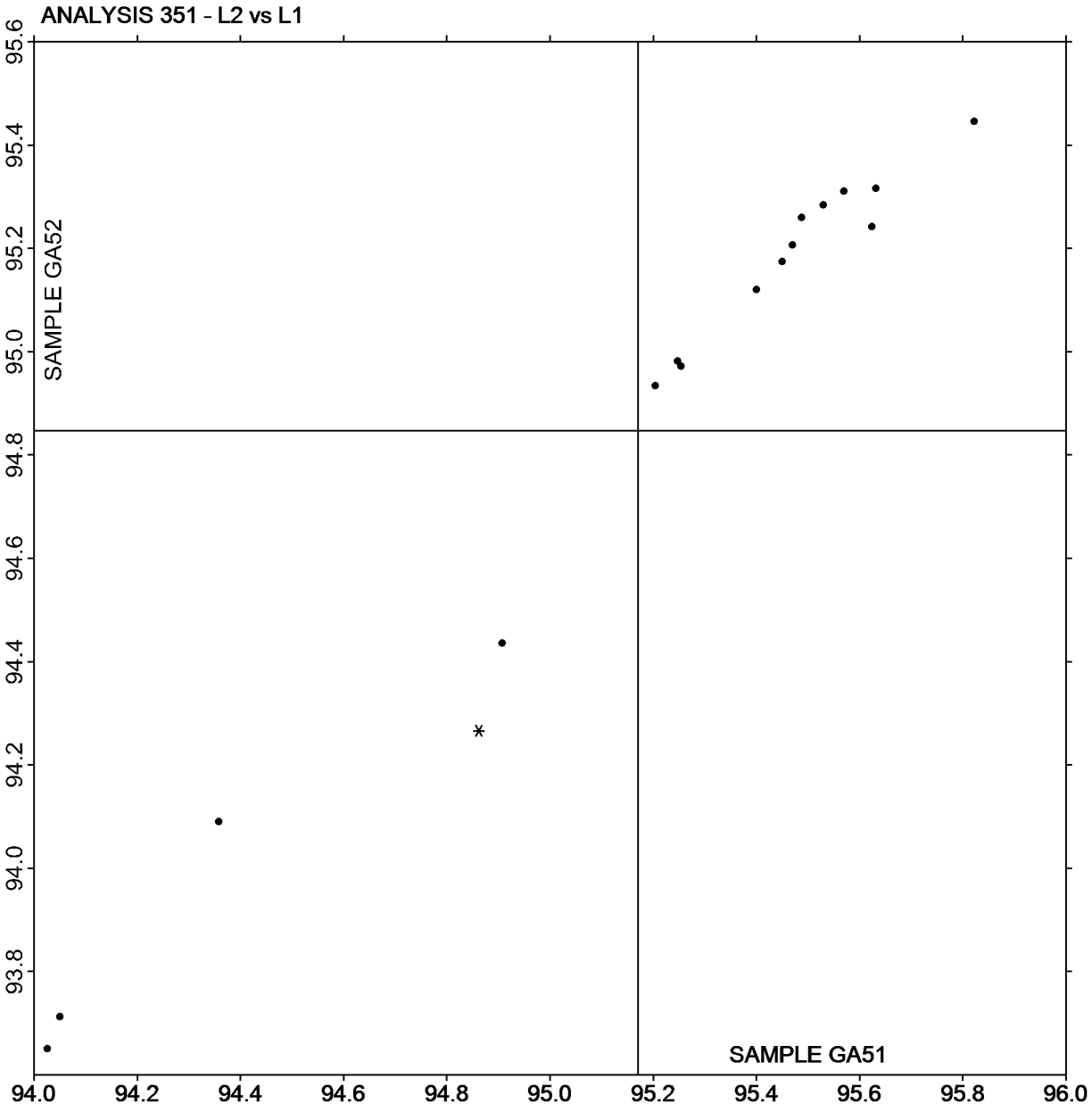
Comments on Assigned Data Flags for Test #351

Y7JZKY (X) - High L values, inconsistent within the replicates for the L values of Sample GA51. Large delta a and delta b.

Key to Instrument Codes Reported by Participants

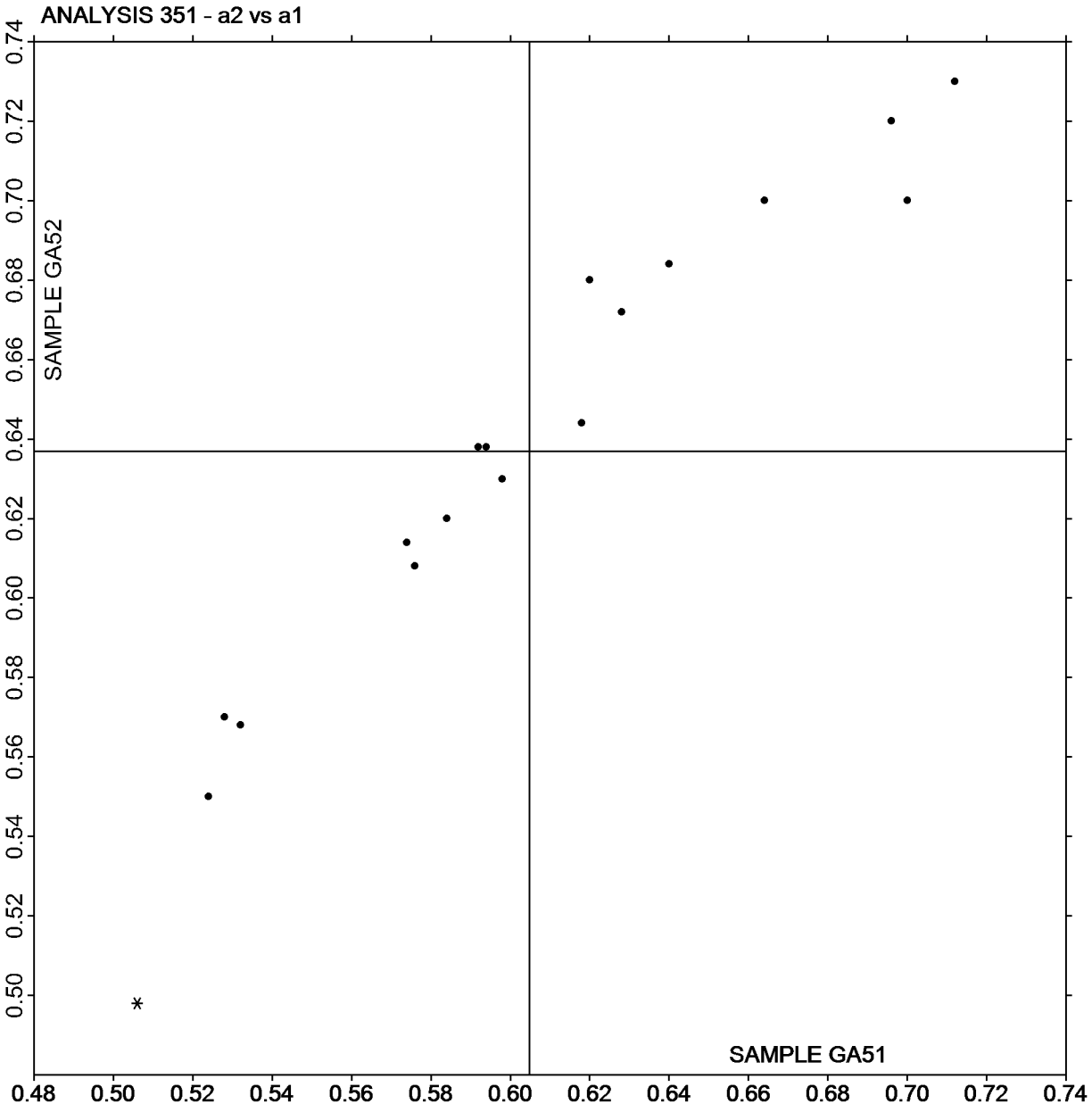
EF	Datacolor Elrepho 3000	EH	Datacolor Elrepho SF450
HE	Hunter LabScan	HT	Hunter UltraScan Vis
HV	Hunter Ultrascan XE	LS	L & W Elrepho SE 070
NF	Minolta CM-3600d Spectrophotometer	NG	Minolta CM-3700d Spectrophotometer
TC	Technidyne Color Touch Series	XM	X-Rite CA-22
XP	X-Rite Spectrophotometer DTP	XX	Instrument make/model not specified by lab

Plot of L values GA52 v L values GA51



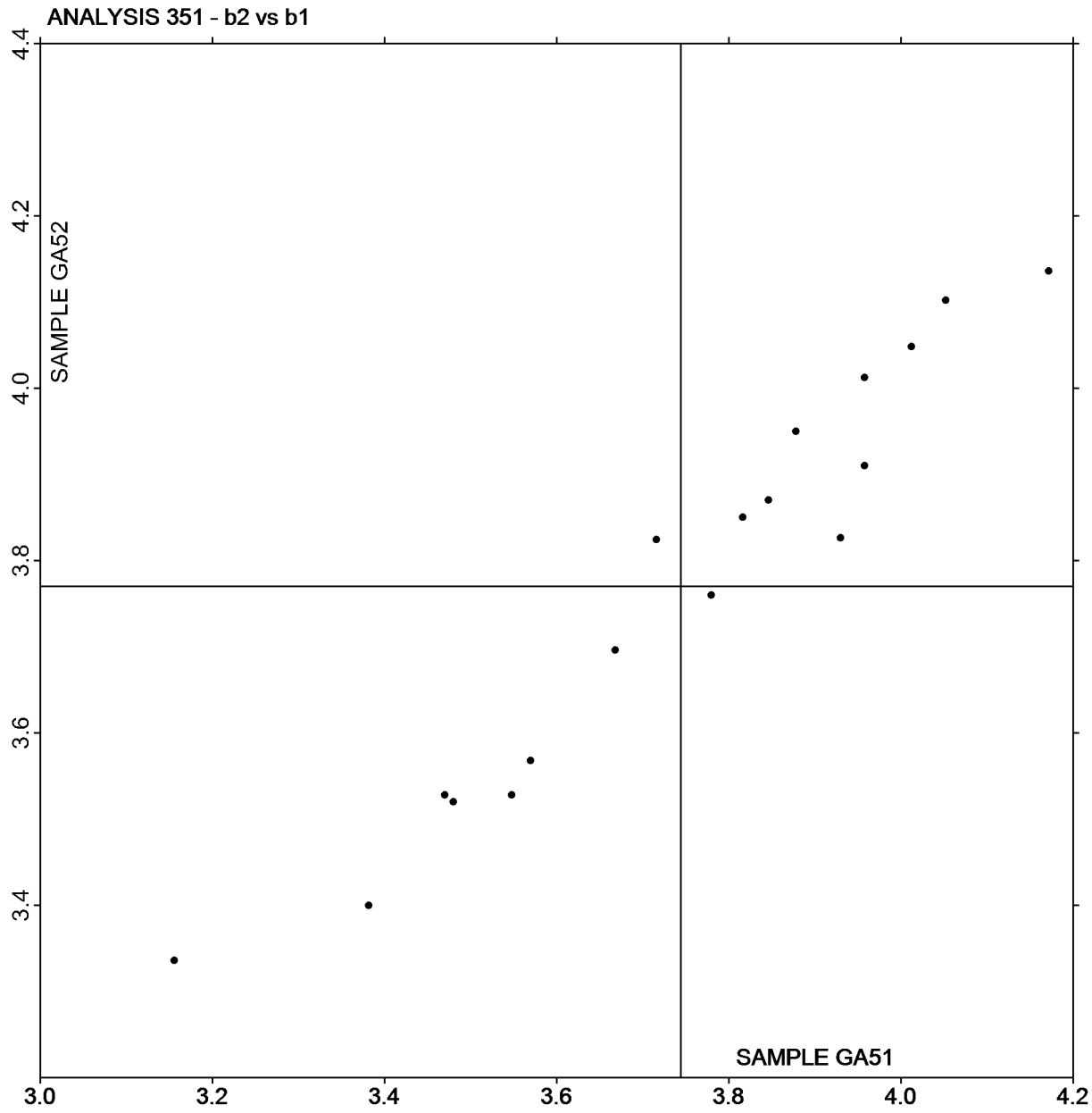
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Plot of a values GA52 v a values GA51



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 GA52 v b values GA51



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 360
Thickness (Caliper), Printing papers
TAPPI Official Test Method T411

WebCode	Data Flag	Sample GV51 Lab Mean	Sample GV51 Diff from Grand Mean	Sample GV51 CPV	Sample GV52 Lab Mean	Sample GV52 Diff from Grand Mean	Sample GV52 CPV	Instr Code
22HNL4		4.562	-0.074	-0.98	4.585	-0.064	-0.85	EM
2E6VMB		4.590	-0.046	-0.61	4.590	-0.059	-0.79	TM
3BPKA8		4.642	0.006	0.08	4.657	0.008	0.11	MS
3CW6T2		4.693	0.057	0.77	4.680	0.031	0.41	EM
3MACJA		4.575	-0.061	-0.81	4.567	-0.082	-1.09	FR
4N8U9H		4.583	-0.053	-0.70	4.589	-0.060	-0.80	PP
698FLT		4.686	0.051	0.68	4.713	0.064	0.85	LW
6QQCZ2		4.647	0.011	0.15	4.633	-0.016	-0.22	LW
76K3CP		4.703	0.067	0.90	4.683	0.034	0.45	LA
7AZQWM		4.620	-0.016	-0.21	4.633	-0.017	-0.22	TM
86E87P		4.634	-0.002	-0.02	4.662	0.013	0.17	EM
88LH7Y		4.735	0.099	1.33	4.692	0.043	0.56	PP
8BPC64		4.673	0.038	0.50	4.719	0.070	0.92	LW
8VWJHG		4.689	0.053	0.71	4.680	0.031	0.41	LA
92G4ZN		4.715	0.079	1.06	4.699	0.050	0.66	TA
9GQZAP		4.640	0.004	0.06	4.683	0.034	0.45	TA
9RPLKU		4.690	0.054	0.73	4.684	0.035	0.46	TA
9UV78U		4.534	-0.102	-1.36	4.503	-0.146	-1.94	TM
AFUUCV		4.592	-0.044	-0.59	4.544	-0.105	-1.39	PP
ALK8DJ		4.648	0.012	0.16	4.642	-0.007	-0.10	LW
AR2RCP	X	4.348	-0.288	-3.84	4.449	-0.200	-2.65	TA
BJPZBX		4.622	-0.014	-0.18	4.632	-0.017	-0.23	TM
BKDLTM		4.560	-0.075	-1.01	4.645	-0.004	-0.05	XX
C3JZZ9		4.604	-0.032	-0.42	4.620	-0.029	-0.39	LA
C4L8UL		4.660	0.024	0.32	4.740	0.091	1.20	XX
CJ3WDG		4.671	0.035	0.47	4.668	0.019	0.25	EM
CQJGCM		4.650	0.014	0.19	4.683	0.034	0.45	EM
DMZZFN		4.460	-0.175	-2.34	4.503	-0.147	-1.94	TA
E6VR2L		4.533	-0.103	-1.37	4.560	-0.089	-1.18	LA
EMFENX		4.701	0.065	0.87	4.722	0.073	0.97	LW
FUMLDX	*	4.867	0.231	3.08	4.849	0.199	2.64	LW
GRHFCW		4.669	0.033	0.44	4.698	0.049	0.64	LA
GXM3CD		4.761	0.125	1.68	4.783	0.134	1.77	LW
HUMGXF		4.674	0.038	0.51	4.726	0.077	1.01	LW
J87JVX		4.735	0.099	1.33	4.750	0.100	1.33	LW
J9G2E3		4.608	-0.028	-0.37	4.618	-0.031	-0.42	EM
LWEQBC		4.595	-0.041	-0.54	4.553	-0.096	-1.28	PP
MU8LLV		4.642	0.006	0.08	4.622	-0.027	-0.36	LW
NJ28QM		4.695	0.059	0.79	4.644	-0.005	-0.07	EM
NKFRKH		4.520	-0.116	-1.55	4.534	-0.115	-1.53	PP

Paper & Paperboard Interlaboratory Testing Program

Analysis 360
Thickness (Caliper), Printing papers
TAPPI Official Test Method T411

WebCode	Data Flag	Sample GV51 Lab Mean	Sample GV51 Diff from Grand Mean	Sample GV51 CPV	Sample GV52 Lab Mean	Sample GV52 Diff from Grand Mean	Sample GV52 CPV	Instr Code
NQ3FH9		4.653	0.017	0.23	4.686	0.037	0.49	LW
P2FU3M		4.590	-0.046	-0.61	4.647	-0.002	-0.03	LW
P9YZYU		4.722	0.086	1.15	4.748	0.099	1.31	TM
PDADE8		4.626	-0.010	-0.13	4.654	0.004	0.06	LW
QMEMJB		4.689	0.053	0.71	4.660	0.011	0.14	TM
QZXEXK		4.626	-0.010	-0.13	4.599	-0.050	-0.67	TA
RZDVRD		4.683	0.047	0.63	4.694	0.045	0.59	XX
T96LY7		4.728	0.092	1.23	4.766	0.116	1.54	TM
TDZD73		4.690	0.054	0.73	4.670	0.021	0.27	LW
U3T6UA		4.633	-0.003	-0.04	4.664	0.015	0.19	EM
VLLF6F		4.642	0.006	0.08	4.658	0.009	0.11	PP
X9BR3W		4.579	-0.057	-0.76	4.616	-0.033	-0.44	PP
XFR3FX		4.618	-0.018	-0.24	4.646	-0.003	-0.04	TM
XN3CXY		4.450	-0.186	-2.48	4.478	-0.171	-2.27	PP
XVZ448		4.597	-0.039	-0.52	4.674	0.025	0.33	EM
XY983P		4.532	-0.104	-1.39	4.558	-0.092	-1.21	TM
Y7JZKY		4.630	-0.006	-0.08	4.710	0.061	0.80	TM
YGKDQQ		4.698	0.062	0.83	4.673	0.024	0.31	EM
ZDE8QB		4.658	0.022	0.30	4.706	0.056	0.74	LW
ZKZ7HJ		4.715	0.079	1.05	4.711	0.061	0.81	LW
ZLAATM	*	4.562	-0.074	-0.99	4.674	0.025	0.33	LW
ZRXXQD		4.527	-0.109	-1.45	4.501	-0.148	-1.96	TM
ZYYALA		4.490	-0.146	-1.95	4.480	-0.169	-2.24	TM

Summary Statistics	Sample GV51	Sample GV52
Grand Means	4.64 mils	4.65 mils
Stnd Dev Btwn Labs	0.07 mils	0.08 mils

Statistics based on 62 of 63 reporting participants.

Comments on Assigned Data Flags for Test #360

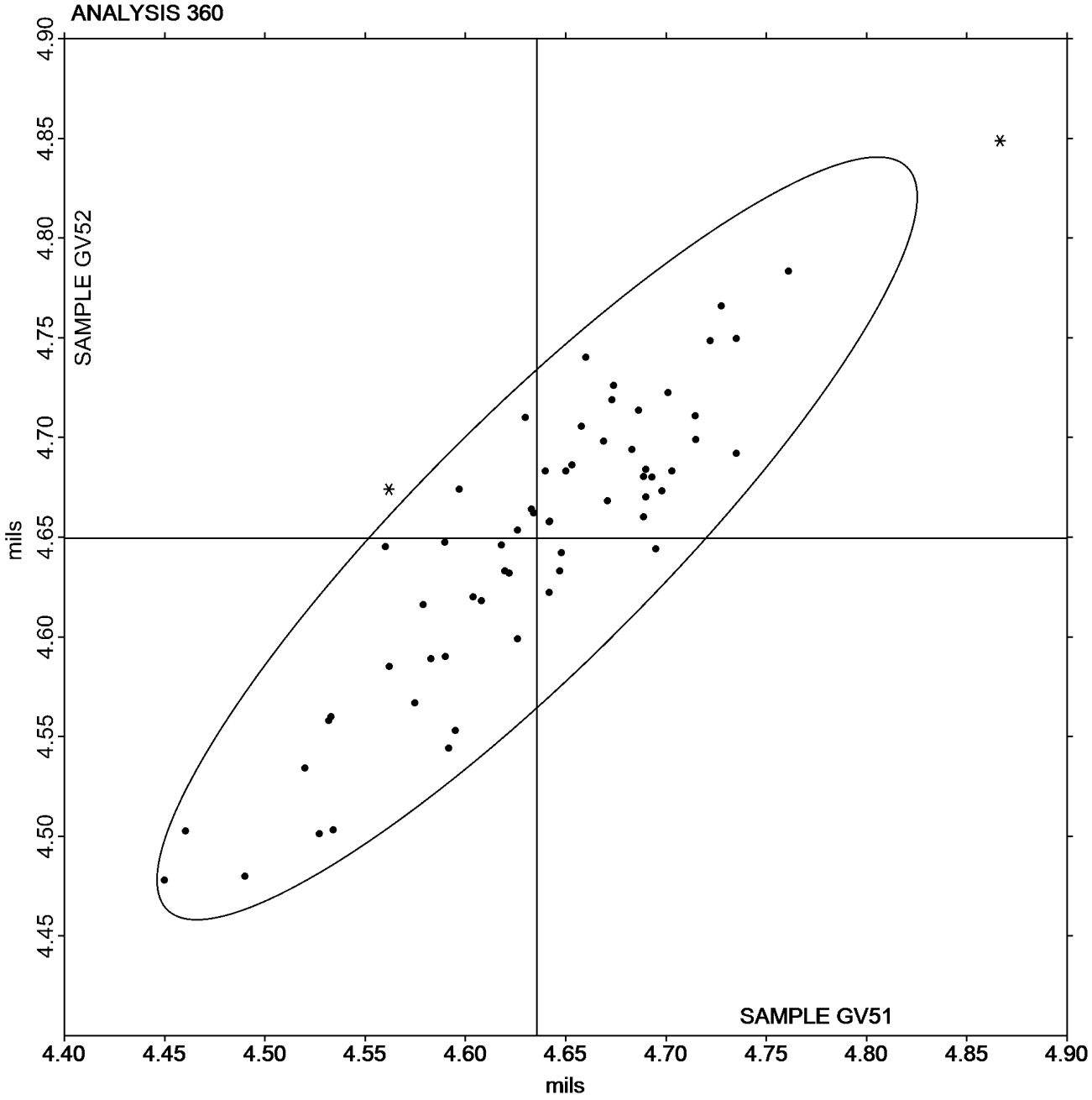
AR2RCP (X) - Data for sample GV51 are low.

Key to Instrument Codes Reported by Participants

EM	Emveco	FR	Frank Instruments
LA	L & W Autoline	LW	L & W
MS	Messmer	PP	Technidyne Profile/Plus
TA	Thwing-Albert	TM	TMI
XX	Instrument make/model not specified by lab		

Grand Mean Sample GV51 = 4.6357 mils

Grand Mean Sample GV52 = 4.6494 mils



Paper & Paperboard Interlaboratory Testing Program

Analysis 361
Thickness (Caliper), Packaging papers
TAPPI Official Test Method T411

WebCode	Data Flag	Sample GY51 Lab Mean	Sample GY51 Diff from Grand Mean	Sample GY51 CPV	Sample GY52 Lab Mean	Sample GY52 Diff from Grand Mean	Sample GY52 CPV	Instr Code
2KAL2B		7.607	0.064	0.50	9.524	0.061	0.38	EM
4L2AKH		7.519	-0.024	-0.18	9.420	-0.043	-0.26	EM
669YD7		7.626	0.083	0.65	9.613	0.150	0.92	TM
6RXNJN		7.591	0.048	0.38	9.420	-0.043	-0.26	XX
6YKCGE		7.551	0.008	0.07	9.505	0.042	0.26	EM
7LRADD	X	7.610	0.067	0.52	9.835	0.372	2.28	TM
7U4F3P		7.540	-0.002	-0.02	9.394	-0.069	-0.42	LA
8QJY9B		7.500	-0.043	-0.33	9.390	-0.073	-0.45	TA
8VWJHG		7.591	0.048	0.37	9.492	0.029	0.18	LA
9RPLKU		7.715	0.172	1.34	9.664	0.201	1.23	TA
9UV78U		7.436	-0.107	-0.83	9.397	-0.066	-0.40	TM
AEU4XZ		7.780	0.237	1.84	9.772	0.309	1.89	TM
AFUUCV		7.469	-0.074	-0.58	9.370	-0.093	-0.57	LW
AR2RCP		7.301	-0.242	-1.88	9.233	-0.230	-1.41	TA
BFM6MN		7.639	0.096	0.75	9.496	0.033	0.20	EM
CRZNLB		7.240	-0.303	-2.35	9.080	-0.383	-2.35	TM
D86FYZ		7.580	0.037	0.29	9.470	0.007	0.04	LA
EMFENX		7.659	0.117	0.91	9.612	0.150	0.92	LW
FFTWKL		7.677	0.135	1.05	9.685	0.222	1.36	XX
GXM3CD		7.706	0.163	1.27	9.715	0.252	1.55	XX
H6JHEP		7.492	-0.050	-0.39	9.338	-0.125	-0.76	TM
JDTB3Q		7.657	0.114	0.89	9.632	0.169	1.04	LA
JJFYZG		7.450	-0.093	-0.72	9.390	-0.073	-0.45	LA
JQZ4NB		7.490	-0.053	-0.41	9.380	-0.083	-0.51	LW
MWUAVA		7.370	-0.173	-1.34	9.240	-0.223	-1.37	TM
N7EWPB		7.670	0.127	0.99	9.597	0.134	0.82	LA
P2FWP7		7.618	0.076	0.59	9.587	0.124	0.76	LW
RHGJ8J	*	7.500	-0.043	-0.33	9.555	0.092	0.57	LW
TD2BJJ		7.509	-0.034	-0.26	9.398	-0.065	-0.40	TM
VENTBV		7.430	-0.113	-0.88	9.345	-0.118	-0.72	TA
X78WJT		7.440	-0.103	-0.80	9.320	-0.143	-0.88	TA
Y26DWL		7.701	0.158	1.23	9.625	0.162	1.00	EM
Y4WCBJ		7.550	0.007	0.06	9.480	0.017	0.11	LA
ZYYALA		7.300	-0.243	-1.89	9.130	-0.333	-2.04	TM

Summary Statistics	Sample GY51	Sample GY52
Grand Means	7.54 mils	9.46 mils
Stnd Dev Btwn Labs	0.13 mils	0.16 mils

Statistics based on 33 of 34 reporting participants.

Comments on Assigned Data Flags for Test #361

7LRADD (X) - Inconsistent in testing between samples.

Analysis Notes:

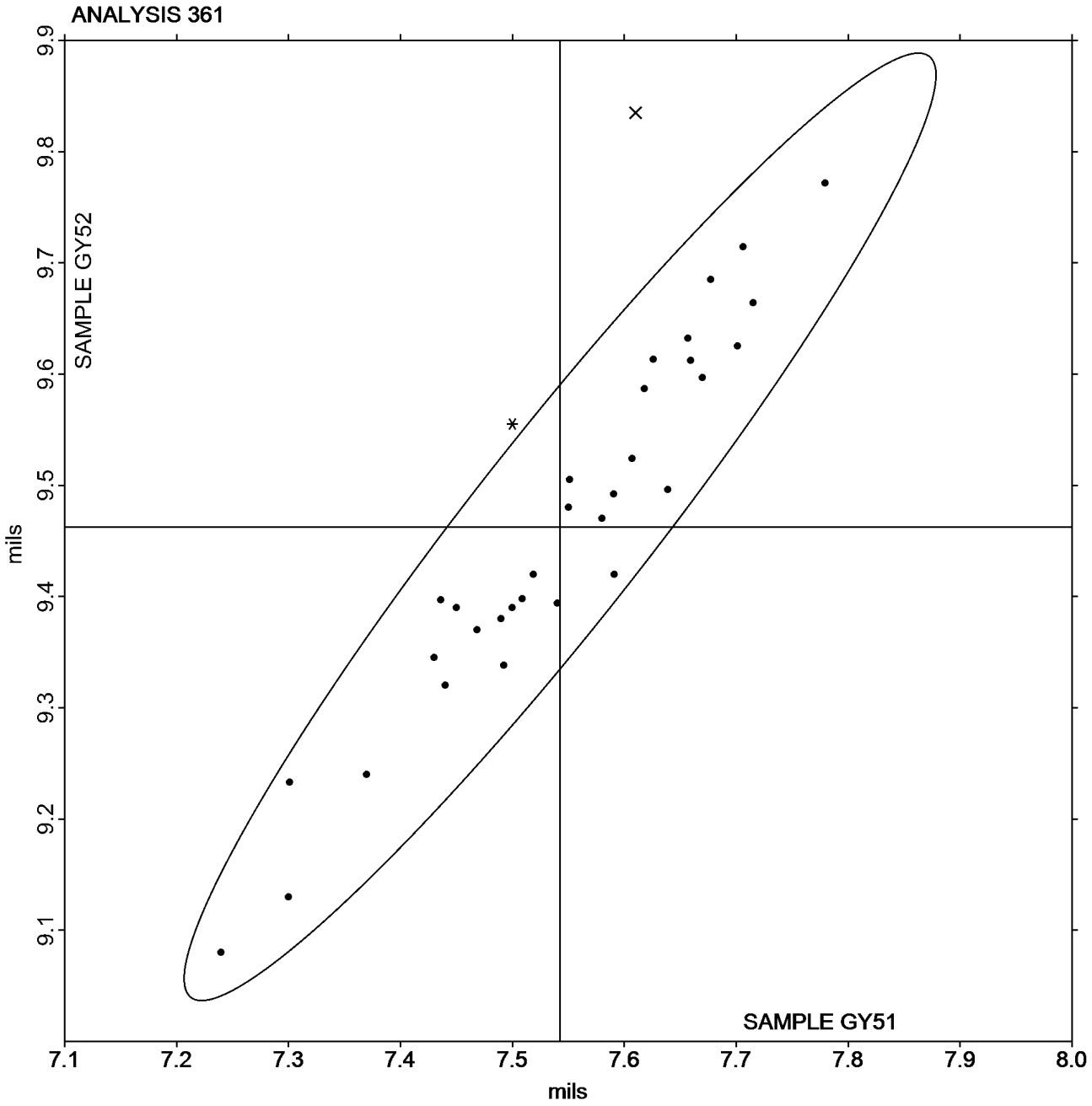
FFTWKL - Data appear to be reported as micrometers, not mils as indicated on datasheet. Units corrected by CTS.

Key to Instrument Codes Reported by Participants

EM	Emveco	LA	L & W Autoline
LW	L & W	TA	Thwing-Albert
TM	TMI	XX	Instrument make/model not specified by lab

Grand Mean Sample GY51 = 7.5425 mils

Grand Mean Sample GY52 = 9.4627 mils



Paper & Paperboard Interlaboratory Testing Program

Analysis 364

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

TAPPI Official Test Method T549

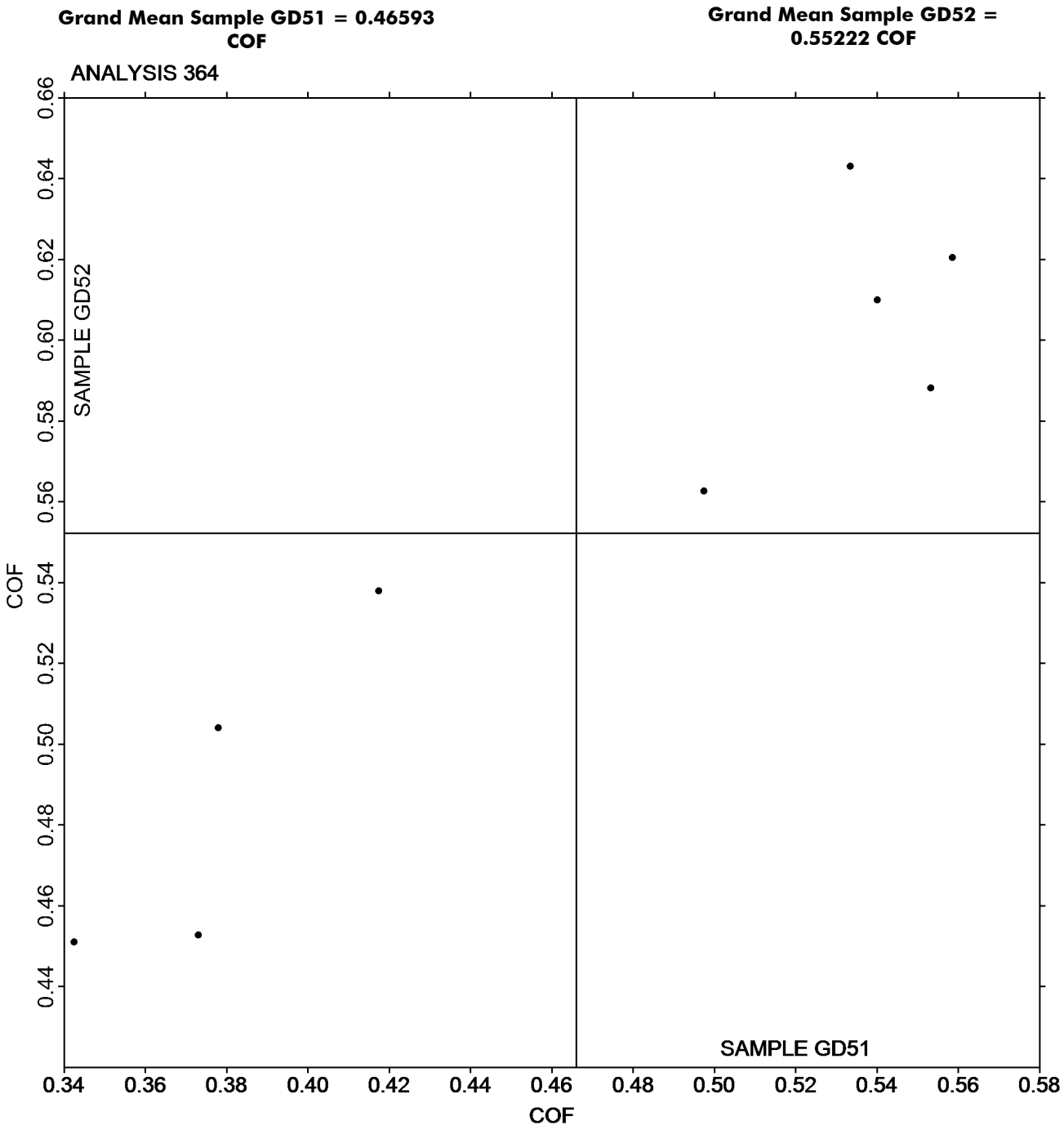
WebCode	Data Flag	Sample GD51 Lab Mean	Sample GD51 Diff from Grand Mean	Sample GD51 CPV	Sample GD52 Lab Mean	Sample GD52 Diff from Grand Mean	Sample GD52 CPV	Instr Code
2E6VMB		0.3424	-0.1235	-1.41	0.4510	-0.1012	-1.43	XX
3CW6T2		0.5400	0.0741	0.85	0.6100	0.0578	0.81	TA
7U4F3P		0.4974	0.0315	0.36	0.5626	0.0104	0.15	TA
CJ3WDG		0.5586	0.0927	1.06	0.6204	0.0682	0.96	TA
ENCWMD		0.5334	0.0675	0.77	0.6430	0.0908	1.28	TA
GXM3CD		0.5532	0.0873	1.00	0.5882	0.0360	0.51	TL
QZXEXK		0.3780	-0.0879	-1.01	0.5040	-0.0482	-0.68	TA
RK7RDD		0.4174	-0.0485	-0.55	0.5380	-0.0142	-0.20	IT
ZLAATM		0.3730	-0.0929	-1.06	0.4528	-0.0994	-1.40	TM

Summary Statistics	Sample GD51	Sample GD52
Grand Means	0.47 COF	0.55 COF
Stnd Dev Btwn Labs	0.09 COF	0.07 COF

Statistics based on 9 of 9 reporting participants.

Key to Instrument Codes Reported by Participants

IT	IMASS SP-2100	TA	Thwing-Albert Friction Tester
TL	TMI 32-90 Lab Master/Slip and Friction	TM	TMI 32-06 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 365

Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers

TAPPI Official Test Method T549

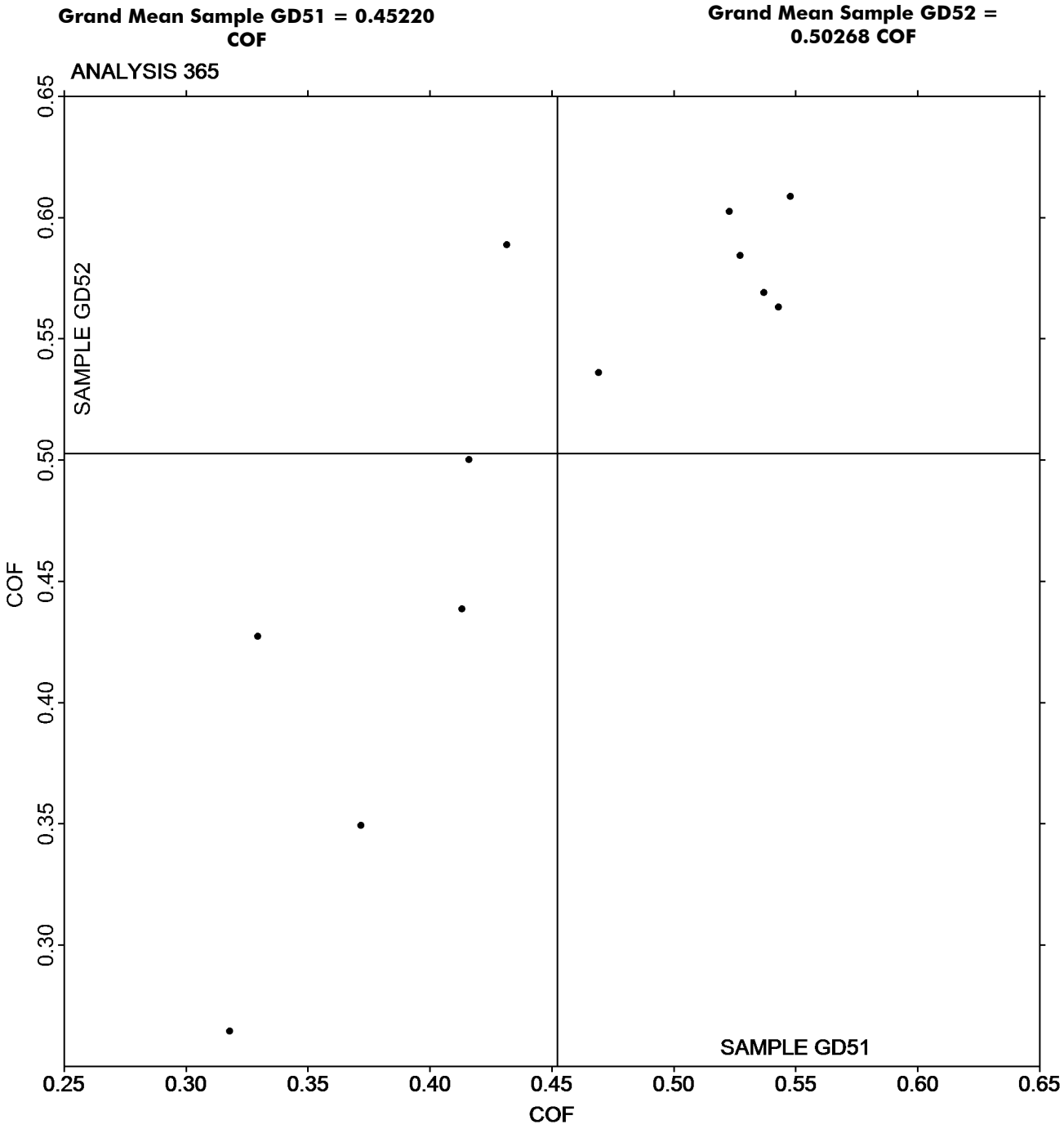
WebCode	Data Flag	Sample GD51 Lab Mean	Sample GD51 Diff from Grand Mean	Sample GD51 CPV	Sample GD52 Lab Mean	Sample GD52 Diff from Grand Mean	Sample GD52 CPV	Instr Code
22HNL4		0.5272	0.0750	0.89	0.5844	0.0817	0.74	TA
2E6VMB		0.3716	-0.0806	-0.95	0.3494	-0.1533	-1.39	XX
7U4F3P		0.4692	0.0170	0.20	0.5360	0.0333	0.30	TA
8VWJHG		0.5370	0.0848	1.00	0.5690	0.0663	0.60	TM
DMZZFN		0.3178	-0.1344	-1.59	0.2646	-0.2381	-2.15	TA
ENCWMD		0.4160	-0.0362	-0.43	0.5002	-0.0025	-0.02	TA
GXM3CD		0.5228	0.0706	0.84	0.6024	0.0997	0.90	TL
MQNDCA		0.4314	-0.0208	-0.25	0.5888	0.0861	0.78	TM
NKFRKH		0.5430	0.0908	1.08	0.5630	0.0603	0.55	TA
RK7RDD		0.3294	-0.1228	-1.45	0.4272	-0.0755	-0.68	IR
U969NH		0.5478	0.0956	1.13	0.6086	0.1059	0.96	TA
ZLAATM		0.4132	-0.0390	-0.46	0.4386	-0.0641	-0.58	TM

Summary Statistics	Sample GD51	Sample GD52
Grand Means	0.45 COF	0.50 COF
Stnd Dev Btwn Labs	0.08 COF	0.11 COF

Statistics based on 12 of 12 reporting participants.

Key to Instrument Codes Reported by Participants

IR	IMASS SP-2000	TA	Thwing-Albert Friction Tester
TL	TMI 32-90 Lab Master/Slip and Friction	TM	TMI 32-06 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 370

Air Resistance - Gurley Oil Type

TAPPI Official Test Method T460

WebCode	Data Flag	Sample GE51 Lab Mean	Sample GE51 Diff from Grand Mean	Sample GE51 CPV	Sample GE52 Lab Mean	Sample GE52 Diff from Grand Mean	Sample GE52 CPV	Instr Code
2E6VMB		25.00	-0.60	-0.46	12.70	-1.10	-1.47	GS
2KAL2B		25.72	0.12	0.09	13.91	0.11	0.15	PP
3CW6T2		26.11	0.50	0.38	13.64	-0.16	-0.21	PP
6HUK9Y	X	18.13	-7.47	-5.65	9.70	-4.10	-5.46	TN
6RXNJN		23.80	-1.80	-1.36	12.34	-1.46	-1.95	VM
7U4F3P		25.49	-0.11	-0.09	14.32	0.52	0.69	LA
88LH7Y		24.47	-1.13	-0.86	13.65	-0.15	-0.20	HG
8BPC64		25.49	-0.11	-0.09	13.89	0.09	0.12	LP
92G4ZN		24.76	-0.84	-0.64	13.26	-0.54	-0.72	PP
9RPLKU		27.05	1.45	1.09	13.69	-0.11	-0.15	GA
AFUUCV		25.58	-0.02	-0.02	14.28	0.48	0.64	PP
BJPZBX		26.56	0.96	0.72	13.02	-0.79	-1.05	HG
C3JZZ9		24.68	-0.92	-0.70	13.87	0.07	0.09	LA
C4L8UL		23.52	-2.08	-1.57	13.57	-0.23	-0.31	XX
CQJGCM		26.25	0.65	0.49	14.34	0.54	0.72	HG
CRZNLB		27.02	1.42	1.07	13.78	-0.02	-0.03	TL
E6VR2L	*	29.15	3.55	2.68	15.52	1.72	2.29	LA
ENCWMD		26.65	1.05	0.79	13.73	-0.07	-0.10	WG
FFTWKL		22.76	-2.84	-2.15	12.28	-1.53	-2.03	LP
FUMLDX		27.38	1.78	1.34	15.05	1.25	1.66	LP
GXM3CD		25.93	0.33	0.25	13.62	-0.18	-0.24	LP
J87JVX		23.90	-1.70	-1.29	12.79	-1.01	-1.35	LP
JCGAJD		26.58	0.98	0.74	14.95	1.15	1.53	LP
JJFYZG	X	120.20	94.60	71.51	191.30	177.50	236.41	LA
JQZ4NB		25.41	-0.19	-0.15	13.77	-0.03	-0.04	TL
K7MWWF		23.73	-1.87	-1.42	12.94	-0.86	-1.15	LP
L6CEBP		26.02	0.41	0.31	14.34	0.54	0.72	LA
LG4XWL		28.16	2.56	1.93	14.28	0.48	0.64	XX
LWEQBC		25.77	0.17	0.13	13.56	-0.24	-0.32	HG
MFPVJL	X	33.17	7.57	5.72	15.79	1.99	2.65	GA
MWUAVA		27.57	1.97	1.49	14.84	1.04	1.38	TL
NH7KHP		25.28	-0.32	-0.24	13.81	0.01	0.01	XX
NJ28QM		26.85	1.25	0.94	14.39	0.59	0.78	HG
P2FWP7		25.18	-0.42	-0.32	13.46	-0.34	-0.46	LW
PDADE8		25.50	-0.10	-0.08	14.90	1.10	1.46	LW
QZXEXK		24.61	-1.00	-0.75	13.18	-0.62	-0.83	PP
T96LY7		23.57	-2.03	-1.54	12.69	-1.11	-1.48	PR
UKXR69		26.04	0.44	0.33	14.21	0.41	0.54	LP
UVHWEU		23.89	-1.72	-1.30	12.89	-0.92	-1.22	RE
VLLF6F		26.63	1.03	0.78	13.46	-0.34	-0.45	PP

Paper & Paperboard Interlaboratory Testing Program

Analysis 370

Air Resistance - Gurley Oil Type

TAPPI Official Test Method T460

WebCode	Data Flag	Sample GE51 Lab Mean	Sample GE51 Diff from Grand Mean	Sample GE51 CPV	Sample GE52 Lab Mean	Sample GE52 Diff from Grand Mean	Sample GE52 CPV	Instr Code
X9BR3W		26.01	0.40	0.30	14.83	1.03	1.37	PP
XVZ448		25.04	-0.56	-0.43	13.40	-0.41	-0.54	PP
XY983P		25.16	-0.44	-0.34	14.16	0.36	0.48	LP
YGKDQQ		25.93	0.33	0.25	13.85	0.05	0.06	PP
ZDE8QB		25.15	-0.45	-0.34	14.53	0.73	0.97	LP
ZRXXQD	X	14.38	-11.22	-8.48	7.78	-6.02	-8.02	LW

Summary Statistics	Sample GE51	Sample GE52
Grand Means	25.60 sec/100 cc	13.80 sec/100 cc
Stnd Dev Btwn Labs	1.32 sec/100 cc	0.75 sec/100 cc

Statistics based on 42 of 46 reporting participants.

Comments on Assigned Data Flags for Test #370

MFPVJL (X) - Data for sample GE51 are high. Inconsistent within the determinations of sample GE51.

JJFYZG (X) - Extreme Data.

ZRXXQD (X) - Extreme Data.

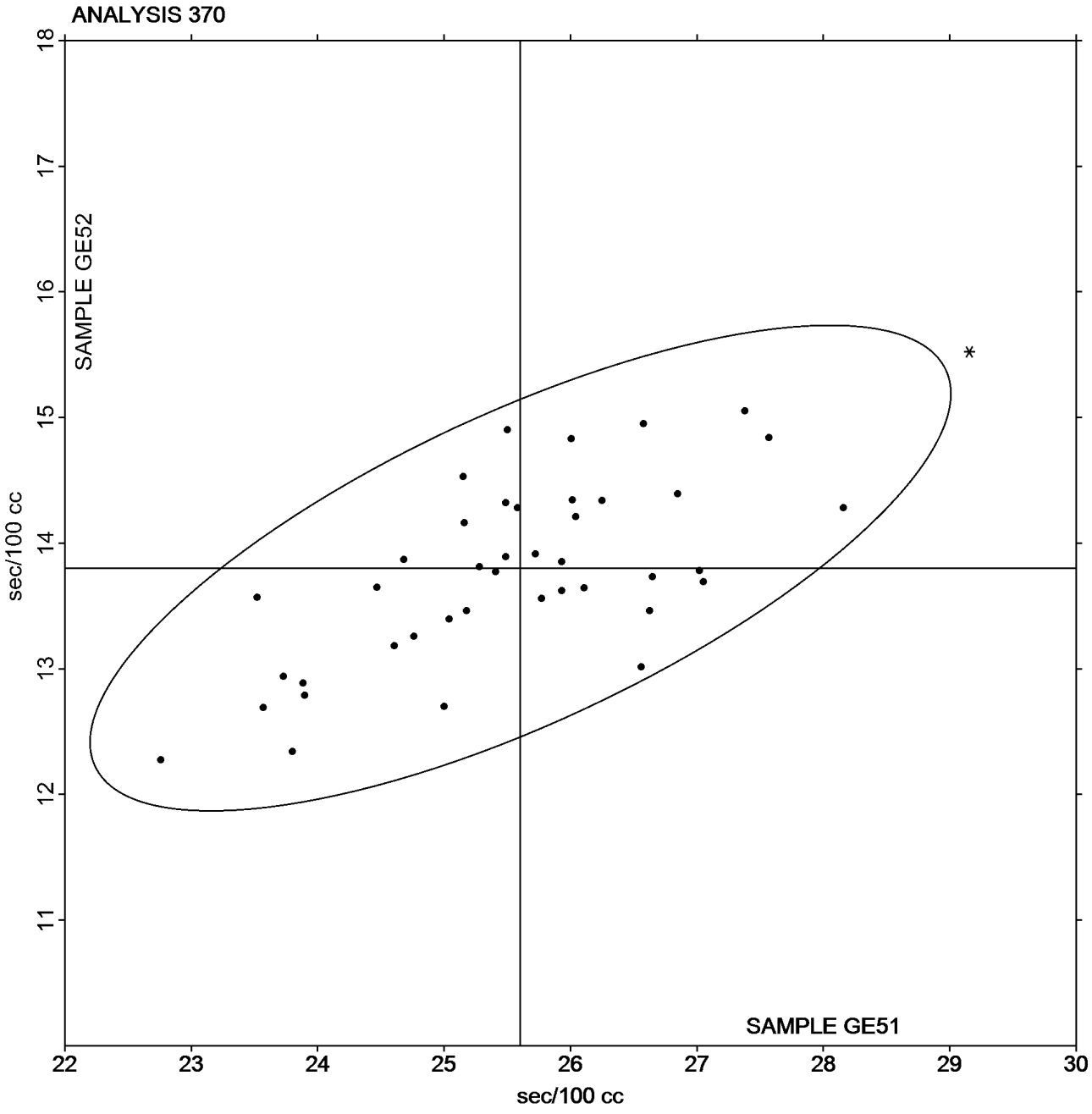
6HUK9Y (X) - Data for both samples are low.

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	GS	Gurley-Hill S-P-S Tester #4190
HG	Technidyne - Hagerty Model #1	LA	L & W Autoline
LP	L & W Densometer, Air Permeance	LW	L & W Type Gurley Densometer, Oil Flotation
PP	Technidyne Profile/Plus	PR	Parker Print-Surf (PPS) Model M590
RE	Regmed Gurley Densometer PGH-T	TL	Gurley Densometer #4110, Oil Flotation
TN	Gurley S-P-S Tester #4190	VM	Valmet PaperLab (was Kajaani/Robotest)
WG	W & LE Gurley Tester	XX	Instrument make/model not specified by lab

Grand Mean Sample GE51 = 25.603 sec/100 cc

Grand Mean Sample GE52 = 13.802 sec/100 cc



Paper & Paperboard Interlaboratory Testing Program

Analysis 372

Porosity - Sheffield Type - Sheffield Units for 3/4 inch Diameter Orifice

TAPPI Official Test Method T547

WebCode	Data Flag	Sample GE51 Lab Mean	Sample GE51 Diff from Grand Mean	Sample GE51 CPV	Sample GE52 Lab Mean	Sample GE52 Diff from Grand Mean	Sample GE52 CPV	Instr Code
2E6VMB	X	119.9	10.2	1.87	158.2	-31.8	-7.42	SH
3MGEFA		111.2	1.5	0.28	191.7	1.7	0.39	TT
6RXNJN		110.2	0.5	0.09	189.8	-0.2	-0.06	PP
88LH7Y		112.4	2.7	0.50	182.2	-7.8	-1.83	TT
8YVZQ6		102.0	-7.7	-1.42	193.1	3.0	0.71	GA
92G4ZN		117.2	7.5	1.38	195.1	5.1	1.18	HM
9RPLKU		99.2	-10.5	-1.94	183.9	-6.1	-1.43	GA
C4L8UL		107.7	-2.0	-0.36	188.7	-1.3	-0.31	XX
CQYZUY	X	49.8	-59.9	-11.00	97.0	-93.0	-21.67	TT
QMEMJB		114.0	4.3	0.79	194.8	4.8	1.11	SH
RUNHTB		111.1	1.4	0.26	189.1	-0.9	-0.22	PP
RUTNHK		112.0	2.3	0.42	192.0	2.0	0.46	HM
Y7JZKY	X	118.3	8.6	1.58	182.6	-7.4	-1.73	TT

Summary Statistics	Sample GE51	Sample GE52
Grand Means	109.70 Sheffield Units	190.04 Sheffield Units
Stnd Dev Btwn Labs	5.45 Sheffield Units	4.29 Sheffield Units

Statistics based on 10 of 13 reporting participants.

Comments on Assigned Data Flags for Test #372

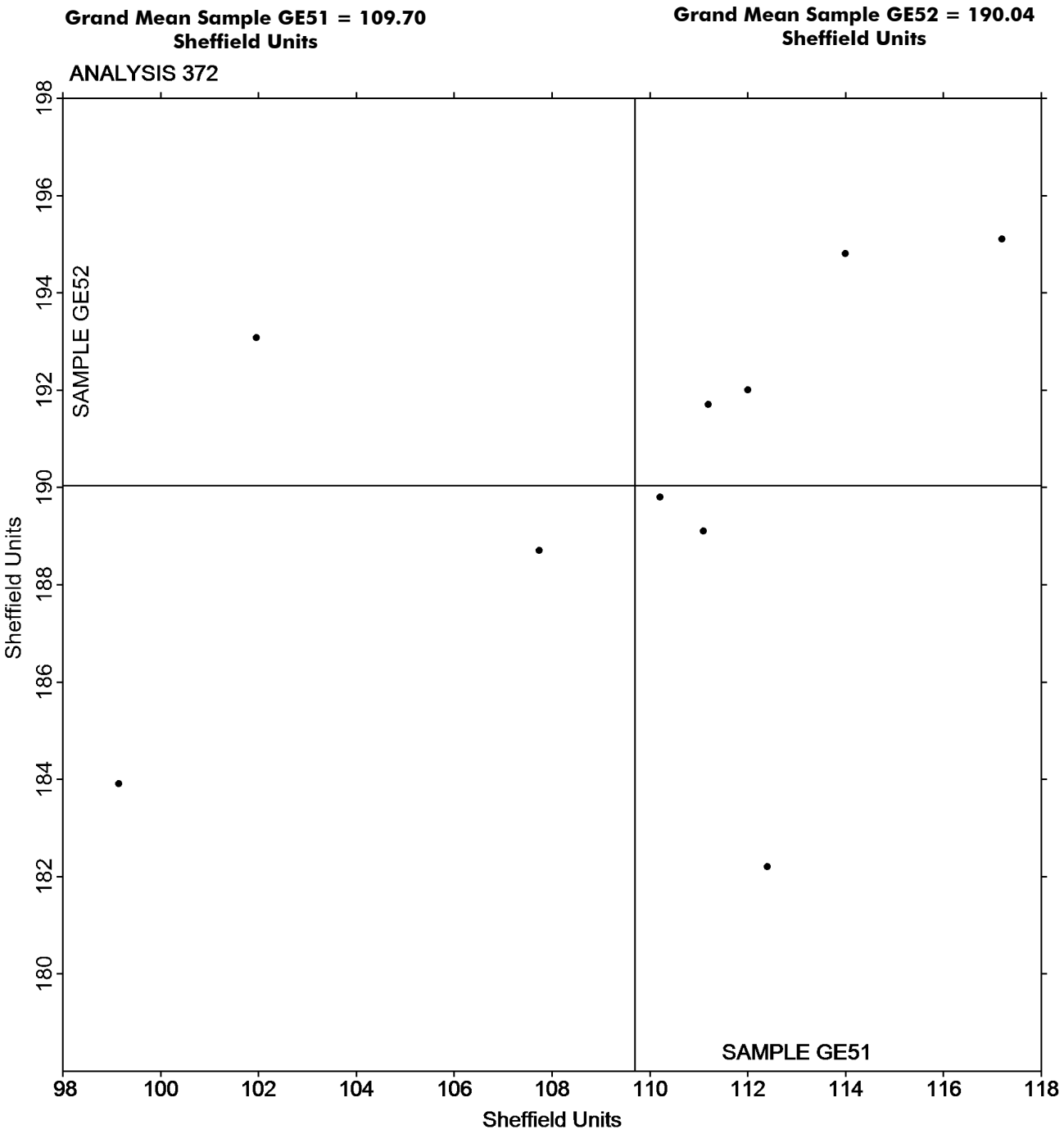
CQYZUY (X) - Extreme Data.

2E6VMB (X) - Extreme Data for Sample GE52.

Y7JZKY (X) - Inconsistent in testing between samples.

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	HM	Technidyne - Hagerty Model #538
PP	Technidyne Profile/Plus	SH	Sheffield
TT	TMI Monitor/Smoothness II, Model 58-24	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 376

Roughness - Print Surf Method - 0.5 to 4.0 Microns

TAPPI Official Test Method T555

		Sample GJ51			Sample GJ52			
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
2JWAYY		0.7930	-0.0532	-0.39	0.7500	-0.0402	-0.29	ZZ
4L2AKH	*	0.4890	-0.3572	-2.60	0.4740	-0.3162	-2.30	ZZ
698FLT		0.8150	-0.0312	-0.23	0.7310	-0.0592	-0.43	ZZ
6RXNJN	X	1.3760	0.5298	3.85	0.8910	0.1008	0.73	ZZ
6YKCGE		0.8410	-0.0052	-0.04	0.7820	-0.0082	-0.06	ZZ
88LH7Y		0.8510	0.0048	0.04	0.7760	-0.0142	-0.10	ZZ
8R8LHP		0.8500	0.0038	0.03	0.8000	0.0098	0.07	ZZ
9UV78U		0.8220	-0.0242	-0.18	0.7540	-0.0362	-0.26	ZZ
AEU4XZ		0.5800	-0.2662	-1.94	0.5640	-0.2262	-1.65	ZZ
B4CJFP	X	1.6470	0.8008	5.82	1.5330	0.7428	5.41	ZZ
BFM6MN		0.8540	0.0078	0.06	0.8010	0.0108	0.08	ZZ
CQJGCM		0.7850	-0.0612	-0.44	0.7090	-0.0812	-0.59	ZZ
D86FYZ		0.7830	-0.0632	-0.46	0.7190	-0.0712	-0.52	ZZ
DKP6PP	X	1.9400	1.0938	7.95	1.9350	1.1448	8.34	ZZ
DMZZFN		0.9660	0.1198	0.87	0.9340	0.1438	1.05	ZZ
EMFENX		0.9550	0.1088	0.79	0.8890	0.0988	0.72	ZZ
ENCWMD		0.7440	-0.1022	-0.74	0.6970	-0.0932	-0.68	ZZ
GRHFCW		0.8660	0.0198	0.14	0.8220	0.0318	0.23	ZZ
J9G2E3		0.9080	0.0618	0.45	0.8530	0.0628	0.46	ZZ
LWEQBC		0.8900	0.0438	0.32	0.8510	0.0608	0.44	ZZ
MDJBVL		0.8280	-0.0182	-0.13	0.7670	-0.0232	-0.17	ZZ
N7EWPB		0.9000	0.0538	0.39	0.8720	0.0818	0.60	ZZ
P2FU3M		1.1820	0.3358	2.44	1.1270	0.3368	2.45	ZZ
QZXEXK		0.9910	0.1448	1.05	0.9490	0.1588	1.16	ZZ
RUTNHK		0.7470	-0.0992	-0.72	0.6540	-0.1362	-0.99	ZZ
TRLQKX		0.8370	-0.0092	-0.07	0.8000	0.0098	0.07	ZZ
U3T6UA		0.8360	-0.0102	-0.07	0.7930	0.0028	0.02	ZZ
U969NH		0.7750	-0.0712	-0.52	0.6870	-0.1032	-0.75	ZZ
UVCTF9		1.0000	0.1538	1.12	0.9360	0.1458	1.06	ZZ
XVZ448		0.8080	-0.0382	-0.28	0.7520	-0.0382	-0.28	ZZ
XY983P		0.7630	-0.0832	-0.60	0.6840	-0.1062	-0.77	ZZ
Y26DWL		0.7830	-0.0632	-0.46	0.7560	-0.0342	-0.25	ZZ
Y4WCBJ	*	0.7920	-0.0542	-0.39	0.6720	-0.1182	-0.86	ZZ
Y7JZKY		1.1970	0.3508	2.55	1.1420	0.3518	2.56	ZZ

Summary Statistics	Sample GJ51	Sample GJ52
Grand Means	0.85 Microns	0.79 Microns
Stnd Dev Btwn Labs	0.14 Microns	0.14 Microns

Statistics based on 31 of 34 reporting participants.

Comments on Assigned Data Flags for Test #376

6RXNJN (X) - Data for sample GJ51 are high.

B4CJFP (X) - Data for both samples are high. Possible Systematic Error.

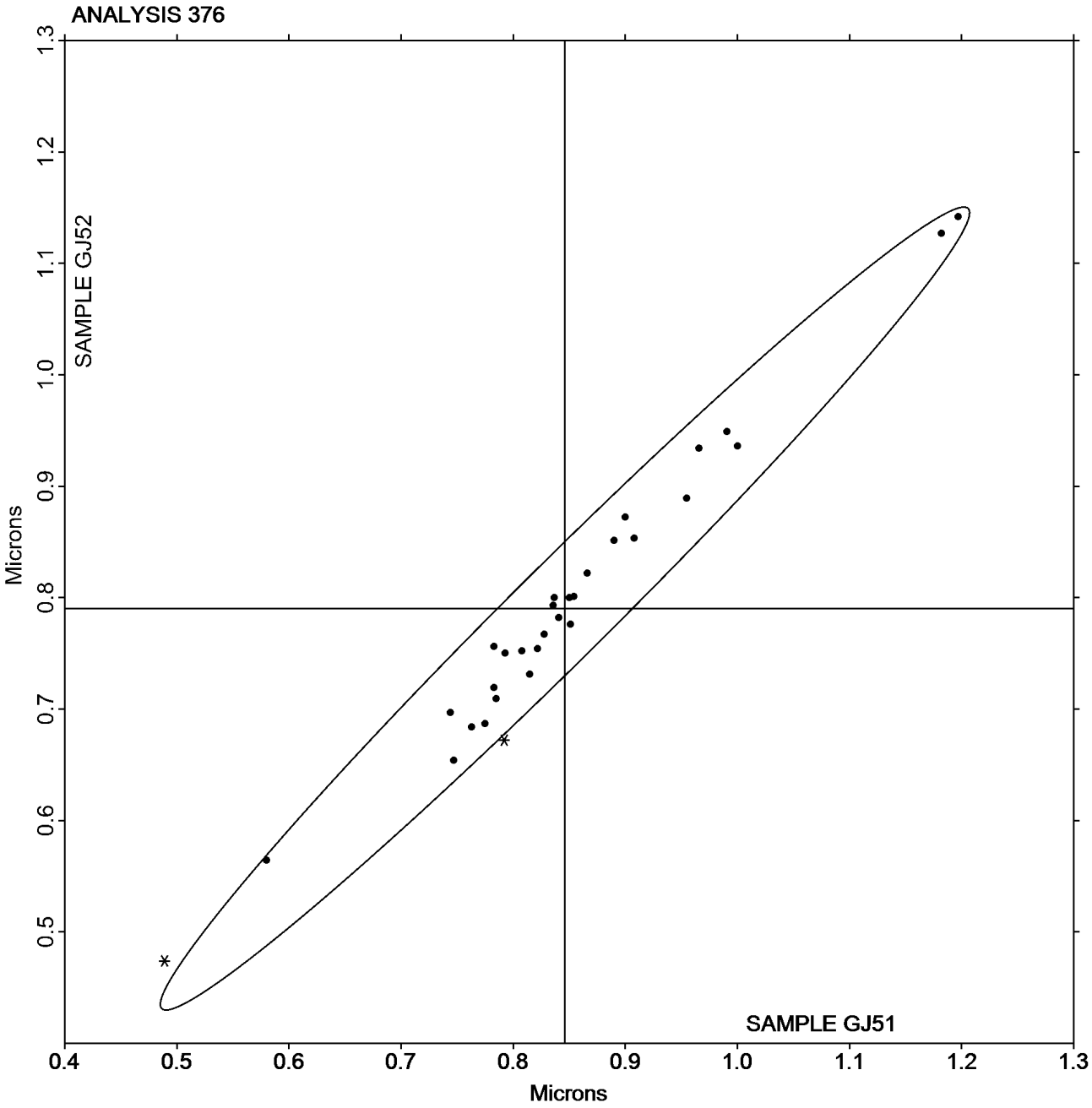
DKP6PP (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample GJ51 = 0.84616 Microns

Grand Mean Sample GJ52 = 0.79023 Microns



Paper & Paperboard Interlaboratory Testing Program

Analysis 377

Roughness - Print Surf Method - 2.5 to 6.0 Microns

TAPPI Official Test Method T555

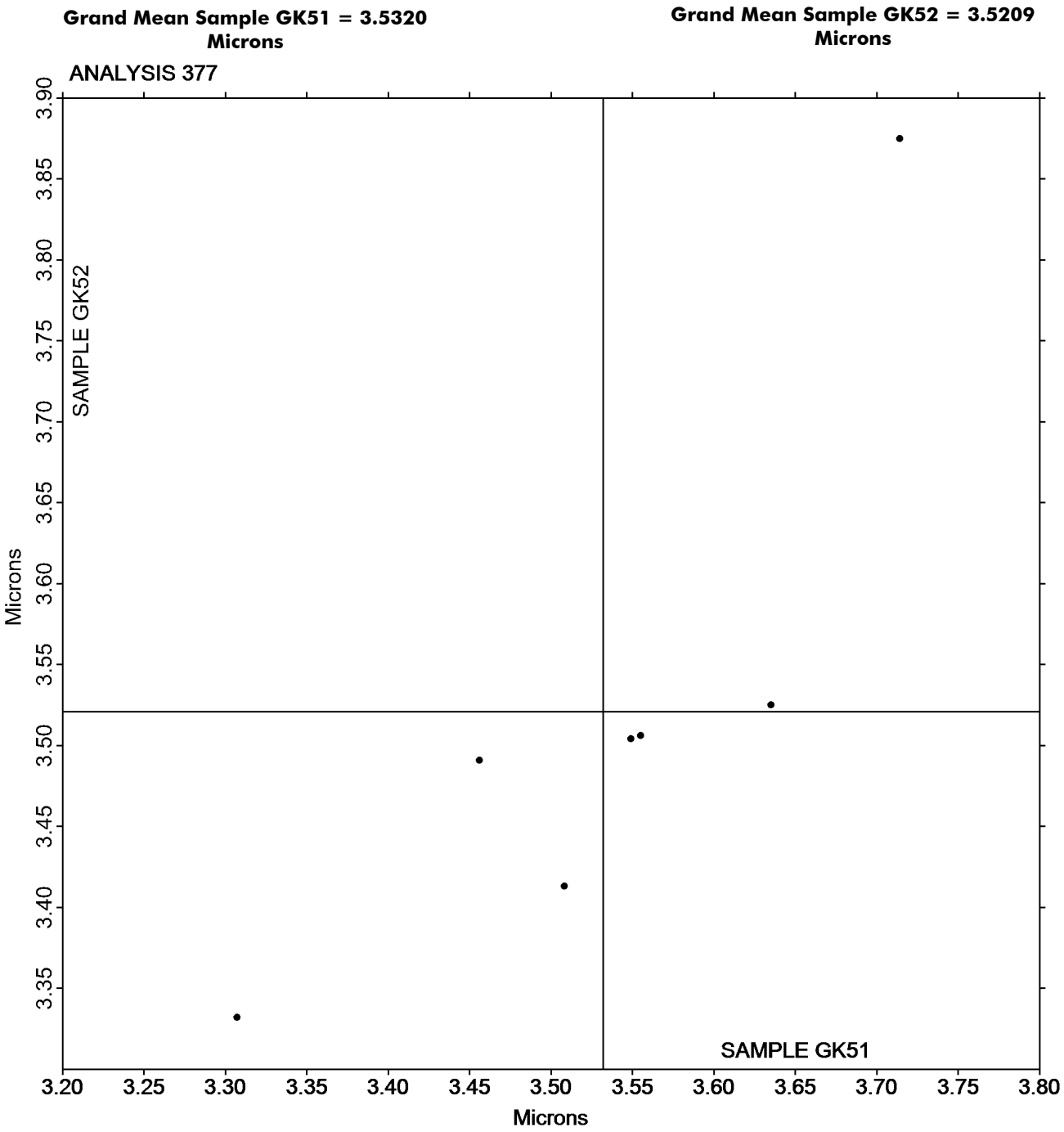
WebCode	Data Flag	Sample GK51 Lab Mean	Sample GK51 Diff from Grand Mean	Sample GK51 CPV	Sample GK52 Lab Mean	Sample GK52 Diff from Grand Mean	Sample GK52 CPV	Instr Code
2KAL2B		3.549	0.017	0.13	3.504	-0.017	-0.10	ZZ
3CW6T2		3.714	0.182	1.40	3.875	0.354	2.08	ZZ
AFUUCV		3.508	-0.024	-0.18	3.413	-0.108	-0.63	ZZ
C3JZZ9		3.307	-0.225	-1.73	3.332	-0.189	-1.11	ZZ
CJ3WDG		3.635	0.103	0.79	3.525	0.004	0.02	ZZ
ENCWMD		3.456	-0.076	-0.58	3.491	-0.030	-0.18	ZZ
GXM3CD		3.555	0.023	0.18	3.506	-0.015	-0.09	ZZ

Summary Statistics	Sample GK51	Sample GK52
Grand Means	3.53 Microns	3.52 Microns
Stnd Dev Btwn Labs	0.13 Microns	0.17 Microns

Statistics based on 7 of 7 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 378

Roughness - Sheffield Type

TAPPI Official Test Method T538

WebCode	Data Flag	Sample GL51 Lab Mean	Sample GL51 Diff from Grand Mean	Sample GL51 CPV	Sample GL52 Lab Mean	Sample GL52 Diff from Grand Mean	Sample GL52 CPV	Instr Code
2E6VMB		154.8	8.5	1.14	152.8	5.1	0.61	XX
2JWAYY		148.2	1.9	0.25	150.2	2.5	0.30	LW
2KAL2B		142.1	-4.3	-0.58	148.9	1.2	0.14	PP
3CW6T2		146.6	0.3	0.03	155.6	7.9	0.94	PP
4748VX		146.2	-0.1	-0.02	149.6	1.9	0.23	HM
4FTZ69	*	166.1	19.8	2.67	168.1	20.4	2.42	TT
4L2AKH		139.7	-6.6	-0.89	141.5	-6.2	-0.73	PP
6QQCZ2		135.3	-11.0	-1.49	138.0	-9.7	-1.15	SH
6RXNJN	X	197.3	51.0	6.87	186.9	39.2	4.64	VM
6YKCGE		152.8	6.4	0.87	151.6	3.9	0.46	PP
76K3CP		141.8	-4.5	-0.61	141.8	-5.9	-0.69	LA
7LRADD		150.4	4.1	0.55	150.0	2.4	0.28	GA
86E87P	*	162.3	16.0	2.15	155.2	7.5	0.89	PP
88LH7Y		152.6	6.3	0.85	147.9	0.2	0.03	TT
8YVZQ6		144.7	-1.6	-0.22	140.8	-6.9	-0.81	GA
9RPLKU		149.2	2.9	0.39	148.8	1.1	0.13	PP
9UV78U		144.4	-2.0	-0.27	145.7	-2.0	-0.23	HM
AEU4XZ		158.6	12.3	1.66	165.2	17.5	2.08	TT
AFUUCV		144.9	-1.5	-0.20	151.0	3.3	0.40	PP
AXQEV2		148.3	2.0	0.27	146.2	-1.5	-0.17	GA
B4CJFP		135.0	-11.3	-1.53	135.6	-12.1	-1.43	LW
BFM6MN		146.3	0.0	0.00	152.3	4.6	0.55	LW
BJPZBX		149.5	3.2	0.43	142.7	-5.0	-0.59	TS
C3JZZ9		156.5	10.2	1.37	156.1	8.4	1.00	LA
C4L8UL		136.5	-9.8	-1.32	131.5	-16.2	-1.91	XX
CJ3WDG		142.1	-4.2	-0.57	152.2	4.5	0.54	HM
CQYZUY	X	95.8	-50.5	-6.81	91.2	-56.5	-6.69	TT
D86FYZ	X	151.1	4.8	0.64	170.0	22.3	2.64	LA
DMZZFN		146.7	0.4	0.05	143.1	-4.6	-0.54	PP
E6VR2L		135.6	-10.7	-1.45	131.7	-15.9	-1.89	LA
ENCWMD		158.5	12.2	1.64	161.0	13.3	1.58	XX
GXM3CD		147.0	0.7	0.09	155.2	7.5	0.89	LW
JCGAJD		141.2	-5.1	-0.69	142.9	-4.8	-0.56	LW
LWEQBC		141.3	-5.0	-0.68	139.4	-8.3	-0.98	HM
MQNDCA	X	204.7	58.4	7.87	177.9	30.2	3.58	TS
N7EWPB		146.7	0.4	0.05	146.9	-0.8	-0.09	LA
NJ28QM		140.5	-5.8	-0.79	135.9	-11.8	-1.39	HM
PDADE8		147.4	1.1	0.15	155.5	7.8	0.93	TS
QMEMJB		146.5	0.2	0.02	148.6	0.9	0.11	SH
QZXEXK		147.0	0.7	0.09	157.7	10.0	1.19	PP

Paper & Paperboard Interlaboratory Testing Program

Analysis 378

Roughness - Sheffield Type

TAPPI Official Test Method T538

WebCode	Data Flag	Sample GL51 Lab Mean	Sample GL51 Diff from Grand Mean	Sample GL51 CPV	Sample GL52 Lab Mean	Sample GL52 Diff from Grand Mean	Sample GL52 CPV	Instr Code
RUNHTB		143.7	-2.6	-0.35	153.6	5.9	0.70	PP
RZDVRD		130.5	-15.8	-2.13	134.0	-13.7	-1.62	XX
U969NH		152.7	6.4	0.86	152.5	4.8	0.57	HM
UFNCX7		142.3	-4.1	-0.55	148.2	0.5	0.06	XX
VENTBV		149.2	2.8	0.38	143.5	-4.2	-0.50	PP
VLLF6F		136.6	-9.7	-1.31	144.4	-3.2	-0.38	PP
X78WJT		141.7	-4.6	-0.62	143.3	-4.4	-0.52	PP
X9BR3W		153.9	7.6	1.02	155.1	7.5	0.88	PP
XN3CXY		144.5	-1.8	-0.24	145.6	-2.1	-0.25	PP
XVZ448		139.3	-7.0	-0.95	137.2	-10.4	-1.24	PP
XY983P		145.8	-0.5	-0.07	140.9	-6.8	-0.80	TS
Y26DWL		147.0	0.7	0.09	144.1	-3.6	-0.43	PP
Y4WCBJ		141.9	-4.4	-0.60	149.0	1.3	0.16	LA
Y7JZKY		153.7	7.4	0.99	152.1	4.4	0.52	TT
YGKDQQ	X	123.5	-22.8	-3.08	138.5	-9.2	-1.09	SH
ZLAATM		146.5	0.2	0.02	144.7	-2.9	-0.35	PP
ZMHMCA		141.9	-4.4	-0.60	145.9	-1.8	-0.22	MP
ZRXXQD		135.2	-11.1	-1.50	133.9	-13.8	-1.63	SH
ZYYALA		162.0	15.7	2.11	169.0	21.3	2.53	GL

Summary Statistics	Sample GL51	Sample GL52
Grand Means	146.32 Sheffield	147.67 Sheffield
Stnd Dev Btwn Labs	7.42 Sheffield	8.45 Sheffield

Statistics based on 54 of 59 reporting participants.

Comments on Assigned Data Flags for Test #378

D86FYZ (X) - Inconsistent in testing between samples.

6RXNJN (X) - Extreme Data.

YGKDQQ (X) - Data for sample GL51 are low.

CQYZUY (X) - Extreme Data.

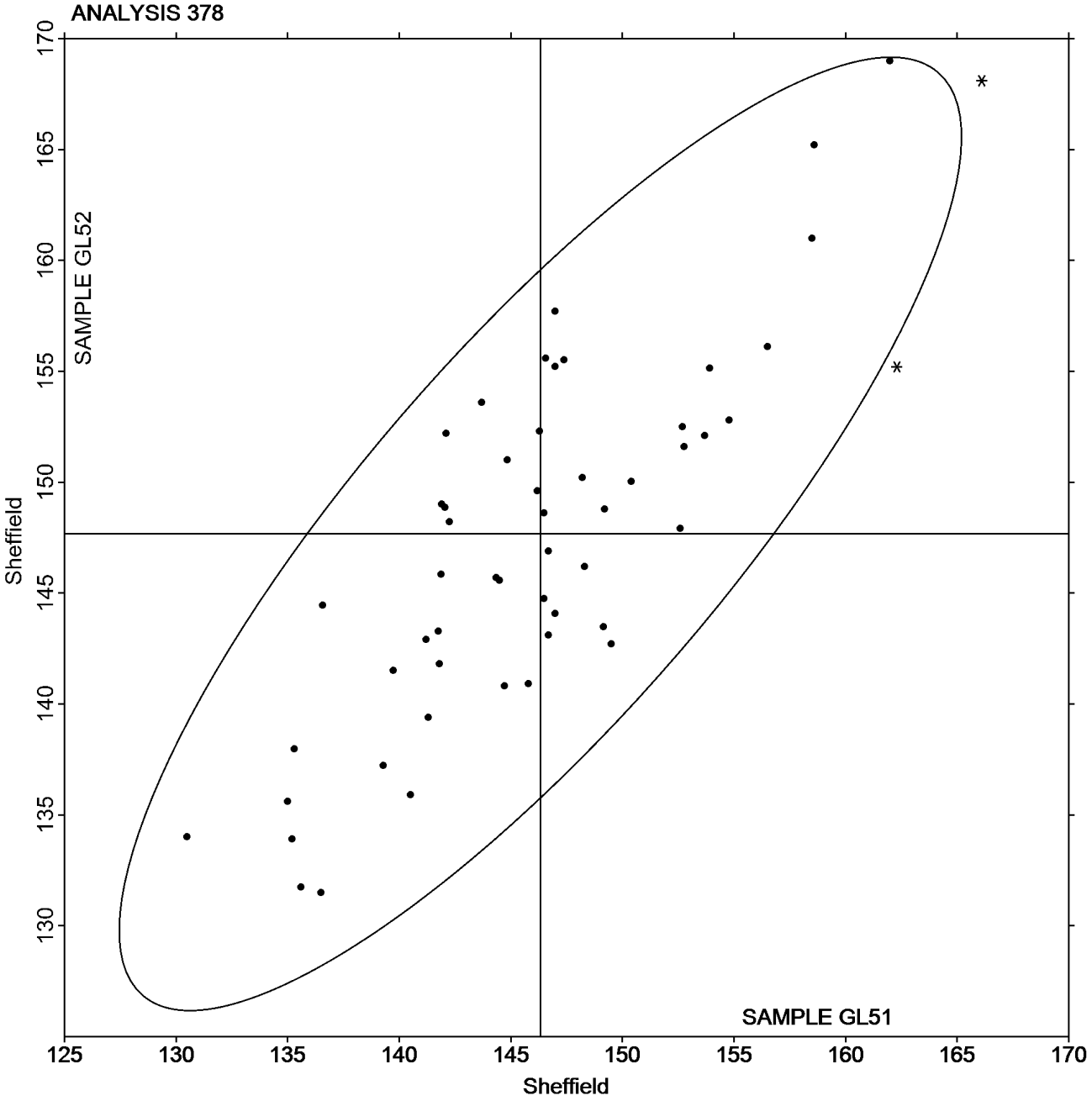
MQNDCA (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	GL	Giddings and Lewis Sheffield
HM	Technidyne - Hagerty Model #538	LA	L & W Roughness Sheffield - Autoline
LW	L & W Roughness Tester	MP	Metso Paperlab
PP	Technidyne Profile/Plus	SH	Sheffield (Bendix Precisionaire)
TS	TMI Monitor/Smoothness, Model 58-02	TT	TMI Monitor/Smoothness II, Model 58-24
VM	Valmet PaperLab (was Kajaani\Robotest)	XX	Instrument make/model not specified by lab

Grand Mean Sample GL51 = 146.32
Sheffield

Grand Mean Sample GL52 = 147.67
Sheffield



Paper & Paperboard Interlaboratory Testing Program

Analysis 382
Moisture in Paper
TAPPI Official Test Method T412

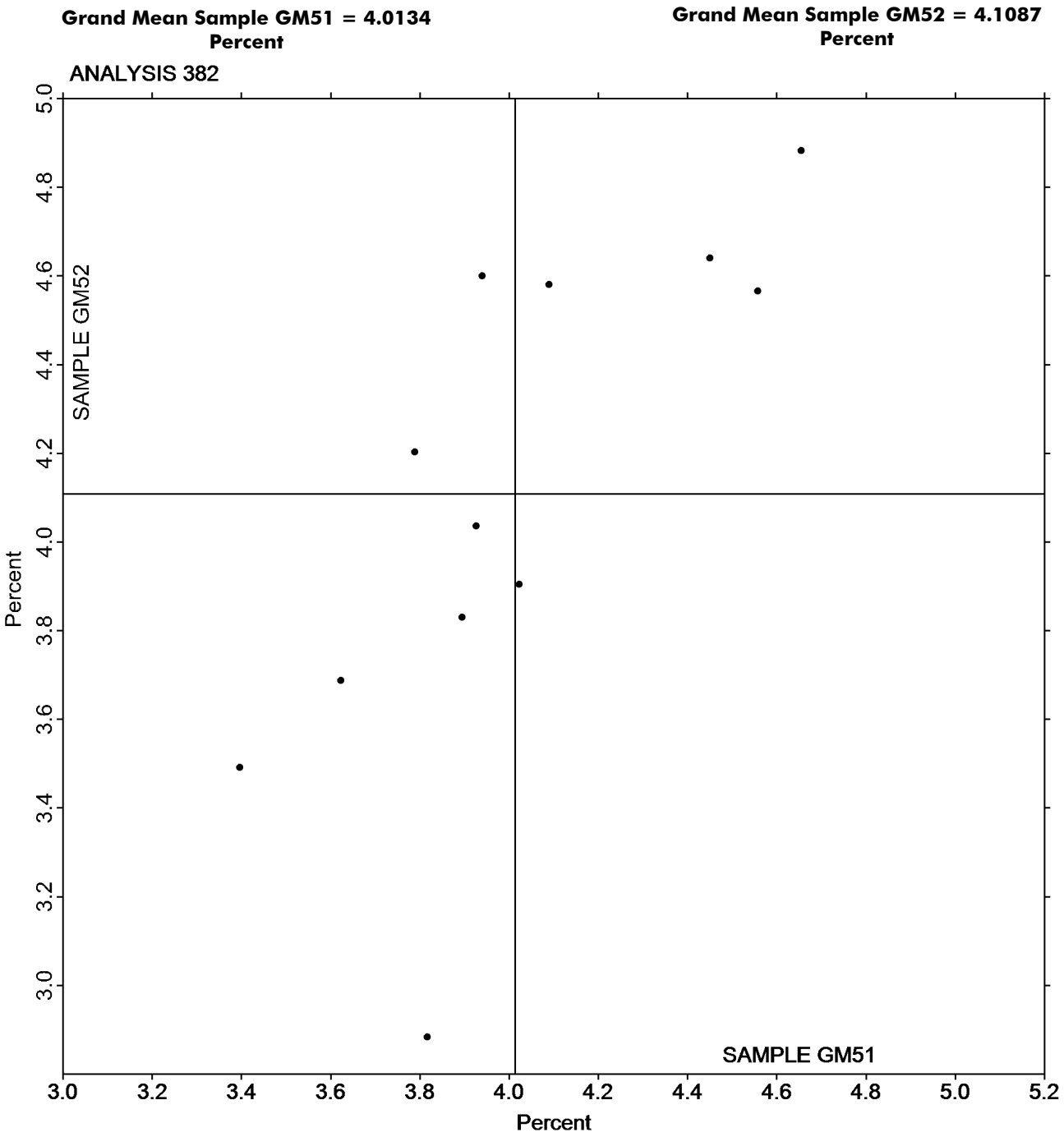
WebCode	Data Flag	Sample GM51 Lab Mean	Sample GM51 Diff from Grand Mean	Sample GM51 CPV	Sample GM52 Lab Mean	Sample GM52 Diff from Grand Mean	Sample GM52 CPV	Instr Code
2UDW9Z		3.396	-0.617	-1.64	3.491	-0.617	-1.06	ZZ
3BPKA8		3.895	-0.118	-0.32	3.830	-0.279	-0.48	ZZ
3CW6T2		4.655	0.641	1.71	4.882	0.774	1.33	ZZ
669YD7		3.926	-0.087	-0.23	4.036	-0.073	-0.12	ZZ
6WTFU7		3.940	-0.073	-0.20	4.600	0.491	0.84	ZZ
8BPC64		3.623	-0.390	-1.04	3.688	-0.421	-0.72	ZZ
AEU4XZ		4.450	0.437	1.16	4.640	0.531	0.91	ZZ
GQQ8CT		3.817	-0.196	-0.52	2.884	-1.225	-2.10	ZZ
H9KDAL		3.789	-0.224	-0.60	4.203	0.094	0.16	ZZ
LUUJCP		4.557	0.544	1.45	4.566	0.457	0.78	ZZ
P2FU3M		4.023	0.009	0.02	3.904	-0.204	-0.35	ZZ
TEV6U9		4.090	0.077	0.20	4.580	0.471	0.81	ZZ

Summary Statistics	Sample GM51	Sample GM52
Grand Means	4.01 Percent	4.11 Percent
Stnd Dev Btwn Labs	0.38 Percent	0.58 Percent

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 384

Opacity (89% Reflectance Backing) - Fine Papers

TAPPI Official Test Method T425

WebCode	Data Flag	Sample GN51 Lab Mean	Sample GN51 Diff from Grand Mean	Sample GN51 CPV	Sample GN52 Lab Mean	Sample GN52 Diff from Grand Mean	Sample GN52 CPV	Instr Code
2E6VMB		88.19	-0.75	-1.52	88.44	-0.62	-1.18	ZZ
3CW6T2		89.25	0.31	0.62	89.78	0.71	1.34	ZZ
6MN9CL		89.27	0.32	0.64	89.19	0.12	0.24	ZZ
6QQCZ2		89.51	0.57	1.14	89.59	0.53	0.99	ZZ
86E87P		89.24	0.30	0.59	89.61	0.55	1.03	ZZ
88LH7Y		89.42	0.48	0.96	89.36	0.30	0.56	ZZ
9RPLKU		88.54	-0.40	-0.81	88.95	-0.11	-0.21	ZZ
9UV78U		89.41	0.47	0.94	89.33	0.27	0.50	ZZ
AFUUCV		88.98	0.04	0.08	88.99	-0.08	-0.14	ZZ
BJPZBX	*	89.07	0.13	0.25	89.95	0.89	1.67	ZZ
C3JZZ9		88.90	-0.04	-0.09	88.76	-0.30	-0.57	ZZ
C4L8UL	*	88.00	-0.94	-1.90	87.68	-1.38	-2.61	ZZ
CJ3WDG		88.91	-0.04	-0.07	89.11	0.04	0.08	ZZ
CQJGCM		88.83	-0.11	-0.23	89.09	0.03	0.05	ZZ
DKP6PP	*	87.44	-1.50	-3.02	87.59	-1.47	-2.77	ZZ
DMZZFN	X	97.50	8.56	17.22	97.52	8.46	15.92	ZZ
E6VR2L		89.15	0.21	0.41	89.34	0.28	0.52	ZZ
GRHFCW		88.75	-0.20	-0.40	89.12	0.05	0.10	ZZ
LWEQBC		89.24	0.30	0.59	88.78	-0.28	-0.53	ZZ
MDJBVL		88.88	-0.07	-0.14	88.80	-0.27	-0.50	ZZ
MWUAVA		88.78	-0.16	-0.33	88.62	-0.44	-0.84	ZZ
NJ28QM		88.16	-0.78	-1.58	88.30	-0.76	-1.44	ZZ
P9YZYU		88.89	-0.05	-0.11	88.76	-0.30	-0.57	ZZ
PDADE8		89.07	0.13	0.25	89.49	0.43	0.80	ZZ
QMEMJB		88.98	0.04	0.07	89.34	0.28	0.52	ZZ
QZXEXK		89.43	0.49	0.98	89.69	0.63	1.18	ZZ
RZDVRD		89.01	0.06	0.12	89.11	0.04	0.08	ZZ
T96LY7		88.60	-0.34	-0.69	89.26	0.20	0.37	ZZ
U3T6UA		88.97	0.03	0.05	88.98	-0.08	-0.16	ZZ
U969NH		89.25	0.31	0.61	89.14	0.08	0.14	ZZ
UVCTF9		88.41	-0.54	-1.08	88.66	-0.41	-0.77	ZZ
X9BR3W		88.80	-0.14	-0.29	88.93	-0.13	-0.24	ZZ
XN3CXY		89.30	0.36	0.72	89.23	0.17	0.31	ZZ
YGKDQQ		89.24	0.30	0.59	89.64	0.58	1.08	ZZ
ZLAATM		88.98	0.03	0.06	88.83	-0.23	-0.44	ZZ
ZYYALA	*	90.22	1.28	2.57	89.81	0.75	1.40	ZZ

Summary Statistics	Sample GN51	Sample GN52
Grand Means	88.94 Percent	89.06 Percent
Stnd Dev Btwn Labs	0.50 Percent	0.53 Percent

Statistics based on 35 of 36 reporting participants.

Comments on Assigned Data Flags for Test #384

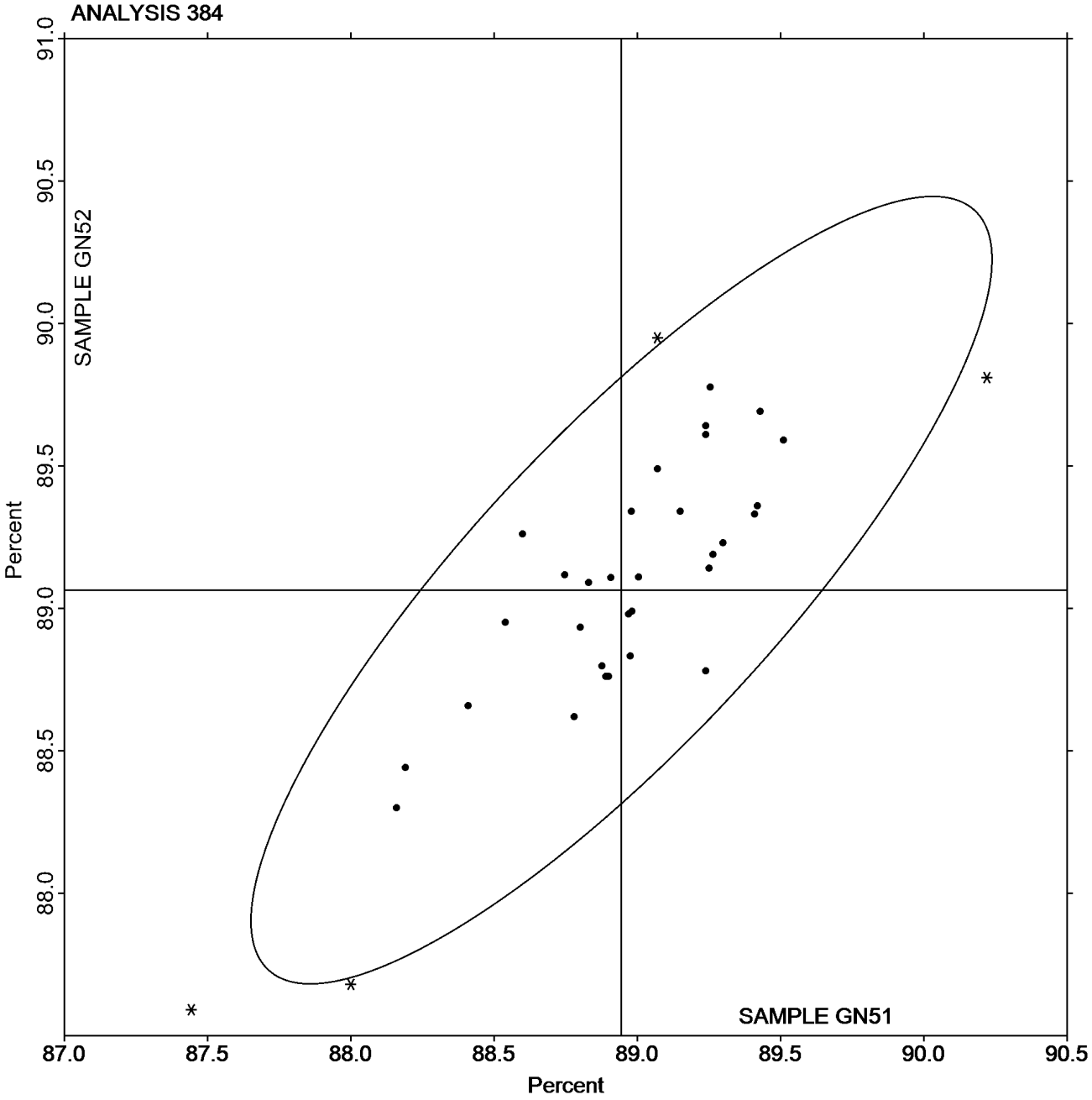
DMZZFN (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample GN51 = 88.944 Percent

Grand Mean Sample GN52 = 89.064 Percent



Paper & Paperboard Interlaboratory Testing Program

Analysis 386

Opacity (Paper Backing) - Fine Papers and Newsprint

TAPPI Official Test Method T519

WebCode	Data Flag	Sample GP51 Lab Mean	Sample GP51 Diff from Grand Mean	Sample GP51 CPV	Sample GP52 Lab Mean	Sample GP52 Diff from Grand Mean	Sample GP52 CPV	Instr Code
8BPC64		90.03	-0.02	-0.13	90.02	-0.08	-0.77	ZZ
8VWJHG		90.16	0.11	0.76	90.05	-0.05	-0.46	ZZ
92G4ZN		90.02	-0.03	-0.18	90.11	0.01	0.06	ZZ
9UV78U		90.09	0.04	0.29	90.16	0.06	0.55	ZZ
CQYZUY		89.85	-0.20	-1.31	90.11	0.01	0.12	ZZ
CRZNLB		90.04	-0.01	-0.05	90.13	0.03	0.28	ZZ
DMZZFN	X	88.75	-1.30	-8.64	88.94	-1.16	-10.74	ZZ
EMFENX		90.23	0.19	1.24	90.07	-0.03	-0.27	ZZ
FFTWKL		90.17	0.12	0.80	89.93	-0.17	-1.55	ZZ
FUMLDX		89.84	-0.20	-1.36	90.26	0.16	1.51	ZZ
HLM4RK		90.34	0.30	1.98	90.19	0.09	0.84	ZZ
HUMGXF		89.93	-0.12	-0.81	90.30	0.20	1.87	ZZ
J87JVX		90.11	0.06	0.41	89.93	-0.17	-1.54	ZZ
NQ3FH9		89.85	-0.20	-1.30	90.12	0.02	0.15	ZZ
P2FWP7		89.93	-0.12	-0.77	90.20	0.10	0.95	ZZ
TDZD73		90.26	0.21	1.40	90.12	0.02	0.15	ZZ
UKXR69		90.08	0.03	0.23	90.16	0.06	0.54	ZZ
UVHWEU		90.05	0.00	0.03	89.93	-0.17	-1.59	ZZ
ZKZ7HJ		89.86	-0.19	-1.23	90.01	-0.09	-0.84	ZZ

Summary Statistics	Sample GP51	Sample GP52
Grand Means	90.05 Percent	90.10 Percent
Stnd Dev Btwn Labs	0.15 Percent	0.11 Percent

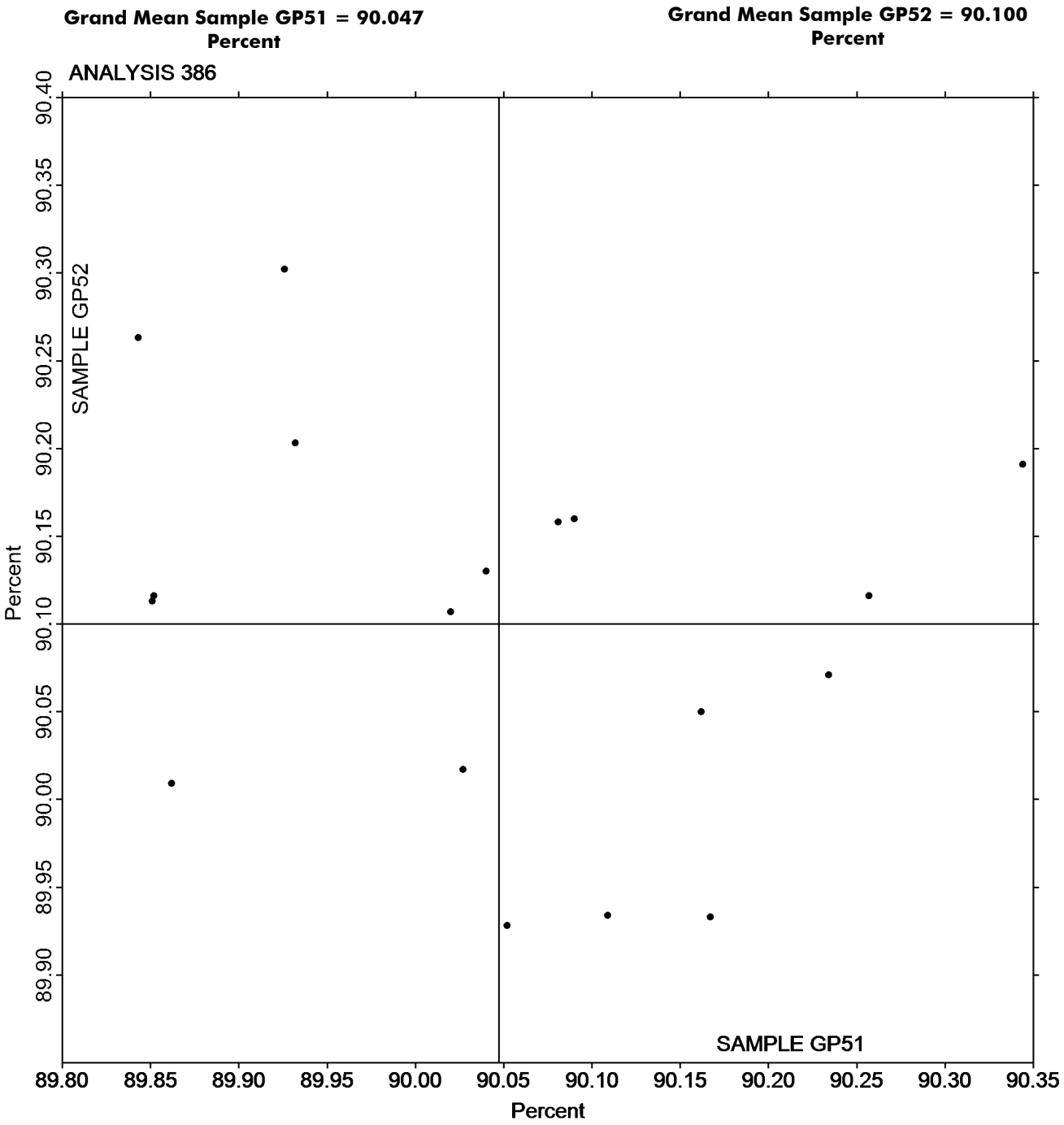
Statistics based on 18 of 19 reporting participants.

Comments on Assigned Data Flags for Test #386

DMZZFN (X) - Extreme Data.

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 #2922G, February 2018

Analysis 390

Directional Brightness

TAPPI Official Test Method T452

WebCode	Data Flag	Sample GR51 Lab Mean	Sample GR51 Diff from Grand Mean	Sample GR51 CPV	Sample GR52 Lab Mean	Sample GR52 Diff from Grand Mean	Sample GR52 CPV	Instr Code
2E6VMB	X	89.91	6.03	4.18	80.75	5.18	3.21	PE
2JWAYY		82.95	-0.93	-0.64	77.03	1.46	0.91	HZ
2KAL2B		83.04	-0.84	-0.58	74.73	-0.83	-0.52	TS
3BPKA8		82.16	-1.72	-1.19	74.53	-1.04	-0.64	XX
4L2AKH		85.10	1.22	0.84	76.18	0.61	0.38	TT
6QQCZ2		83.36	-0.52	-0.36	74.40	-1.16	-0.72	TA
6YKCGE	*	87.43	3.54	2.46	80.12	4.55	2.82	HG
86E87P		82.93	-0.96	-0.66	74.63	-0.94	-0.58	TS
9RPLKU		85.15	1.26	0.88	74.36	-1.21	-0.75	XC
9UV78U		83.31	-0.57	-0.39	74.83	-0.74	-0.46	TS
BFM6MN		83.39	-0.49	-0.34	75.01	-0.55	-0.34	TT
BJPZBX		82.10	-1.78	-1.23	75.21	-0.35	-0.22	TS
C3JZZ9		84.30	0.42	0.29	75.49	-0.08	-0.05	TS
C4L8UL		83.40	-0.48	-0.33	75.75	0.19	0.12	XX
CQJGCM		83.71	-0.17	-0.12	75.74	0.17	0.11	TT
D86FYZ	X	77.15	-6.73	-4.67	71.55	-4.02	-2.49	EA
DKP6PP		85.66	1.78	1.23	76.16	0.59	0.37	VM
DMZZFN		82.63	-1.26	-0.87	74.13	-1.44	-0.89	TS
FYLZ2M		83.32	-0.56	-0.39	74.69	-0.88	-0.54	TS
MWUAVA		83.09	-0.79	-0.55	76.94	1.37	0.85	TS
QZXEXK		83.11	-0.77	-0.53	74.45	-1.11	-0.69	TT
RZDVRD		85.63	1.74	1.21	77.00	1.44	0.89	XX
U969NH		82.86	-1.02	-0.71	74.50	-1.06	-0.66	TT
UVCTF9		84.89	1.01	0.70	76.05	0.49	0.30	TS
VENTBV		83.14	-0.74	-0.52	74.60	-0.96	-0.59	TS
X78WJT		83.00	-0.88	-0.61	74.31	-1.25	-0.78	TS
X9BR3W		82.94	-0.94	-0.65	74.00	-1.56	-0.97	TS
XN3CXY		83.34	-0.54	-0.38	74.55	-1.01	-0.63	XX
Y26DWL	*	87.84	3.96	2.74	80.54	4.98	3.08	HG
Y4WCBJ		84.94	1.06	0.73	75.90	0.34	0.21	TT

Summary Statistics	Sample GR51	Sample GR52
Grand Means	83.88 Percent	75.56 Percent
Stnd Dev Btwn Labs	1.44 Percent	1.61 Percent

Statistics based on 28 of 30 reporting participants.

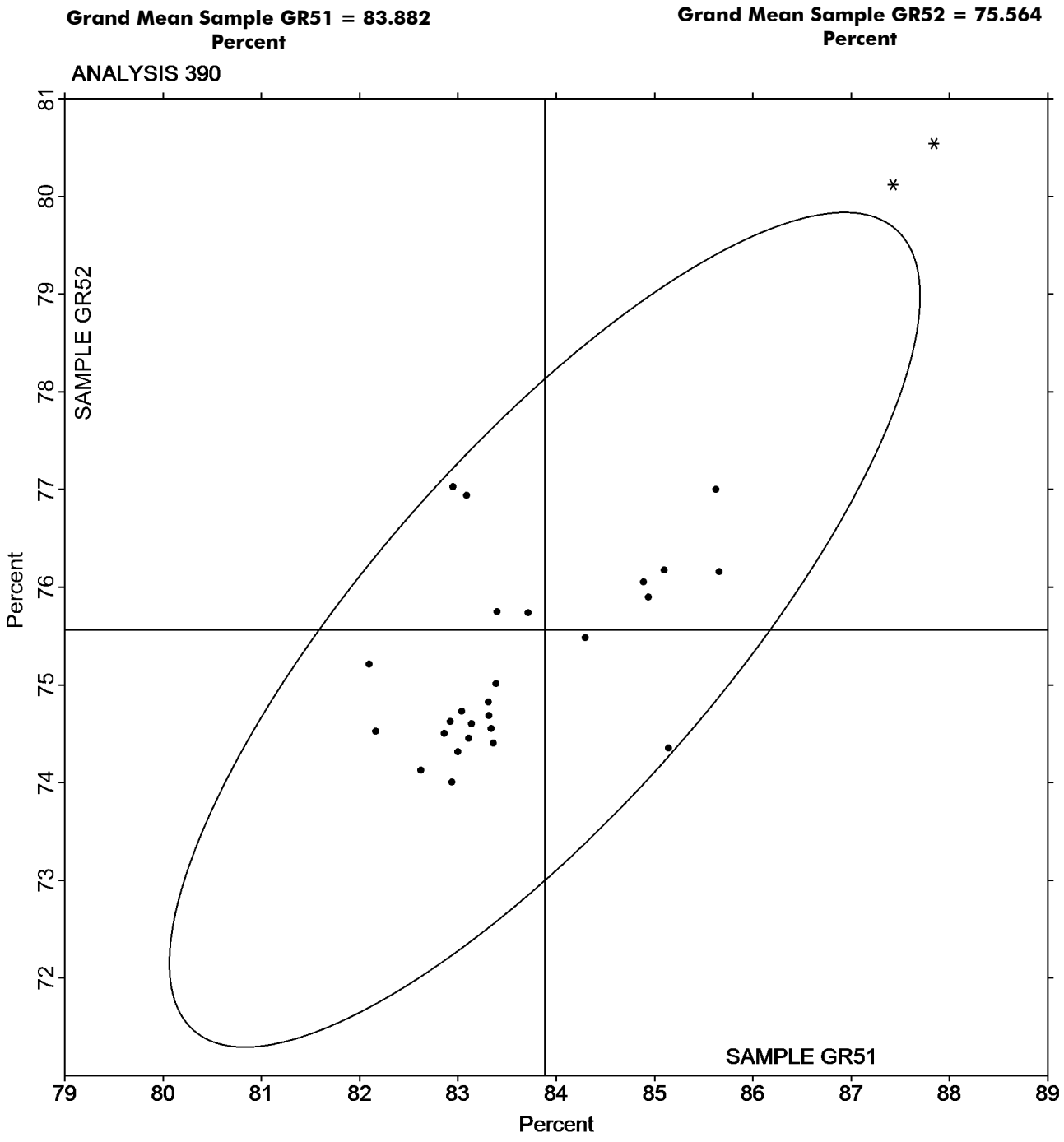
Comments on Assigned Data Flags for Test #390

D86FYZ (X) - Data for sample GR51 are low. Inconsistent within the determinations of sample GR51.

2E6VMB (X) - Data for both samples are high. Possible Systematic Error.

Key to Instrument Codes Reported by Participants

EA	L & W Autoline 400	HG	Hunter Labscan / XE
HZ	Hunter Lab ColorFlex EZ Series	PE	Photovolt 577
TA	Technidyne, Diano, M.S. S-4	TS	Technidyne Brightimeter Micro S-5
TT	Technidyne Brightimeter Micro S4-M	VM	Valmet PaperLab (was Kajaani/Robotest)
XC	X-Rite Color i5	XX	Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Analysis 391

Directional Brightness of Fluorescent Samples

TAPPI Official Test Method T452

WebCode	Data Flag	Sample GZ51 Lab Mean	Sample GZ51 Diff from Grand Mean	Sample GZ51 CPV	Sample GZ52 Lab Mean	Sample GZ52 Diff from Grand Mean	Sample GZ52 CPV	Instr Code
3CW6T2		82.33	-1.01	-1.00	90.45	-0.23	-0.27	TS
AFUUCV		83.44	0.10	0.10	90.37	-0.32	-0.37	TS
BJPZBX		82.95	-0.39	-0.38	90.73	0.05	0.06	TS
E6VR2L		82.10	-1.24	-1.23	90.12	-0.56	-0.65	TT
GRHFCW		83.15	-0.19	-0.19	90.21	-0.47	-0.55	TS
HLM4RK		82.94	-0.40	-0.39	91.07	0.39	0.45	TS
LWEQBC		82.36	-0.98	-0.97	90.40	-0.28	-0.33	TT
MDJBVL		83.41	0.07	0.07	90.50	-0.18	-0.21	PP
NJ28QM		82.82	-0.52	-0.52	89.51	-1.18	-1.35	HT
PDADE8		84.24	0.90	0.89	91.36	0.68	0.78	TS
RZDVRD	X	93.74	10.40	10.30	93.73	3.05	3.50	XX
T96LY7		84.56	1.22	1.21	92.26	1.58	1.81	TS
U3T6UA		82.76	-0.58	-0.57	90.50	-0.18	-0.21	TT
Y7JZKY		85.18	1.84	1.82	91.06	0.38	0.43	TT
YGKDQQ		82.61	-0.73	-0.72	89.27	-1.41	-1.62	HT
ZLAATM		85.23	1.89	1.88	92.46	1.77	2.04	TS

Summary Statistics	Sample GZ51	Sample GZ52
Grand Means	83.34 Percent	90.68 Percent
Stnd Dev Btwn Labs	1.01 Percent	0.87 Percent

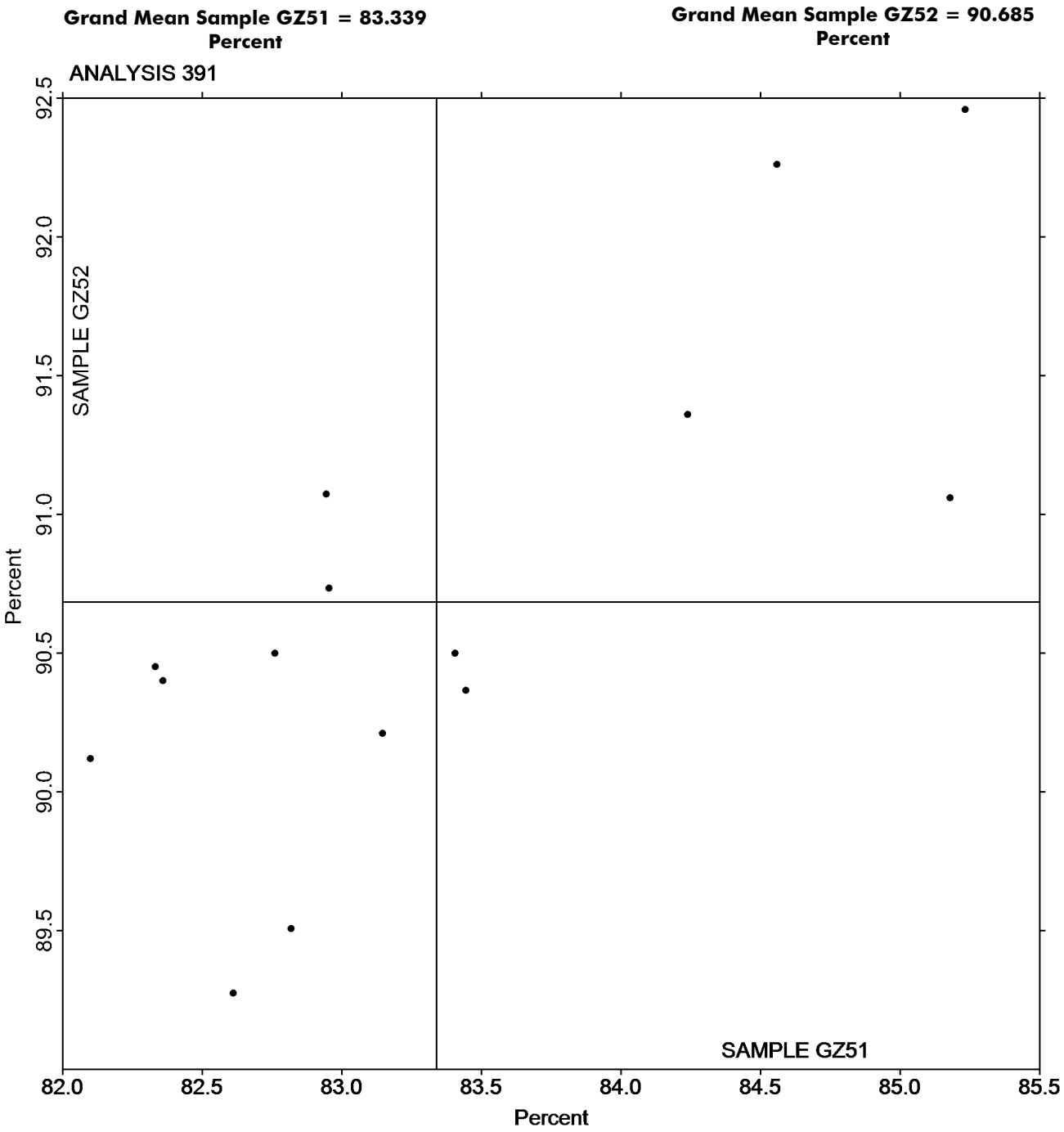
Statistics based on 15 of 16 reporting participants.

Comments on Assigned Data Flags for Test #391

RZDVRD (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

HT	Hunter UltraScan Vis	PP	Technidyne Profile/Plus
TS	Technidyne Brightimeter Micro S-5	TT	Technidyne Brightimeter Micro S4-M
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 392
Diffuse Brightness
TAPPI Official Test Method T525

WebCode	Data Flag	Sample GR51 Lab Mean	Sample GR51 Diff from Grand Mean	Sample GR51 CPV	Sample GR52 Lab Mean	Sample GR52 Diff from Grand Mean	Sample GR52 CPV	Instr Code
22HNL4		83.95	0.13	0.37	75.05	0.13	0.60	TC
2KAL2B		84.11	0.29	0.80	75.04	0.12	0.53	TC
3BPKA8		83.96	0.14	0.39	75.10	0.18	0.80	EE
4L2AKH		83.23	-0.59	-1.66	74.94	0.02	0.09	TL
4N8U9H		83.72	-0.10	-0.27	74.57	-0.35	-1.52	TC
698FLT		83.67	-0.15	-0.42	74.95	0.03	0.13	TC
88LH7Y		84.12	0.30	0.84	75.20	0.28	1.23	TC
8BPC64		83.62	-0.20	-0.55	74.60	-0.32	-1.41	LS
8VWJHG		83.50	-0.32	-0.90	74.67	-0.24	-1.08	LA
92G4ZN		84.29	0.47	1.31	75.43	0.51	2.27	TC
9UV78U	X	86.78	2.96	8.27	75.38	0.46	2.02	TC
BFM6MN		83.60	-0.22	-0.61	74.56	-0.35	-1.56	EG
BKDLTM		84.24	0.42	1.17	75.03	0.11	0.49	XX
C3JZZ9		83.81	-0.01	-0.04	74.93	0.01	0.07	TC
CRZNLB		83.30	-0.52	-1.45	74.69	-0.23	-1.01	TM
DMZZFN		83.79	-0.03	-0.09	74.88	-0.04	-0.17	TC
EMFENX		83.93	0.11	0.30	74.93	0.01	0.04	LS
GEV9EV		83.93	0.11	0.32	74.83	-0.08	-0.37	TC
HLM4RK		84.07	0.25	0.70	75.17	0.26	1.13	TC
J9G2E3		83.69	-0.13	-0.36	74.92	0.00	0.02	TC
JCGAJD		83.85	0.03	0.09	74.76	-0.15	-0.68	EF
MU8LLV		83.97	0.15	0.41	75.03	0.11	0.49	TC
MZAVNG	X	63.95	-19.87	-55.54	57.91	-17.00	-74.99	XX
TDZD73		83.90	0.08	0.22	74.90	-0.02	-0.07	TC
U969NH		84.69	0.87	2.43	75.25	0.33	1.48	LT
UKXR69		84.23	0.41	1.15	75.01	0.10	0.42	TC
UVHWEU		83.58	-0.24	-0.66	74.46	-0.46	-2.01	EG
XFR3FX		83.89	0.07	0.19	75.01	0.10	0.42	TC
Y4WCBJ		83.08	-0.74	-2.08	74.71	-0.20	-0.90	EG
ZKZ7HJ		83.24	-0.58	-1.62	75.05	0.13	0.58	TM

Summary Statistics	Sample GR51	Sample GR52
Grand Means	83.82 Percent	74.92 Percent
Stnd Dev Btwn Labs	0.36 Percent	0.23 Percent

Statistics based on 28 of 30 reporting participants.

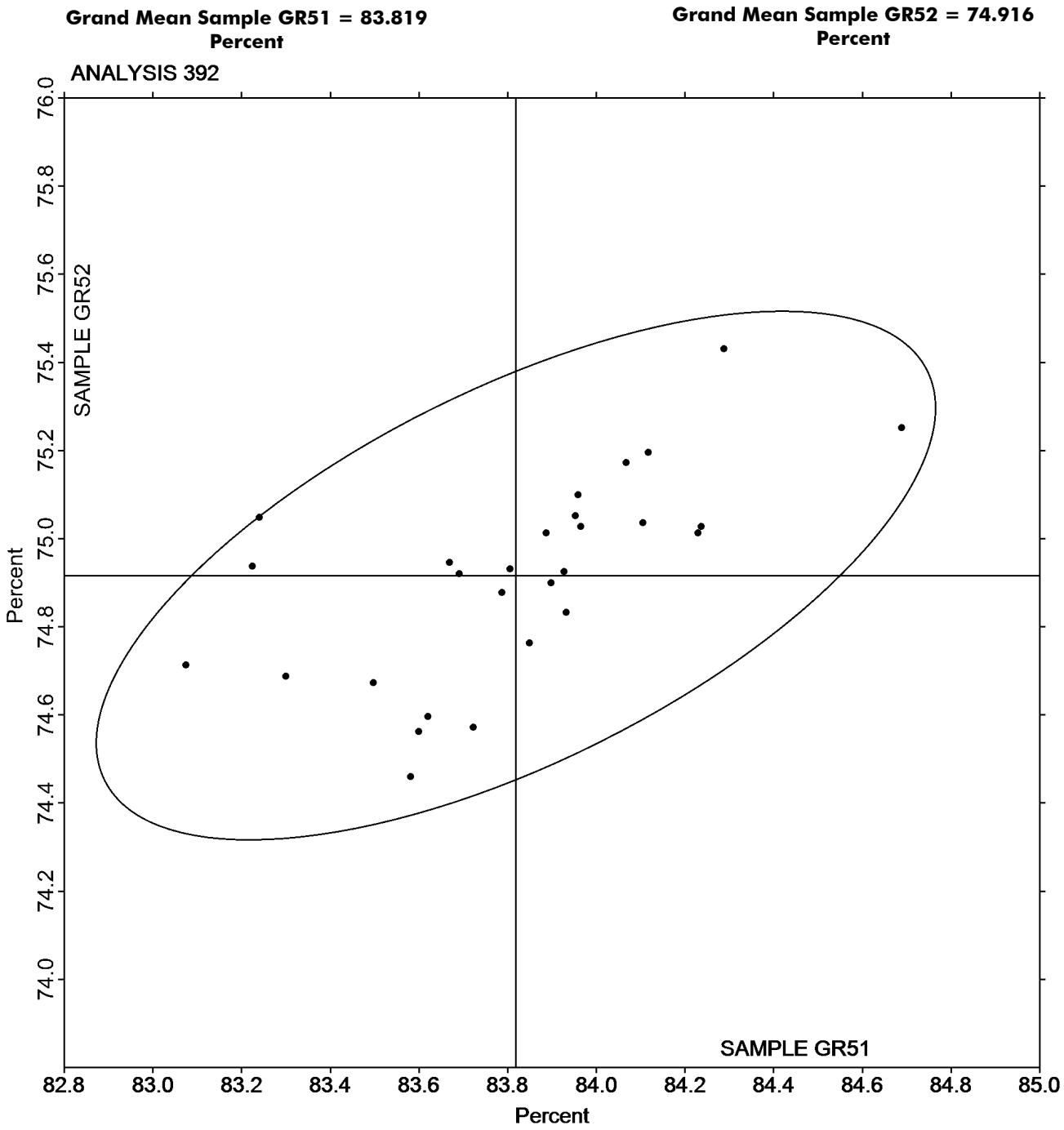
Comments on Assigned Data Flags for Test #392

MZAVNG (X) - Extreme Data.

9UV78U (X) - Extreme Data for Sample GR51.

Key to Instrument Codes Reported by Participants

EE	Datacolor Elrepho 2000	EF	Datacolor Elrepho 3000
EG	Datacolor Elrepho 450X	LA	L & W Elrepho - Autoline
LS	L & W Elrepho SE 070	LT	L & W Elrepho SE 071
TC	Technidyne Color Touch Series	TL	Technidyne Technibrite TB-1
TM	Technidyne Technibrite Micro TB-1C	XX	Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Analysis 394

Fluorescent Component of Directional Brightness

TAPPI Official Test Method T452

WebCode	Data Flag	Sample GZ51 Lab Mean	Sample GZ51 Diff from Grand Mean	Sample GZ51 CPV	Sample GZ52 Lab Mean	Sample GZ52 Diff from Grand Mean	Sample GZ52 CPV	Instr Code
3CW6T2		1.618	0.114	0.68	3.534	0.212	1.09	TS
AFUUCV		1.548	0.044	0.26	3.292	-0.030	-0.15	TS
BJPZBX		1.224	-0.280	-1.68	3.074	-0.248	-1.27	TS
E6VR2L		1.640	0.136	0.81	3.540	0.218	1.12	TT
GRHFCW		1.738	0.234	1.40	3.510	0.188	0.97	TS
HLM4RK		1.216	-0.288	-1.72	2.938	-0.384	-1.97	TS
LWEQBC		1.500	-0.004	-0.02	3.320	-0.002	-0.01	TT
MDJBVL		1.542	0.038	0.23	3.314	-0.008	-0.04	PP
RZDVRD	X	2.702	1.198	7.17	3.436	0.114	0.59	XX
T96LY7		1.520	0.016	0.10	3.380	0.058	0.30	TS
ZLAATM		1.494	-0.010	-0.06	3.316	-0.006	-0.03	TS

Summary Statistics	Sample GZ51	Sample GZ52
Grand Means	1.50 Percent	3.32 Percent
Stnd Dev Btwn Labs	0.17 Percent	0.19 Percent

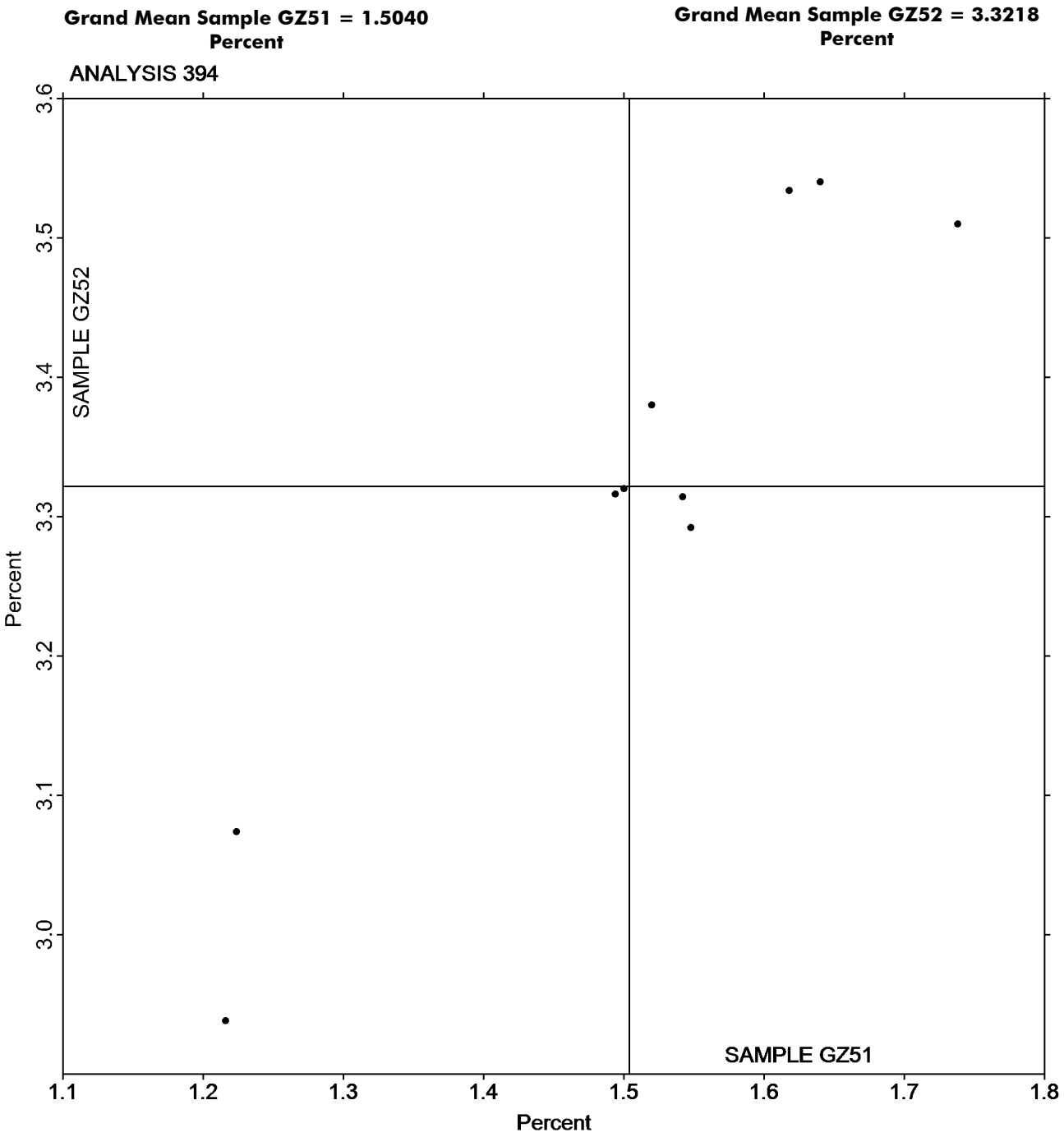
Statistics based on 10 of 11 reporting participants.

Comments on Assigned Data Flags for Test #394

RZDVRD (X) - Extreme Data for Sample GZ51.

Key to Instrument Codes Reported by Participants

PP	Technidyne Profile/Plus	TS	Technidyne Brightimeter Micro S-5
TT	Technidyne Brightimeter Micro S4-M	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

Report #2922G, February 2018

Analysis 395

Specular Gloss at 75 Degrees - High Range

TAPPI Official Test Method T480

WebCode	Data Flag	Sample GT51 Lab Mean	Sample GT51 Diff from Grand Mean	Sample GT51 CPV	Sample GT52 Lab Mean	Sample GT52 Diff from Grand Mean	Sample GT52 CPV	Instr Code
4L2AKH		82.69	-0.32	-0.45	83.01	-0.57	-0.69	GS
6RXNJN		82.25	-0.76	-1.06	82.69	-0.89	-1.08	VM
6YKCGE		83.13	0.12	0.16	83.29	-0.29	-0.35	TH
BFM6MN		84.18	1.17	1.62	84.87	1.29	1.57	TH
CQJGCM		83.35	0.34	0.47	84.27	0.69	0.84	TH
DKP6PP		83.71	0.70	0.97	83.92	0.34	0.42	VM
DMZZFN		81.84	-1.18	-1.64	83.10	-0.48	-0.58	TH
EMFENX		82.29	-0.72	-1.00	82.82	-0.76	-0.92	LB
GEV9EV	X	79.28	-3.73	-5.18	80.19	-3.39	-4.12	ZH
GRHFCW		82.40	-0.61	-0.85	83.56	-0.02	-0.02	LA
HLM4RK		82.97	-0.04	-0.06	83.62	0.04	0.05	LA
LWEQBC		83.04	0.03	0.04	83.27	-0.31	-0.38	PP
MDJBVL		83.18	0.17	0.23	84.26	0.68	0.83	PP
N7EWPB		82.90	-0.11	-0.16	83.77	0.19	0.23	LA
U3T6UA		84.54	1.53	2.12	85.01	1.43	1.74	TG
UVCTF9		82.49	-0.52	-0.73	82.30	-1.28	-1.55	LA
XY983P		83.52	0.51	0.70	84.54	0.96	1.17	XX
Y26DWL		83.57	0.56	0.77	83.91	0.33	0.40	TH
Y4WCBJ		82.20	-0.81	-1.13	82.19	-1.39	-1.69	LF

Summary Statistics	Sample GT51	Sample GT52
Grand Means	83.01 Gloss Units	83.58 Gloss Units
Stnd Dev Btwn Labs	0.72 Gloss Units	0.82 Gloss Units

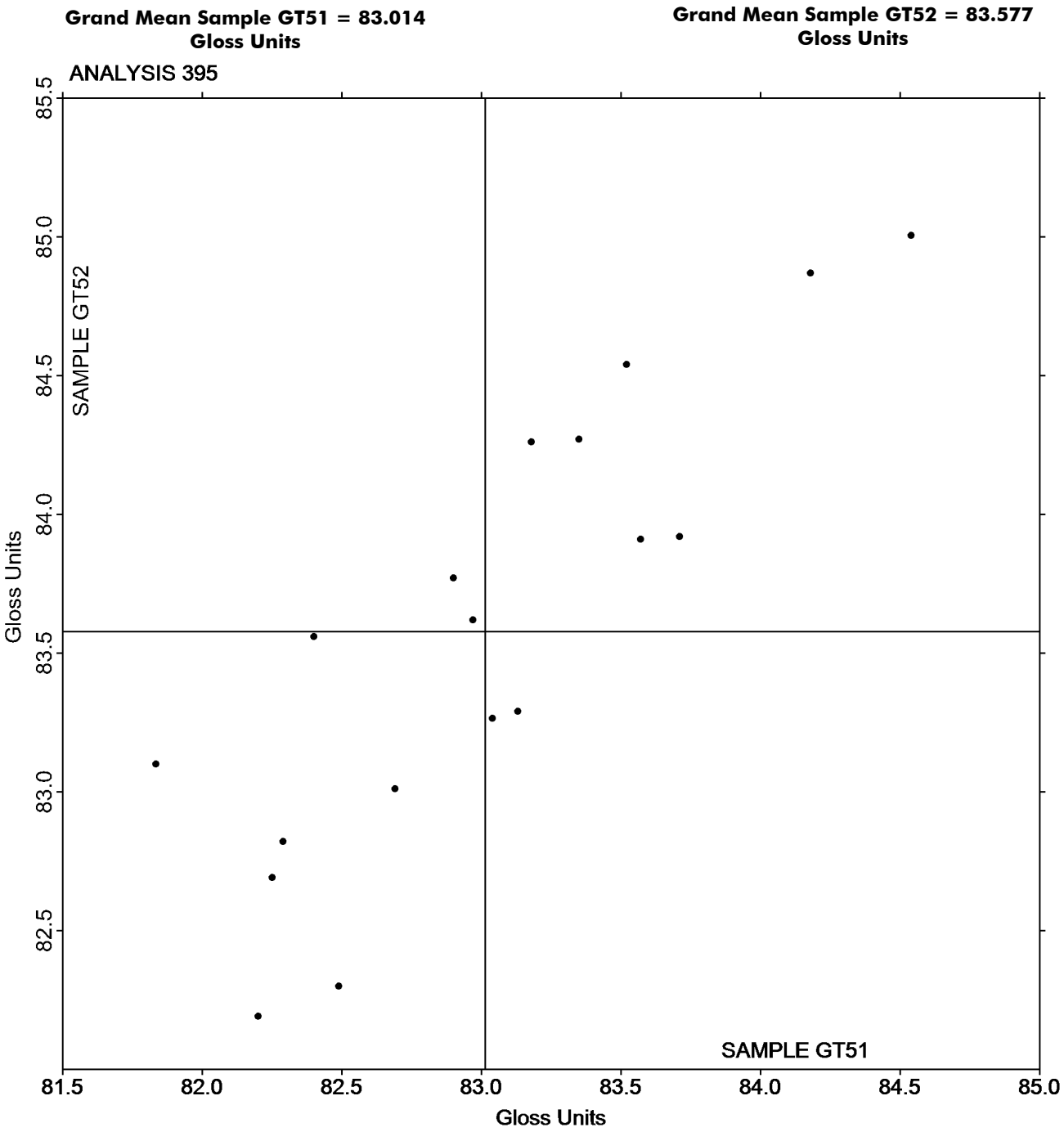
Statistics based on 18 of 19 reporting participants.

Comments on Assigned Data Flags for Test #395

GEV9EV (X) - Data for both samples are low. Possible Systematic Error.

Key to Instrument Codes Reported by Participants

GS	BYK-Gardner Glossgard II	LA	L & W Gloss - Autoline 300
LB	L & W Gloss Tester Code 224	LF	L & W Autoline 400
PP	Technidyne Profile/Plus	TG	Technidyne T480
TH	Technidyne T480A	VM	Valmet PaperLab (was Kajaani/Robotest)
XX	Instrument make/model not specified by lab	ZH	Zehntner ZLR 1050



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 396

Specular Gloss at 75 Degrees - Low Range

TAPPI Official Test Method T480

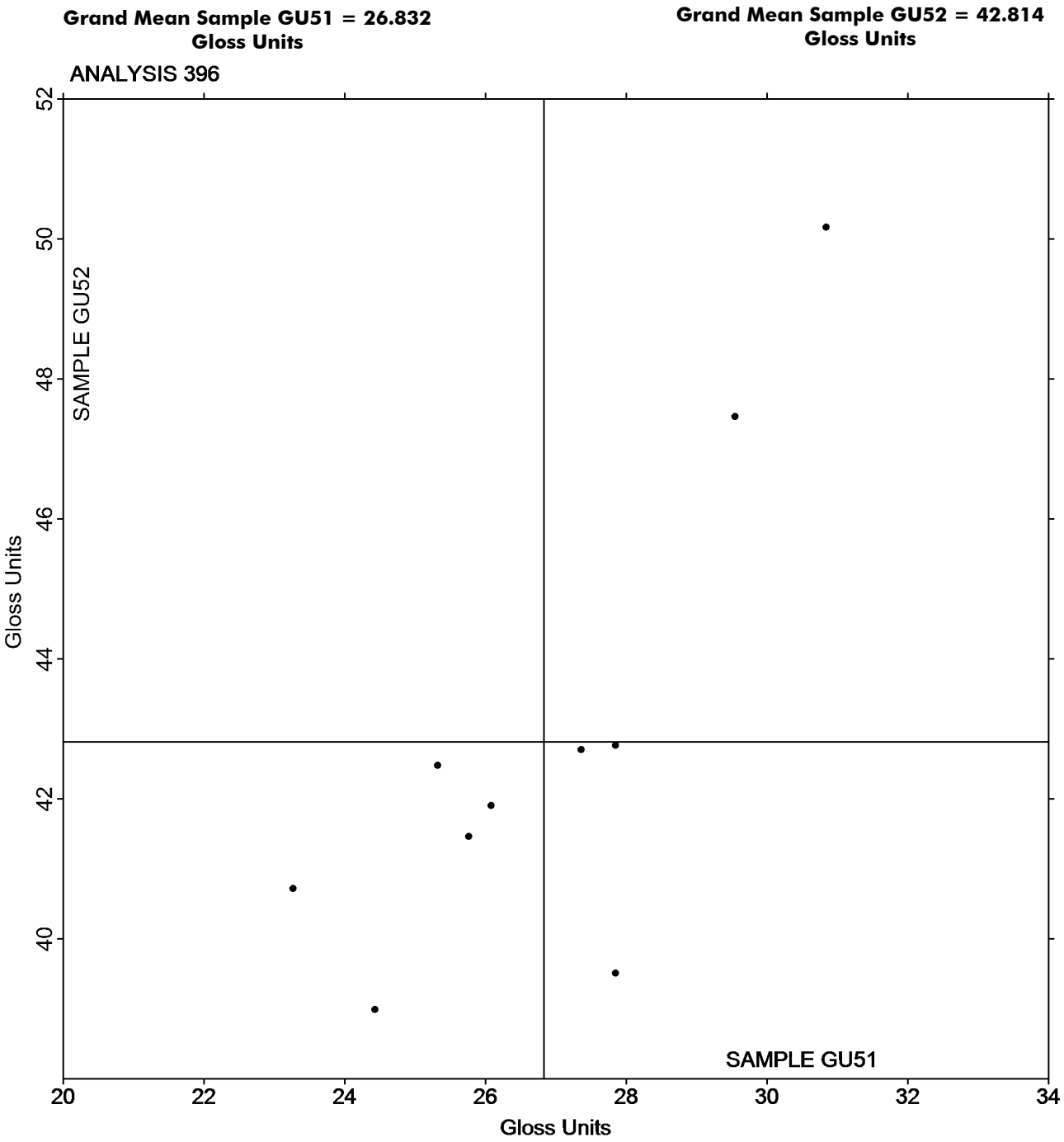
WebCode	Data Flag	Sample GU51 Lab Mean	Sample GU51 Diff from Grand Mean	Sample GU51 CPV	Sample GU52 Lab Mean	Sample GU52 Diff from Grand Mean	Sample GU52 CPV	Instr Code
2JWAYY		25.76	-1.07	-0.46	41.46	-1.35	-0.39	GA
2KAL2B		27.85	1.02	0.44	39.51	-3.30	-0.95	TH
6QQCZ2		25.33	-1.51	-0.65	42.48	-0.34	-0.10	TH
88LH7Y		29.55	2.72	1.17	47.46	4.65	1.34	TH
9RPLKU		27.85	1.02	0.44	42.76	-0.05	-0.02	TH
9UV78U		30.84	4.01	1.73	50.17	7.35	2.12	TG
CJ3WDG		27.36	0.53	0.23	42.70	-0.11	-0.03	PP
EMFENX		23.27	-3.56	-1.54	40.72	-2.09	-0.60	LA
HLM4RK		24.43	-2.40	-1.04	38.99	-3.82	-1.10	LA
P2FU3M		26.08	-0.75	-0.32	41.90	-0.91	-0.26	XX

Summary Statistics	Sample GU51	Sample GU52
Grand Means	26.83 Gloss Units	42.81 Gloss Units
Stnd Dev Btwn Labs	2.32 Gloss Units	3.47 Gloss Units

Statistics based on 10 of 10 reporting participants.

Key to Instrument Codes Reported by Participants

GA	BYK-Gardner (model not specified)	LA	L & W Gloss - Autoline 300
PP	Technidyne Profile/Plus	TG	Technidyne T480
TH	Technidyne T480A	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 398
Grammage (Mass per Unit Area)
TAPPI Official Test Method T410

WebCode	Data Flag	Sample GW51 Lab Mean	Sample GW51 Diff from Grand Mean	Sample GW51 CPV	Sample GW52 Lab Mean	Sample GW52 Diff from Grand Mean	Sample GW52 CPV	Instr Code
2XCCJ9		103.4	-0.2	-0.37	88.99	-0.17	-0.30	ZZ
3BPKA8		103.5	0.0	-0.05	89.71	0.55	1.00	ZZ
3MACJA		103.8	0.3	0.44	89.38	0.22	0.41	ZZ
669YD7		103.4	-0.1	-0.24	89.13	-0.03	-0.05	ZZ
6QQCZ2		102.5	-1.1	-1.84	88.12	-1.04	-1.88	ZZ
76K3CP		103.4	-0.2	-0.38	88.83	-0.33	-0.60	ZZ
7U4F3P		104.3	0.8	1.30	90.13	0.97	1.76	ZZ
86E87P		103.0	-0.6	-1.08	89.04	-0.12	-0.22	ZZ
88LH7Y		103.7	0.1	0.16	88.44	-0.71	-1.30	ZZ
8BPC64		103.5	-0.1	-0.14	89.08	-0.08	-0.14	ZZ
9RPLKU	X	149.2	45.6	79.23	148.77	59.61	108.29	ZZ
AEU4XZ		103.8	0.2	0.40	89.78	0.62	1.12	ZZ
EMFENX		103.5	-0.1	-0.15	88.80	-0.36	-0.65	ZZ
FFTWKL		103.8	0.2	0.32	89.57	0.41	0.75	ZZ
H6JHEP		103.7	0.1	0.20	88.99	-0.17	-0.31	ZZ
HUMGXF	*	104.7	1.1	1.94	89.24	0.08	0.14	ZZ
JDTB3Q		104.3	0.7	1.18	89.10	-0.06	-0.11	ZZ
LUUJCP		104.5	0.9	1.55	89.63	0.47	0.86	ZZ
NJ28QM		103.3	-0.2	-0.43	88.76	-0.40	-0.73	ZZ
P2FU3M		103.5	-0.1	-0.17	89.31	0.15	0.27	ZZ
P2FWP7		104.1	0.5	0.90	89.29	0.13	0.24	ZZ
P9YZYU		104.3	0.7	1.18	90.17	1.01	1.84	ZZ
PDADE8		102.9	-0.7	-1.15	88.66	-0.50	-0.92	ZZ
QMEMJB		102.4	-1.2	-2.05	88.35	-0.81	-1.47	ZZ
RHGJ8J		103.3	-0.3	-0.45	88.84	-0.32	-0.58	ZZ
T96LY7		103.4	-0.1	-0.22	89.30	0.14	0.26	ZZ
XN3CXY		102.7	-0.9	-1.60	88.44	-0.72	-1.31	ZZ
YGKDQQ		104.0	0.4	0.75	90.22	1.06	1.93	ZZ

Summary Statistics	Sample GW51	Sample GW52
Grand Means	103.57 g/sq m	89.16 g/sq m
Stnd Dev Btwn Labs	0.58 g/sq m	0.55 g/sq m

Statistics based on 27 of 28 reporting participants.

Comments on Assigned Data Flags for Test #398

9RPLKU (X) - Extreme Data.

Analysis Notes:

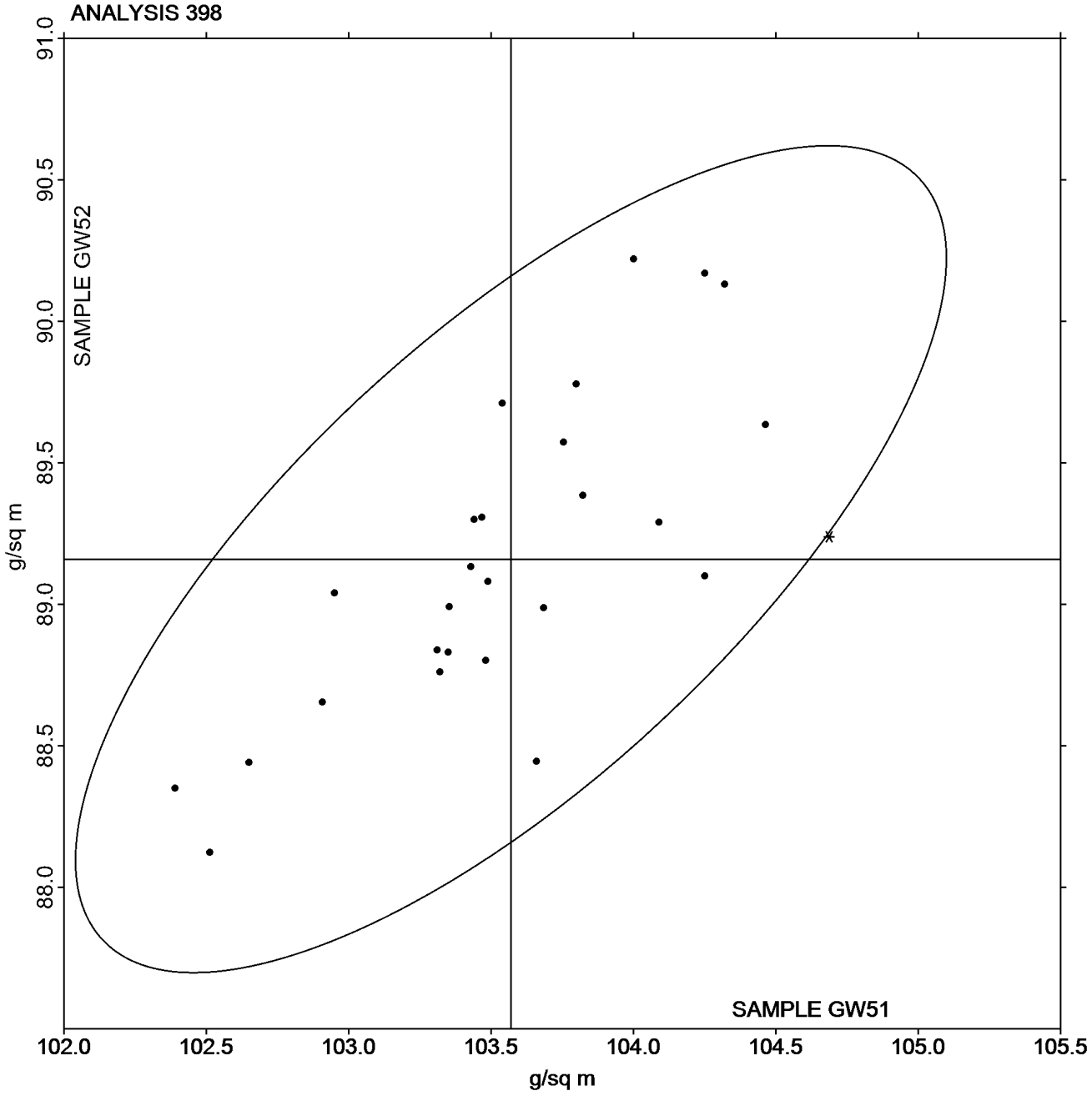
AEU4XZ - One determination removed from the Lab Mean for Sample GW52 (TAPPI T1205 using Grubbs test at 1% risk level).

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample GW51 = 103.57 g/sq m

Grand Mean Sample GW52 = 89.160 g/sq m



Paper & Paperboard Interlaboratory Testing Program

Analysis 399
Sizing Test (Hercules Type)
TAPPI Official Test Method T530

WebCode	Data Flag	Sample GX51 Lab Mean	Sample GX51 Diff from Grand Mean	Sample GX51 CPV	Sample GX52 Lab Mean	Sample GX52 Diff from Grand Mean	Sample GX52 CPV	Instr Code
2E6VMB		11.18	-1.54	-0.44	21.07	0.80	0.16	HE
3CW6T2		12.16	-0.56	-0.16	18.76	-1.51	-0.31	HE
3U823Y		13.60	0.88	0.25	24.80	4.53	0.92	XX
4748VX		8.21	-4.51	-1.30	12.83	-7.44	-1.52	HE
6RXNJN		6.92	-5.80	-1.67	15.25	-5.02	-1.02	HE
86E87P	X	40.80	28.08	8.09	40.10	19.83	4.04	HE
88LH7Y		13.03	0.31	0.09	26.56	6.29	1.28	HE
AFUUCV		10.41	-2.31	-0.66	15.12	-5.15	-1.05	HE
AR2RCP	*	21.50	8.78	2.53	21.10	0.83	0.17	HE
BJPZBX	X	14.53	1.81	0.52	46.06	25.79	5.26	HE
C3JZZ9		14.64	1.92	0.55	25.88	5.61	1.14	XX
C4L8UL		10.15	-2.57	-0.74	15.54	-4.73	-0.96	XX
CJ3WDG		13.77	1.05	0.30	17.52	-2.75	-0.56	HE
GRHFCW		9.74	-2.98	-0.86	18.07	-2.20	-0.45	HE
GXM3CD		11.97	-0.75	-0.22	19.92	-0.35	-0.07	HE
L6CEBP		10.26	-2.46	-0.71	14.99	-5.28	-1.08	HE
MFPVJL		12.13	-0.59	-0.17	18.99	-1.28	-0.26	HE
PDADE8		7.94	-4.78	-1.38	18.08	-2.19	-0.45	HE
QMEMJB		14.62	1.90	0.55	23.38	3.11	0.63	HE
QZXEXK		14.38	1.66	0.48	23.42	3.15	0.64	HE
RUNHTB		18.18	5.46	1.57	22.48	2.21	0.45	XX
U969NH		15.84	3.12	0.90	16.92	-3.35	-0.68	HE
UVCTF9		9.37	-3.35	-0.96	14.32	-5.95	-1.21	HE
VENTBV		11.73	-0.99	-0.28	18.86	-1.41	-0.29	HE
X78WJT		12.51	-0.21	-0.06	19.69	-0.58	-0.12	HE
X9BR3W	*	16.13	3.41	0.98	33.15	12.88	2.63	HE
XN3CXY	X	31.90	19.18	5.52	51.20	30.93	6.31	XX
Y7JZKY		11.30	-1.42	-0.41	20.50	0.23	0.05	HE
ZLAATM	X	37.53	24.81	7.15	30.35	10.08	2.06	HE
ZYYALA		19.01	6.29	1.81	29.78	9.51	1.94	HE

Summary Statistics	Sample GX51	Sample GX52
Grand Means	12.72 Seconds	20.27 Seconds
Stnd Dev Btwn Labs	3.47 Seconds	4.90 Seconds

Statistics based on 26 of 30 reporting participants.

Comments on Assigned Data Flags for Test #399

ZLAATM (X) - Extreme Data for Sample GX51.

BJPZBX (X) - Data for sample GX52 are high. Inconsistent within the determinations of sample GX52.

86E87P (X) - Extreme Data.

XN3CXY (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

HE	Hercules Sizing Tester	XX	Instrument make/model not specified by lab

Grand Mean Sample GX51 = 12.718 Seconds

Grand Mean Sample GX52 = 20.269 Seconds