Collaborative Testing Services, Inc.

Paper & Paperboard Testing Program

Summary Report #2972 G - December 2018

Analysis	Analysis Name
350	Color & Color Difference - Near White Papers - C/2deg obs
351	Color & Color Difference - Near White Papers - D65/10deg obs
360	Thickness (Caliper), Printing papers
361	Thickness (Caliper), Packaging papers
364	Coefficient of Static Friction - Horizontal Plane Method - Printing Papers
365	Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers
370	Air Resistance - Gurley Oil Type
372	Porosity - Sheffield Type - Sheffield Units for 3/4 inch Diameter Orifice
376	Roughness - Print Surf Method - 0.5 to 4.0 Microns
377	Roughness - Print Surf Method - 2.5 to 6.0 Microns
378	Roughness - Sheffield Type
382	Moisture in Paper
384	Opacity (89% Reflectance Backing) - Fine Papers
386	Opacity (Paper Backing) - Fine Papers and Newsprint
390	Directional Brightness
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398	Grammage (Mass per Unit Area)
399	Sizing Test (Hercules Type)

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
29VUZA		GA61	94.19	-0.82	3.83	-0.39	0.00	0.06	0.40	TC
		GA62	93.79	-0.82	3.89					
4NHPRQ		GA61	96.08	-0.77	3.04	-0.40	0.02	0.09	0.41	XS
		GA62	95.68	-0.75	3.13					
6ZAVZE		GA61	95.32	-0.73	3.78	-0.33	-0.02	0.09	0.34	TC
		GA62	94.99	-0.75	3.87					
7AQ2C9	X	GA61	95.10	0.75	3.92	-0.02	0.03	0.19	0.19 X	LS
		GA62	95.08	0.79	4.10					
8FXU2X		GA61	94.07	-0.82	3.89	-0.43	-0.01	0.11	0.44	LA
		GA62	93.64	-0.82	4.00					
CWLUWD		GA61	95.37	-0.83	3.84	-0.34	-0.01	0.14	0.37	LS
		GA62	95.03	-0.84	3.98					
D6VKZG		GA61	93.41	-0.13	3.39	-0.45	0.05	0.09	0.46	TS
		GA62	92.96	-0.07	3.48					
DCV292		GA61	93.14	-0.22	3.47	-0.32	-0.05	0.10	0.34	TS
		GA62	92.82	-0.27	3.56					
EHFJ4N		GA61	93.10	-0.19	3.28	-0.54	0.09	0.13	0.56	TS
		GA62	92.57	-0.09	3.41					
EN46BB		GA61	95.30	-0.67	4.00	-0.22	-0.11	-0.12	0.27	EH
		GA62	95.08	-0.77	3.88					
HCHYQH		GA61	94.84	-0.77	3.13	-0.40	-0.01	0.05	0.40	HE
		GA62	94.44	-0.78	3.18					
MXHQWW		GA61	95.39	-0.73	3.72	-0.30	0.01	0.08	0.32	TC
		GA62	95.09	-0.72	3.80					
NHLUBD		GA61	93.32	-0.43	3.66	-0.52	0.11	0.11	0.54	TS
		GA62	92.80	-0.32	3.77					
QF8B3R		GA61	93.36	-0.36	3.47	-0.42	0.04	0.07	0.43	TS
		GA62	92.94	-0.32	3.53					
TRDY9U		GA61	94.13	-0.81	3.73	-0.39	0.00	0.08	0.40	XX
		GA62	93.74	-0.81	3.81					
TT8PE9		GA61	95.03	-0.65	3.63	-0.43	-0.03	0.08	0.44	HE
		GA62	94.60	-0.68	3.71					

Paper & Paperboard Interlaboratory Testing Program

Report #2972 G, December 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
XCNP9K		GA61	94.33	-0.70	4.14	-0.59	-0.04	-0.04	0.60	VM
		GA62	93.74	-0.74	4.10					
YGZRW2		GA61	94.78	-0.75	3.41	-0.40	-0.01	0.06	0.40	HE
		GA62	94.38	-0.76	3.47					
ZHLTFU		GA61	95.41	-0.75	3.90	-0.34	-0.01	0.14	0.37	EH
		GA62	95.07	-0.76	4.04					

Summary Statistics

Grand Means							
GA61	94.509	-0.618	3.642	-0.400	0.002	0.075	0.416
GA62	94.128	-0.616	3.723				
Stnd Dev Btwn Labs							
GA61	0.917	0.238	0.301	0.089	0.050	0.062	0.084
GA62	0.979	0.266	0.294				

Statistics based on 18 of 19 reporting participants

Comments on Assigned Data Flags for Test #350

7AQ2C9 (X) - High data for "a" values for both samples. High delta "L" value; low delta "E" value.

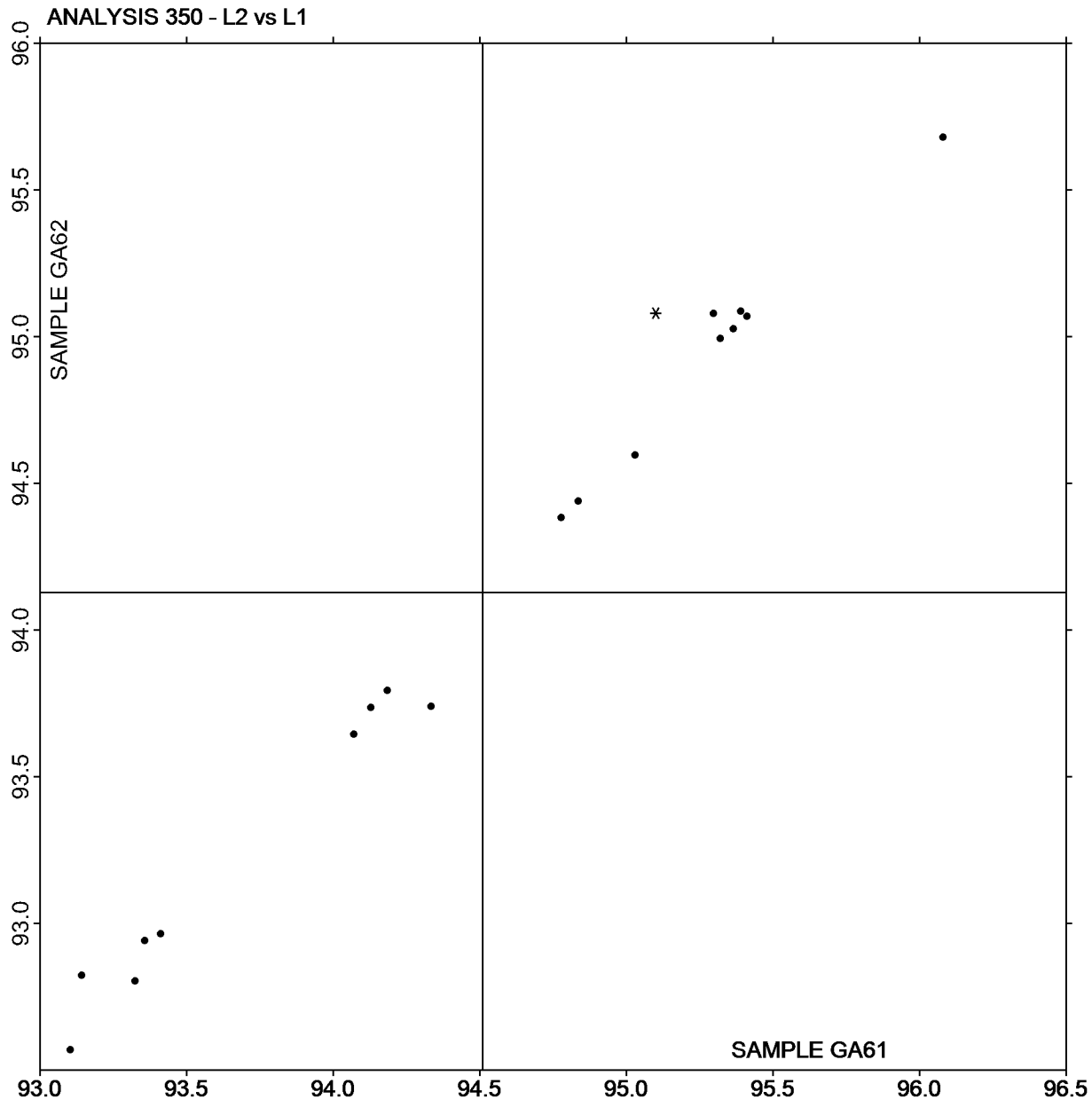
Analysis Notes:

7AQ2C9 - 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

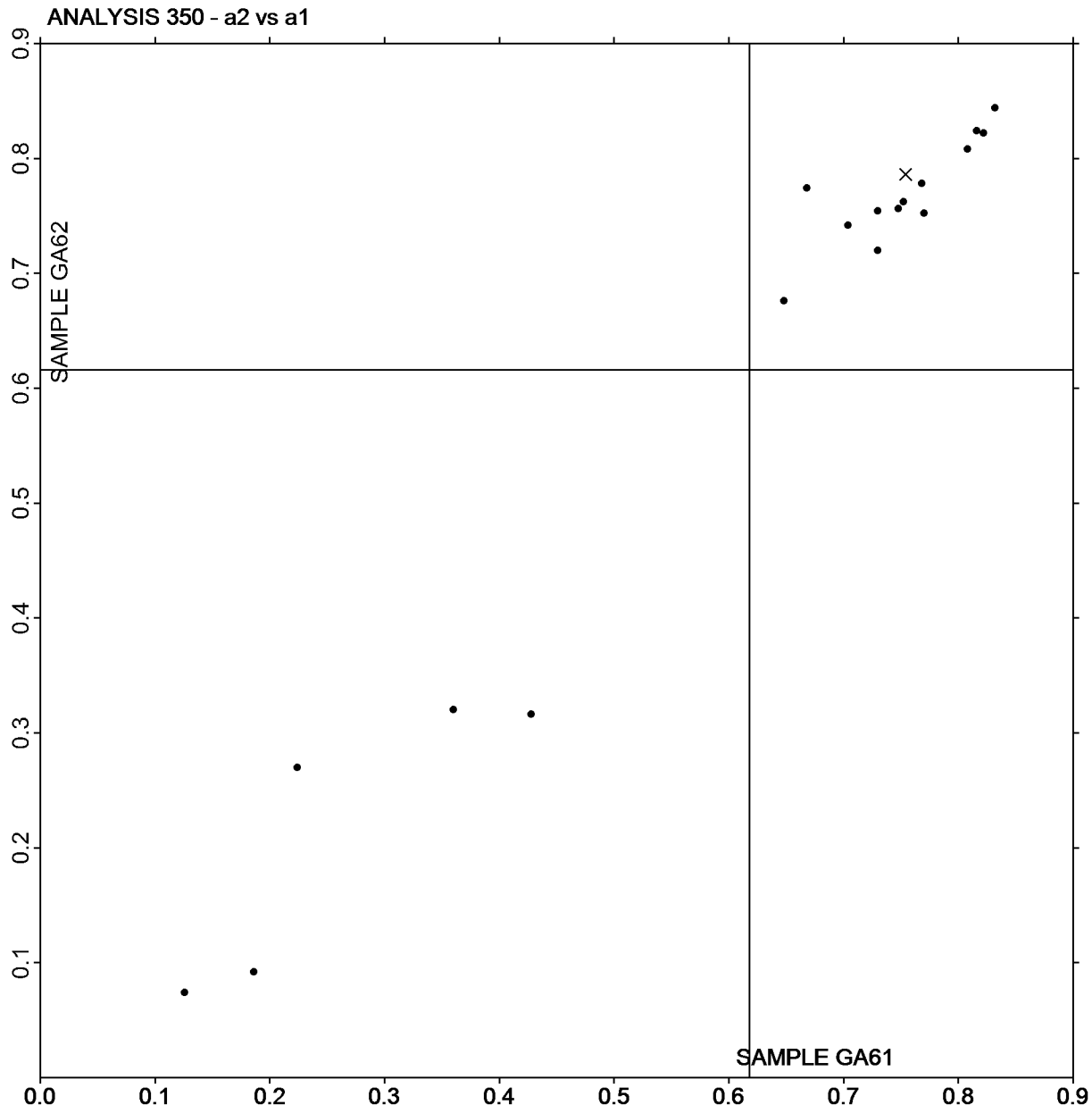
EH	Datacolor Elrepho SF450	HE	Hunter LabScan
LA	L & W Elrepho AL300	LS	L & W Elrepho SE 070
TC	Technidyne Color Touch Series	TS	Technidyne Brightimeter Micro S-5
VM	Valmet PaperLab (was Kajaani/Robotest)	XS	X-Rite 938 Spectrodensitometer
XX	Instrument make/model not specified by lab		

Plot of L values GA62 v L values GA61



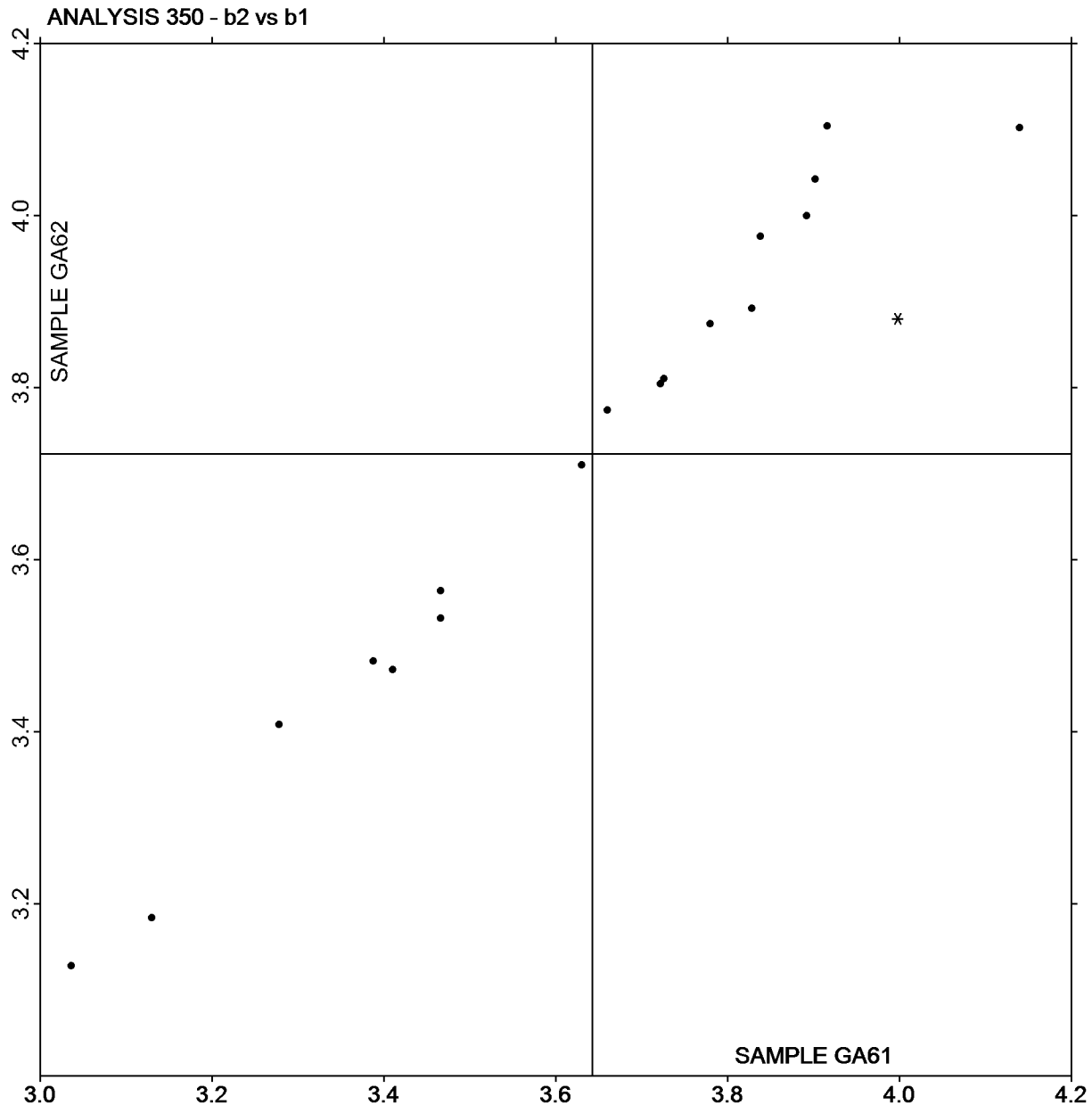
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Plot of a values GA62 v a values GA61



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 GA62 v b values GA61



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 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
7AQ2C9	X	GA61	95.10	0.61	4.01	-0.40	0.00	0.12	0.42	LS
		GA62	94.70	0.61	4.13					
8L2TE9		GA61	95.54	-0.66	3.94	-0.33	-0.05	0.08	0.34	HT
		GA62	95.21	-0.70	4.01					
999RC8		GA61	95.87	-0.52	3.69	-0.32	-0.02	0.11	0.34	HV
		GA62	95.55	-0.54	3.80					
9LDR6B		GA61	95.11	-0.79	3.61	-1.09	-0.01	0.08	1.10 X	XC
		GA62	94.02	-0.80	3.69					
A8Q3LZ		GA61	95.87	-0.62	3.80	-0.40	-0.04	0.10	0.42	HE
		GA62	95.47	-0.67	3.90					
CW6HE9		GA61	95.40	-0.70	3.84	-0.34	0.00	0.14	0.37	EF
		GA62	95.06	-0.70	3.98					
FAH6Z2		GA61	94.23	-0.64	3.36	-0.42	-0.03	0.09	0.43	XA
		GA62	93.81	-0.67	3.45					
HV99PY		GA61	94.51	-0.74	3.50	-0.27	0.08	0.25	0.37	HE
		GA62	94.24	-0.66	3.74					
J8XEC2		GA61	95.40	-0.57	4.20	-0.36	-0.03	0.16	0.40	NG
		GA62	95.04	-0.60	4.37					
K4WRX4		GA61	95.30	-0.65	3.79	-0.33	-0.04	0.09	0.34	TC
		GA62	94.97	-0.69	3.88					
P6XCVE		GA61	95.59	-0.54	3.88	-0.33	-0.02	0.11	0.35	NF
		GA62	95.26	-0.56	3.99					
TT8PE9		GA61	95.04	-0.65	3.59	-0.48	-0.03	0.10	0.49	HE
		GA62	94.57	-0.68	3.69					
TZ7EVD		GA61	95.44	-0.58	3.93	-0.32	-0.04	0.09	0.34	HT
		GA62	95.12	-0.62	4.02					
YPT38W		GA61	95.08	-0.62	3.95	-0.32	-0.03	0.10	0.34	LS
		GA62	94.76	-0.65	4.06					
ZLM2K6		GA61	95.03	-0.65	3.97	-0.36	-0.02	0.15	0.39	EH
		GA62	94.67	-0.66	4.12					

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

Summary Statistics

Grand Means							
GA61	95.236	-0.638	3.804	-0.405	-0.019	0.119	0.430
GA62	94.831	-0.657	3.923				
Stnd Dev Btwn Labs							
GA61	0.447	0.073	0.220	0.205	0.032	0.045	0.197
GA62	0.509	0.065	0.224				

Statistics based on 14 of 15 reporting participants

Comments on Assigned Data Flags for Test #351

7AQ2C9 (X) - Extreme data for "a" values for both samples.

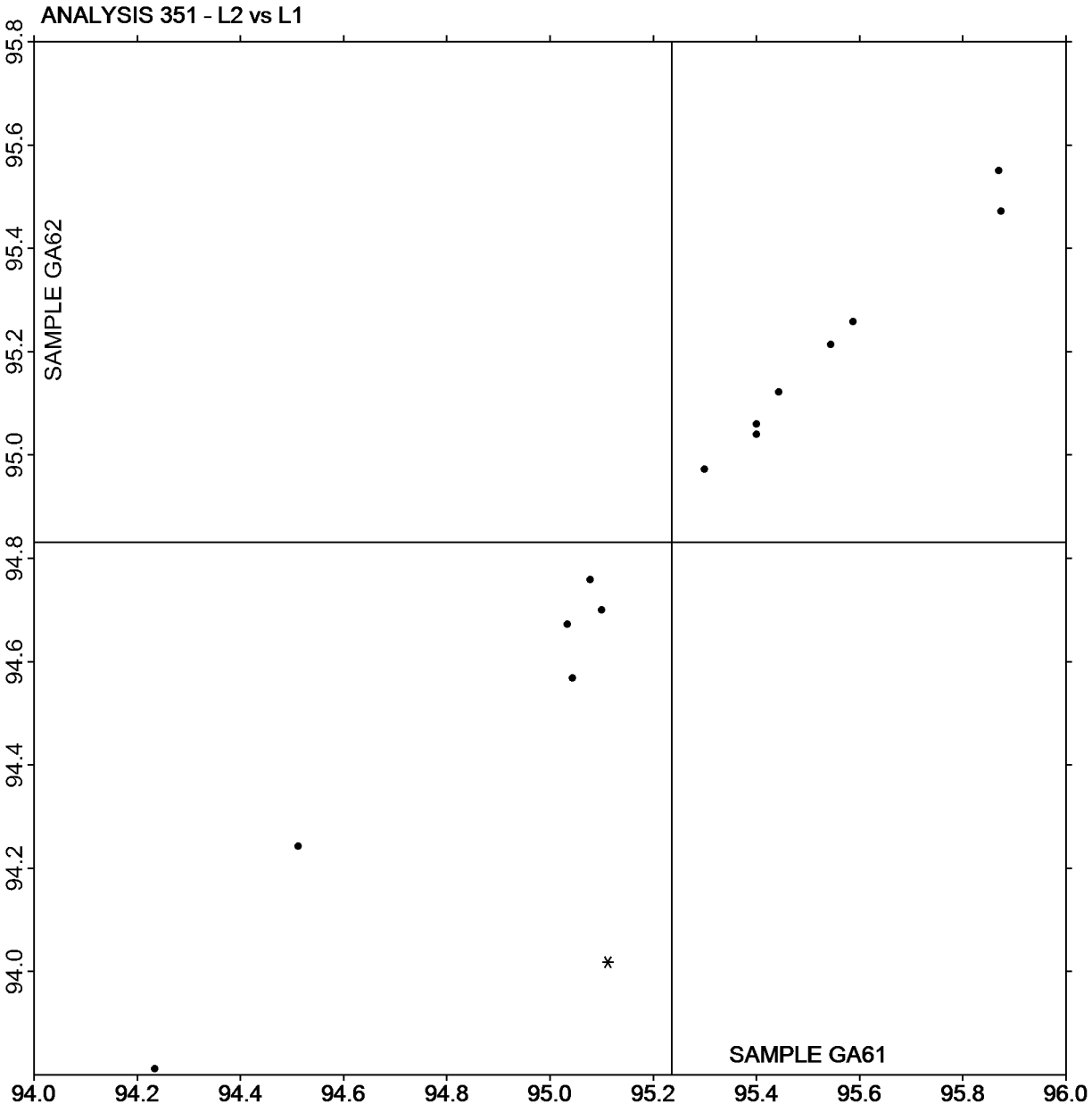
Analysis Notes:

7AQ2C9 - 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

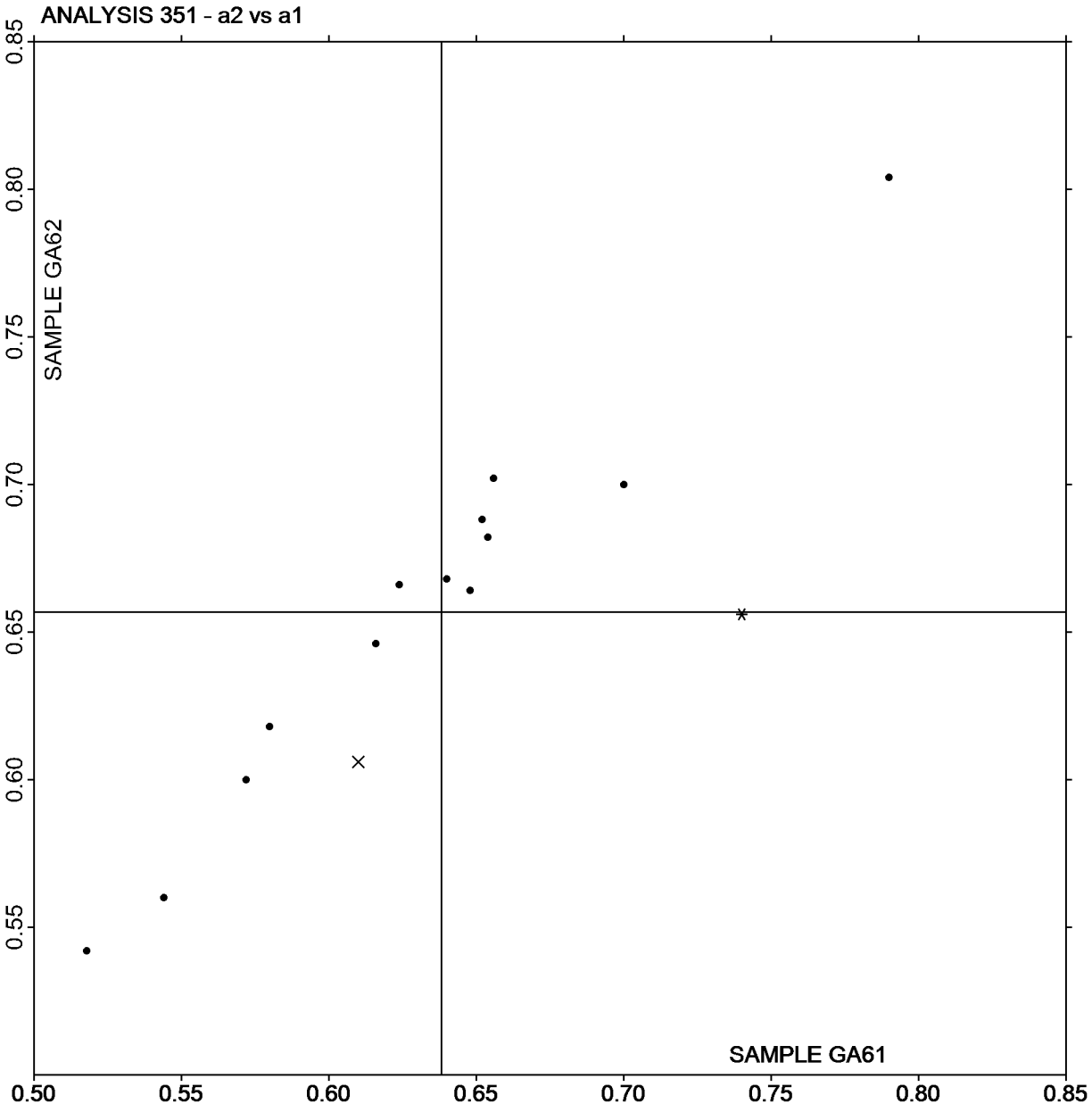
EF	Datacolor Elrepho 3000	EH	Datacolor Elrepho SF450
HE	Hunter LabScan	HT	Hunter UltraScan Vis
HV	Hunter Ultrascan XE	LS	L & W Elrepho SE 070
NF	Minolta CM-3600d Spectrophotometer	NG	Minolta CM-3700d Spectrophotometer
TC	Technidyne Color Touch Series	XA	X-Rite (model not specified)
XC	X-Rite eXact Series		

Plot of L values GA62 v L values GA61



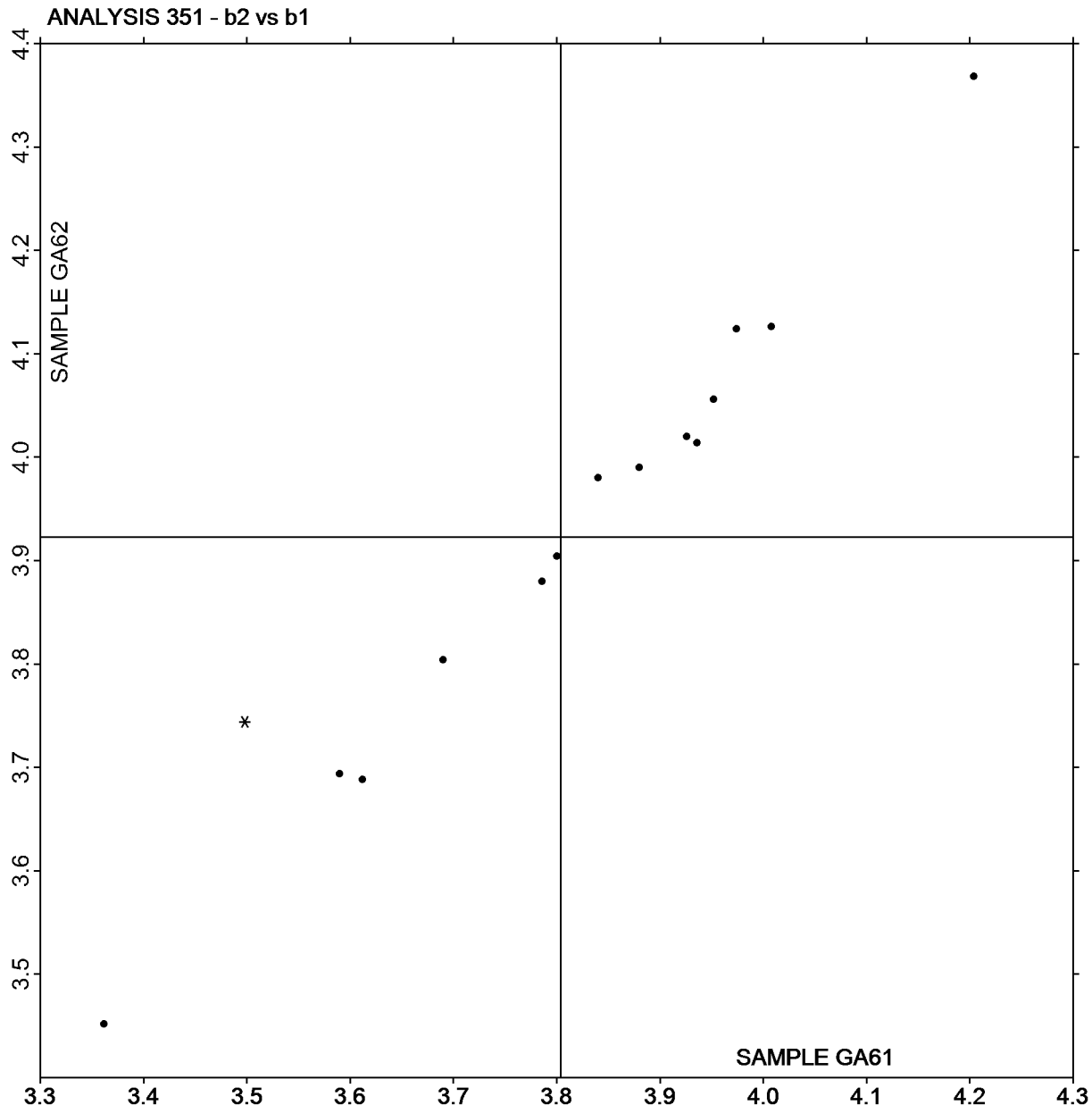
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Plot of a values GA62 v a values GA61



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 GA62 v b values GA61



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

WebCode	Data Flag	Sample GV61 Lab Mean	Sample GV61 Diff from Grand Mean	Sample GV61 CPV	Sample GV62 Lab Mean	Sample GV62 Diff from Grand Mean	Sample GV62 CPV	Instr Code
2FRPX8		5.124	0.158	1.41	5.025	0.064	0.62	TM
34GGVF		4.985	0.019	0.17	4.943	-0.018	-0.17	TA
44V6PF		4.925	-0.041	-0.37	4.992	0.031	0.30	EM
4NHPRQ		4.830	-0.136	-1.22	4.920	-0.041	-0.40	TM
6H9V9E	*	4.663	-0.303	-2.71	4.702	-0.259	-2.50	PP
6VF4PW		4.953	-0.013	-0.12	4.897	-0.064	-0.62	PP
6Z96RB		4.885	-0.081	-0.73	4.905	-0.056	-0.54	LA
6ZAVZE		5.038	0.072	0.64	4.964	0.003	0.03	LA
73FHDJ	*	4.645	-0.321	-2.87	4.730	-0.231	-2.23	PP
7QX8GD		4.991	0.025	0.22	4.968	0.007	0.07	XX
8FXU2X		5.038	0.072	0.64	5.094	0.133	1.29	LA
8L2TE9		5.027	0.061	0.54	5.006	0.045	0.43	EM
999RC8		4.887	-0.079	-0.71	4.832	-0.129	-1.25	TA
9LDR6B		4.894	-0.073	-0.65	5.008	0.047	0.45	LW
A8Q3LZ		5.020	0.054	0.48	5.006	0.045	0.44	TM
BUJHGD		4.961	-0.005	-0.05	4.934	-0.027	-0.26	TA
C7APU9		5.063	0.097	0.86	5.028	0.067	0.64	LW
CWLUWD		5.010	0.044	0.39	4.964	0.003	0.03	LW
D6VKZG		4.982	0.016	0.14	5.021	0.060	0.58	TM
EHFJ4N		4.906	-0.060	-0.54	4.923	-0.038	-0.36	TM
EN46BB		5.049	0.083	0.74	5.101	0.140	1.35	EM
FAH6Z2		4.980	0.014	0.12	4.988	0.027	0.26	LW
FXA4KC		4.940	-0.027	-0.24	4.975	0.014	0.14	LW
G26HHL		4.860	-0.106	-0.95	4.855	-0.106	-1.02	EM
GC4ZC9		5.004	0.038	0.34	4.949	-0.012	-0.12	XX
GGWBCY		5.035	0.069	0.62	5.078	0.117	1.12	PP
J8XEC2		4.876	-0.090	-0.81	4.802	-0.159	-1.53	PP
K4WRX4		4.969	0.002	0.02	5.000	0.039	0.38	PP
L23EWW		5.159	0.193	1.72	5.067	0.105	1.02	LW
LMRF9Y		5.034	0.068	0.61	5.015	0.054	0.52	LW
LZUAGM		5.057	0.091	0.81	5.060	0.099	0.95	LW
MF2MEB		4.869	-0.097	-0.87	4.900	-0.061	-0.59	MS
MJ4LP4		4.940	-0.026	-0.23	4.919	-0.042	-0.41	PP
MVX3E6		5.004	0.037	0.33	4.998	0.037	0.35	LW
MXHQWW		4.998	0.032	0.28	4.981	0.020	0.19	TA
NHLUBD		4.918	-0.048	-0.43	4.873	-0.088	-0.85	LA
P6XCVE		5.048	0.082	0.73	5.091	0.130	1.25	TM
QF8B3R		4.913	-0.053	-0.48	5.027	0.066	0.64	EM
TL8E2P		5.027	0.061	0.54	4.997	0.036	0.35	EM
TRDY9U		4.880	-0.086	-0.77	4.890	-0.071	-0.69	XX

Paper & Paperboard Interlaboratory Testing Program

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

WebCode	Data Flag	Sample GV61 Lab Mean	Sample GV61 Diff from Grand Mean	Sample GV61 CPV	Sample GV62 Lab Mean	Sample GV62 Diff from Grand Mean	Sample GV62 CPV	Instr Code
TU48EP		5.177	0.211	1.88	5.110	0.149	1.44	TM
TZ7EVD		5.025	0.059	0.52	5.012	0.051	0.49	EM
VLY67U		5.024	0.057	0.51	5.064	0.103	1.00	LW
VVA63Q		4.845	-0.121	-1.08	4.772	-0.189	-1.82	MT
VWL4WZ		5.096	0.130	1.16	4.960	-0.001	-0.01	LW
W2RYEE		5.044	0.078	0.69	5.130	0.169	1.63	LW
W9BD2K		4.904	-0.062	-0.56	4.915	-0.046	-0.44	EM
WEF2YR	*	4.756	-0.210	-1.88	4.680	-0.281	-2.71	TA
WWDLAK		5.011	0.045	0.40	5.038	0.077	0.74	TM
Y3T4KX		5.104	0.138	1.23	5.046	0.085	0.82	TM
Z7UAWJ		5.125	0.158	1.41	5.020	0.059	0.57	LW
ZLK82Y		4.750	-0.216	-1.93	4.800	-0.161	-1.55	TM

Summary Statistics	Sample GV61	Sample GV62
Grand Means	4.97 mils	4.96 mils
Stnd Dev Btwn Labs	0.11 mils	0.10 mils

Statistics based on 52 of 52 reporting participants.

Analysis Notes:

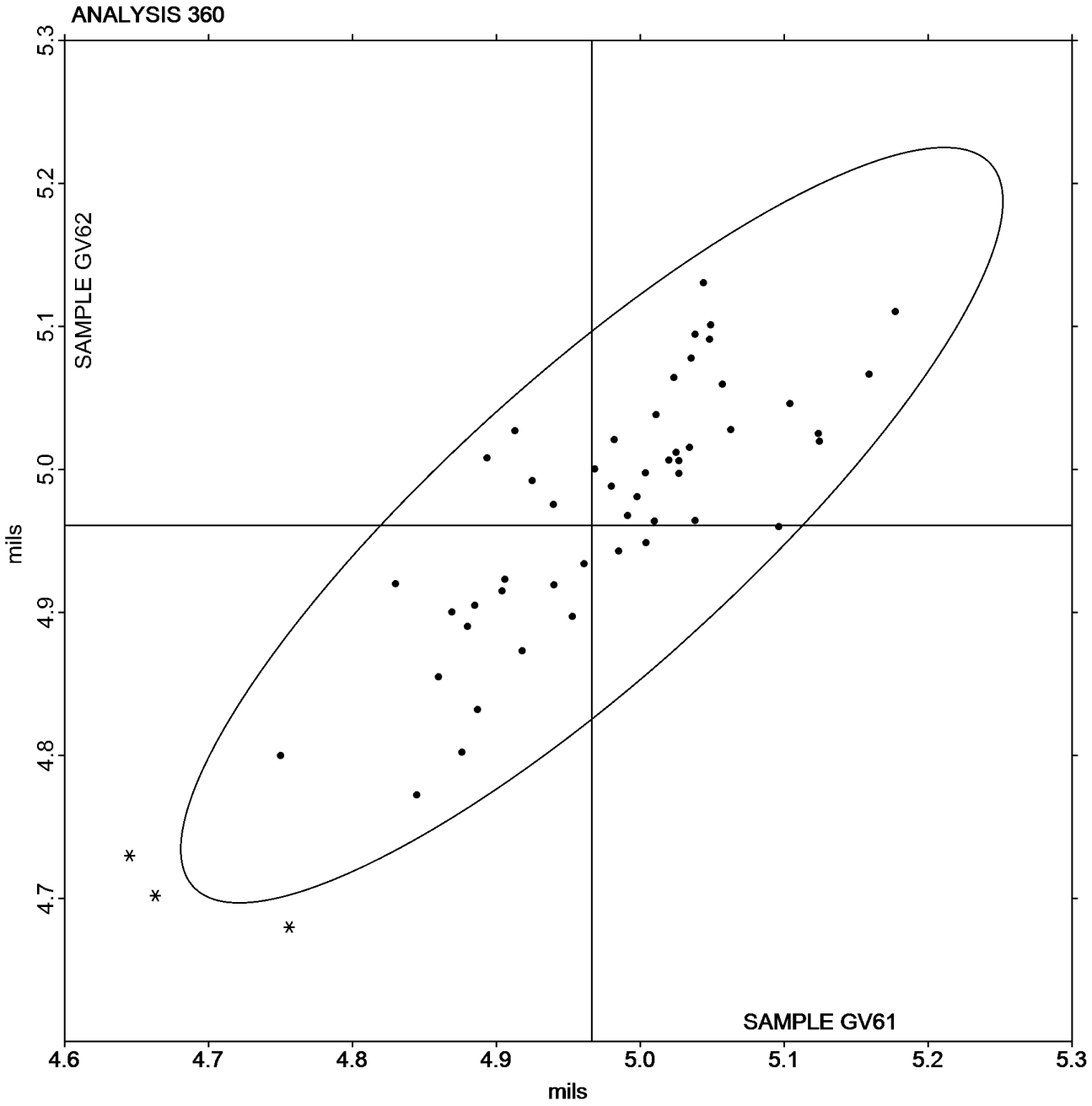
K4WRX4 - Data appear to be reported as micrometers, not mils as indicated on datasheet. Units corrected by CTS.

Key to Instrument Codes Reported by Participants

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

Grand Mean Sample GV61 = 4.9663 mils

Grand Mean Sample GV62 = 4.9610 mils



Paper & Paperboard Interlaboratory Testing Program

Analysis 361

Thickness (Caliper), Packaging papers

TAPPI Official Test Method T411

WebCode	Data Flag	Sample GY61 Lab Mean	Sample GY61 Diff from Grand Mean	Sample GY61 CPV	Sample GY62 Lab Mean	Sample GY62 Diff from Grand Mean	Sample GY62 CPV	Instr Code
24Y997		9.460	-0.105	-0.59	7.510	-0.028	-0.17	TA
34GGVF		9.580	0.015	0.09	7.600	0.062	0.38	TA
3VN4X2		9.560	-0.005	-0.03	7.490	-0.048	-0.29	TM
6FJNP3		9.490	-0.075	-0.42	7.495	-0.043	-0.26	TA
7AQ2C9		9.579	0.014	0.08	7.496	-0.042	-0.25	TM
7BLKCP		9.619	0.054	0.31	7.439	-0.099	-0.60	LW
8FXU2X		9.713	0.148	0.83	7.748	0.210	1.28	LA
8FYMXK		9.614	0.049	0.28	7.635	0.097	0.59	TM
8WHHCT		9.628	0.063	0.36	7.592	0.054	0.33	TM
A24C2P		9.508	-0.057	-0.32	7.433	-0.105	-0.64	LW
AZU8PM		9.480	-0.085	-0.48	7.510	-0.028	-0.17	TA
BUJHGD		9.602	0.037	0.21	7.635	0.097	0.59	TA
CHMPTM		9.618	0.053	0.30	7.630	0.092	0.56	TM
D4HVQC		9.634	0.069	0.39	7.575	0.037	0.23	LW
EA2DP7	*	10.138	0.573	3.23	8.051	0.514	3.14	LW
FXA4KC		9.802	0.238	1.34	7.668	0.131	0.80	LW
GGWBCY		9.520	-0.045	-0.25	7.646	0.108	0.66	LW
H849H3		9.496	-0.069	-0.39	7.500	-0.038	-0.23	LW
HCHYQH		9.726	0.161	0.91	7.623	0.085	0.52	EM
HV99PY		9.335	-0.230	-1.30	7.335	-0.203	-1.24	EM
JTH98U		9.629	0.064	0.36	7.544	0.006	0.04	LA
PBLW2F		9.530	-0.035	-0.20	7.460	-0.078	-0.47	LA
QDJR2U		9.410	-0.155	-0.87	7.350	-0.188	-1.15	TM
TT8PE9		9.551	-0.014	-0.08	7.562	0.024	0.15	EM
TU48EP		9.717	0.152	0.85	7.681	0.144	0.88	TM
VL3RJ2	*	9.103	-0.461	-2.60	7.039	-0.499	-3.05	TM
VN9Y3U		9.417	-0.148	-0.83	7.445	-0.093	-0.57	MM
VP4VBN		9.502	-0.063	-0.35	7.540	0.002	0.01	TM
VWJGFL		9.560	-0.005	-0.03	7.490	-0.048	-0.29	LA
WEF2YR		9.329	-0.236	-1.33	7.310	-0.228	-1.39	TA
XCNP9K		9.526	-0.039	-0.22	7.508	-0.030	-0.18	VP
YGZRW2		9.542	-0.023	-0.13	7.415	-0.123	-0.75	EM
YPT38W		9.612	0.047	0.27	7.584	0.046	0.28	LA
Z7UAWJ		9.763	0.198	1.11	7.733	0.195	1.19	XX
ZLK82Y	*	9.230	-0.335	-1.89	7.370	-0.168	-1.02	TM
ZLM2K6		9.813	0.248	1.40	7.712	0.174	1.06	EM

Paper & Paperboard Interlaboratory Testing Program

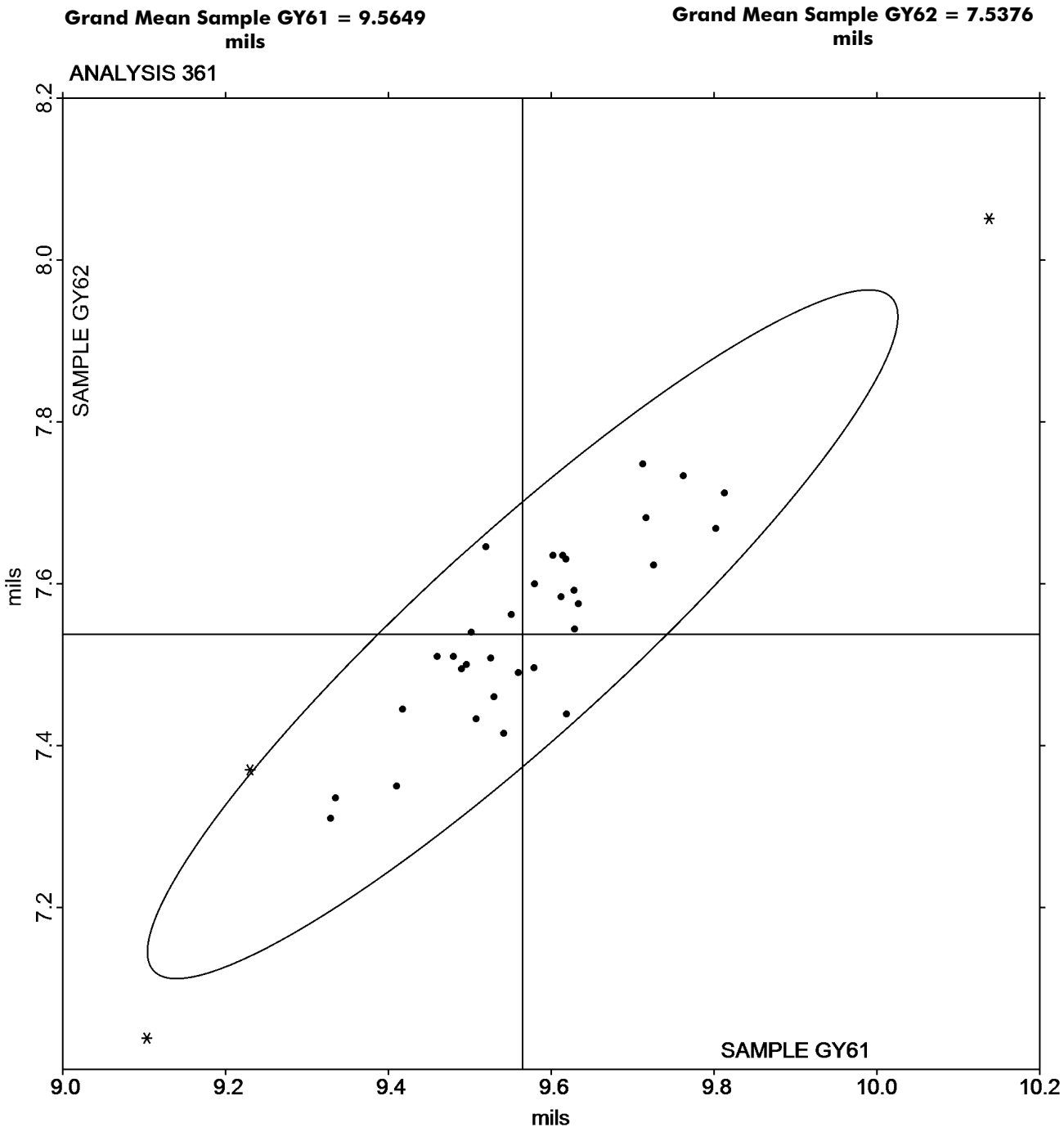
Analysis 361
Thickness (Caliper), Packaging papers
TAPPI Official Test Method T411

Summary Statistics	Sample GY61	Sample GY62
Grand Means	9.56 mils	7.54 mils
Stnd Dev Btwn Labs	0.18 mils	0.16 mils

Statistics based on 36 of 36 reporting participants.

Key to Instrument Codes Reported by Participants

EM	Emveco	LA	L & W Autoline
LW	L & W	MM	Mitutoyo Digital Micrometer
TA	Thwing-Albert	TM	TMI
VP	Valmet Paper Lab	XX	Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Analysis 364

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

TAPPI Official Test Method T549

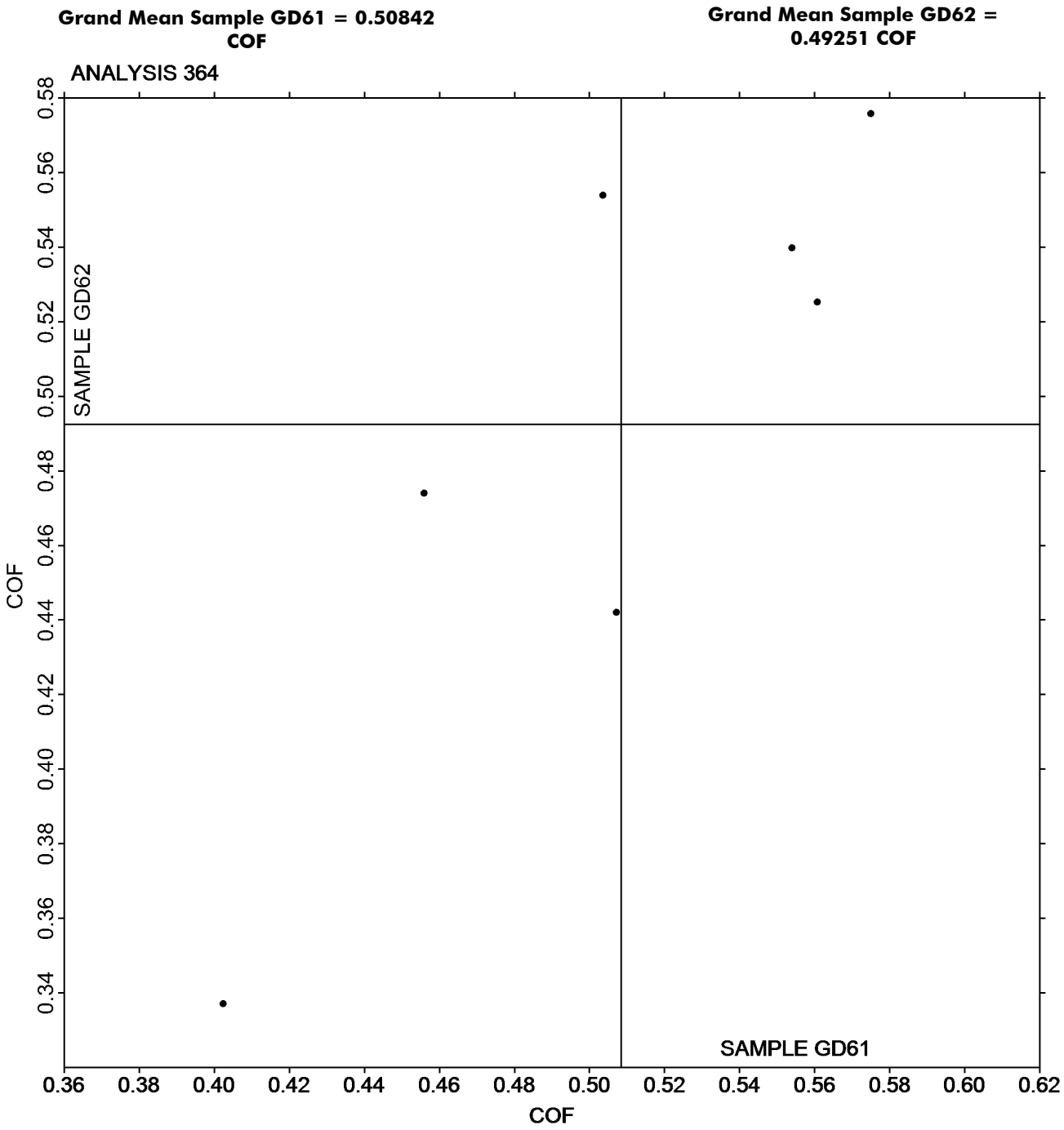
WebCode	Data Flag	Sample GD61 Lab Mean	Sample GD61 Diff from Grand Mean	Sample GD61 CPV	Sample GD62 Lab Mean	Sample GD62 Diff from Grand Mean	Sample GD62 CPV	Instr Code
4NHPRQ		0.4024	-0.1060	-1.70	0.3370	-0.1555	-1.88	XX
4WB3P6		0.5750	0.0666	1.07	0.5758	0.0833	1.01	TA
999RC8		0.4560	-0.0524	-0.84	0.4740	-0.0185	-0.22	TA
JE2B7Y		0.5607	0.0523	0.84	0.5252	0.0327	0.40	CH
QF8B3R		0.5540	0.0456	0.73	0.5398	0.0473	0.57	TA
ULAABM		0.5072	-0.0012	-0.02	0.4420	-0.0505	-0.61	IT
Z7UAWJ		0.5036	-0.0048	-0.08	0.5538	0.0613	0.74	TL

Summary Statistics	Sample GD61	Sample GD62
Grand Means	0.51 COF	0.49 COF
Stnd Dev Btwn Labs	0.06 COF	0.08 COF

Statistics based on 7 of 7 reporting participants.

Key to Instrument Codes Reported by Participants

CH	Cheminstruments AR-1000	IT	IMASS SP-2100
TA	Thwing-Albert Friction Tester	TL	TMI 32-90 Lab Master/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

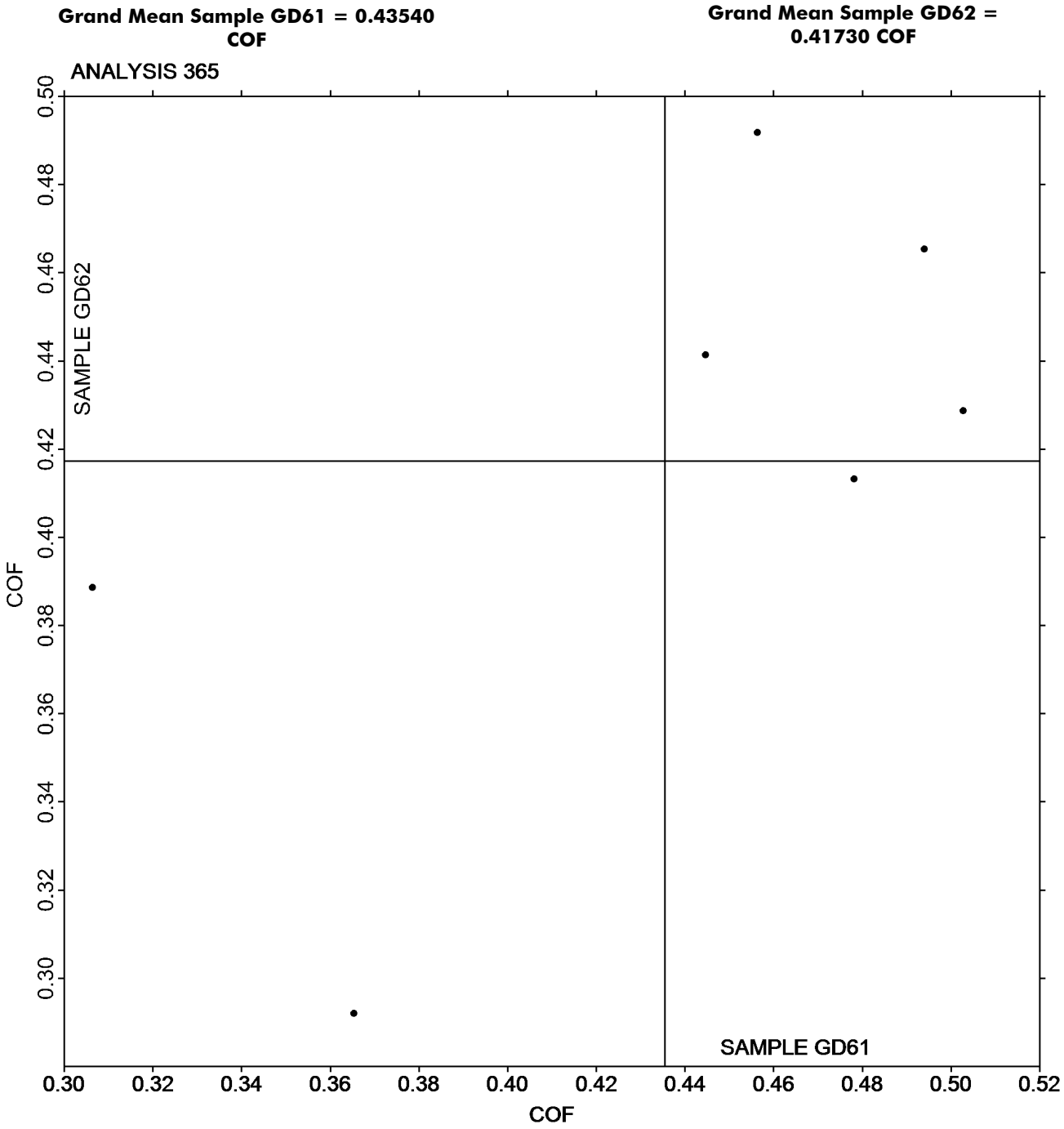
WebCode	Data Flag	Sample GD61 Lab Mean	Sample GD61 Diff from Grand Mean	Sample GD61 CPV	Sample GD62 Lab Mean	Sample GD62 Diff from Grand Mean	Sample GD62 CPV	Instr Code
4NHPRQ		0.3064	-0.1290	-1.77	0.3886	-0.0287	-0.44	XX
4WB3P6		0.4782	0.0428	0.59	0.4132	-0.0041	-0.06	TA
DCV292		0.4940	0.0586	0.80	0.4654	0.0481	0.74	TA
JE2B7Y		0.5028	0.0674	0.92	0.4287	0.0114	0.18	CH
ULAABM		0.3654	-0.0700	-0.96	0.2920	-0.1253	-1.94	IR
W9BD2K		0.4446	0.0092	0.13	0.4414	0.0241	0.37	TA
Z7UAWJ		0.4564	0.0210	0.29	0.4918	0.0745	1.15	TL

Summary Statistics	Sample GD61	Sample GD62
Grand Means	0.44 COF	0.42 COF
Stnd Dev Btwn Labs	0.07 COF	0.06 COF

Statistics based on 7 of 7 reporting participants.

Key to Instrument Codes Reported by Participants

CH	Cheminstruments AR-1000	IR	IMASS SP-2000
TA	Thwing-Albert Friction Tester	TL	TMI 32-90 Lab Master/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 GE61 Lab Mean	Sample GE61 Diff from Grand Mean	Sample GE61 CPV	Sample GE62 Lab Mean	Sample GE62 Diff from Grand Mean	Sample GE62 CPV	Instr Code
34GGVF		29.00	0.34	0.25	26.20	0.38	0.33	GA
3VN4X2		29.51	0.85	0.61	27.58	1.76	1.54	TL
44V6PF		26.92	-1.73	-1.24	24.49	-1.33	-1.16	PP
4NHPRQ		30.20	1.54	1.11	26.20	0.38	0.33	GS
4WB3P6		28.91	0.25	0.18	25.98	0.16	0.14	WG
6H9V9E		29.44	0.78	0.56	26.43	0.61	0.53	PP
6Z96RB		30.76	2.11	1.51	28.27	2.46	2.14	LA
73FHDJ		29.93	1.27	0.91	27.09	1.27	1.11	HG
78N42F		29.89	1.24	0.89	26.03	0.22	0.19	PP
7JGP36		29.90	1.24	0.89	25.08	-0.74	-0.64	GA
8L2TE9		30.17	1.51	1.09	27.03	1.21	1.06	HG
999RC8		25.79	-2.86	-2.05	23.63	-2.18	-1.90	PP
9D4GY7		28.12	-0.54	-0.38	24.99	-0.83	-0.72	XX
9LDR6B		27.50	-1.16	-0.83	25.00	-0.82	-0.71	LW
BUJHGD		29.93	1.27	0.91	25.90	0.08	0.07	PP
CVUTY3		28.10	-0.56	-0.40	26.61	0.79	0.69	LP
CW6HE9		30.85	2.19	1.57	28.57	2.75	2.40	LP
CWLUWD		27.03	-1.63	-1.16	24.77	-1.05	-0.91	LP
D4HVQC		26.81	-1.85	-1.32	25.78	-0.04	-0.03	LP
D6VKZG		28.81	0.15	0.11	25.33	-0.49	-0.43	LW
EA2DP7		28.68	0.02	0.02	25.75	-0.07	-0.06	LW
EHFJ4N		28.26	-0.40	-0.28	25.25	-0.57	-0.49	LP
EN46BB		28.55	-0.11	-0.08	25.57	-0.25	-0.22	PP
FNZYA7		27.36	-1.30	-0.93	25.67	-0.15	-0.13	PP
GGWBCY		29.61	0.95	0.68	26.34	0.52	0.46	PP
H849H3		28.28	-0.37	-0.27	24.87	-0.95	-0.83	TL
HV99PY		29.92	1.27	0.91	25.96	0.14	0.12	PP
L23EWW		26.18	-2.48	-1.77	25.89	0.07	0.06	LP
MJ4LP4		29.06	0.40	0.29	24.99	-0.83	-0.72	PP
MXHQWW		28.09	-0.56	-0.40	25.68	-0.14	-0.12	PP
NHLUBD		29.40	0.74	0.53	24.41	-1.41	-1.23	LA
P6XCVE		28.04	-0.62	-0.44	23.97	-1.85	-1.61	PR
QDJR2U		30.95	2.29	1.64	27.95	2.13	1.86	TL
RAVMYP	*	26.81	-1.84	-1.32	26.65	0.83	0.72	PP
RF7V7K		28.88	0.22	0.16	26.12	0.30	0.26	LA
TRDY9U		27.67	-0.99	-0.71	25.30	-0.52	-0.45	XX
TZ7EVD		29.25	0.59	0.43	26.67	0.85	0.74	PP
VLY67U		28.68	0.02	0.02	26.61	0.79	0.69	LP
VWJGFL		29.70	1.04	0.75	25.40	-0.42	-0.36	LA
VWL4WZ		27.27	-1.39	-0.99	23.65	-2.17	-1.89	LP

Paper & Paperboard Interlaboratory Testing Program

Analysis 370

Air Resistance - Gurley Oil Type

TAPPI Official Test Method T460

WebCode	Data Flag	Sample GE61 Lab Mean	Sample GE61 Diff from Grand Mean	Sample GE61 CPV	Sample GE62 Lab Mean	Sample GE62 Diff from Grand Mean	Sample GE62 CPV	Instr Code
X9APFZ		30.19	1.53	1.10	27.42	1.60	1.40	XX
XCNP9K		31.36	2.70	1.94	27.00	1.18	1.03	VM
Y3T4KX		27.29	-1.37	-0.98	24.87	-0.95	-0.83	HG
Z3T78G		25.85	-2.81	-2.01	23.96	-1.86	-1.62	LP
Z7UAWJ		27.69	-0.97	-0.69	25.28	-0.54	-0.47	LP
ZHLTFU		27.55	-1.11	-0.79	25.43	-0.38	-0.34	RE

Summary Statistics	Sample GE61	Sample GE62
Grand Means	28.66 sec/100 cc	25.82 sec/100 cc
Stnd Dev Btwn Labs	1.40 sec/100 cc	1.15 sec/100 cc

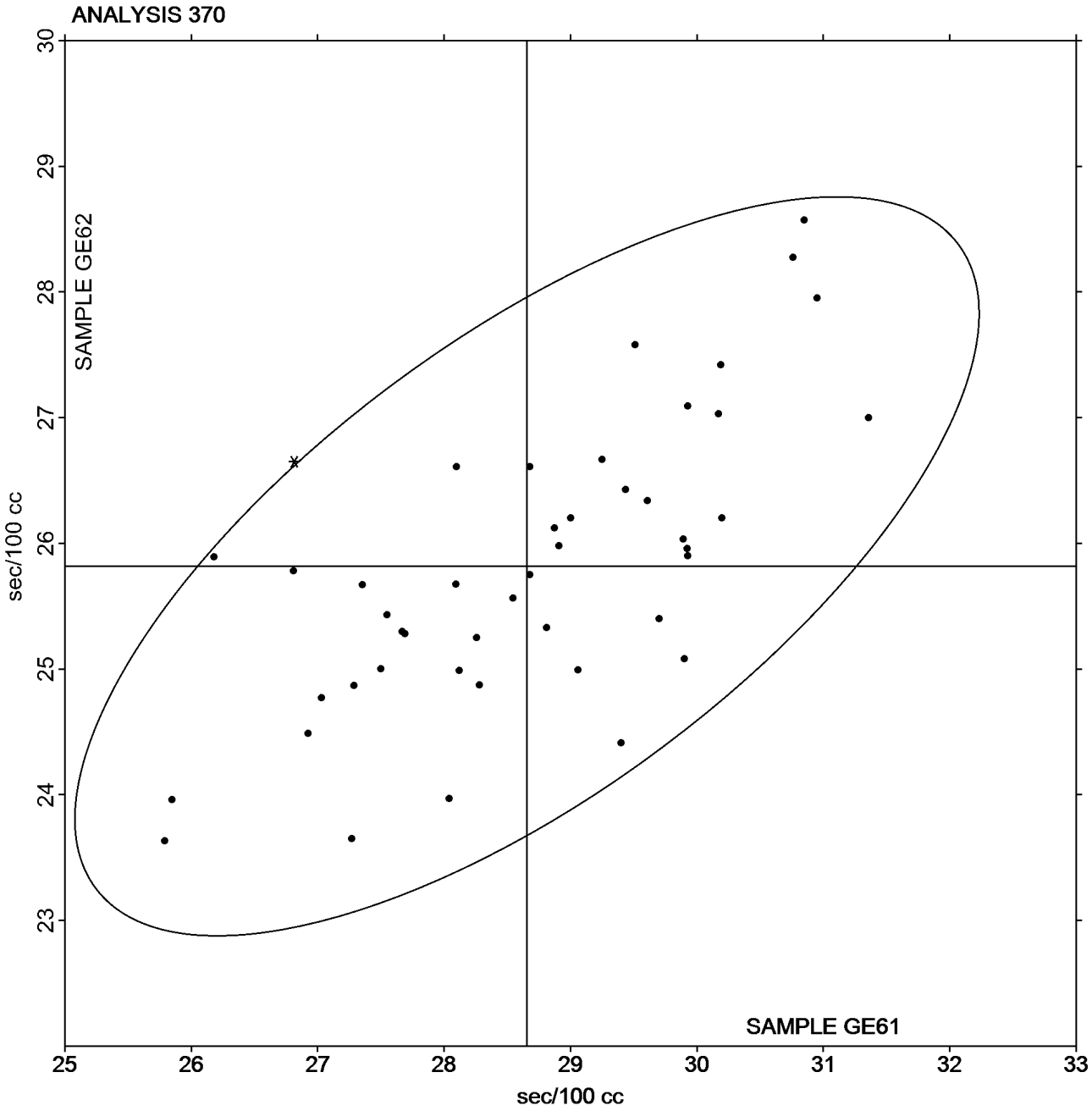
Statistics based on 46 of 46 reporting participants.

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
VM	Valmet PaperLab (was Kajaani/Robotest)	WG	W & LE Gurley Tester
XX	Instrument make/model not specified by lab		

Grand Mean Sample GE61 = 28.655 sec/100 cc

Grand Mean Sample GE62 = 25.818 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 GE61 Lab Mean	Sample GE61 Diff from Grand Mean	Sample GE61 CPV	Sample GE62 Lab Mean	Sample GE62 Diff from Grand Mean	Sample GE62 CPV	Instr Code
34GGVF		100.6	-0.8	-0.13	114.2	3.4	0.68	GA
3ZUWPC		88.2	-13.3	-2.02	102.6	-8.1	-1.60	GA
4NHPRQ		111.0	9.6	1.46	113.0	2.2	0.44	SH
4U7CKB	X	43.8	-57.6	-8.77	39.1	-71.7	-14.07	TT
K4WRX4	X	28.4	-73.0	-11.11	25.7	-85.1	-16.71	PP
L9Q4G8		103.5	2.1	0.32	105.6	-5.2	-1.01	HM
MXHQWW		105.4	4.0	0.60	110.2	-0.6	-0.11	HM
TRDY9U		100.0	-1.4	-0.22	109.0	-1.8	-0.34	XX
WWDLAK		103.8	2.4	0.36	118.8	8.0	1.58	SH
XCNP9K		98.9	-2.5	-0.38	112.6	1.9	0.37	PP

Summary Statistics	Sample GE61	Sample GE62
Grand Means	101.42 Sheffield Units	110.75 Sheffield Units
Stnd Dev Btwn Labs	6.57 Sheffield Units	5.09 Sheffield Units

Statistics based on 8 of 10 reporting participants.

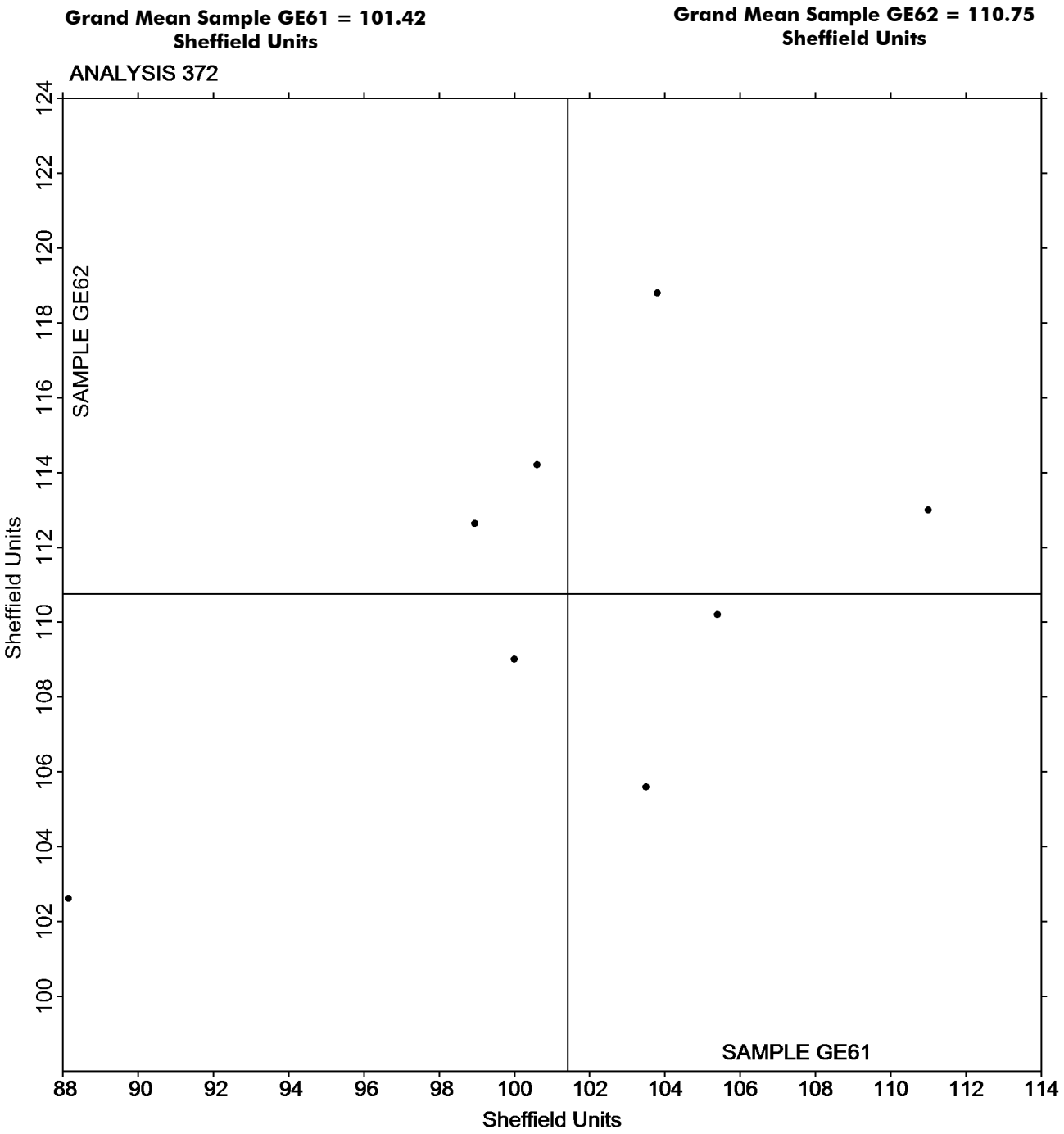
Comments on Assigned Data Flags for Test #372

4U7CKB (X) - Extreme Data.

K4WRX4 (X) - Extreme Data.

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

Report #2972G, December 2018

Analysis 376

Roughness - Print Surf Method - 0.5 to 4.0 Microns

TAPPI Official Test Method T555

WebCode	Data Flag	Sample GJ61 Lab Mean	Sample GJ61 Diff from Grand Mean	Sample GJ61 CPV	Sample GJ62 Lab Mean	Sample GJ62 Diff from Grand Mean	Sample GJ62 CPV	Instr Code
29VUZA		0.8670	0.0292	0.28	0.7890	-0.0490	-0.57	ZZ
44V6PF		0.8040	-0.0338	-0.33	0.8820	0.0440	0.51	ZZ
4WB3P6		0.6530	-0.1848	-1.79	0.7210	-0.1170	-1.37	ZZ
6ZAVZE		0.7220	-0.1158	-1.12	0.8210	-0.0170	-0.20	ZZ
73FHDJ		0.9290	0.0912	0.88	0.8380	0.0000	0.00	ZZ
7AQ2C9		0.6120	-0.2258	-2.19	0.6950	-0.1430	-1.67	ZZ
7BLKCP		0.8560	0.0182	0.18	0.8060	-0.0320	-0.37	ZZ
999RC8		0.7950	-0.0428	-0.41	0.8790	0.0410	0.48	ZZ
BUJHGD		0.8420	0.0042	0.04	0.7730	-0.0650	-0.76	ZZ
DCV292		0.7830	-0.0548	-0.53	0.8170	-0.0210	-0.24	ZZ
EHFJ4N		0.9860	0.1482	1.44	0.8960	0.0580	0.68	ZZ
EN46BB		0.8690	0.0312	0.30	0.7850	-0.0530	-0.62	ZZ
FXA4KC		0.8940	0.0562	0.54	0.8280	-0.0100	-0.12	ZZ
G26HHL		1.0370	0.1992	1.93	1.0370	0.1990	2.32	ZZ
H7AKZ8		0.9050	0.0672	0.65	0.8090	-0.0290	-0.34	ZZ
HCHYQH		0.7740	-0.0638	-0.62	0.8480	0.0100	0.12	ZZ
J6UJTY	*	0.9580	0.1202	1.16	1.0870	0.2490	2.91	ZZ
L9Q4G8		0.7240	-0.1138	-1.10	0.7880	-0.0500	-0.58	ZZ
MVX3E6		0.8580	0.0202	0.20	0.7840	-0.0540	-0.63	ZZ
PBLW2F		0.9170	0.0792	0.77	0.8180	-0.0200	-0.23	ZZ
RLCA8P	X	1.8460	1.0082	9.77	1.8350	0.9970	11.64	ZZ
TCM26E		0.7220	-0.1158	-1.12	0.7210	-0.1170	-1.37	ZZ
TL8E2P		0.7700	-0.0678	-0.66	0.8600	0.0220	0.26	ZZ
TT8PE9		0.8420	0.0042	0.04	0.8360	-0.0020	-0.02	ZZ
TU48EP		0.7830	-0.0548	-0.53	0.8470	0.0090	0.11	ZZ
VAA7FR		0.9240	0.0862	0.83	0.8090	-0.0290	-0.34	ZZ
W2RYEE		1.0320	0.1942	1.88	1.0090	0.1710	2.00	ZZ
XCNP9K	X	1.2830	0.4452	4.31	0.9150	0.0770	0.90	ZZ
YGZRW2		0.7510	-0.0868	-0.84	0.8320	-0.0060	-0.07	ZZ
YPT38W		0.8770	0.0392	0.38	0.8300	-0.0080	-0.09	ZZ
ZLM2K6		0.8110	-0.0268	-0.26	0.8560	0.0180	0.21	ZZ

Summary Statistics	Sample GJ61	Sample GJ62
Grand Means	0.84 Microns	0.84 Microns
Stnd Dev Btwn Labs	0.10 Microns	0.09 Microns

Statistics based on 29 of 31 reporting participants.

Comments on Assigned Data Flags for Test #376

XCNP9K (X) - Data for sample GJ61 are high.

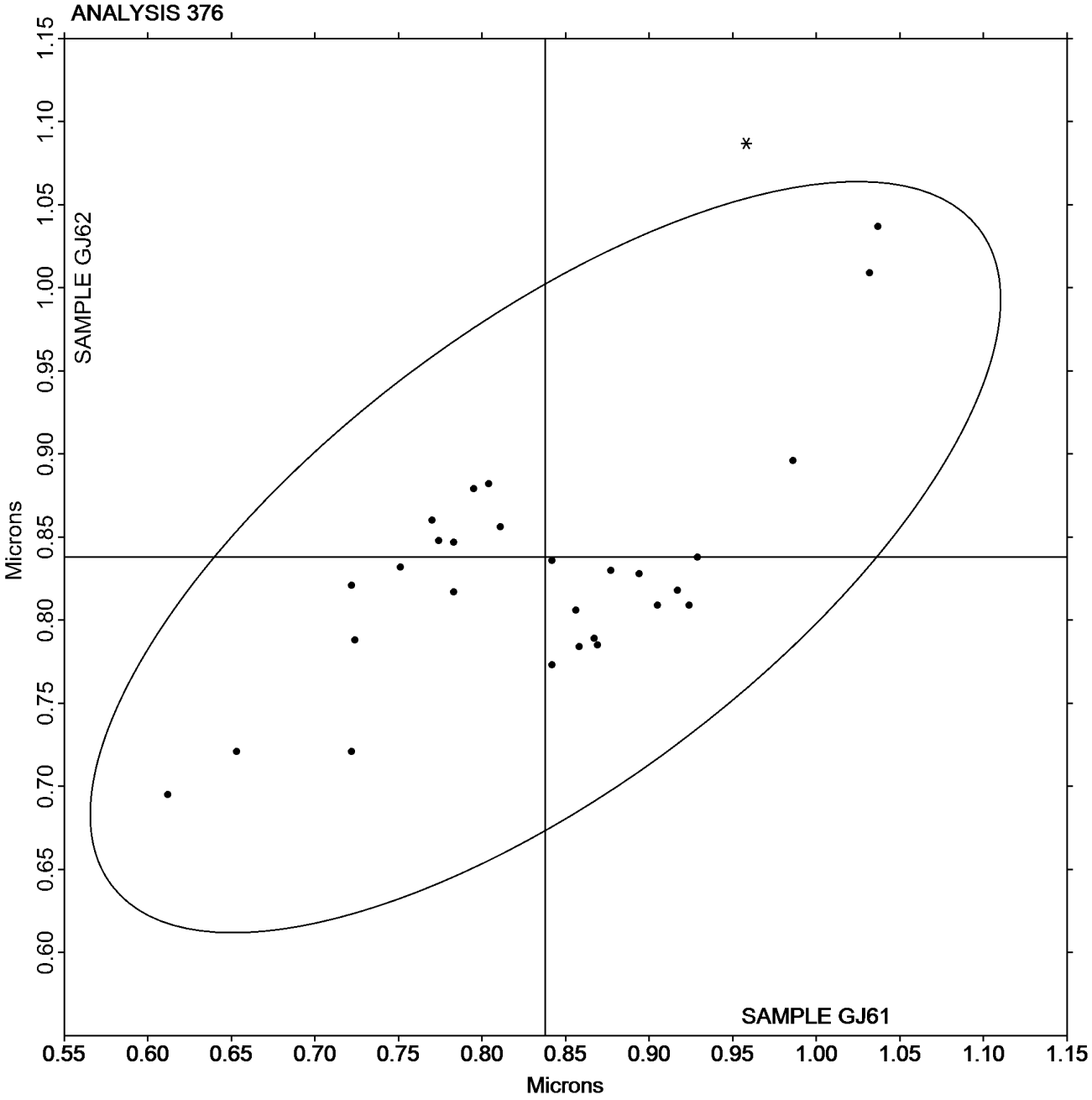
RLCA8P (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Grand Mean Sample GJ61 = 0.83783 Microns

Grand Mean Sample GJ62 = 0.83797 Microns



Paper & Paperboard Interlaboratory Testing Program

Analysis 377

Roughness - Print Surf Method - 2.5 to 6.0 Microns

TAPPI Official Test Method T555

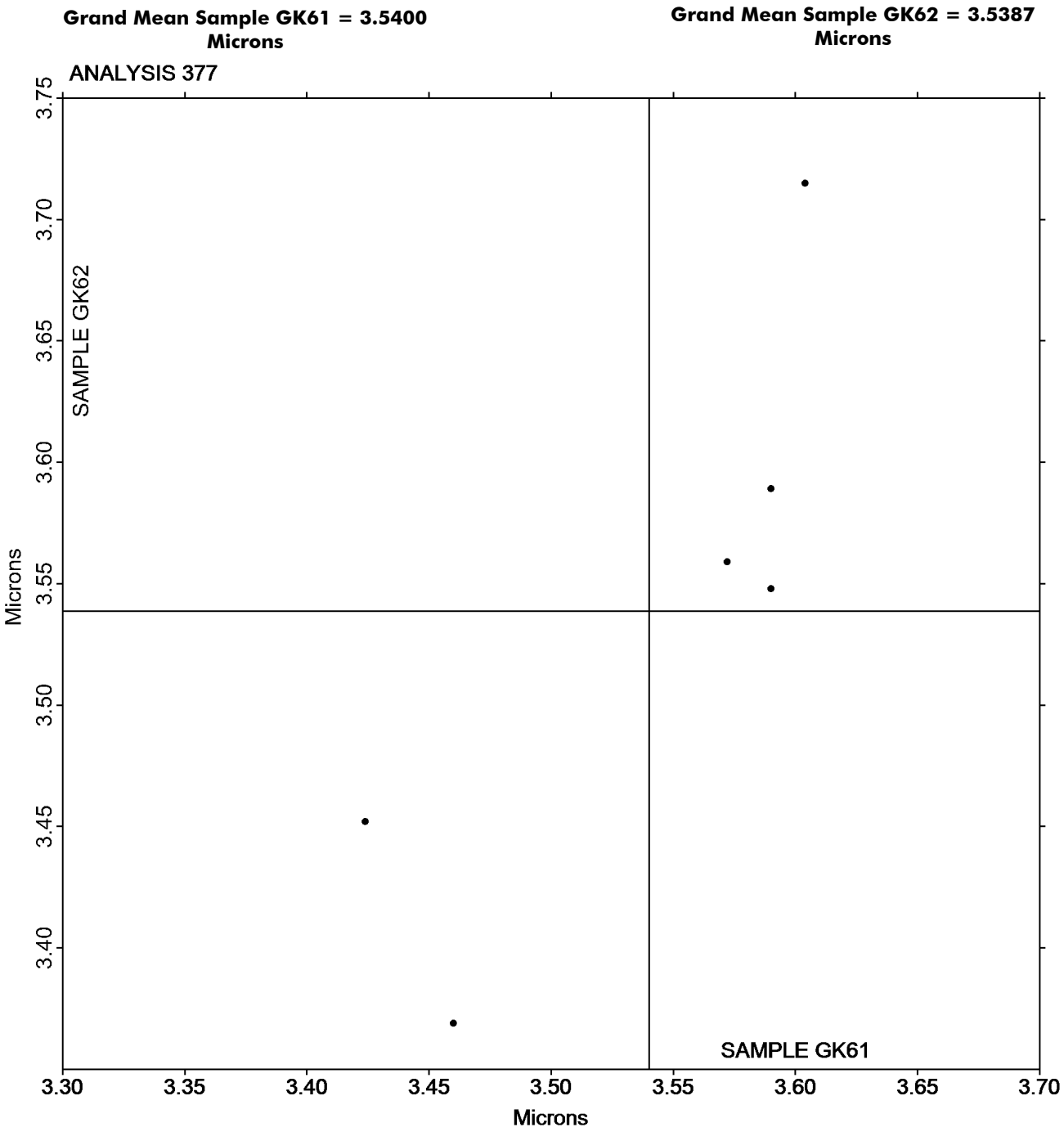
WebCode	Data Flag	Sample GK61 Lab Mean	Sample GK61 Diff from Grand Mean	Sample GK61 CPV	Sample GK62 Lab Mean	Sample GK62 Diff from Grand Mean	Sample GK62 CPV	Instr Code
4WB3P6		3.460	-0.080	-1.03	3.369	-0.170	-1.43	ZZ
GGWBCY		3.590	0.050	0.65	3.548	0.009	0.08	ZZ
HV99PY		3.604	0.064	0.83	3.715	0.176	1.49	ZZ
NHLUBD		3.424	-0.116	-1.50	3.452	-0.087	-0.73	ZZ
QF8B3R		3.590	0.050	0.65	3.589	0.050	0.42	ZZ
Z7UAWJ		3.572	0.032	0.41	3.559	0.020	0.17	ZZ

Summary Statistics	Sample GK61	Sample GK62
Grand Means	3.54 Microns	3.54 Microns
Stnd Dev Btwn Labs	0.08 Microns	0.12 Microns

Statistics based on 6 of 6 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 GL61 Lab Mean	Sample GL61 Diff from Grand Mean	Sample GL61 CPV	Sample GL62 Lab Mean	Sample GL62 Diff from Grand Mean	Sample GL62 CPV	Instr Code
24Y997		126.3	3.8	0.48	140.0	-7.6	-0.96	PP
34GGVF		109.6	-12.9	-1.63	147.4	-0.2	-0.02	PP
3ZUWPC		125.3	2.8	0.36	138.2	-9.4	-1.19	GA
44V6PF		106.0	-16.5	-2.09	143.7	-3.9	-0.49	PP
4NHPRQ		138.2	15.7	1.99	150.3	2.7	0.34	XX
4WB3P6		136.2	13.7	1.73	165.5	17.9	2.26	XX
6FJNP3		115.5	-7.0	-0.89	144.4	-3.2	-0.40	PP
6H9V9E		125.9	3.4	0.43	152.8	5.3	0.66	PP
6Z96RB		106.0	-16.5	-2.08	132.2	-15.4	-1.94	LA
73FHDJ		126.4	3.9	0.49	148.1	0.5	0.07	HM
78N42F		121.8	-0.7	-0.08	146.0	-1.6	-0.20	PP
7AQ2C9	*	143.3	20.8	2.63	156.8	9.2	1.16	TT
7BLKCP		120.9	-1.6	-0.20	144.0	-3.6	-0.45	LA
7QX8GD		128.5	6.0	0.76	151.5	3.9	0.49	XX
8L2TE9		123.9	1.4	0.18	146.4	-1.2	-0.15	HM
8WHHCT		138.0	15.5	1.96	155.6	8.0	1.01	GA
999RC8		116.8	-5.7	-0.72	153.3	5.7	0.72	PP
9LDR6B		126.8	4.3	0.54	151.1	3.5	0.44	TS
CW6HE9		115.5	-7.0	-0.89	139.9	-7.7	-0.97	LW
D6VKZG	*	113.1	-9.4	-1.19	123.0	-24.6	-3.10	SH
DCV292		126.9	4.4	0.56	150.7	3.1	0.39	HM
EHFJ4N		123.9	1.4	0.18	143.8	-3.8	-0.48	TS
FAH6Z2		112.2	-10.3	-1.31	147.3	-0.3	-0.04	PP
FNZYA7		126.8	4.3	0.54	158.8	11.2	1.42	PP
GGWBCY		126.5	4.0	0.51	156.9	9.3	1.17	PP
H7AKZ8		132.8	10.3	1.30	153.8	6.2	0.78	LW
HCHYQH		121.1	-1.4	-0.18	155.1	7.5	0.95	PP
HV99PY		128.3	5.8	0.73	146.7	-0.9	-0.11	LW
J8XEC2		114.1	-8.4	-1.07	152.9	5.3	0.67	PP
K4WRX4		128.7	6.2	0.78	148.3	0.8	0.10	PP
MJ4LP4		119.8	-2.7	-0.34	146.0	-1.6	-0.20	PP
NHLUBD		125.1	2.6	0.33	152.1	4.5	0.57	LA
PBLW2F		124.9	2.4	0.30	159.3	11.7	1.48	LA
QF8B3R		112.9	-9.6	-1.22	138.0	-9.6	-1.21	PP
QFRPTP		120.6	-1.9	-0.24	140.3	-7.2	-0.91	XX
TRDY9U		116.9	-5.6	-0.71	135.6	-12.0	-1.51	XX
TT8PE9		118.1	-4.4	-0.56	148.6	1.0	0.13	PP
TU48EP		128.0	5.5	0.70	151.0	3.4	0.43	HM
TZ7EVD		115.0	-7.5	-0.95	132.5	-15.1	-1.90	SH
VXFRFV		126.8	4.3	0.54	159.6	12.0	1.52	GA

Paper & Paperboard Interlaboratory Testing Program

Analysis 378

Roughness - Sheffield Type

TAPPI Official Test Method T538

WebCode	Data Flag	Sample GL61 Lab Mean	Sample GL61 Diff from Grand Mean	Sample GL61 CPV	Sample GL62 Lab Mean	Sample GL62 Diff from Grand Mean	Sample GL62 CPV	Instr Code
WUBFYL		119.7	-2.8	-0.35	149.5	1.9	0.24	TT
WWDLAK		117.7	-4.8	-0.61	152.3	4.7	0.60	SH
XCNP9K		118.7	-3.8	-0.48	142.6	-5.0	-0.63	VM
Y3T4KX		117.9	-4.6	-0.58	141.3	-6.3	-0.79	TS
YGZRW2		128.0	5.5	0.69	147.9	0.4	0.04	PP
YPT38W		120.0	-2.5	-0.32	150.6	3.1	0.39	PP
Z7UAWJ		122.0	-0.5	-0.06	147.3	-0.3	-0.03	LW
ZLK82Y	X	148.5	26.0	3.29	178.0	30.4	3.84	GL
ZLM2K6		122.6	0.1	0.01	144.7	-2.9	-0.36	LW

Summary Statistics	Sample GL61	Sample GL62
Grand Means	122.50 Sheffield	147.58 Sheffield
Stnd Dev Btwn Labs	7.90 Sheffield	7.93 Sheffield

Statistics based on 48 of 49 reporting participants.

Comments on Assigned Data Flags for Test #378

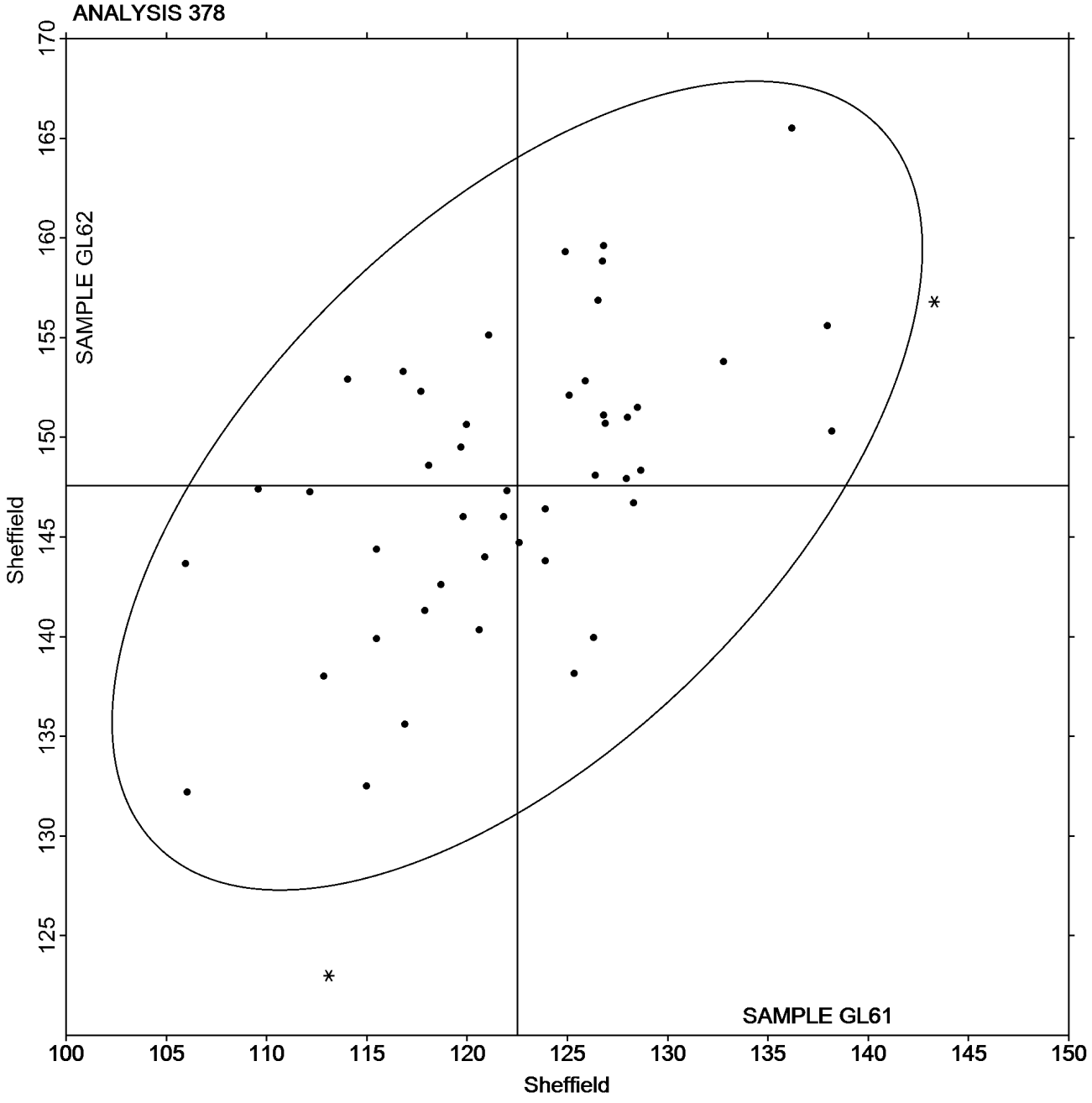
ZLK82Y (X) - Data for both samples are high.

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	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 GL61 = 122.50
Sheffield

Grand Mean Sample GL62 = 147.58
Sheffield



Paper & Paperboard Interlaboratory Testing Program

Analysis 382
Moisture in Paper
TAPPI Official Test Method T412

WebCode	Data Flag	Sample GM61 Lab Mean	Sample GM61 Diff from Grand Mean	Sample GM61 CPV	Sample GM62 Lab Mean	Sample GM62 Diff from Grand Mean	Sample GM62 CPV	Instr Code
7AQ2C9		5.140	0.290	0.56	5.240	0.312	0.56	ZZ
ARXEAF		4.868	0.018	0.03	4.866	-0.062	-0.11	ZZ
CHMPTM	M	4.710	-0.140	-0.27	No data reported for this sample			ZZ
CWLUWD		3.808	-1.042	-2.00	4.001	-0.927	-1.68	ZZ
MF2MEB		4.955	0.105	0.20	4.970	0.042	0.08	ZZ
MVX3E6		5.126	0.276	0.53	5.271	0.343	0.62	ZZ
TTACVM		5.503	0.652	1.25	5.516	0.588	1.06	ZZ
VN9Y3U		4.236	-0.614	-1.18	4.044	-0.884	-1.60	ZZ
VP4VBN		5.170	0.320	0.61	5.410	0.482	0.87	ZZ
VQEH8G		4.846	-0.004	-0.01	5.036	0.108	0.19	ZZ

Summary Statistics	Sample GM61	Sample GM62
Grand Means	4.85 Percent	4.93 Percent
Stnd Dev Btwn Labs	0.52 Percent	0.55 Percent

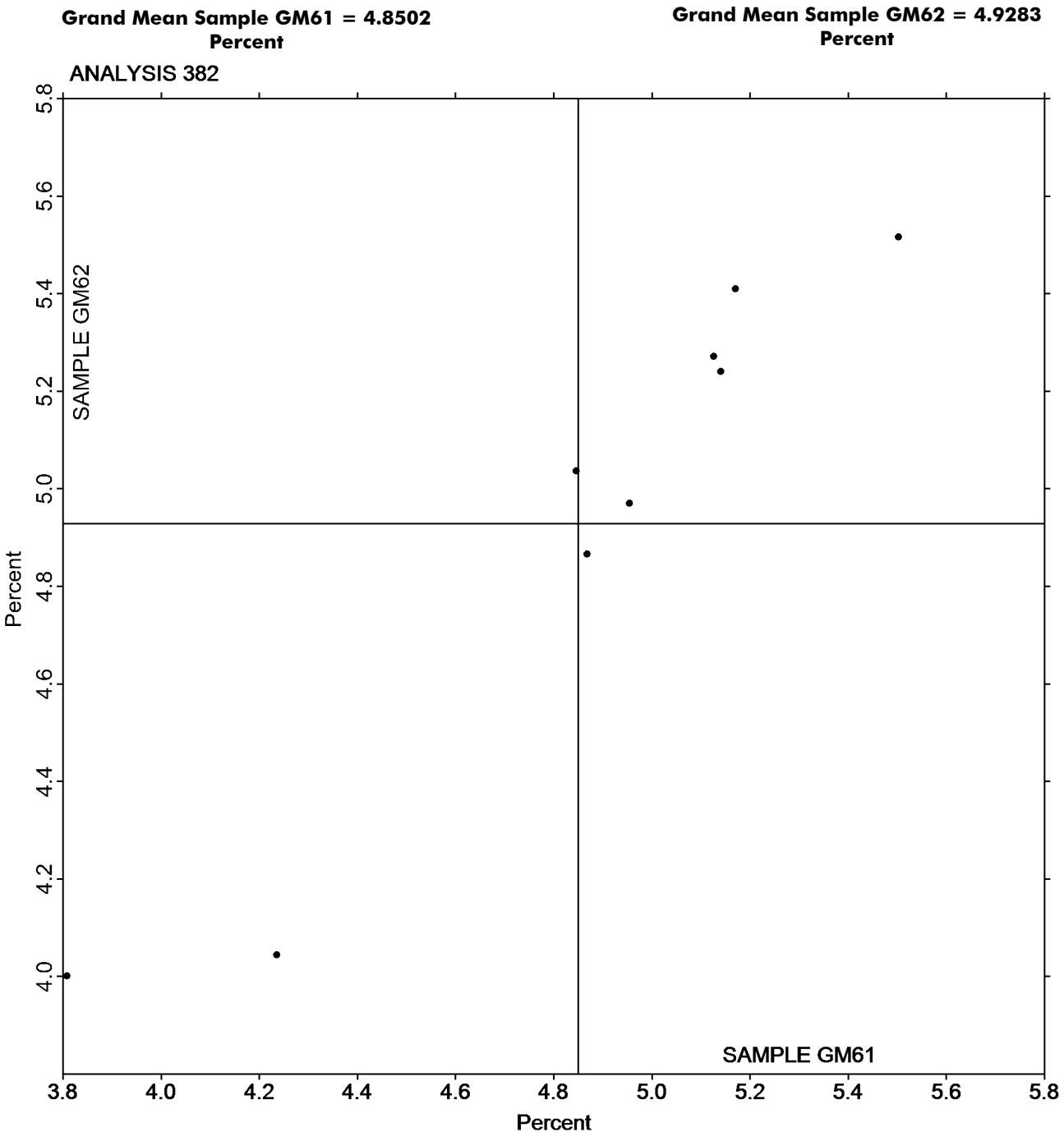
Statistics based on 9 of 10 reporting participants.

Comments on Assigned Data Flags for Test #382

CHMPTM (M) - Participant did not submit data for sample GM62.

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 #2972G, December 2018

Analysis 384

Opacity (89% Reflectance Backing) - Fine Papers

TAPPI Official Test Method T425

WebCode	Data Flag	Sample GN61 Lab Mean	Sample GN61 Diff from Grand Mean	Sample GN61 CPV	Sample GN62 Lab Mean	Sample GN62 Diff from Grand Mean	Sample GN62 CPV	Instr Code
29VUZA		89.16	0.06	0.11	93.60	0.10	0.27	ZZ
34GGVF		89.18	0.08	0.14	93.41	-0.09	-0.26	ZZ
4NHPRQ		89.85	0.75	1.38	93.65	0.15	0.40	ZZ
6H9V9E		88.88	-0.22	-0.40	93.30	-0.21	-0.57	ZZ
6Z96RB	X	85.71	-3.39	-6.26	87.35	-6.15	-16.83	ZZ
6ZAVZE		89.51	0.41	0.75	93.86	0.36	0.98	ZZ
73FHDJ		89.13	0.03	0.05	93.72	0.22	0.59	ZZ
7QX8GD		88.48	-0.62	-1.15	93.30	-0.21	-0.57	ZZ
8L2TE9		89.31	0.21	0.38	93.26	-0.24	-0.67	ZZ
999RC8		89.31	0.21	0.38	93.94	0.44	1.19	ZZ
9LDR6B		88.89	-0.21	-0.39	93.12	-0.38	-1.05	ZZ
A8Q3LZ		88.94	-0.16	-0.30	93.46	-0.04	-0.12	ZZ
ABT3LW		88.99	-0.11	-0.21	93.34	-0.16	-0.44	ZZ
BUJHGD		89.82	0.72	1.32	93.64	0.14	0.37	ZZ
DCV292		89.62	0.52	0.96	93.92	0.42	1.14	ZZ
EN46BB		88.66	-0.44	-0.82	93.77	0.27	0.73	ZZ
FAH6Z2		89.18	0.08	0.14	93.90	0.40	1.08	ZZ
GGWBCY		89.23	0.12	0.23	93.47	-0.04	-0.11	ZZ
J6UJTY		88.26	-0.85	-1.56	93.00	-0.50	-1.38	ZZ
J8XEC2		89.16	0.06	0.11	93.85	0.35	0.95	ZZ
K4WRX4	X	93.66	4.56	8.41	93.71	0.21	0.58	ZZ
NHLUBD		88.80	-0.30	-0.56	93.82	0.32	0.86	ZZ
P6XCVE		89.78	0.68	1.25	93.39	-0.11	-0.31	ZZ
QDJR2U		88.46	-0.64	-1.19	93.41	-0.09	-0.26	ZZ
QF8B3R		88.96	-0.14	-0.26	93.26	-0.24	-0.66	ZZ
RAVMYP		89.42	0.32	0.59	93.64	0.14	0.38	ZZ
RLCA8P		87.74	-1.37	-2.52	92.73	-0.77	-2.11	ZZ
TL8E2P		89.37	0.27	0.49	93.68	0.18	0.48	ZZ
TRDY9U	X	91.85	2.75	5.07	95.44	1.93	5.29	ZZ
TU48EP		87.95	-1.15	-2.12	92.56	-0.95	-2.59	ZZ
TZ7EVD		89.09	-0.01	-0.02	93.29	-0.21	-0.58	ZZ
WWDLAK		90.04	0.94	1.73	94.23	0.73	1.99	ZZ
Y3T4KX		89.18	0.08	0.14	93.24	-0.26	-0.72	ZZ
ZLK82Y		89.82	0.72	1.32	93.86	0.36	0.97	ZZ

Summary Statistics	Sample GN61	Sample GN62
Grand Means	89.10 Percent	93.50 Percent
Stnd Dev Btwn Labs	0.54 Percent	0.37 Percent

Statistics based on 31 of 34 reporting participants.

Comments on Assigned Data Flags for Test #384

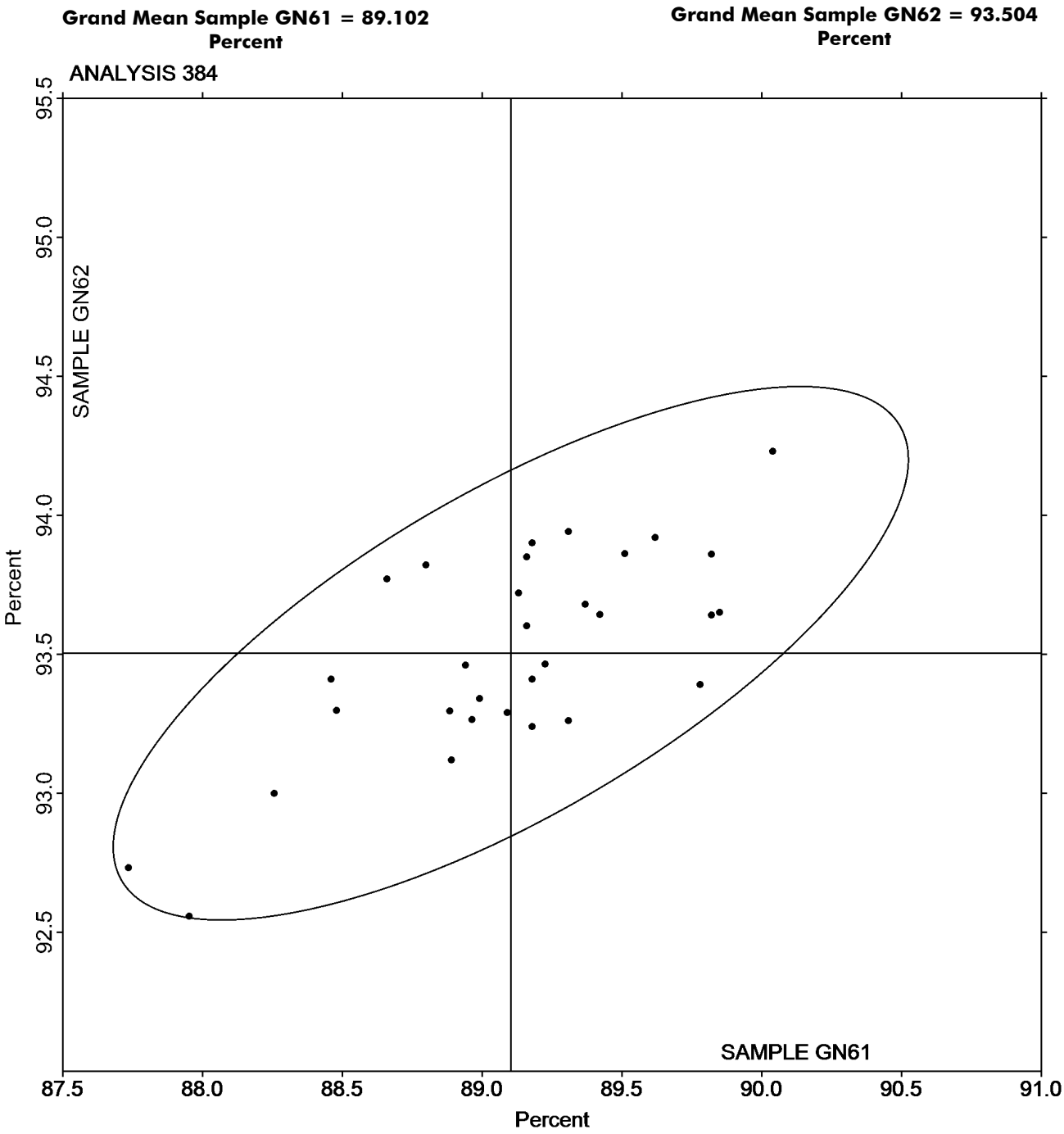
6Z96RB (X) - Extreme Data.

TRDY9U (X) - Data for both samples are high.

K4WRX4 (X) - Extreme Data for Sample GN61.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Paper & Paperboard Interlaboratory Testing Program

Analysis 386

Opacity (Paper Backing) - Fine Papers and Newsprint

TAPPI Official Test Method T519

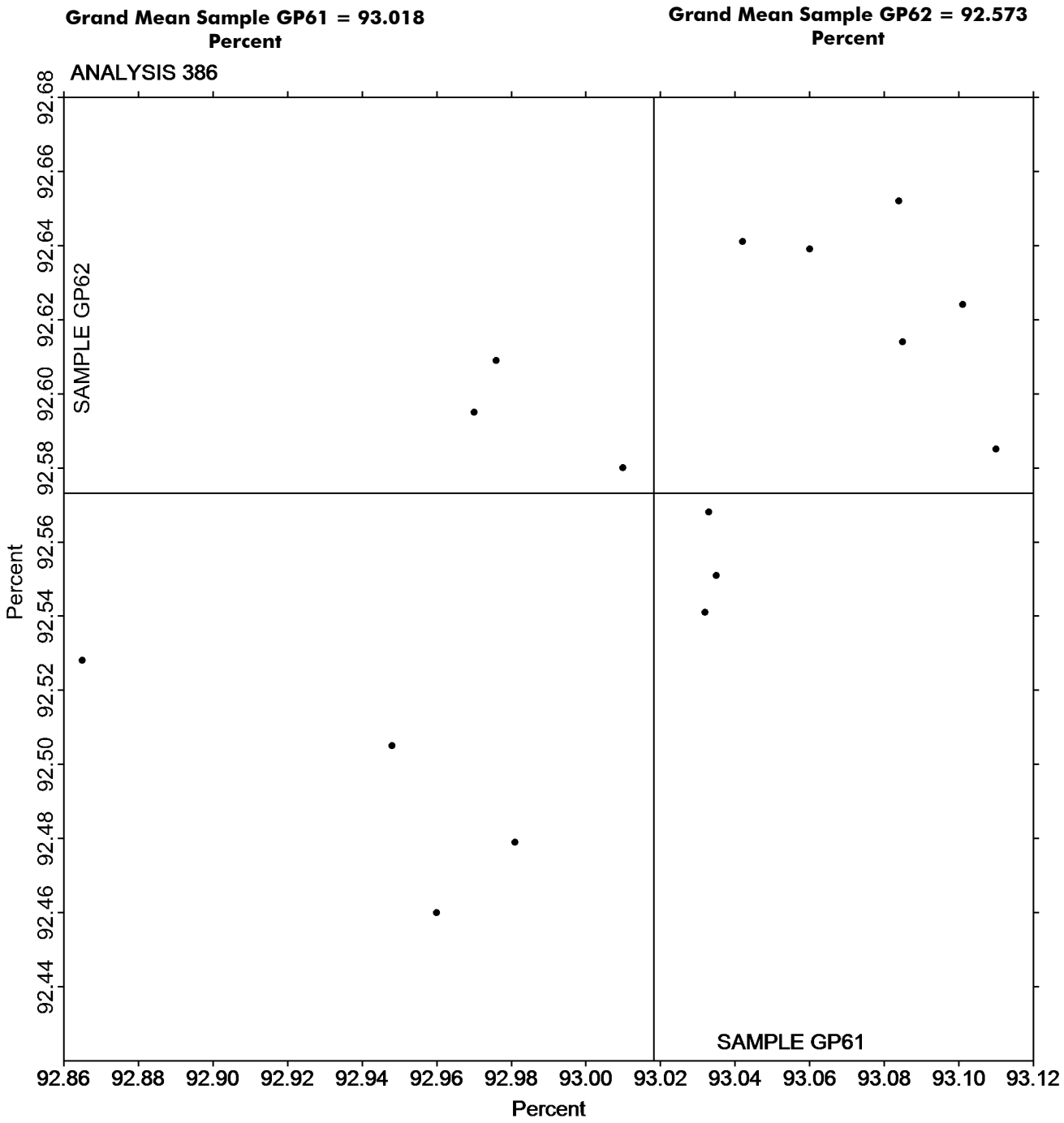
WebCode	Data Flag	Sample GP61 Lab Mean	Sample GP61 Diff from Grand Mean	Sample GP61 CPV	Sample GP62 Lab Mean	Sample GP62 Diff from Grand Mean	Sample GP62 CPV	Instr Code
3VN4X2		93.01	-0.01	-0.13	92.58	0.01	0.12	ZZ
67RBJC		93.06	0.04	0.64	92.64	0.07	1.13	ZZ
8FXU2X		92.96	-0.06	-0.89	92.46	-0.11	-1.94	ZZ
C7APU9		93.03	0.01	0.21	92.54	-0.03	-0.55	ZZ
CVUTY3		93.10	0.08	1.26	92.62	0.05	0.87	ZZ
CWLUWD		92.87	-0.15	-2.34	92.53	-0.05	-0.77	ZZ
D4HVQC		93.11	0.09	1.40	92.59	0.01	0.20	ZZ
EA2DP7		93.04	0.02	0.26	92.55	-0.02	-0.38	ZZ
FXA4KC		92.97	-0.05	-0.74	92.60	0.02	0.37	ZZ
GC4ZC9		93.08	0.07	1.00	92.65	0.08	1.35	ZZ
L23EWW		93.09	0.07	1.02	92.61	0.04	0.70	ZZ
LMRF9Y		92.95	-0.07	-1.07	92.51	-0.07	-1.17	ZZ
MXHQWW		93.03	0.01	0.23	92.57	-0.01	-0.09	ZZ
TU48EP		93.04	0.02	0.36	92.64	0.07	1.16	ZZ
VWL4WZ		92.98	-0.04	-0.57	92.48	-0.09	-1.61	ZZ
ZHLTFU		92.98	-0.04	-0.64	92.61	0.04	0.61	ZZ

Summary Statistics	Sample GP61	Sample GP62
Grand Means	93.02 Percent	92.57 Percent
Stnd Dev Btwn Labs	0.07 Percent	0.06 Percent

Statistics based on 16 of 16 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 390
Directional Brightness
TAPPI Official Test Method T452

WebCode	Data Flag	Sample GR61 Lab Mean	Sample GR61 Diff from Grand Mean	Sample GR61 CPV	Sample GR62 Lab Mean	Sample GR62 Diff from Grand Mean	Sample GR62 CPV	Instr Code
24Y997		83.41	-1.40	-0.79	82.48	-1.59	-0.84	TS
34GGVF		84.40	-0.40	-0.23	83.68	-0.39	-0.21	XC
4NHPRQ	*	89.39	4.59	2.61	88.66	4.58	2.42	PE
6FJNP3		83.28	-1.52	-0.87	82.42	-1.65	-0.87	TS
6H9V9E	X	82.01	-2.79	-1.59	82.38	-1.70	-0.90	TP
7QX8GD		85.50	0.70	0.40	84.70	0.63	0.33	XX
999RC8		82.90	-1.90	-1.08	81.91	-2.16	-1.14	TT
DCV292		83.30	-1.50	-0.85	82.71	-1.36	-0.72	TT
EN46BB		83.49	-1.31	-0.75	82.69	-1.39	-0.73	TT
FAH6Z2		83.08	-1.73	-0.98	82.39	-1.69	-0.89	TT
H7AKZ8		88.53	3.73	2.12	87.79	3.72	1.97	HZ
HCHYQH		85.97	1.17	0.67	85.26	1.18	0.63	HG
HV99PY		85.07	0.27	0.15	84.16	0.08	0.04	HG
J6UJTY		85.30	0.50	0.28	84.36	0.29	0.15	TS
J8XEC2		84.58	-0.23	-0.13	83.65	-0.42	-0.22	XX
MF2MEB		84.24	-0.56	-0.32	83.43	-0.64	-0.34	XX
NHLUBD		83.03	-1.77	-1.01	82.21	-1.87	-0.99	TS
QDJR2U		84.99	0.19	0.11	84.44	0.36	0.19	TS
RLCA8P		84.85	0.05	0.03	83.96	-0.12	-0.06	VM
TRDY9U	*	86.41	1.61	0.92	86.49	2.41	1.28	XX
TT8PE9		85.54	0.74	0.42	84.91	0.84	0.44	TT
TU48EP		84.37	-0.43	-0.24	83.50	-0.57	-0.30	TS
VP4VBN	*	88.16	3.36	1.91	88.24	4.16	2.20	TS
Y3T4KX		83.51	-1.29	-0.73	82.74	-1.34	-0.71	TS
YGZRW2		85.15	0.35	0.20	84.37	0.29	0.16	HG
YPT38W		83.21	-1.59	-0.90	82.31	-1.76	-0.93	PP
ZLM2K6		83.18	-1.63	-0.92	82.46	-1.61	-0.85	TT

Summary Statistics	Sample GR61	Sample GR62
Grand Means	84.80 Percent	84.07 Percent
Stnd Dev Btwn Labs	1.76 Percent	1.89 Percent

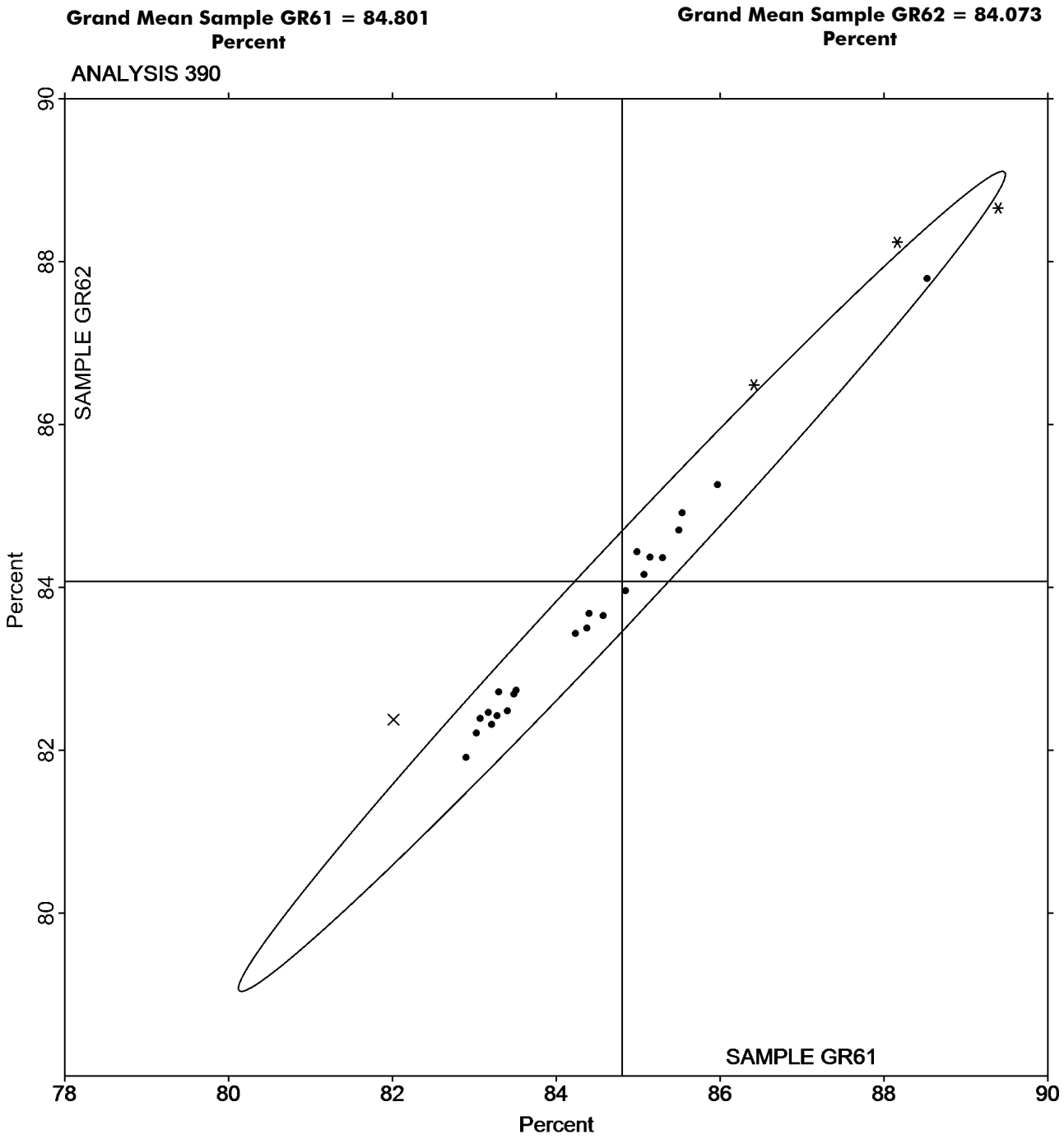
Statistics based on 26 of 27 reporting participants.

Comments on Assigned Data Flags for Test #390

6H9V9E (X) - Inconsistent in testing between samples.

Key to Instrument Codes Reported by Participants

HG	Hunter Labscan / XE	HZ	Hunter Lab ColorFlex EZ Series
PE	Photovolt 577	PP	Technidyne Profile/Plus
TP	Technidyne Test/Plus	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

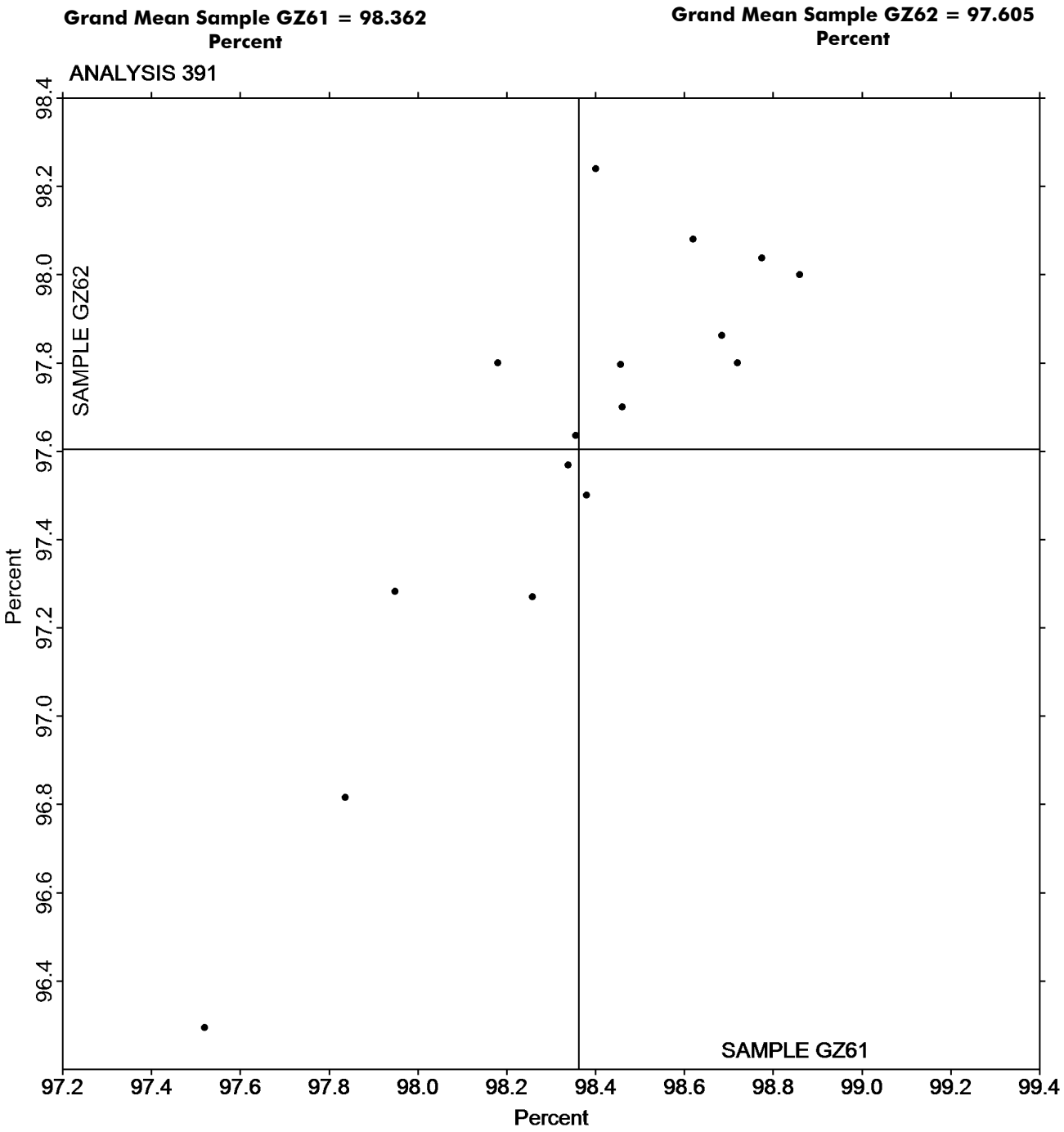
WebCode	Data Flag	Sample GZ61 Lab Mean	Sample GZ61 Diff from Grand Mean	Sample GZ61 CPV	Sample GZ62 Lab Mean	Sample GZ62 Diff from Grand Mean	Sample GZ62 CPV	Instr Code
29VUZA		98.34	-0.02	-0.07	97.57	-0.04	-0.07	PP
67RBJC		97.95	-0.41	-1.15	97.28	-0.32	-0.65	TS
6Z96RB		98.38	0.02	0.05	97.50	-0.11	-0.21	TT
6ZAVZE		98.46	0.09	0.26	97.80	0.19	0.38	TS
73FHDJ		98.72	0.36	1.00	97.80	0.19	0.39	TT
7AQ2C9		98.40	0.04	0.11	98.24	0.63	1.27	LE
7QX8GD		98.36	-0.01	-0.02	97.64	0.03	0.06	XX
8L2TE9		97.84	-0.53	-1.46	96.82	-0.79	-1.58	HT
9LDR6B		98.46	0.10	0.27	97.70	0.09	0.19	TS
BUJHGD		98.68	0.32	0.90	97.86	0.26	0.52	PP
GGWBCY		98.26	-0.10	-0.29	97.27	-0.34	-0.67	TS
K4WRX4		98.18	-0.18	-0.51	97.80	0.19	0.39	PP
P6XCVE		98.62	0.26	0.72	98.08	0.47	0.95	TS
TL8E2P		98.86	0.50	1.39	98.00	0.39	0.79	TT
TZ7EVD		97.52	-0.84	-2.34	96.29	-1.31	-2.63	HT
Y3T4KX		98.77	0.41	1.15	98.04	0.43	0.87	TS

Summary Statistics	Sample GZ61	Sample GZ62
Grand Means	98.36 Percent	97.61 Percent
Stnd Dev Btwn Labs	0.36 Percent	0.50 Percent

Statistics based on 16 of 16 reporting participants.

Key to Instrument Codes Reported by Participants

HT	Hunter UltraScan Vis	LE	L & W Elrepho
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 GR61 Lab Mean	Sample GR61 Diff from Grand Mean	Sample GR61 CPV	Sample GR62 Lab Mean	Sample GR62 Diff from Grand Mean	Sample GR62 CPV	Instr Code
3VN4X2	*	85.01	1.18	2.07	84.15	1.10	2.80	TM
67RBJC		83.78	-0.05	-0.09	82.93	-0.13	-0.33	TC
7AQ2C9		82.55	-1.29	-2.27	82.30	-0.75	-1.93	LE
8FXU2X		83.72	-0.11	-0.20	82.89	-0.16	-0.42	LA
CVUTY3	*	85.41	1.57	2.77	83.33	0.28	0.71	TC
CW6HE9		84.00	0.16	0.29	83.11	0.06	0.15	EF
CWLUWD		83.76	-0.08	-0.14	82.94	-0.11	-0.29	LE
DCV292		83.67	-0.16	-0.29	83.10	0.04	0.11	LT
FNZYA7		83.96	0.12	0.21	83.16	0.10	0.26	TC
FXA4KC	*	83.57	-0.27	-0.47	83.69	0.63	1.62	LE
G26HHL		83.94	0.11	0.19	82.98	-0.07	-0.18	TC
GZBRC7		84.11	0.28	0.49	83.35	0.29	0.75	XX
HV99PY		83.79	-0.05	-0.09	82.97	-0.09	-0.22	TC
LWXHDW		83.67	-0.16	-0.29	82.89	-0.17	-0.43	TC
MF2MEB		83.90	0.06	0.11	83.07	0.01	0.04	EE
MXHQWW		83.94	0.11	0.19	83.22	0.17	0.42	TC
NHLUBD		83.83	-0.01	-0.02	82.91	-0.14	-0.37	TC
TT8PE9		84.06	0.23	0.40	83.11	0.06	0.15	TL
TU48EP		84.39	0.56	0.98	83.53	0.47	1.20	TC
W2RYEE		83.75	-0.09	-0.16	82.87	-0.19	-0.48	TC
W9BD2K		83.76	-0.08	-0.14	82.76	-0.30	-0.76	TC
YPT38W		82.77	-1.07	-1.88	82.56	-0.50	-1.27	EG
Z93CTF		83.64	-0.20	-0.35	83.35	0.30	0.76	TZ
ZHLTFU		83.69	-0.15	-0.26	82.82	-0.23	-0.59	EG
ZLM2K6		83.24	-0.60	-1.05	82.40	-0.66	-1.68	EG

Summary Statistics	Sample GR61	Sample GR62
Grand Means	83.84 Percent	83.05 Percent
Stnd Dev Btwn Labs	0.57 Percent	0.39 Percent

Statistics based on 25 of 25 reporting participants.

Key to Instrument Codes Reported by Participants

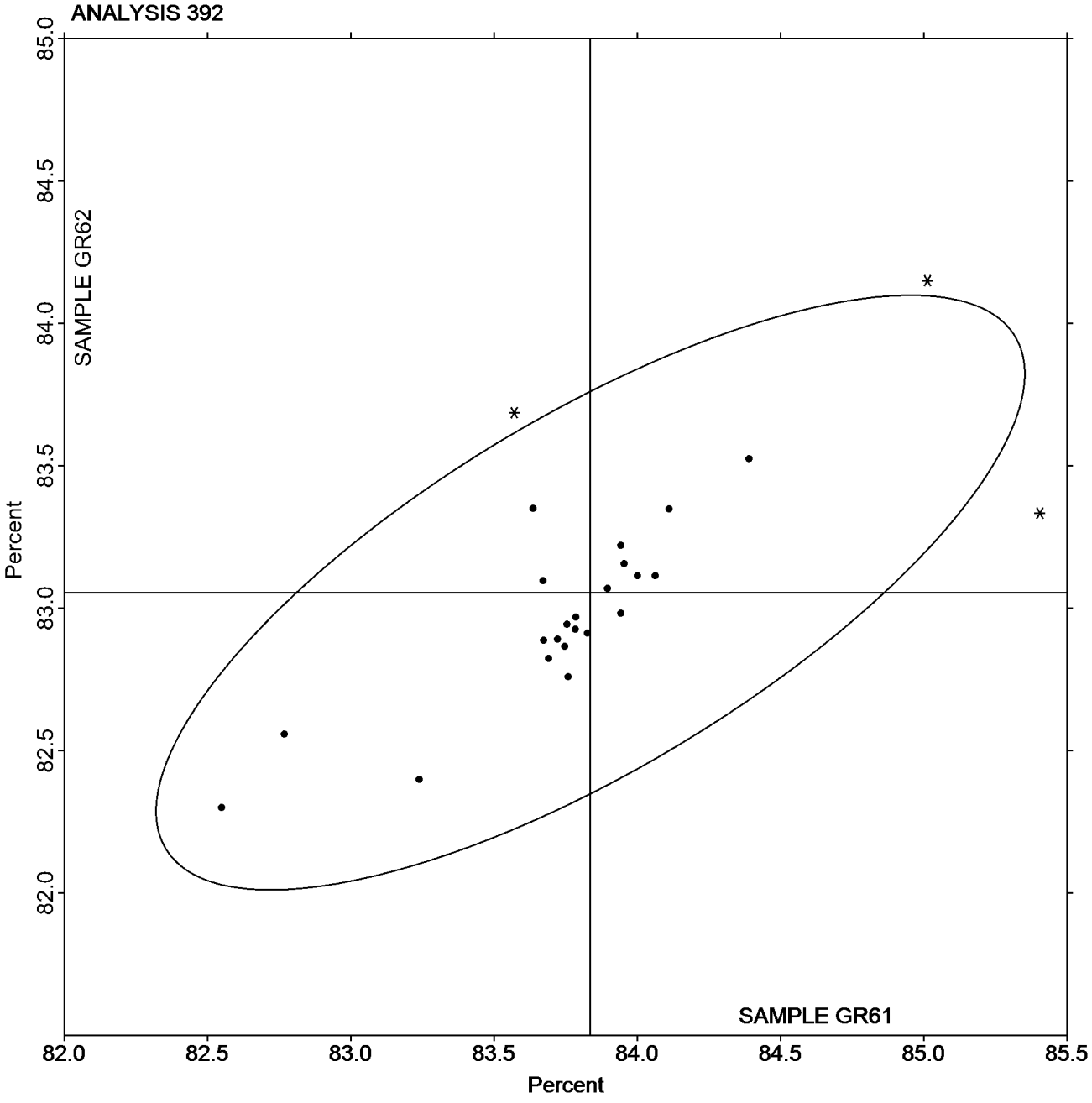
EE	Datacolor Elrepho 2000	EF	Datacolor Elrepho 3000
EG	Datacolor Elrepho 450X	LA	L & W Elrepho - Autoline
LE	L & W Elrepho	LT	L & W Elrepho SE 071
TC	Technidyne Color Touch Series	TL	Technidyne Technibrite TB-1
TM	Technidyne Technibrite Micro TB-1C	TZ	Technibrite Model TB-1
XX	Instrument make/model not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

Key to Instrument Codes Reported by Participants

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

Grand Mean Sample GR61 = 83.836 Percent

Grand Mean Sample GR62 = 83.055 Percent



Paper & Paperboard Interlaboratory Testing Program

Analysis 394

Fluorescent Component of Directional Brightness

TAPPI Official Test Method T452

WebCode	Data Flag	Sample GZ61 Lab Mean	Sample GZ61 Diff from Grand Mean	Sample GZ61 CPV	Sample GZ62 Lab Mean	Sample GZ62 Diff from Grand Mean	Sample GZ62 CPV	Instr Code
29VUZA		8.860	0.188	0.41	8.762	0.182	0.39	PP
67RBJC		8.330	-0.342	-0.74	8.244	-0.336	-0.73	TS
6Z96RB		8.020	-0.652	-1.42	7.980	-0.600	-1.30	TT
6ZAVZE		8.612	-0.060	-0.13	8.410	-0.170	-0.37	TS
73FHDJ		9.340	0.668	1.46	9.400	0.820	1.77	TT
7AQ2C9	X	12.460	3.788	8.25	12.160	3.580	7.74	LE
7QX8GD		8.234	-0.438	-0.95	8.152	-0.428	-0.93	XX
BUJHGD		8.430	-0.242	-0.53	8.316	-0.264	-0.57	PP
GGWBCY		8.576	-0.096	-0.21	8.462	-0.118	-0.26	TS
K4WRX4		8.800	0.128	0.28	8.740	0.160	0.35	PP
P6XCVE		8.620	-0.052	-0.11	8.540	-0.040	-0.09	TS
Y3T4KX		9.568	0.896	1.95	9.378	0.798	1.72	TS

Summary Statistics	Sample GZ61	Sample GZ62
Grand Means	8.67 Percent	8.58 Percent
Stnd Dev Btwn Labs	0.46 Percent	0.46 Percent

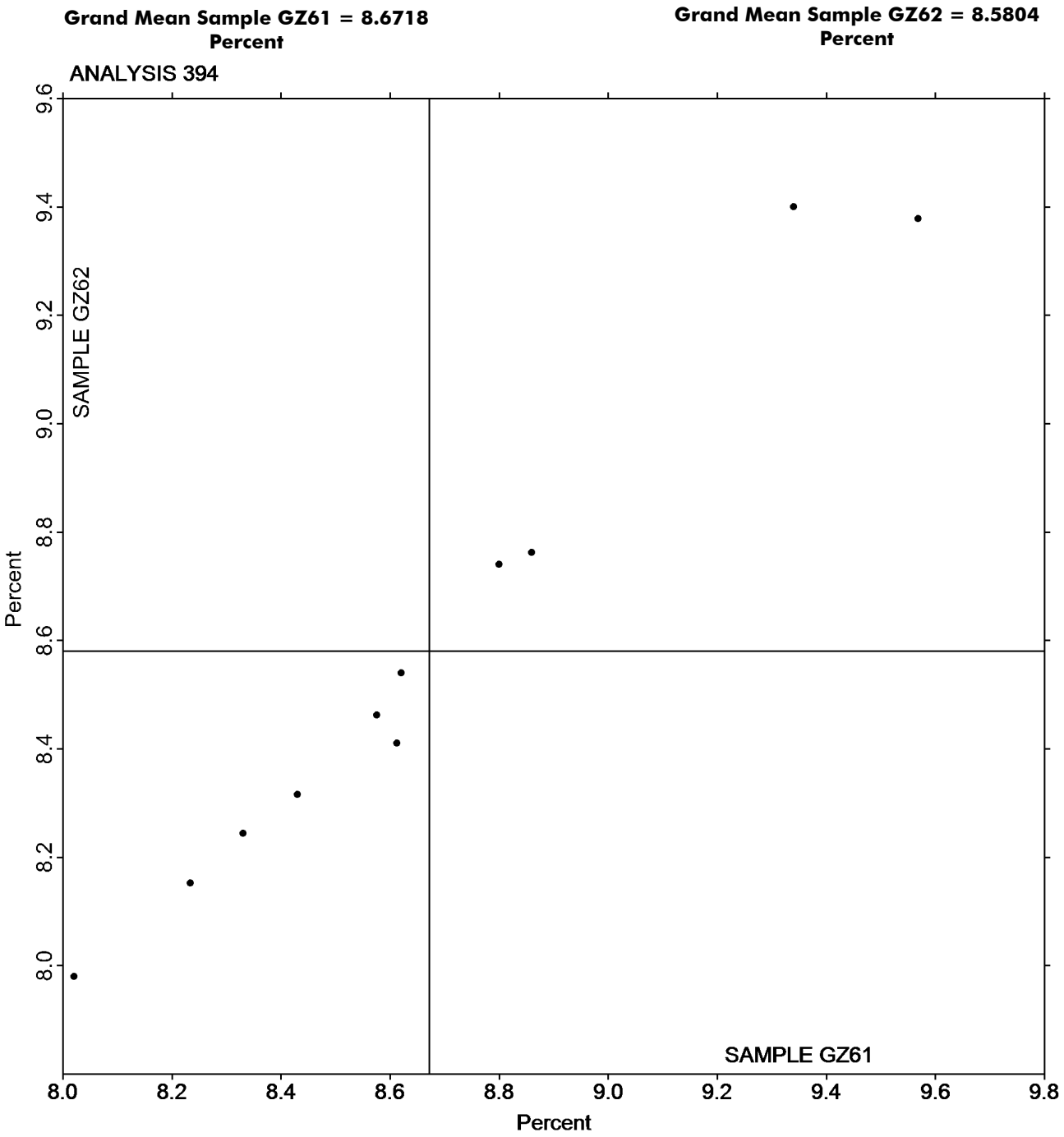
Statistics based on 11 of 12 reporting participants.

Comments on Assigned Data Flags for Test #394

7AQ2C9 (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

LE	L & W Elrepho	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 #2972G, December 2018

Analysis 395

Specular Gloss at 75 Degrees - High Range

TAPPI Official Test Method T480

WebCode	Data Flag	Sample GT61 Lab Mean	Sample GT61 Diff from Grand Mean	Sample GT61 CPV	Sample GT62 Lab Mean	Sample GT62 Diff from Grand Mean	Sample GT62 CPV	Instr Code
29VUZA		84.73	-0.48	-0.29	85.65	-0.03	-0.02	PP
67RBJC		84.51	-0.70	-0.43	83.18	-2.50	-1.29	LA
6ZAVZE		84.30	-0.91	-0.56	85.60	-0.08	-0.04	LA
73FHDJ		83.17	-2.04	-1.25	83.92	-1.76	-0.91	PP
7BLKCP		84.43	-0.78	-0.48	83.54	-2.14	-1.10	GM
BUJHGD		86.26	1.06	0.65	86.70	1.02	0.52	PP
EHFJ4N		85.79	0.59	0.36	87.16	1.48	0.76	XX
EN46BB		85.38	0.18	0.11	86.83	1.15	0.59	TH
FXA4KC		85.74	0.54	0.33	86.48	0.80	0.41	LB
GC4ZC9		84.87	-0.34	-0.21	84.54	-1.14	-0.59	EP
HCHYQH		86.04	0.84	0.51	87.20	1.52	0.78	TH
J6UJTY		84.87	-0.34	-0.21	85.78	0.10	0.05	LA
LWXHDW		81.62	-3.59	-2.21	81.41	-4.27	-2.20	ZH
PBLW2F	*	89.68	4.48	2.76	90.82	5.14	2.64	LA
RLCA8P		84.86	-0.35	-0.21	86.08	0.40	0.20	VM
TL8E2P		85.73	0.53	0.32	85.45	-0.24	-0.12	TG
TT8PE9		84.54	-0.67	-0.41	85.23	-0.45	-0.23	GS
XCNP9K		83.88	-1.33	-0.82	84.81	-0.87	-0.45	VM
YGZRW2		87.19	1.99	1.22	85.88	0.20	0.10	TH
YPT38W	X	76.87	-8.34	-5.13	83.73	-1.95	-1.01	GA
ZLM2K6		86.51	1.31	0.80	87.43	1.75	0.90	TH

Summary Statistics	Sample GT61	Sample GT62
Grand Means	85.21 Gloss Units	85.68 Gloss Units
Stnd Dev Btwn Labs	1.62 Gloss Units	1.94 Gloss Units

Statistics based on 20 of 21 reporting participants.

Comments on Assigned Data Flags for Test #395

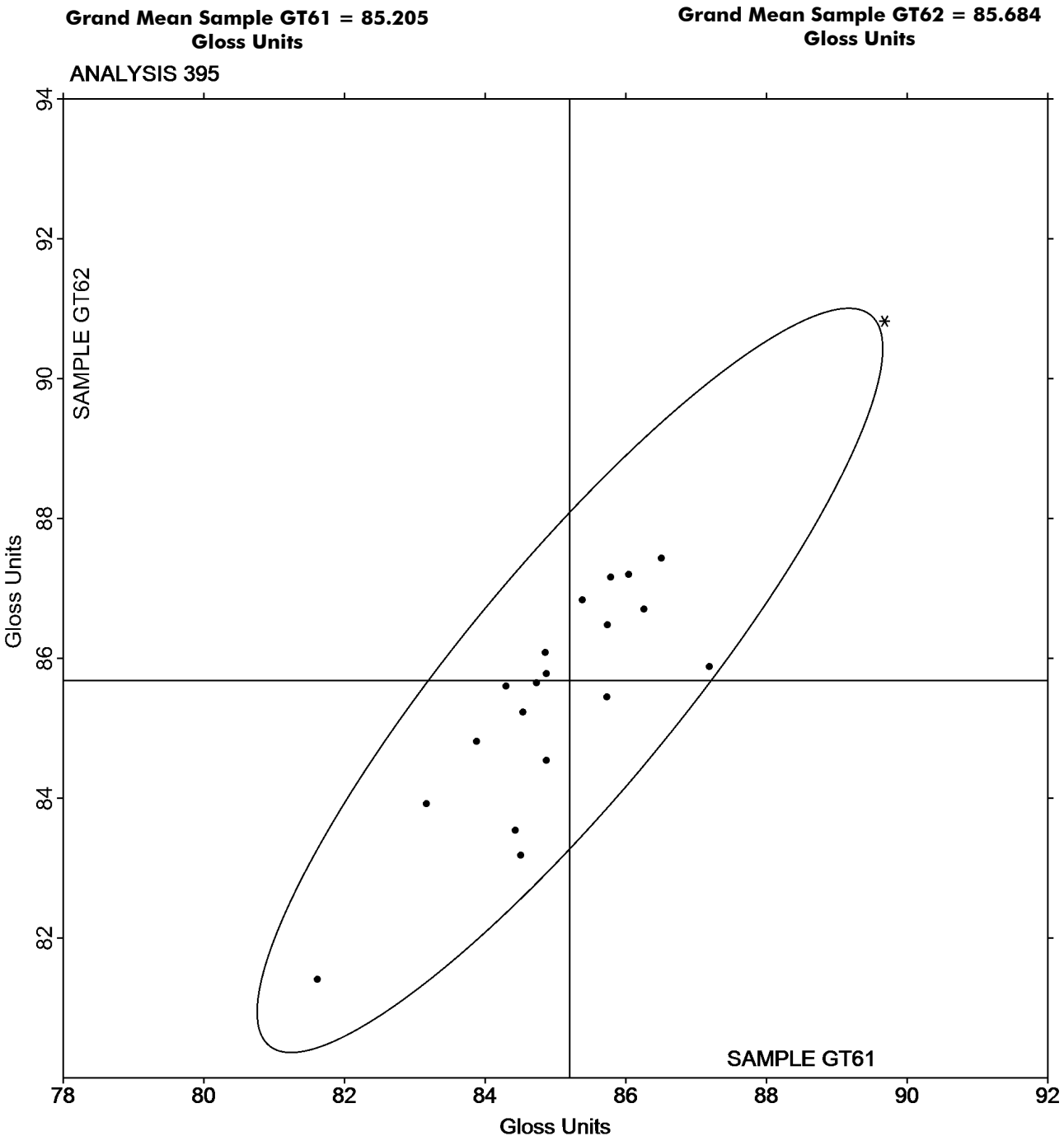
YPT38W (X) - Data for sample GT61 are low. Inconsistent within the determinations of sample GT61.

Key to Instrument Codes Reported by Participants

EP	Erichsen Picogloss 503	GA	BYK-Gardner (model not specified)
GM	BYK-Gardner micro-gloss	GS	BYK-Gardner Glossgard II
LA	L & W Gloss - Autoline 300	LB	L & W Gloss Tester Code 224
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

Key to Instrument Codes Reported by Participants

EP	Erichsen Picogloss 503	GA	BYK-Gardner (model not specified)
GM	BYK-Gardner micro-gloss	GS	BYK-Gardner Glossgard II
LA	L & W Gloss - Autoline 300	LB	L & W Gloss Tester Code 224
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



Paper & Paperboard Interlaboratory Testing Program

Analysis 396

Specular Gloss at 75 Degrees - Low Range

TAPPI Official Test Method T480

WebCode	Data Flag	Sample GU61 Lab Mean	Sample GU61 Diff from Grand Mean	Sample GU61 CPV	Sample GU62 Lab Mean	Sample GU62 Diff from Grand Mean	Sample GU62 CPV	Instr Code
34GGVF		34.10	0.24	0.13	47.30	1.72	0.47	TH
67RBJC		30.88	-2.98	-1.62	36.26	-9.32	-2.55	LA
7AQ2C9		36.63	2.78	1.52	45.61	0.03	0.01	LE
BUJHGD		34.71	0.85	0.47	47.58	2.00	0.55	PP
FAH6Z2		32.40	-1.46	-0.80	43.36	-2.22	-0.61	TH
FXA4KC		32.87	-0.99	-0.54	46.37	0.79	0.22	LA
H7AKZ8		32.76	-1.10	-0.60	45.54	-0.04	-0.01	GS
HV99PY		35.11	1.25	0.68	48.72	3.14	0.86	TH
MVX3E6		33.79	-0.07	-0.04	45.76	0.18	0.05	XX
QF8B3R		32.43	-1.43	-0.78	44.51	-1.07	-0.29	PP
TU48EP		36.74	2.88	1.57	50.35	4.77	1.31	TG

Summary Statistics	Sample GU61	Sample GU62
Grand Means	33.86 Gloss Units	45.58 Gloss Units
Stnd Dev Btwn Labs	1.83 Gloss Units	3.65 Gloss Units

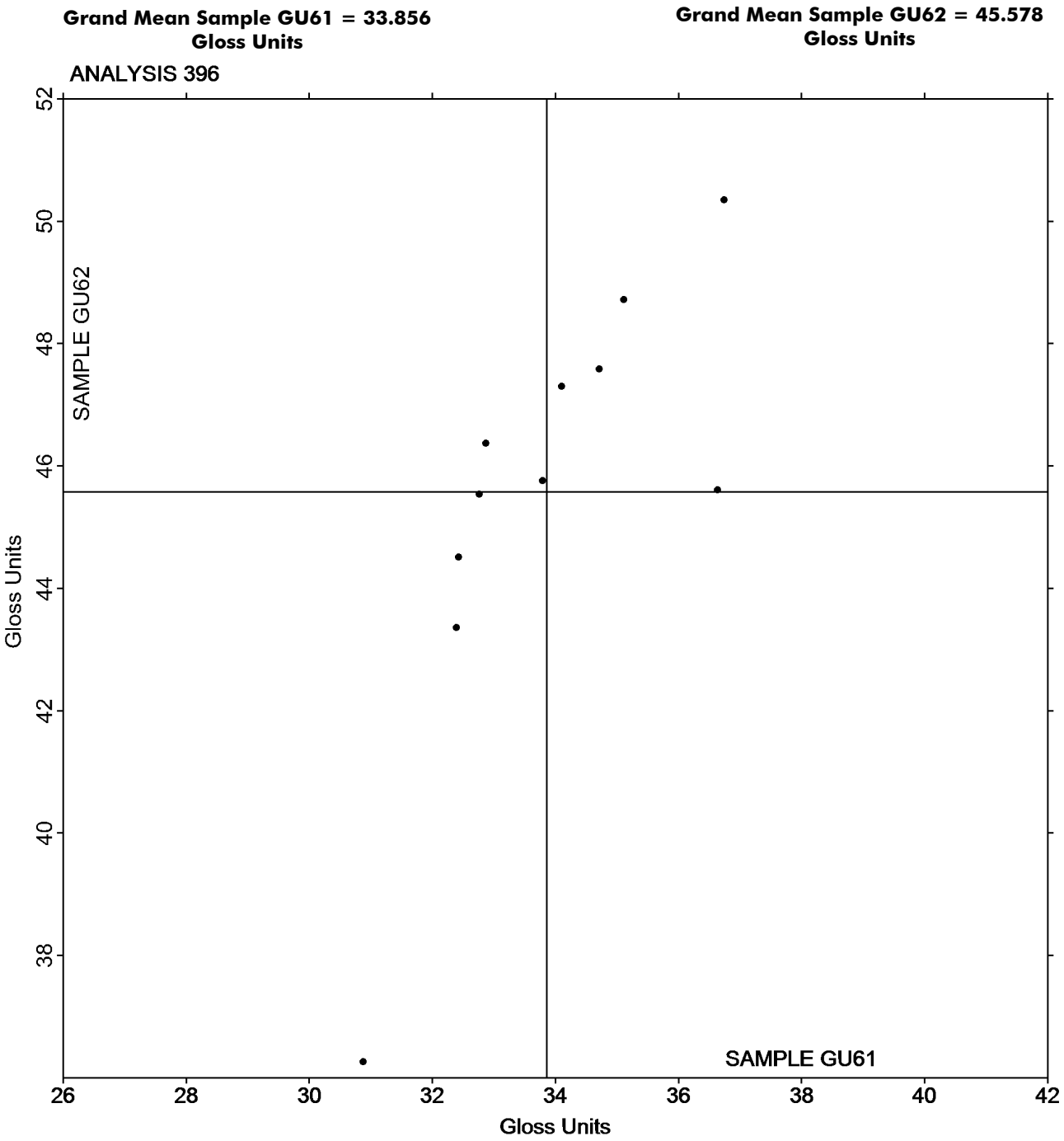
Statistics based on 11 of 11 reporting participants.

Analysis Notes:

7AQ2C9 - One determination removed from the Lab Mean of Sample GU61 per Grubb's Test at 1% risk (TAPPI 1205).

Key to Instrument Codes Reported by Participants

GS	BYK-Gardner Glossgard II	LA	L & W Gloss - Autoline 300
LE	L & W Elrepho	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 GW61 Lab Mean	Sample GW61 Diff from Grand Mean	Sample GW61 CPV	Sample GW62 Lab Mean	Sample GW62 Diff from Grand Mean	Sample GW62 CPV	Instr Code
34GGVF		102.1	-1.3	-2.02	88.74	-0.44	-0.71	ZZ
7AQ2C9	*	101.9	-1.5	-2.24	87.44	-1.74	-2.82	ZZ
7BNC8C		104.3	0.9	1.38	89.85	0.67	1.09	ZZ
8L2TE9		103.1	-0.3	-0.41	89.26	0.08	0.13	ZZ
9LDR6B		104.3	0.9	1.39	89.85	0.67	1.09	ZZ
A24C2P		103.5	0.1	0.20	89.09	-0.08	-0.14	ZZ
A8Q3LZ		103.9	0.5	0.76	89.16	-0.02	-0.03	ZZ
BUJHGD	X	152.2	48.8	74.02	131.96	42.78	69.51	ZZ
C7APU9		103.5	0.1	0.16	89.96	0.78	1.27	ZZ
CHMPTM		103.4	0.0	0.02	88.63	-0.55	-0.89	ZZ
CWLUWD		103.7	0.3	0.43	89.41	0.23	0.38	ZZ
D4HVQC		103.1	-0.3	-0.41	89.17	0.00	-0.01	ZZ
EA2DP7		103.6	0.2	0.27	89.17	-0.01	-0.01	ZZ
FAH6Z2		103.4	0.0	-0.01	89.34	0.16	0.27	ZZ
FXA4KC		103.6	0.2	0.29	89.56	0.38	0.62	ZZ
GC4ZC9		103.0	-0.3	-0.50	88.82	-0.36	-0.59	ZZ
HGA8DX		103.5	0.2	0.25	88.74	-0.44	-0.71	ZZ
J8XEC2	X	10.3	-93.1	-141.17	89.81	0.63	1.03	ZZ
JLKED2		103.5	0.1	0.20	90.16	0.99	1.60	ZZ
JTH98U		103.2	-0.1	-0.21	88.57	-0.61	-0.99	ZZ
MF2MEB		103.1	-0.3	-0.39	89.43	0.25	0.41	ZZ
MVX3E6		103.2	-0.1	-0.21	89.17	-0.01	-0.02	ZZ
P6XCVE		103.1	-0.3	-0.47	89.58	0.40	0.65	ZZ
TTACVM		104.4	1.0	1.50	90.07	0.89	1.45	ZZ
TZ7EVD		104.9	1.5	2.29	89.77	0.59	0.96	ZZ
VL3RJ2		102.6	-0.8	-1.26	88.48	-0.70	-1.14	ZZ
VN9Y3U		102.8	-0.6	-0.90	88.70	-0.48	-0.78	ZZ
WWDLAK		103.3	-0.1	-0.12	88.51	-0.67	-1.08	ZZ

Summary Statistics	Sample GW61	Sample GW62
Grand Means	103.38 g/sq m	89.18 g/sq m
Stnd Dev Btwn Labs	0.66 g/sq m	0.62 g/sq m

Statistics based on 26 of 28 reporting participants.

Comments on Assigned Data Flags for Test #398

J8XEC2 (X) - Extreme Data for Sample GW61.

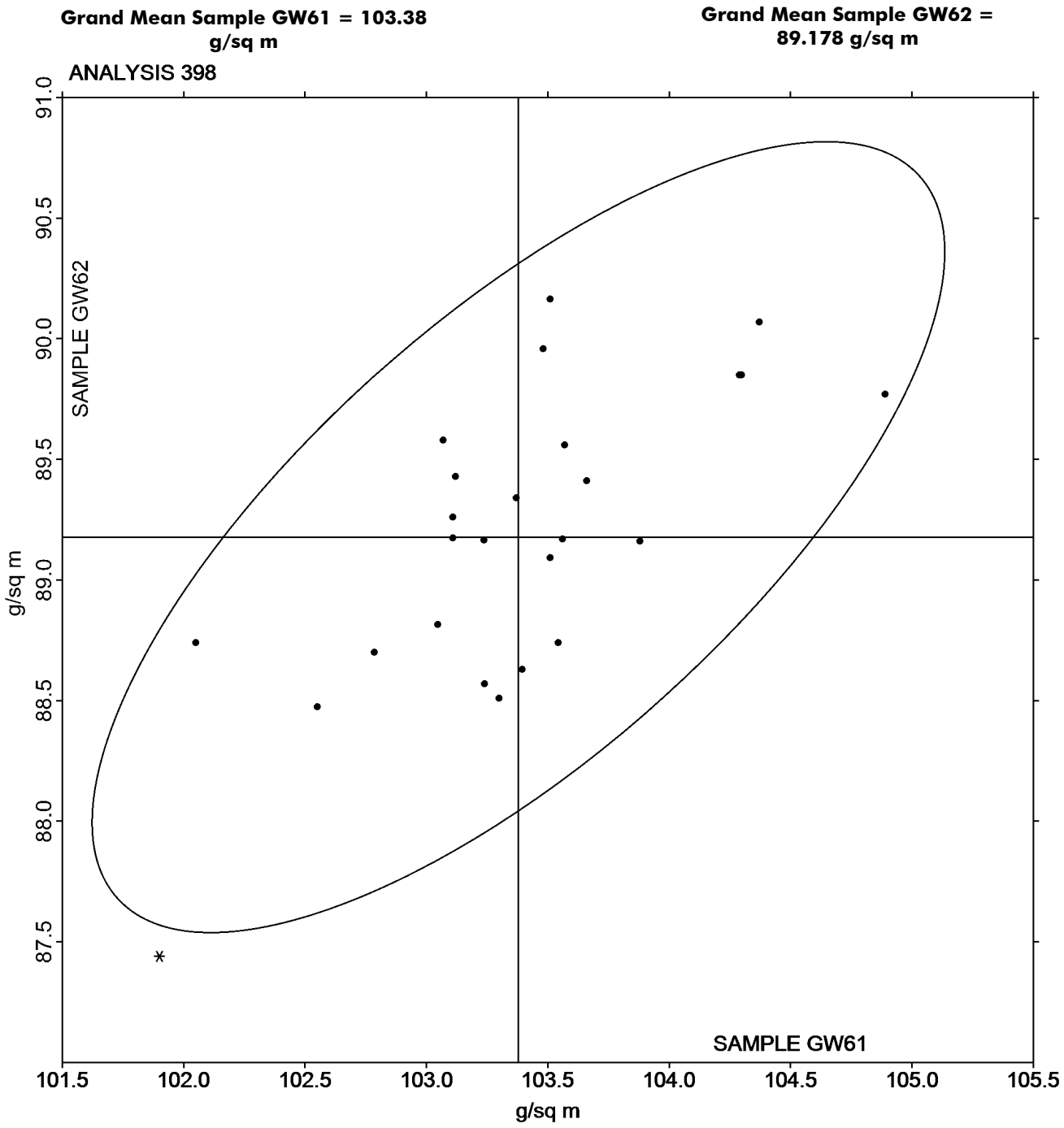
BUJHGD (X) - Extreme Data.

Analysis Notes:

J8XEC2 - Data possibly off by a factor of 10.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Paper & Paperboard Interlaboratory Testing Program

Report #2972G, December 2018

Analysis 399

Sizing Test (Hercules Type)

TAPPI Official Test Method T530

WebCode	Data Flag	Sample GX61 Lab Mean	Sample GX61 Diff from Grand Mean	Sample GX61 CPV	Sample GX62 Lab Mean	Sample GX62 Diff from Grand Mean	Sample GX62 CPV	Instr Code
24Y997		10.15	-2.45	-0.87	13.86	-1.75	-0.55	HE
4NHPRQ		13.50	0.90	0.32	14.00	-1.61	-0.50	HE
6FJNP3		10.36	-2.24	-0.79	14.57	-1.04	-0.33	HE
6H9V9E	X	19.50	6.90	2.46	31.40	15.79	4.95	HE
6ZAVZE		11.20	-1.40	-0.50	14.84	-0.77	-0.24	HE
7JGP36		13.76	1.16	0.41	15.41	-0.20	-0.06	HE
999RC8		17.19	4.59	1.63	19.73	4.12	1.29	HE
9LDR6B		12.54	-0.06	-0.02	14.31	-1.30	-0.41	HE
BUJHGD		9.93	-2.67	-0.95	13.12	-2.49	-0.78	HE
DCV292		15.57	2.97	1.06	15.56	-0.05	-0.02	HE
DG73MD		11.02	-1.58	-0.56	13.56	-2.05	-0.64	HE
GGWBCY		10.30	-2.30	-0.82	14.77	-0.84	-0.26	HE
J6UJTY		12.56	-0.04	-0.01	13.95	-1.66	-0.52	HE
J8XEC2	*	16.47	3.87	1.38	24.31	8.70	2.73	XX
K4WRX4		9.45	-3.15	-1.12	11.50	-4.11	-1.29	HE
NHLUBD		14.41	1.81	0.65	18.43	2.82	0.88	XX
QF8B3R		18.94	6.34	2.26	22.85	7.24	2.27	HE
RF7V7K		11.01	-1.59	-0.56	14.52	-1.09	-0.34	HE
TRDY9U		7.85	-4.75	-1.69	12.61	-3.00	-0.94	XX
WEF2YR		9.53	-3.07	-1.09	10.85	-4.76	-1.49	HE
WWDLAK		14.66	2.06	0.73	17.17	1.56	0.49	HE
XCNP9K		11.54	-1.06	-0.38	14.96	-0.65	-0.20	HE
Y3T4KX		12.68	0.08	0.03	15.19	-0.42	-0.13	HE
Z7UAWJ		11.53	-1.07	-0.38	17.50	1.89	0.59	HE
ZLK82Y		16.14	3.54	1.26	17.06	1.45	0.45	HE

Summary Statistics	Sample GX61	Sample GX62
Grand Means	12.60 Seconds	15.61 Seconds
Stnd Dev Btwn Labs	2.81 Seconds	3.19 Seconds

Statistics based on 24 of 25 reporting participants.

Comments on Assigned Data Flags for Test #399

6H9V9E (X) - Data for sample GX62 are high. Inconsistent within the determinations of sample GX62.

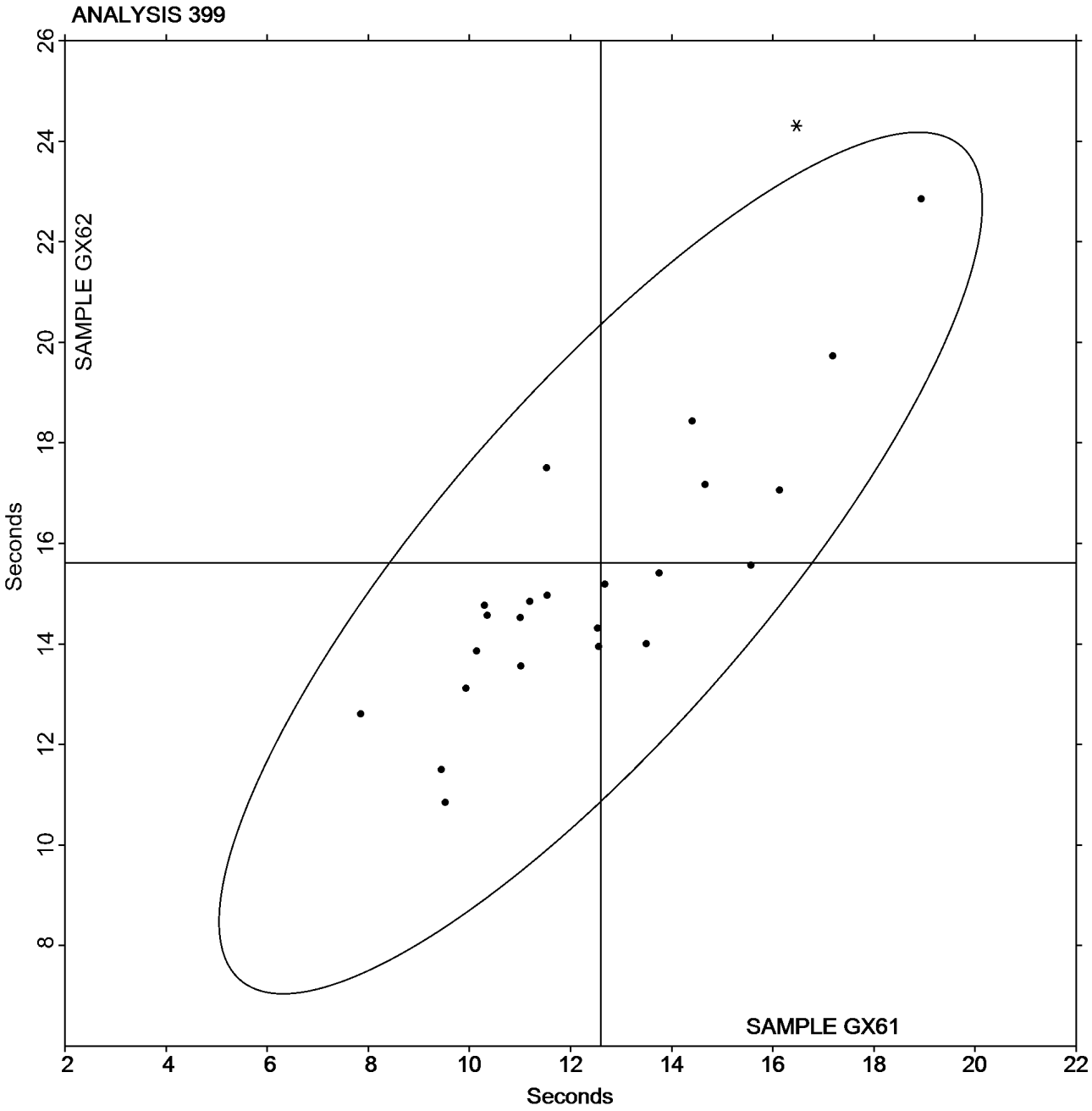
Key to Instrument Codes Reported by Participants

HE Hercules Sizing Tester

XX Instrument make/model not specified by lab

Grand Mean Sample GX61 = 12.595 Seconds

Grand Mean Sample GX62 = 15.610 Seconds



-End of Report-

