



Paper & Paperboard Testing Program

Summary Report #286G-February 2017

[Introduction to the Paper & Paperboard Program](#)

[Explanation of Tables and Definitions of Terms](#)

Analysis	Analysis Name
<u>350</u>	<u>Color & Color Difference (Near White Papers),</u>
<u>351</u>	<u>Color & Color Difference (Near White Papers),</u>
<u>360</u>	<u>Thickness (Caliper), Printing papers,</u>
<u>361</u>	<u>Thickness (Caliper), Packaging papers,</u>
<u>364</u>	<u>Coefficient of Static Friction-Horizontal Plane,</u>
<u>365</u>	<u>Coefficient of Kinetic Friction-Horizontal Plane,</u>
<u>370</u>	<u>Air Resistance, Gurley Oil Type,</u>
<u>372</u>	<u>Porosity, Sheffield Type,</u>
<u>376</u>	<u>Roughness - Print Surf Method 0.5 to 4.0 Microns,</u>
<u>377</u>	<u>Roughness - Print Surf Method 2.5 to 6.0 Microns,</u>
<u>378</u>	<u>Roughness, Sheffield Type,</u>
<u>382</u>	<u>Moisture Content,</u>
<u>384</u>	<u>Opacity (89% Backing) 82 to 95%,</u>
<u>386</u>	<u>Opacity (Paper Backing) 82 to 95%,</u>
<u>390</u>	<u>Brightness (Directional),</u>
<u>391</u>	<u>Directional Brightness of Fluorescent Samples,</u>
<u>392</u>	<u>Brightness (Diffuse),</u>
<u>394</u>	<u>Fluorescent Component of Directional Brightness,</u>
<u>395</u>	<u>Specular Gloss 75 Degree, 50-95 Units,</u>
<u>396</u>	<u>Specular Gloss 75 Degree, 20-65 Units,</u>
<u>398</u>	<u>Grammage (Basis Weight),</u>
<u>399</u>	<u>Sizing Test, Hercules Type,</u>

The CTS Paper, Paperboard & Corrugated Fiberboard 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, wine, and color, 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.

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

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Key for Web Summary Reports (Page 1 of 2)

WebCode	Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Paper Report published on the CTS 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:

<u>DATA FLAG</u>	<u>STATISTICALLY INCLUDED/EXCLUDED</u>	<u>ACTION REQUIRED</u>
*	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

Report #286G
February 2017

Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	ΔL	Δa	Δb	ΔE	
2Q4GZ4		GA39	95.29	-0.74	3.73	-0.31	-0.02	0.04	0.31	EH
		GA40	94.98	-0.76	3.76					
49UECF	X	GA39	97.73	-0.64	1.01	-0.44	-0.04	0.04	0.44	NE
		GA40	97.29	-0.69	1.05					
4KQHGA		GA39	95.36	-0.79	3.64	-0.29	-0.02	0.09	0.31	TC
		GA40	95.06	-0.81	3.73					
8B9B9V		GA39	92.20	-0.26	2.54	0.22	-0.06	0.40	0.46	TS
		GA40	92.42	-0.32	2.94					
9GCEYU		GA39	93.25	-0.78	2.66	-0.18	0.21	0.23	0.36	HH
		GA40	93.07	-0.57	2.89					
BWFPGX		GA39	94.40	-0.02	3.24	-0.35	0.03	0.05	0.36	TS
		GA40	94.05	0.01	3.30					
EMWKXN		GA39	93.92	-0.45	3.39	-0.42	0.07	0.06	0.43	TS
		GA40	93.50	-0.38	3.45					
GYNTRA		GA39	95.12	-0.83	3.59	-0.12	0.02	0.22	0.25	LS
		GA40	95.00	-0.80	3.80					
H7GKD9		GA39	95.44	-0.81	3.55	-0.36	0.13	0.22	0.44	EH
		GA40	95.08	-0.68	3.77					
KELCWN		GA39	94.23	-0.63	3.75	-0.34	-0.03	0.07	0.34	HH
		GA40	93.89	-0.65	3.82					
KXDDQ6		GA39	93.16	-0.10	3.26	-0.27	0.02	0.02	0.27	TS
		GA40	92.89	-0.08	3.28					
LV7HHL		GA39	93.21	0.00	3.09	-0.43	0.05	0.11	0.45	TS
		GA40	92.78	0.05	3.20					
M4ECCE		GA39	93.73	-0.64	3.28	-0.21	0.02	0.04	0.22	HH
		GA40	93.52	-0.62	3.32					
PRX7EH		GA39	93.10	-0.18	3.13	-0.32	0.02	0.08	0.33	TM
		GA40	92.78	-0.17	3.20					
TALQKC		GA39	94.03	-0.47	3.50	-0.36	0.00	0.04	0.36	LA
		GA40	93.67	-0.47	3.53					
TG8LLG		GA39	95.00	-0.67	3.44	-0.35	-0.04	0.03	0.35	HE
		GA40	94.65	-0.71	3.48					



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Analysis 350
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Hunter L,a,b - Illuminant C - 2 Degree Observer

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Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	ΔL	Δa	Δb	ΔE	
VFMLHH		GA39	95.32	-0.82	3.62	-0.85	-0.02	0.09	0.85 X	LS
		GA40	94.47	-0.83	3.70					
WAU2R8		GA39	96.67	-0.63	2.74	-0.18	0.06	0.09	0.21	XS
		GA40	96.49	-0.58	2.83					
XHHE7W		GA39	94.20	-0.79	3.62	-0.38	-0.01	0.02	0.38	TC
		GA40	93.82	-0.80	3.63					
YNLJVV		GA39	94.30	-1.09	3.58	-0.16	0.08	0.16	0.24	HG
		GA40	94.13	-1.01	3.74					
ZYH7XC		GA39	94.46	-0.66	3.48	-0.34	0.01	0.03	0.35	MK
		GA40	94.11	-0.66	3.51					

Grand Means			Summary Statistics						
GA39	94.481	-0.571	3.341						
GA40	94.174	-0.549	3.445	-0.301	0.026	0.104	0.364		
Std Dev Btwn Labs									
GA39	1.271	0.298	0.353						
GA40	1.216	0.296	0.315	0.194	0.062	0.097	0.137		

Statistics based on 20 of 21 reporting participants

Comments on Assigned Data Flags for Test #350

49UECF (X) - Low b values for both samples. Inconsistent within a values for sample GA40.

Key to Instrument Codes Reported by Participants

EH	Datacolor Elrepho SF450	HE	Hunter LabScan
HG	Hunter ColorQUEST	HH	Hunter D25DP - 9000
LA	L & W Elrepho AL300	LS	L & W Elrepho SE 070
MK	Macbeth Color-Eye 7000 Spectrophotometer	NE	Minolta CM-3500d Spectrophotometer
TC	Technidyne Color Touch Series	TM	Technidyne Technibrite Micro TB-1C
TS	Technidyne Brightimeter Micro S-5	XS	X-Rite 938 Spectrodensitometer



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

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Web
Code

F Samples

Hunter L, a, b Color Values

L

a

b

Color Difference Values

ΔL

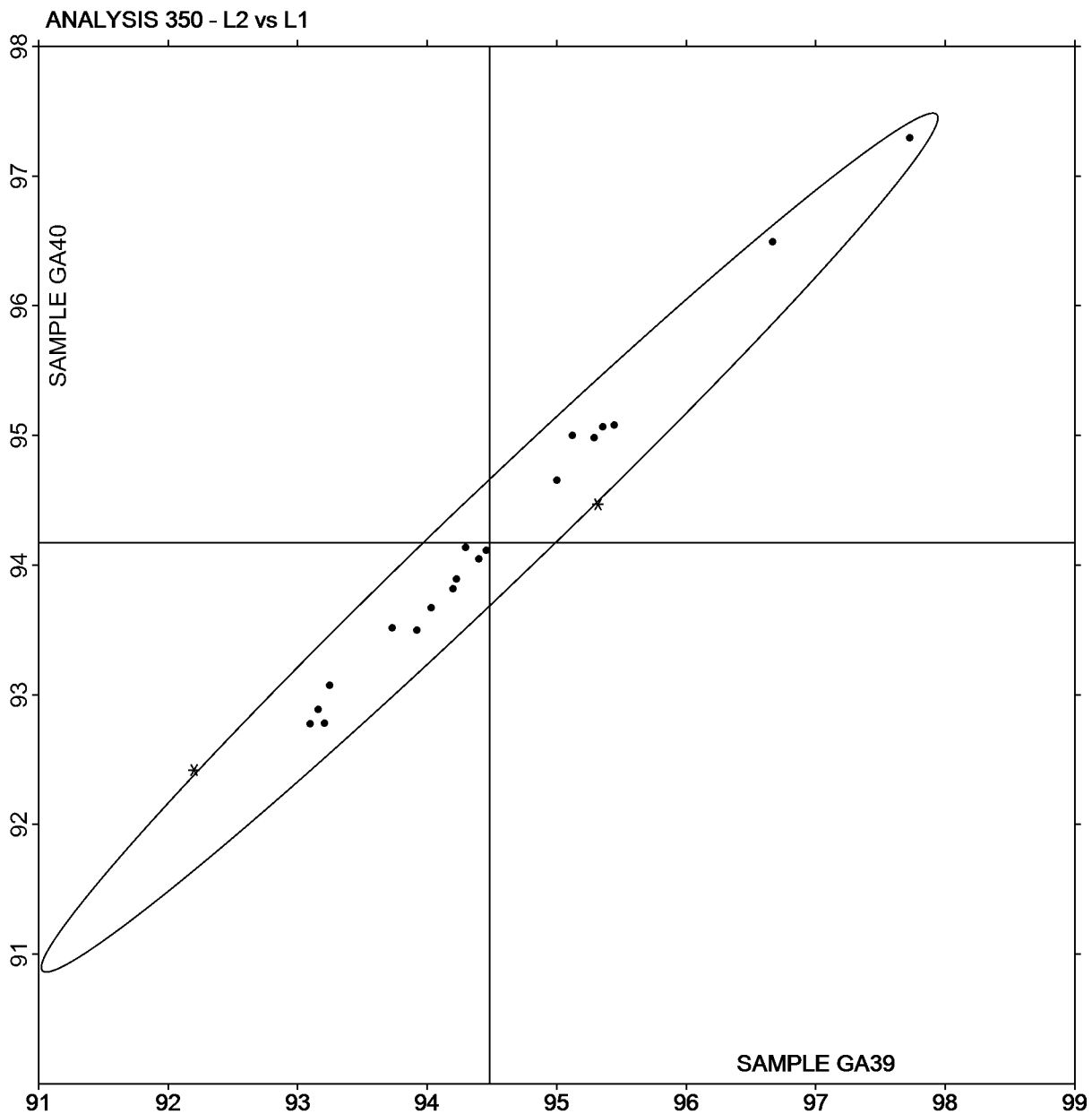
Δa

Δb

ΔE

Instr Code

Plot of L values GA40 v L values GA39



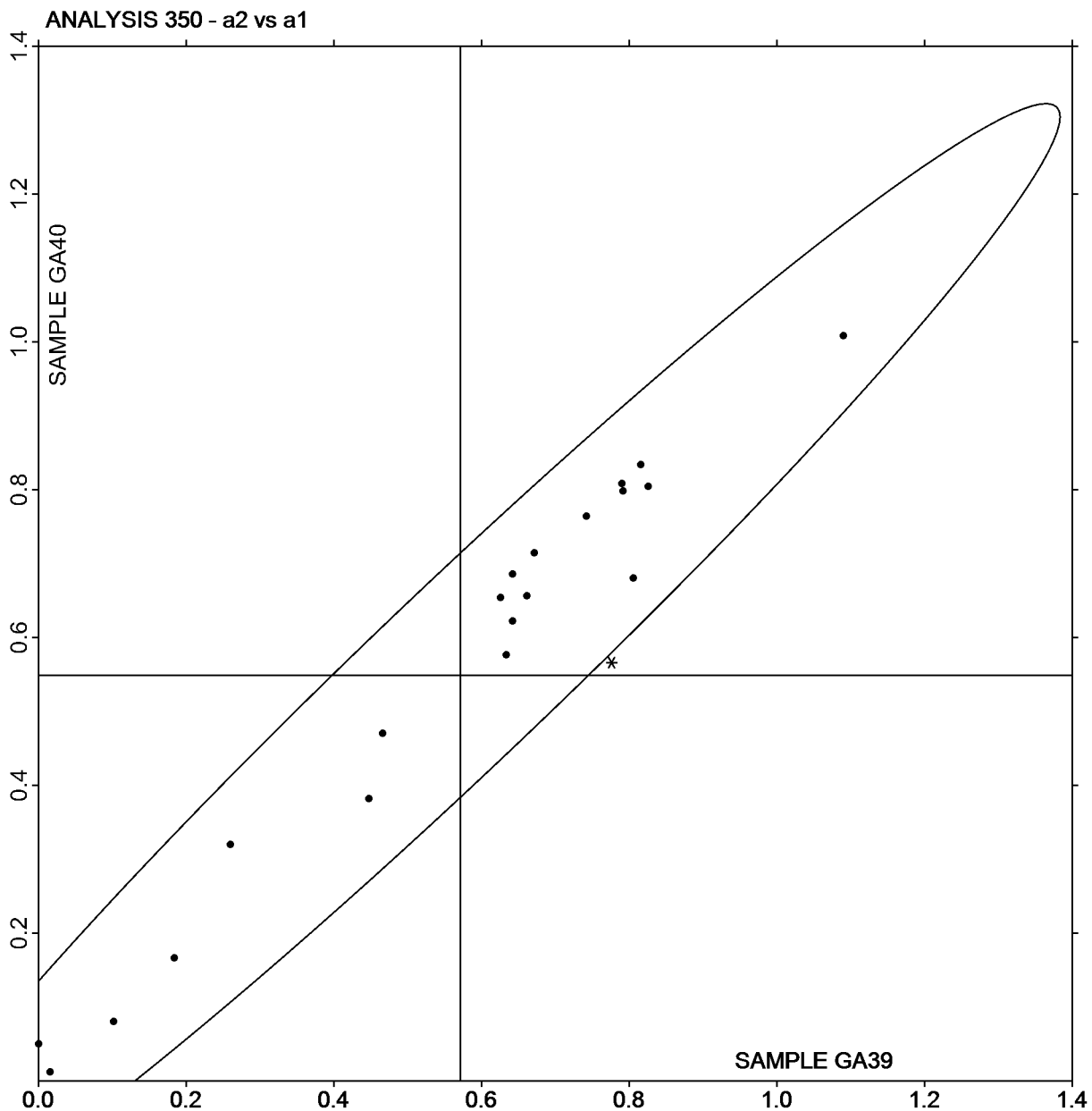


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Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	ΔL	Δa	Δb	ΔE	

Plot of a values GA40 v a values GA39

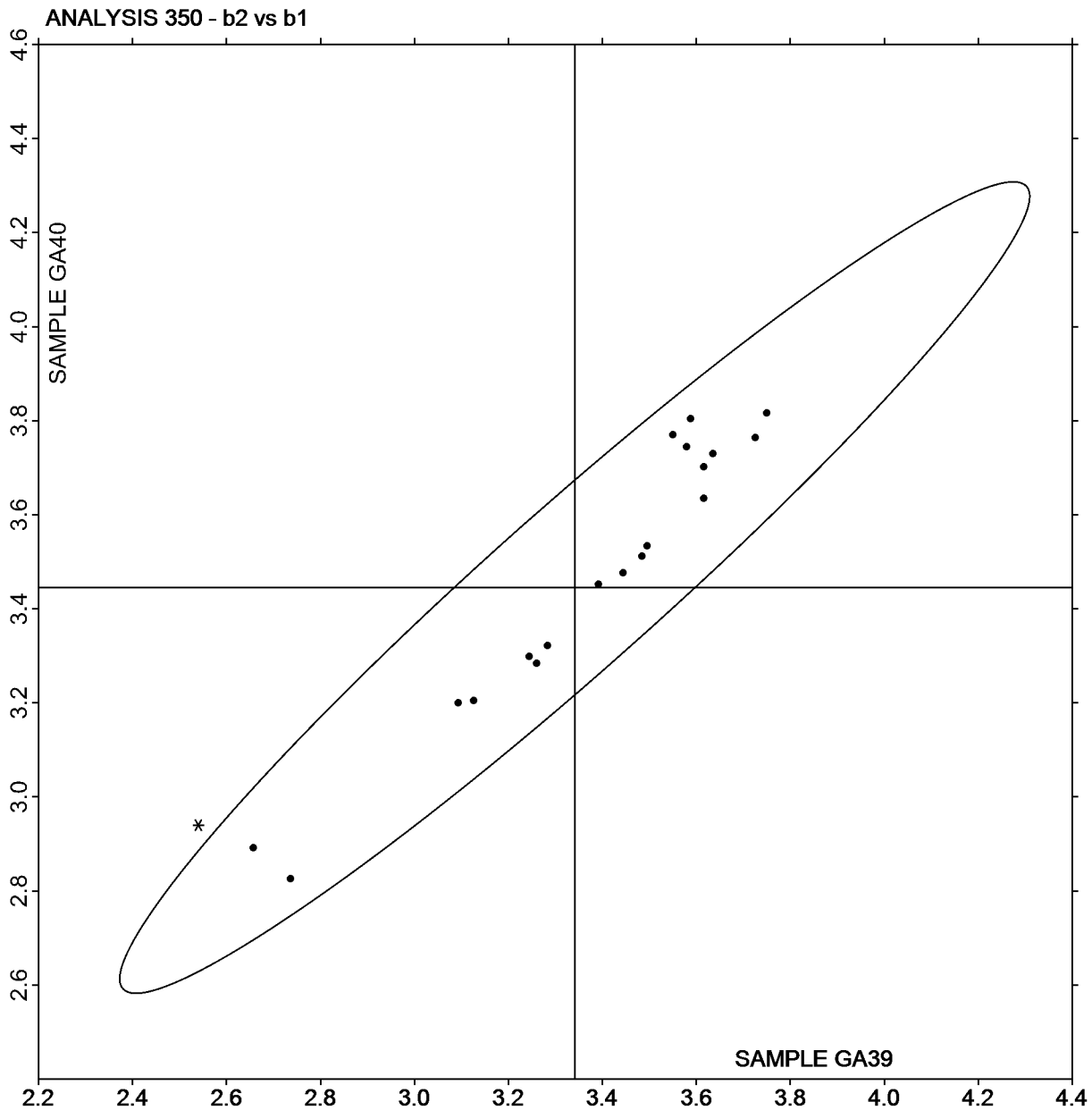




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Plot of b values GA40 v b values GA39





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2FK6NQ	GA39	93.93	-0.58	3.46	-0.24	-0.02	0.20	0.31	XM
	GA40	93.69	-0.60	3.65					
346FMZ	GA39	94.72	-0.63	3.46	-0.33	-0.04	0.03	0.33	HE
	GA40	94.40	-0.67	3.48					
7EXXQY	GA39	95.54	-0.61	3.69	-0.32	-0.03	0.02	0.32	HT
	GA40	95.22	-0.64	3.71					
8J2HR2	GA39	95.66	-0.55	3.85	-0.28	-0.05	0.02	0.28	NF
	GA40	95.38	-0.60	3.87					
9YUDYL	GA39	96.95	-0.45	3.06	-0.20	-0.02	0.13	0.24	XP
	GA40	96.76	-0.47	3.19					
AGA76Z	GA39	95.27	-0.67	3.65	-0.28	-0.02	0.05	0.28	EH
	GA40	94.99	-0.70	3.70					
CRJHBU	GA39	95.50	-0.71	3.83	-0.37	-0.04	0.10	0.39	TC
	GA40	95.13	-0.75	3.93					
CYFHLF	GA39	94.91	-0.53	3.36	-0.30	-0.03	0.02	0.31	HV
	GA40	94.61	-0.56	3.38					
D2L3AF	GA39	95.52	-0.63	3.86	-0.29	-0.03	0.02	0.29	HT
	GA40	95.23	-0.66	3.88					
F2B9KQ	GA39	95.24	-0.64	3.75	0.00	-0.03	0.08	0.09 X	TC
	GA40	95.24	-0.67	3.84					
GYNTRA	GA39	95.30	-0.79	3.70	-0.16	-0.02	0.08	0.18	LS
	GA40	95.14	-0.82	3.78					
J86EP4	GA39	95.45	-0.60	4.01	-0.32	-0.02	0.05	0.32	NG
	GA40	95.13	-0.62	4.06					
MG3FF6	GA39	94.05	-0.64	3.55	-0.37	-0.02	0.05	0.37	TC
	GA40	93.68	-0.66	3.60					
MLJLEZ	GA39	95.69	-0.64	3.71	-0.29	-0.02	0.11	0.31	XP
	GA40	95.41	-0.66	3.82					
MTJ3TC	GA39	95.61	-0.68	3.42	-0.21	-0.03	0.02	0.21	XX
	GA40	95.40	-0.71	3.44					
RVMRVU	GA39	95.54	-0.58	3.87	-0.26	-0.04	0.11	0.29	NG
	GA40	95.28	-0.62	3.98					
TG8LLG	GA39	94.95	-0.67	3.40	-0.37	-0.04	0.08	0.39	HE
	GA40	94.57	-0.71	3.48					
TLECPM	GA39	94.52	-0.69	3.53	-0.32	-0.01	0.04	0.32	HT
	GA40	94.20	-0.70	3.57					



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

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YUEKYV	GA39	95.40	-0.70	3.57	-0.30	0.00	0.13	0.33	EF
	GA40	95.10	-0.70	3.70					
ZC6DXX	GA39	94.12	-0.63	3.52	-0.37	-0.02	0.04	0.37	TC
	GA40	93.75	-0.65	3.56					
ZMK6L9	GA39	95.54	-0.58	4.01	-0.25	-0.02	0.02	0.25	NG
	GA40	95.29	-0.60	4.03					

Grand Means				Summary Statistics					
GA39	95.210	-0.629	3.631						
GA40	94.933	-0.655	3.697	-0.277	-0.027	0.066	0.294		
Std Dev Btwn Labs									
GA39	0.682	0.072	0.236						
GA40	0.715	0.071	0.229	0.086	0.011	0.049	0.071		

Statistics based on 21 of 21 reporting participants

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



Paper & Paperboard Interlaboratory Testing Program
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Color & Color Difference - Near White Papers - D65/10deg obs
Hunter L,a,b - Illuminant D65 - 10 Degree Observer

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Web
Code

F Samples

Hunter L, a, b Color Values

L

a

b

Color Difference Values

ΔL

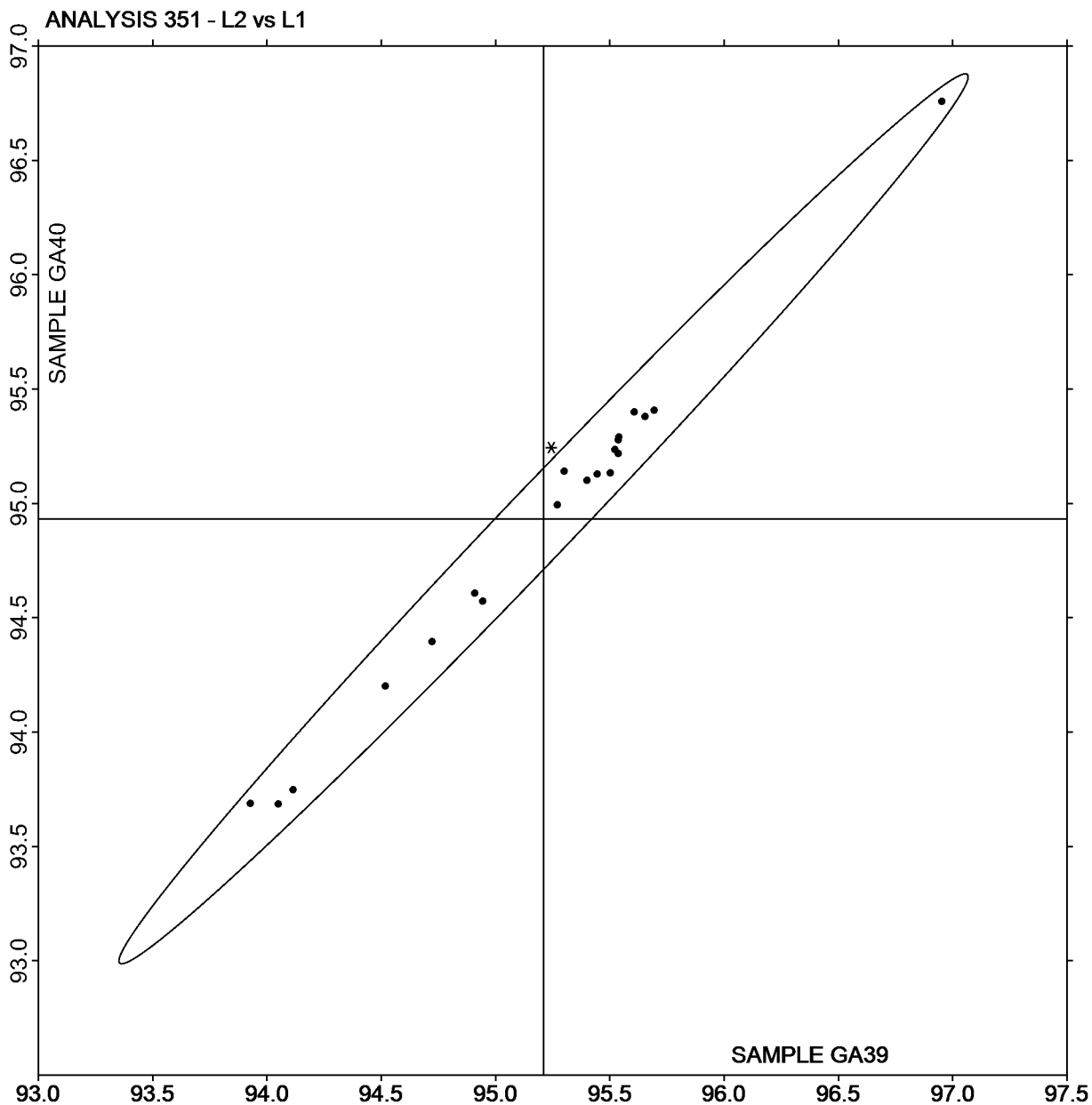
Δa

Δb

ΔE

Instr Code

Plot of L values GA40 v L values GA39



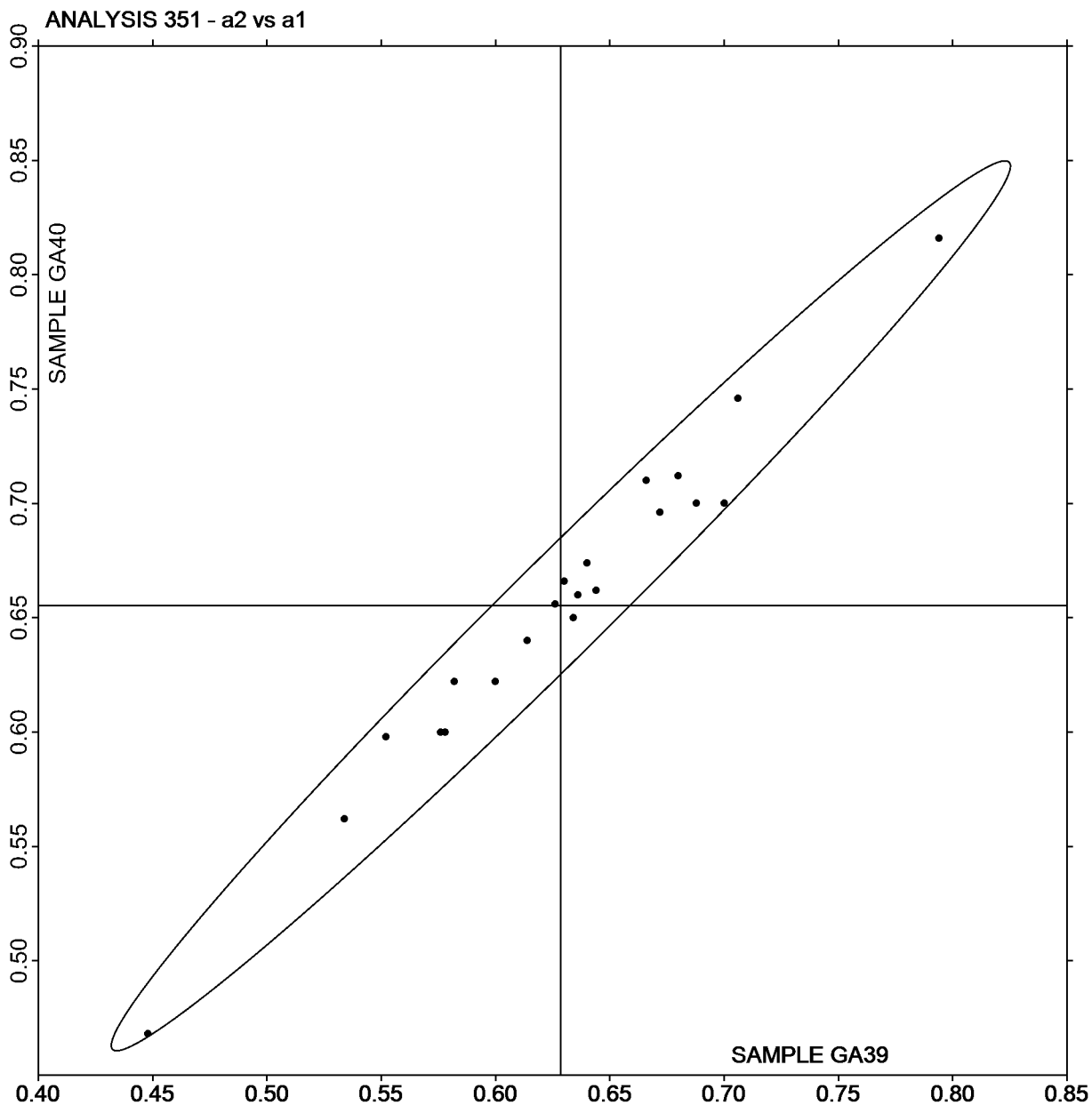


Paper & Paperboard Interlaboratory Testing Program
Analysis 351
Color & Color Difference - Near White Papers - D65/10deg obs
Hunter L,a,b - Illuminant D65 - 10 Degree Observer

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Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	ΔL	Δa	Δb	ΔE	

Plot of a values GA40 v a values GA39

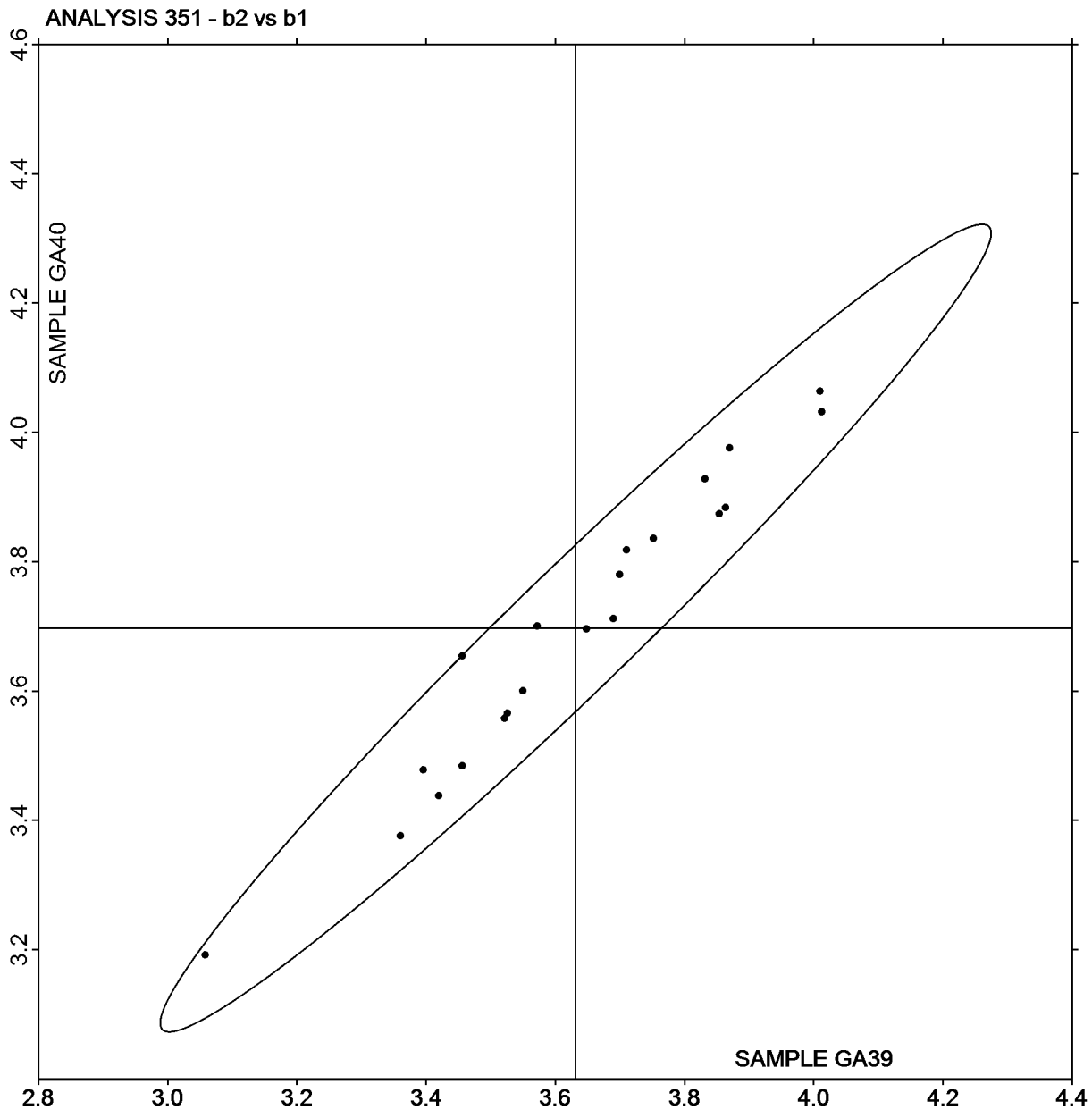




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Plot of b values GA40 v b values GA39





**Paper & Paperboard Interlaboratory Testing Program
Analysis 360
Thickness (Caliper), Printing papers**

Report #286G
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WebCode	Data Flag	Sample GV39			Sample GV40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2AVPVD		5.068	0.088	1.12	4.662	0.040	0.54	LW
2FK6NQ		4.909	-0.071	-0.90	4.539	-0.083	-1.12	LW
346FMZ		5.074	0.094	1.19	4.727	0.105	1.42	TM
38LZ8V		4.924	-0.056	-0.71	4.570	-0.052	-0.71	TA
3T2K6V	*	4.944	-0.036	-0.46	4.469	-0.153	-2.08	EM
4KQHGA		4.979	-0.001	-0.01	4.597	-0.025	-0.34	LA
4MDXAQ		5.079	0.099	1.26	4.700	0.078	1.06	TM
6GM6BV	X	22.974	17.994	229.32	23.967	19.345	262.39	TM
6N2VWM		4.880	-0.100	-1.27	4.520	-0.102	-1.39	XX
7EXXQY		4.927	-0.053	-0.68	4.624	0.002	0.03	EM
8FKY6L		4.810	-0.170	-2.17	4.480	-0.142	-1.93	TM
8J2HR2		5.100	0.120	1.52	4.732	0.110	1.49	TM
9YUDYL		4.870	-0.110	-1.40	4.500	-0.122	-1.66	TM
B784HH		4.989	0.009	0.11	4.642	0.020	0.27	LW
BRLTTR		5.017	0.037	0.47	4.649	0.027	0.36	LW
BWFPGX		4.975	-0.005	-0.06	4.662	0.040	0.54	EM
C24UM7		5.008	0.028	0.36	4.632	0.010	0.14	LW
CRJHBU		4.923	-0.057	-0.73	4.553	-0.069	-0.93	LW
CYFHLF		4.934	-0.046	-0.59	4.607	-0.015	-0.21	TA
D2L3AF		5.060	0.080	1.02	4.709	0.087	1.18	EM
DBCLR V		4.993	0.012	0.16	4.682	0.059	0.81	EM
DTP9BH	*	4.764	-0.216	-2.75	4.505	-0.117	-1.59	TA
EMWKXN		4.977	-0.003	-0.04	4.580	-0.042	-0.57	LA
ETL3CY		4.870	-0.110	-1.40	4.520	-0.102	-1.39	TM
FA93F4		4.960	-0.020	-0.26	4.629	0.007	0.09	PP
FAPWHY		5.040	0.060	0.76	4.738	0.116	1.57	FR
FV88JW	*	4.884	-0.096	-1.22	4.678	0.056	0.76	TM
G8XFJB		5.073	0.093	1.19	4.590	-0.032	-0.44	LW
GEFQT6		5.023	0.043	0.55	4.655	0.033	0.45	EM
H7GKD9		4.984	0.004	0.05	4.668	0.046	0.62	EM
J2LBKM		5.014	0.034	0.43	4.658	0.036	0.49	TM
J86EP4		4.920	-0.060	-0.76	4.569	-0.053	-0.72	XX
KUXNPG		4.978	-0.002	-0.02	4.663	0.041	0.55	LW
KYW6ZP		4.904	-0.076	-0.97	4.533	-0.089	-1.21	LA
LV7HHL		4.907	-0.073	-0.93	4.482	-0.140	-1.90	TM
MLWD8G	*	5.110	0.130	1.65	4.607	-0.015	-0.20	TM
MTJ3TC		4.949	-0.031	-0.40	4.578	-0.044	-0.60	LW
MY4ZHY		4.946	-0.034	-0.43	4.680	0.058	0.78	EM
N3YCTP	X	5.262	0.282	3.60	4.878	0.256	3.47	LW
NA3DV6		4.900	-0.080	-1.02	4.600	-0.022	-0.30	LW
NEVHLN		4.987	0.007	0.09	4.628	0.006	0.08	LW



**Paper & Paperboard Interlaboratory Testing Program
Analysis 360
Thickness (Caliper), Printing papers**

**Report #286G
February 2017**

WebCode	Data Flag	Sample GV39			Sample GV40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
P7X8T4		5.088	0.108	1.38	4.736	0.114	1.54	TA
PRX7EH		4.984	0.004	0.05	4.610	-0.012	-0.16	TA
QPQ9ML		4.858	-0.122	-1.55	4.549	-0.073	-0.99	LW
R6U6EJ		5.000	0.020	0.25	4.673	0.051	0.69	MS
RVMRVU		5.070	0.090	1.15	4.648	0.026	0.35	EM
T8VR8E		5.018	0.038	0.48	4.570	-0.052	-0.71	PP
TALQKC		5.056	0.076	0.97	4.680	0.057	0.78	LA
TDK8UZ		4.949	-0.031	-0.40	4.637	0.015	0.20	TA
VFMLHH		4.998	0.018	0.23	4.633	0.011	0.15	LW
VJ674X		5.091	0.111	1.41	4.724	0.101	1.38	LW
WAU2R8		4.960	-0.020	-0.26	4.660	0.038	0.51	TM
WGAMXP		5.005	0.025	0.32	4.580	-0.042	-0.57	XX
XALGG9		5.109	0.129	1.64	4.740	0.118	1.60	LW
XFCUHW		5.023	0.043	0.55	4.677	0.055	0.75	LW
XR4JBB		4.927	-0.053	-0.68	4.616	-0.006	-0.08	EM
Y3LHJR		4.978	-0.002	-0.03	4.675	0.053	0.72	EM
YHXXLN		5.015	0.035	0.45	4.640	0.018	0.24	LA
ZAZPH9		4.912	-0.068	-0.87	4.554	-0.068	-0.92	EM
ZC6DXX		5.128	0.148	1.89	4.677	0.055	0.74	TA
ZMK6L9		4.991	0.010	0.13	4.510	-0.112	-1.52	LW
ZMNRYP		4.881	-0.099	-1.26	4.561	-0.061	-0.82	LW
ZYH7XC		5.089	0.109	1.39	4.782	0.160	2.17	PP

	Sample GV39	Summary Statistics	Sample GV40
Grand Means	4.9800 mils		4.6221 mils
SD Btwn Labs	0.0785 mils		0.0737 mils
Statistics based on 61 of 63 reporting participants			

Comments on Assigned Data Flags for Test #360

6GM6BV (X) - Extreme Data.

N3YCTP (X) - Data for both samples are high. Possible Systematic Error.

ZMNRYP - 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	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		



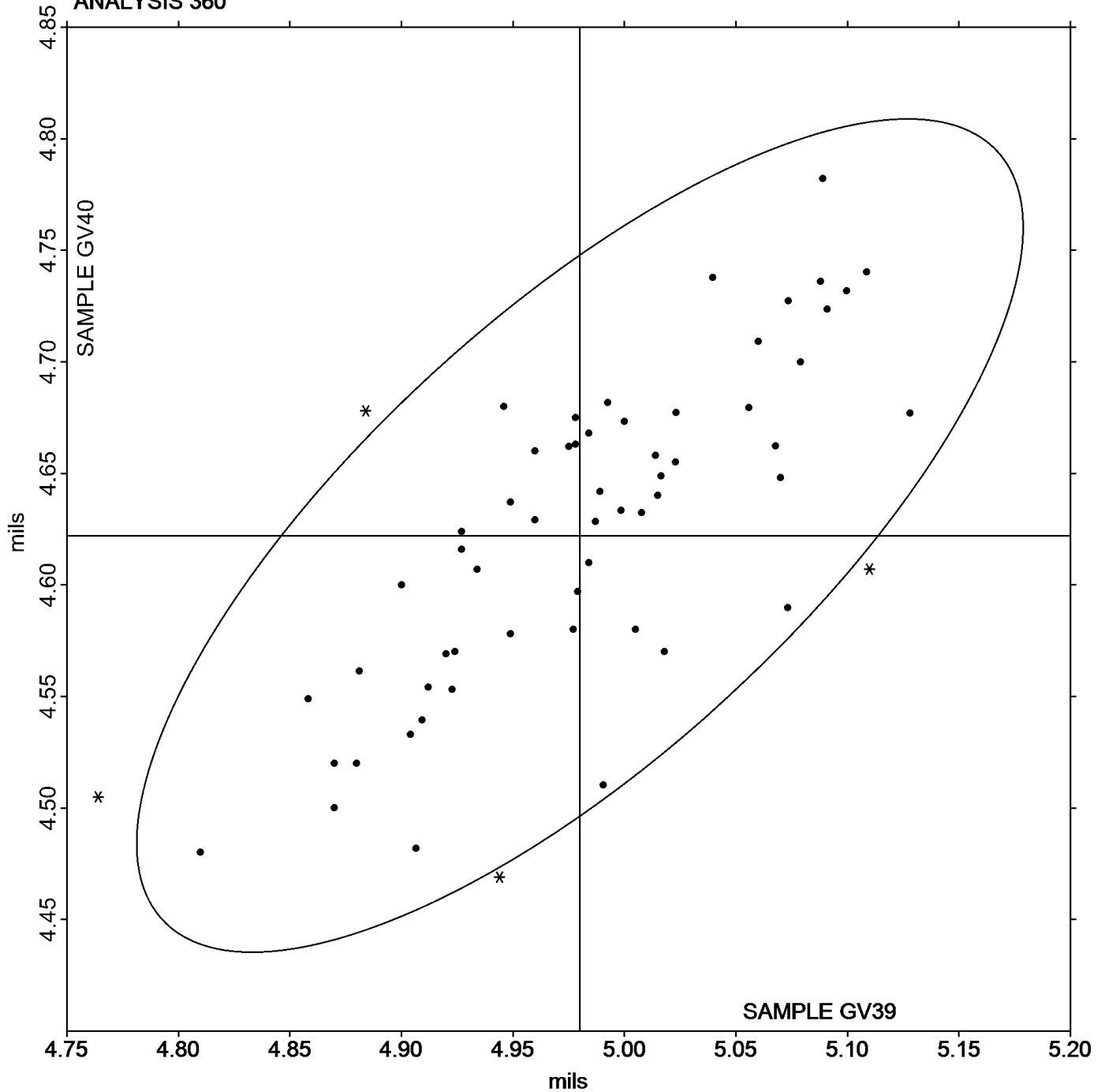
Paper & Paperboard Interlaboratory Testing Program
Analysis 360
Thickness (Caliper), Printing papers

Report #286G
February 2017

Grand Mean Sample **GV39** = 4.9800 mils

Grand Mean Sample **GV40** = 4.6221 mils

ANALYSIS 360





**Paper & Paperboard Interlaboratory Testing Program
Analysis 361
Thickness (Caliper), Packaging papers**

Report #286G
February 2017

WebCode	Data Flag	Sample GY39			Sample GY40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
8B9B9V		14.01	-0.09	-0.52	9.354	-0.107	-0.71	EM
9GCEYU		14.25	0.15	0.88	9.580	0.119	0.79	EM
AGA76Z		14.43	0.33	1.93	9.689	0.228	1.52	EM
C24UM7		14.10	0.01	0.04	9.485	0.024	0.16	LW
CAK9PC		14.00	-0.10	-0.56	9.309	-0.152	-1.01	LW
CWCM4X		14.39	0.30	1.73	9.724	0.263	1.75	LA
D8P7YE		13.85	-0.25	-1.43	9.230	-0.231	-1.54	XX
DAT2HG		14.00	-0.10	-0.59	9.408	-0.053	-0.35	PP
DBCLRV		14.22	0.12	0.71	9.488	0.027	0.18	EM
DTP9BH		14.08	-0.02	-0.11	9.310	-0.151	-1.00	TA
ETL3CY		13.92	-0.18	-1.02	9.370	-0.091	-0.60	TM
G8XFJB		14.00	-0.10	-0.58	9.291	-0.170	-1.13	LW
GYNTRA		14.08	-0.01	-0.07	9.402	-0.059	-0.39	TM
J2LBKM		14.29	0.20	1.16	9.712	0.251	1.67	TM
JJK7GJ		14.30	0.21	1.20	9.610	0.149	0.99	TM
KELCWN		13.85	-0.24	-1.42	9.345	-0.116	-0.77	EM
M4ECCE		14.19	0.09	0.55	9.602	0.141	0.94	EM
MG3FF6		14.22	0.12	0.73	9.525	0.064	0.43	EM
MJRPRR		13.73	-0.36	-2.11	9.160	-0.301	-2.00	TM
NZWCUD		14.11	0.01	0.06	9.465	0.004	0.03	TA
QCFV4Z		14.17	0.07	0.42	9.537	0.076	0.51	XX
QNQDV3		13.92	-0.18	-1.02	9.350	-0.111	-0.74	TM
RRAPBK		13.92	-0.18	-1.02	9.263	-0.198	-1.31	TM
RUFM4		14.16	0.07	0.39	9.552	0.091	0.61	PP
T6TPLJ		14.08	-0.02	-0.09	9.537	0.076	0.51	TM
TALQKC		14.24	0.15	0.86	9.570	0.110	0.73	LA
TG8LLG		13.94	-0.16	-0.94	9.415	-0.046	-0.30	EM
VKW3Q7		13.78	-0.32	-1.84	9.275	-0.186	-1.24	TA
VRT32R		14.03	-0.07	-0.39	9.310	-0.151	-1.01	LA
WQZ7EJ		14.09	-0.01	-0.03	9.380	-0.081	-0.54	TA
XALGG9		14.31	0.22	1.28	9.686	0.225	1.49	XX
XWLJTC		14.17	0.07	0.43	9.590	0.129	0.86	LA
YFBJXD		14.17	0.08	0.45	9.563	0.102	0.68	LW
ZVG39B		14.25	0.16	0.92	9.583	0.122	0.81	TM

	Sample GY39	Summary Statistics	Sample GY40
Grand Means	14.096 mils		9.4608 mils
SD Btwn Labs	0.171 mils		0.1503 mils
Statistics based on 34 of 34 reporting participants			



Paper & Paperboard Interlaboratory Testing Program
Analysis 361
Thickness (Caliper), Packaging papers

Report #286G
February 2017

Analysis Notes:

D8P7YE - Data appear to be reported as mils, not micrometers as indicated on datasheet. Units corrected by CTS.

Key to Instrument Codes Reported by Participants

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

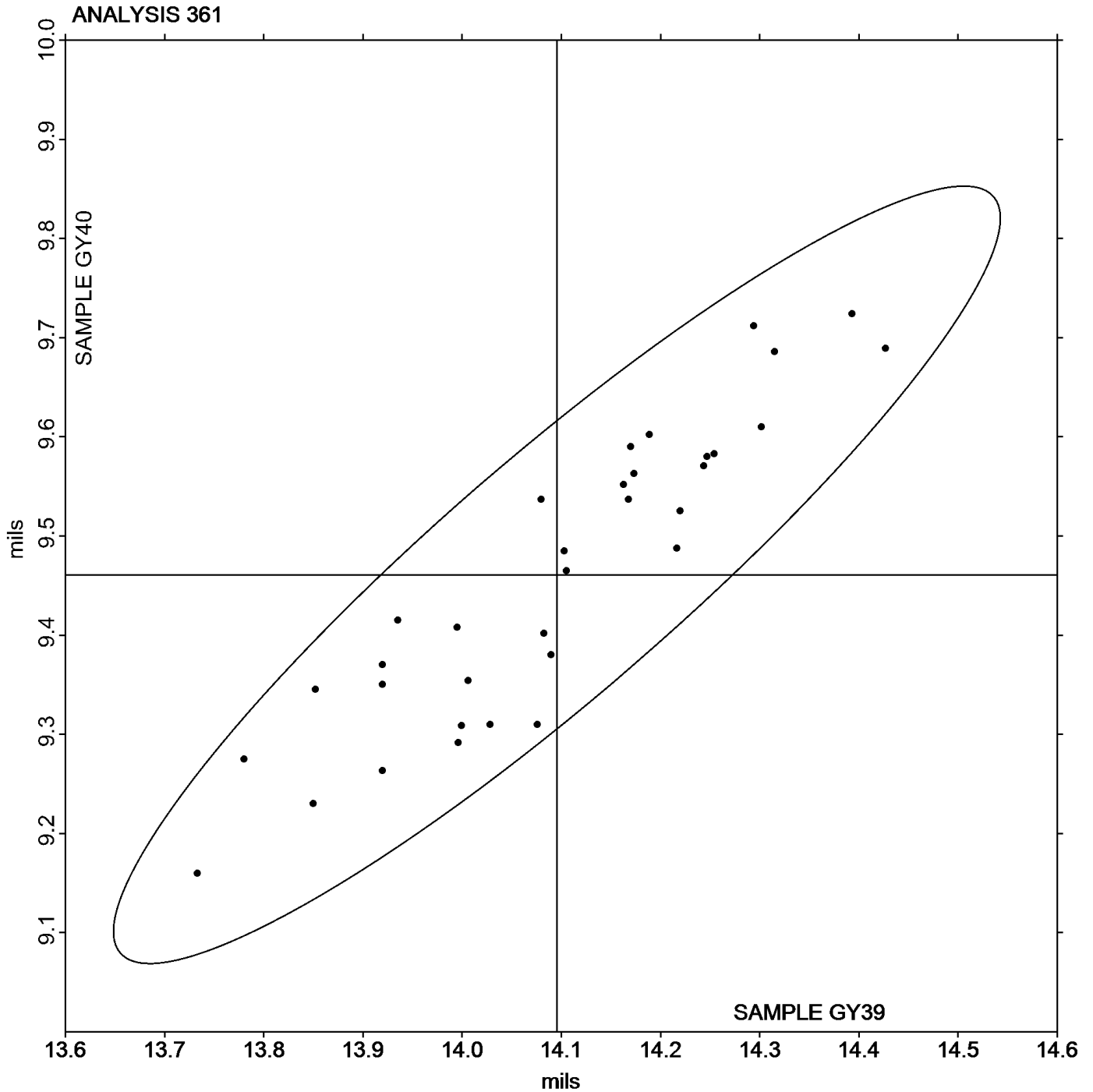


Paper & Paperboard Interlaboratory Testing Program
Analysis 361
Thickness (Caliper), Packaging papers

Report #286G
February 2017

Grand Mean Sample **GY39** = 14.096 mils

Grand Mean Sample **GY40** = 9.4608 mils





**Paper & Paperboard Interlaboratory Testing Program
Analysis 364**

Report #286G
February 2017

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

WebCode	Data Flag	Sample GD39			Sample GD40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
BWFPGX		0.6618	0.0855	1.42	0.5658	0.0309	0.90	XX
JWTAH8		0.5296	-0.0467	-0.77	0.5318	-0.0031	-0.09	IT
VRT32R		0.5130	-0.0633	-1.05	0.4802	-0.0547	-1.59	TA
WAU2R8	X	0.3076	-0.2687	-4.46	0.3574	-0.1775	-5.15	XX
WLPFQ4		0.6078	0.0315	0.52	0.5630	0.0281	0.82	TA
ZMK6L9		0.5694	-0.0069	-0.11	0.5336	-0.0013	-0.04	TM

		Summary Statistics	
	Sample GD39		Sample GD40
Grand Means	0.57632 COF		0.53488 COF
SD Btwn Labs	0.06029 COF		0.03445 COF
Statistics based on 5 of 6 reporting participants			

Comments on Assigned Data Flags for Test #364

WAU2R8 (X) - Data for both samples are low.

Key to Instrument Codes Reported by Participants

IT	IMASS SP-2100	TA	Thwing-Albert Friction Tester
TM	TMI 32-06 Monitor/Slip and Friction	XX	Instrument make/model not specified by lab



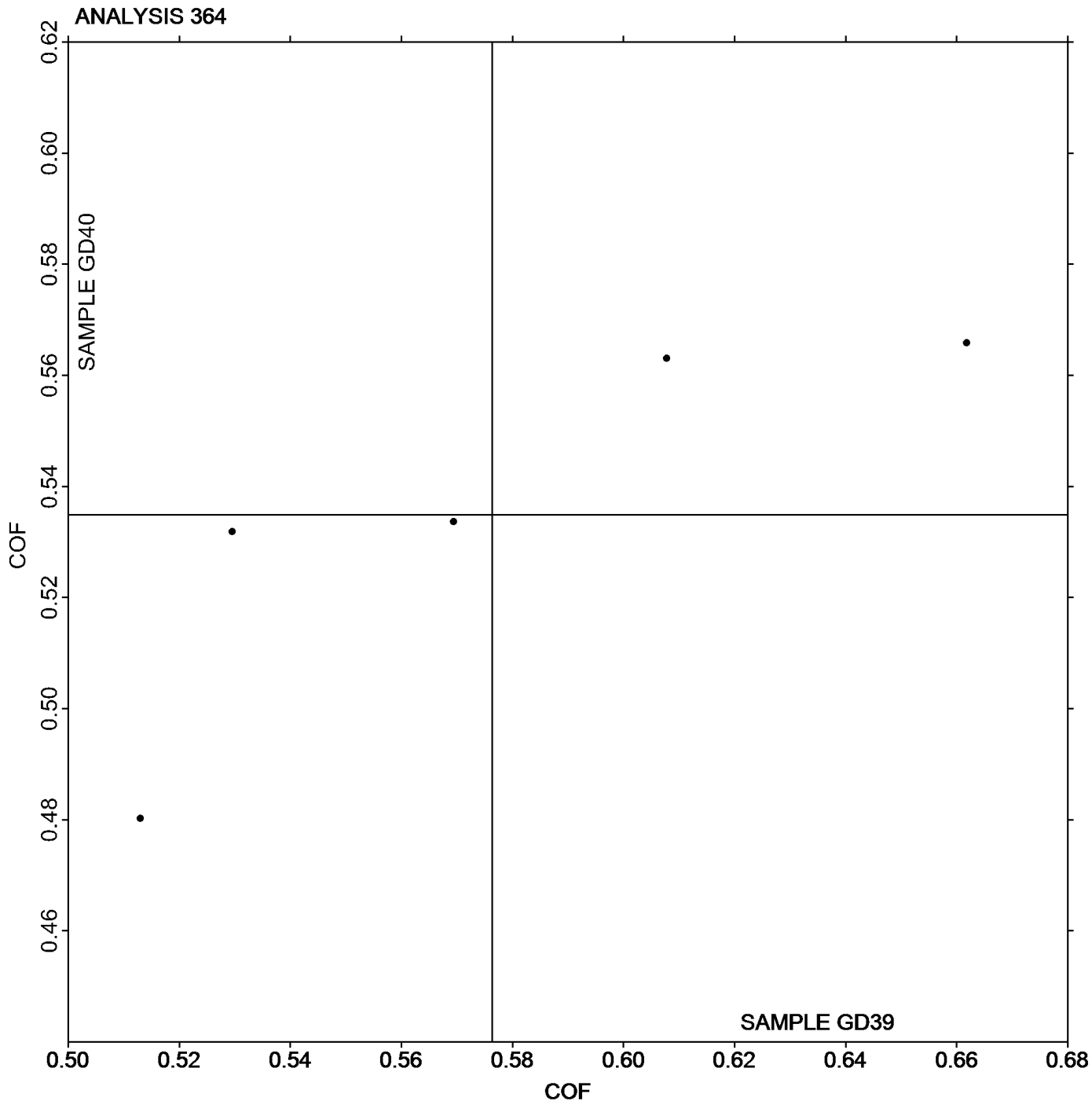
Paper & Paperboard Interlaboratory Testing Program Analysis 364

Report #286G
February 2017

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

Grand Mean Sample **GD39** = 0.57632 COF

Grand Mean Sample **GD40** = 0.53488 COF



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**

**Report #286G
February 2017**

Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers

WebCode	Data Flag	Sample GD39			Sample GD40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
38LZ8V		0.3536	-0.0309	-0.22	0.3352	-0.0466	-0.35	TM
3T2K6V		0.4984	0.1139	0.82	0.4602	0.0784	0.59	TA
JWTAH8		0.3628	-0.0217	-0.16	0.3792	-0.0026	-0.02	IR
KXDDQ6		0.3940	0.0095	0.07	0.4620	0.0802	0.60	TA
PRX7EH		0.1878	-0.1967	-1.42	0.2444	-0.1374	-1.04	TA
TALQKC		0.5444	0.1599	1.16	0.5640	0.1822	1.37	TM
VKEYEY		0.0790	-0.3055	-2.21	0.0736	-0.3082	-2.32	TM
VRT32R		0.4454	0.0609	0.44	0.4366	0.0548	0.41	TA
WAU2R8		0.4422	0.0577	0.42	0.3468	-0.0350	-0.26	XX
WLPFQ4		0.4752	0.0907	0.66	0.4678	0.0860	0.65	TA
ZMK6L9		0.4472	0.0627	0.45	0.4300	0.0482	0.36	TM

		Summary Statistics	
		Sample GD39	Sample GD40
Grand Means		0.38455 COF	0.38180 COF
SD Btwn Labs		0.13830 COF	0.13258 COF
Statistics based on 11 of 11 reporting participants			

Key to Instrument Codes Reported by Participants

IR	IMASS SP-2000	TA	Thwing-Albert Friction Tester
TM	TMI 32-06 Monitor/Slip and Friction	XX	Instrument make/model not specified by lab



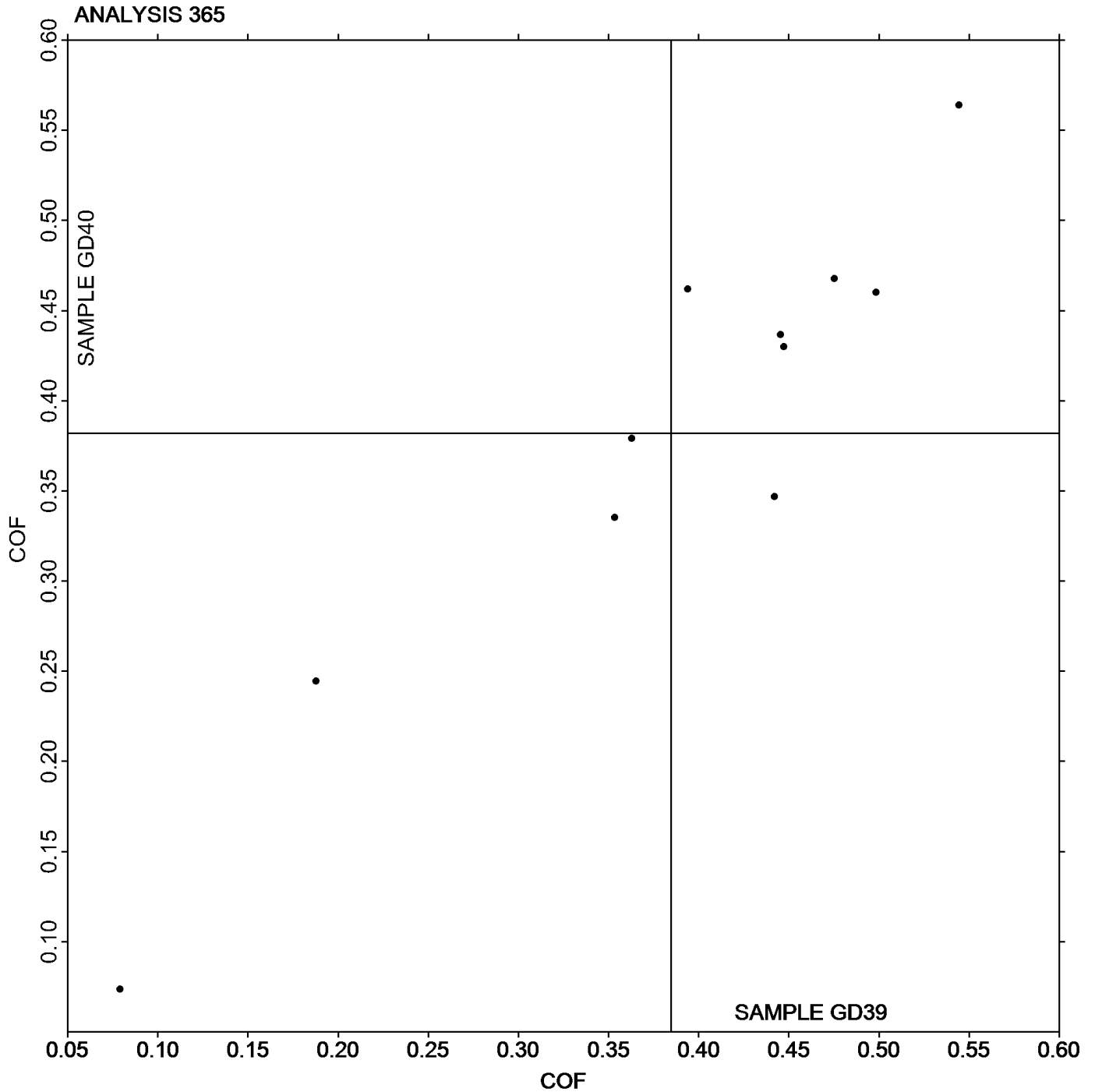
Paper & Paperboard Interlaboratory Testing Program Analysis 365

Report #286G
February 2017

Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers

Grand Mean Sample **GD39** = 0.38455 COF

Grand Mean Sample **GD40** = 0.38180 COF



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**

**Report #286G
February 2017**

WebCode	Data Flag	Sample GE39			Sample GE40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2AVPVD		16.00	-1.09	-1.23	14.77	-0.74	-0.83	LP
2FK6NQ		16.80	-0.29	-0.33	15.70	0.19	0.21	LW
2Q4GZ4		15.24	-1.84	-2.09	13.74	-1.78	-1.98	RE
6N2VWM		18.85	1.76	2.00	16.35	0.84	0.93	WG
7EXXQY		15.93	-1.16	-1.32	14.83	-0.68	-0.76	PP
BTELPB		16.66	-0.43	-0.49	14.01	-1.51	-1.68	TN
CAK9PC		16.48	-0.60	-0.69	14.93	-0.58	-0.65	TL
CYFHLF		16.90	-0.19	-0.22	15.96	0.45	0.50	PP
D2L3AF		18.45	1.36	1.55	16.20	0.69	0.77	HG
DAT2HG		16.59	-0.49	-0.56	14.69	-0.82	-0.92	PP
EMWKXN		17.32	0.23	0.26	16.01	0.50	0.55	LA
FA93F4		17.06	-0.02	-0.03	15.39	-0.12	-0.13	PP
FV88JW		17.34	0.25	0.29	14.58	-0.93	-1.04	HG
G8XFJB		17.42	0.33	0.38	15.79	0.28	0.31	PP
H7GKD9		18.02	0.93	1.06	16.75	1.24	1.38	HG
HTUCUA		17.36	0.27	0.31	15.46	-0.05	-0.06	LP
J2LBKM		17.90	0.81	0.92	16.99	1.48	1.65	GA
JYGKFR		18.40	1.31	1.49	16.08	0.57	0.63	XX
KELCWN		14.96	-2.13	-2.41	13.69	-1.82	-2.03	PP
KYW6ZP		18.45	1.36	1.54	17.04	1.53	1.70	LA
L4L248		17.46	0.37	0.42	16.48	0.97	1.08	XX
LV7HHL		15.78	-1.31	-1.48	14.42	-1.09	-1.22	LP
MG3FF6		17.50	0.41	0.47	15.66	0.14	0.16	PP
MY4ZHY		16.84	-0.25	-0.28	15.76	0.25	0.28	XX
N3YCTP		15.95	-1.14	-1.29	14.17	-1.34	-1.49	LP
NEVHLN		17.81	0.72	0.82	15.90	0.39	0.43	LP
P7X8T4		16.97	-0.12	-0.14	14.80	-0.71	-0.79	PP
QJX7G2		17.14	0.05	0.06	16.15	0.64	0.71	LA
QNQDV3		17.64	0.55	0.63	16.41	0.90	1.00	TL
RUFCM4		16.77	-0.32	-0.37	15.78	0.27	0.30	PP
T8VR8E		16.84	-0.25	-0.28	15.46	-0.05	-0.06	PP
VFMLHH		17.37	0.28	0.32	16.40	0.89	0.99	LP
VRT32R		16.74	-0.35	-0.39	14.54	-0.97	-1.08	LA
WAU2R8		16.30	-0.79	-0.89	15.20	-0.31	-0.35	GS
WLPFQ4		17.56	0.47	0.54	15.25	-0.26	-0.29	WG
XALGG9		16.90	-0.19	-0.21	15.16	-0.35	-0.39	LP
XWLJTC		16.60	-0.49	-0.55	15.30	-0.21	-0.24	LA
Y3LHJR		16.72	-0.37	-0.42	15.05	-0.46	-0.52	PP
YUEKYV		18.19	1.10	1.25	16.83	1.32	1.47	LP
ZC6DXX		18.31	1.22	1.39	16.81	1.30	1.45	HG



**Paper & Paperboard Interlaboratory Testing Program
Analysis 370
Air Resistance - Gurley Oil Type**

**Report #286G
February 2017**

	Sample GE39	Summary Statistics	Sample GE40
Grand Means	17.088 sec/100 cc		15.512 sec/100 cc
SD Btwn Labs	0.881 sec/100 cc		0.898 sec/100 cc
Statistics based on 40 of 40 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 | RE Regmed Gurley Densometer PGH-T |
| TL Gurley Densometer #4110, Oil Flotation | TN Gurley S-P-S Tester #4190 |
| WG W & LE Gurley Tester | XX Instrument make/model not specified by lab |



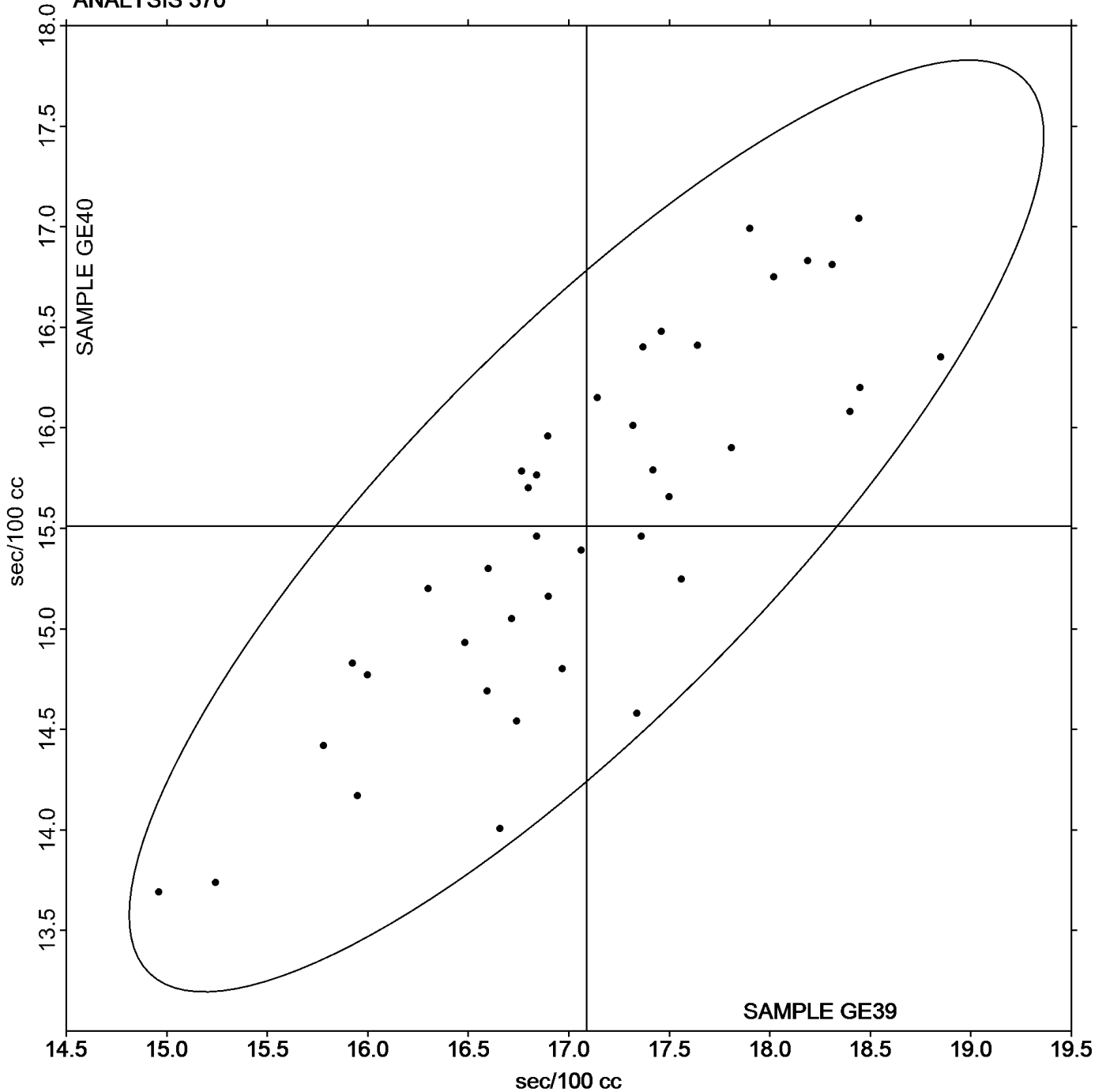
Paper & Paperboard Interlaboratory Testing Program
Analysis 370
Air Resistance - Gurley Oil Type

Report #286G
February 2017

Grand Mean Sample **GE39** = 17.088 sec/100 cc

Grand Mean Sample **GE40** = 15.512 sec/100 cc

ANALYSIS 370





**Paper & Paperboard Interlaboratory Testing Program
Analysis 372**

Report #286G
February 2017

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

WebCode	Data Flag	Sample GE39			Sample GE40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
8ZNYWH		161.1	5.0	0.35	178.4	7.9	0.39	GA
9YUDYL		150.3	-5.8	-0.41	161.1	-9.4	-0.47	TT
CRJHBU		159.7	3.6	0.25	181.2	10.7	0.53	HM
J2LBKM		150.1	-6.0	-0.42	166.1	-4.4	-0.22	GA
KELCWN		167.3	11.2	0.78	187.6	17.1	0.85	SH
MLWD8G		153.0	-3.1	-0.22	160.7	-9.8	-0.49	TT
P2NRL2		185.1	29.0	2.03	210.9	40.4	2.01	TT
VYGKJA		146.3	-9.8	-0.69	157.3	-13.2	-0.66	LP
WAU2R8		130.5	-25.6	-1.79	137.2	-33.3	-1.66	SH
ZC6DXX		157.7	1.6	0.11	164.3	-6.2	-0.31	TT

Summary Statistics		
Sample GE39	Sample GE40	
Grand Means	156.11 Sheffield Units	170.48 Sheffield Units
SD Btwn Labs	14.29 Sheffield Units	20.07 Sheffield Units
Statistics based on 10 of 10 reporting participants		

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	HM	Technidyne - Hagerty Model #538
LP	L & W Densometer, Air Permeance	SH	Sheffield
TT	TMI Monitor/Smoothness II, Model 58-24		



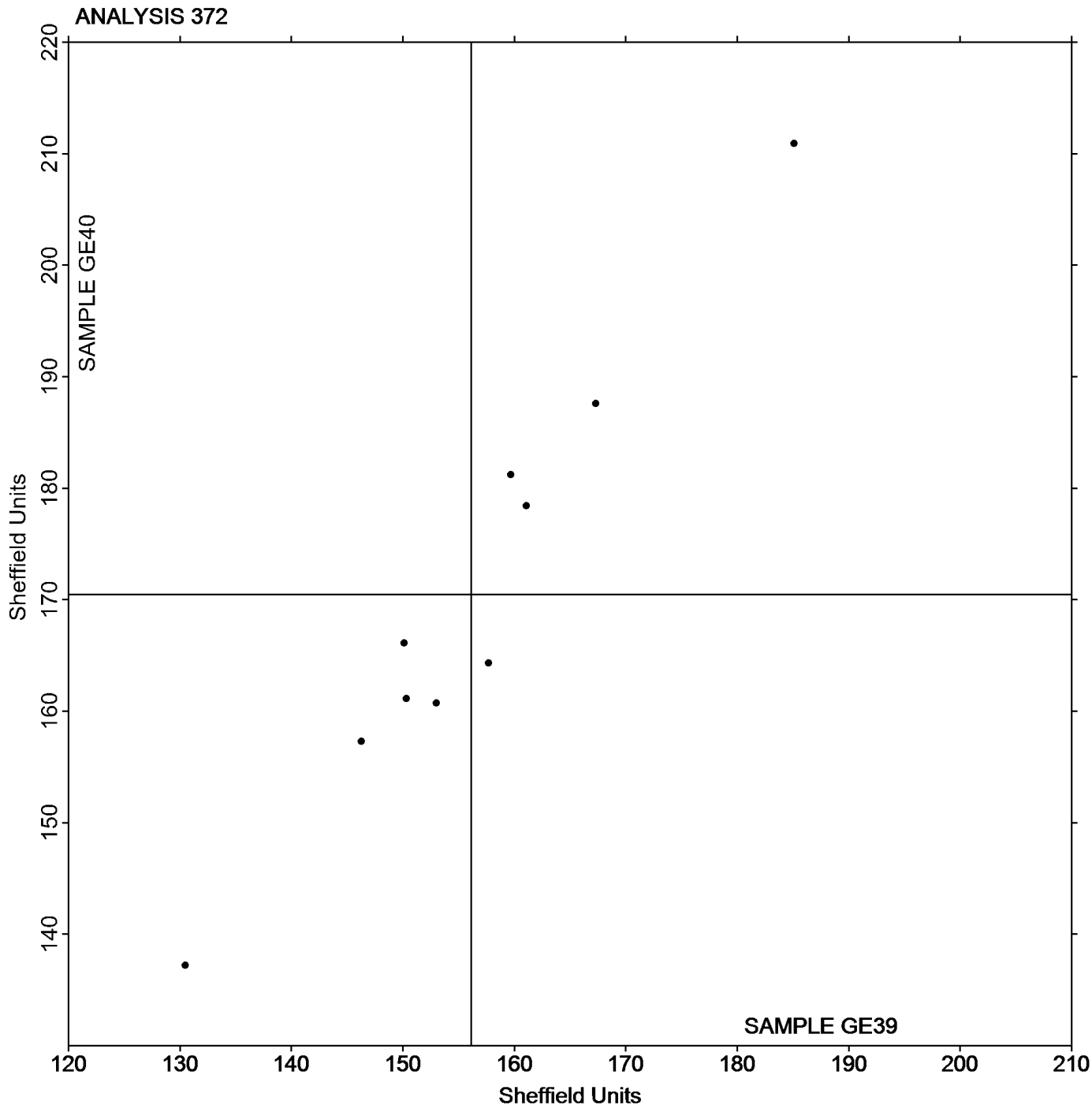
Paper & Paperboard Interlaboratory Testing Program Analysis 372

Report #286G
February 2017

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

Grand Mean Sample **GE39** = 156.11 Sheffield Units

Grand Mean Sample **GE40** = 170.48 Sheffield Units



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**

Report #286G
February 2017

WebCode	Data Flag	Sample GJ39			Sample GJ40		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
4R72YN		1.0810	0.1889	1.74	1.0560	0.2419	2.24
8B9B9V		1.0230	0.1309	1.20	0.9900	0.1759	1.63
8FKY6L		0.8910	-0.0011	-0.01	0.7750	-0.0391	-0.36
9GCEYU		0.8440	-0.0481	-0.44	0.7780	-0.0361	-0.33
9YUDYL		0.8660	-0.0261	-0.24	0.7890	-0.0251	-0.23
AGA76Z		0.8480	-0.0441	-0.41	0.7760	-0.0381	-0.35
C24UM7		0.8090	-0.0831	-0.76	0.7880	-0.0261	-0.24
CWCM4X		0.8250	-0.0671	-0.62	0.6620	-0.1521	-1.41
CYFHLF		0.9420	0.0499	0.46	0.8680	0.0539	0.50
DAT2HG		0.8510	-0.0411	-0.38	0.8250	0.0109	0.10
DBCLR V		1.0490	0.1569	1.44	0.9650	0.1509	1.40
GEFQT6		0.8000	-0.0921	-0.85	0.7350	-0.0791	-0.73
GYNTRA	*	0.5990	-0.2931	-2.69	0.5620	-0.2521	-2.33
H7GKD9		0.8020	-0.0901	-0.83	0.7190	-0.0951	-0.88
KELCWN		0.9540	0.0619	0.57	0.8970	0.0829	0.77
KXDDQ6		0.8450	-0.0471	-0.43	0.7380	-0.0761	-0.70
LV7HHL		0.8820	-0.0101	-0.09	0.7960	-0.0181	-0.17
M4ECCE		0.8160	-0.0761	-0.70	0.7570	-0.0571	-0.53
MY4ZHY		0.8530	-0.0391	-0.36	0.7660	-0.0481	-0.45
PRX7EH	*	1.1110	0.2189	2.01	0.9200	0.1059	0.98
QPQ9ML		0.8730	-0.0191	-0.18	0.8130	-0.0011	-0.01
RUF CM4		0.8570	-0.0351	-0.32	0.7780	-0.0361	-0.33
T7YBTW		1.0260	0.1339	1.23	0.9190	0.1049	0.97
TG8LLG		0.8310	-0.0611	-0.56	0.7480	-0.0661	-0.61
WEKGDT		0.9830	0.0909	0.84	0.9440	0.1299	1.20
WLPFQ4		0.7550	-0.1371	-1.26	0.6270	-0.1871	-1.73
XFCUHW		1.0650	0.1729	1.59	0.9120	0.0979	0.91
XHHE7W		0.8243	-0.0678	-0.62	0.7610	-0.0531	-0.49
XR4JBB		0.9260	0.0339	0.31	0.8440	0.0299	0.28
ZC6DXX		0.8540	-0.0381	-0.35	0.7910	-0.0231	-0.21
ZYH7XC		0.9690	0.0769	0.71	0.9390	0.1249	1.16

	Sample GJ39	Summary Statistics	Sample GJ40
Grand Means	0.89207 Microns		0.81413 Microns
SD Btwn Labs	0.10881 Microns		0.10811 Microns
Statistics based on 31 of 31 reporting participants			

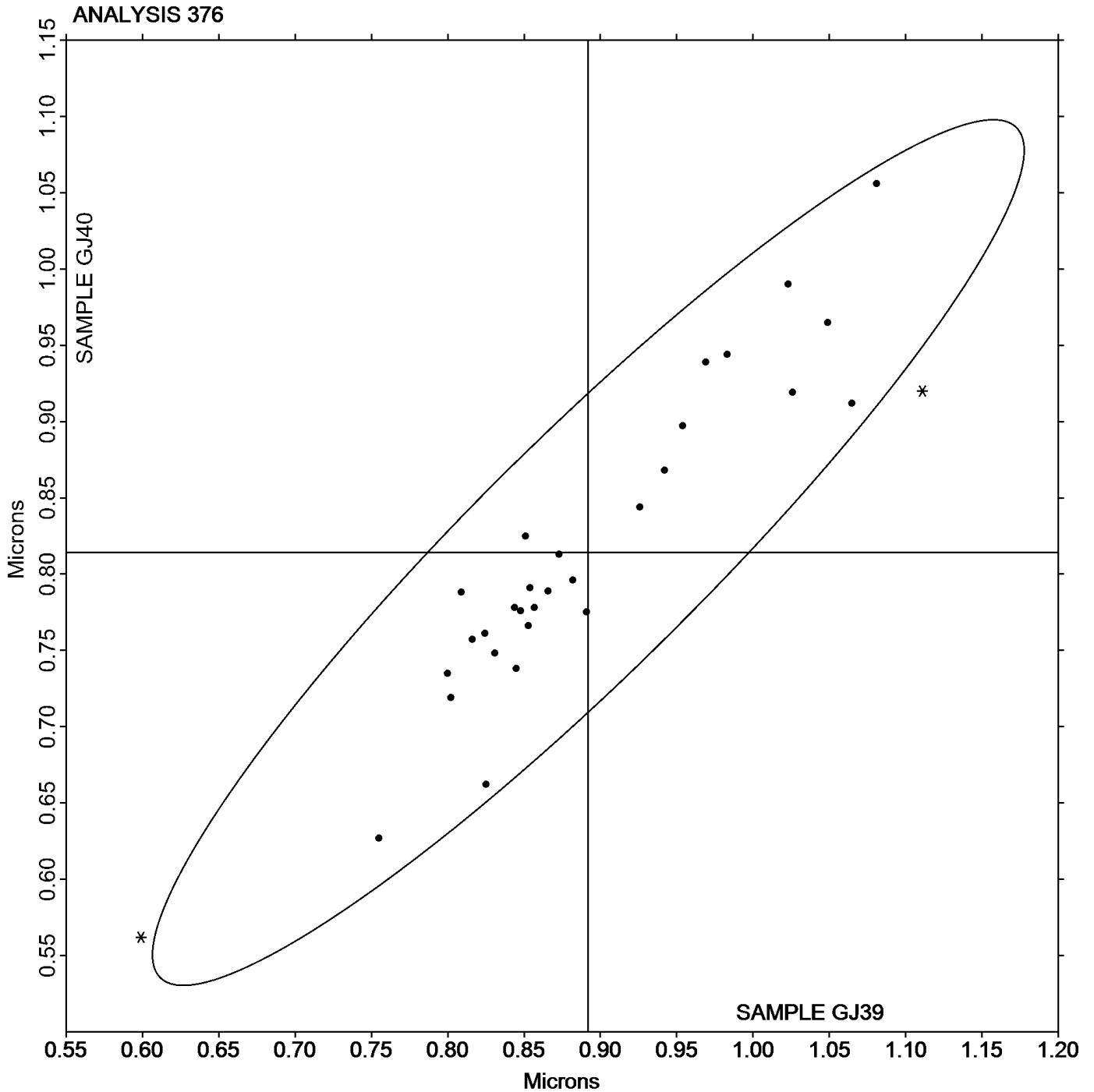


Paper & Paperboard Interlaboratory Testing Program
Analysis 376
Roughness - Print Surf Method - 0.5 to 4.0 Microns

Report #286G
February 2017

Grand Mean Sample **GJ39** = 0.89207 Microns

Grand Mean Sample **GJ40** = 0.81413 Microns





**Paper & Paperboard Interlaboratory Testing Program
Analysis 377
Roughness - Print Surf Method - 2.5 to 6.0 Microns**

**Report #286G
February 2017**

WebCode	Data Flag	Sample GK39			Sample GK40		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
BWFPGX		4.363	0.275	1.06	4.066	0.164	0.62
EMWKXN		3.661	-0.427	-1.64	3.375	-0.527	-2.00
G8XFJB		4.118	0.030	0.12	4.063	0.161	0.61
H7GKD9		3.970	-0.118	-0.45	3.670	-0.232	-0.88
MG3FF6		4.357	0.269	1.03	4.094	0.192	0.73
MJRPRR		3.730	-0.358	-1.37	3.770	-0.132	-0.50
WLPFQ4		4.124	0.036	0.14	3.958	0.056	0.21
XALGG9		4.119	0.031	0.12	3.881	-0.021	-0.08
Y3LHJR		4.348	0.260	1.00	4.240	0.338	1.28

		Summary Statistics	
		Sample GK39	Sample GK40
Grand Means		4.0878 Microns	3.9019 Microns
SD Btwn Labs		0.2606 Microns	0.2637 Microns
Statistics based on 9 of 9 reporting participants			



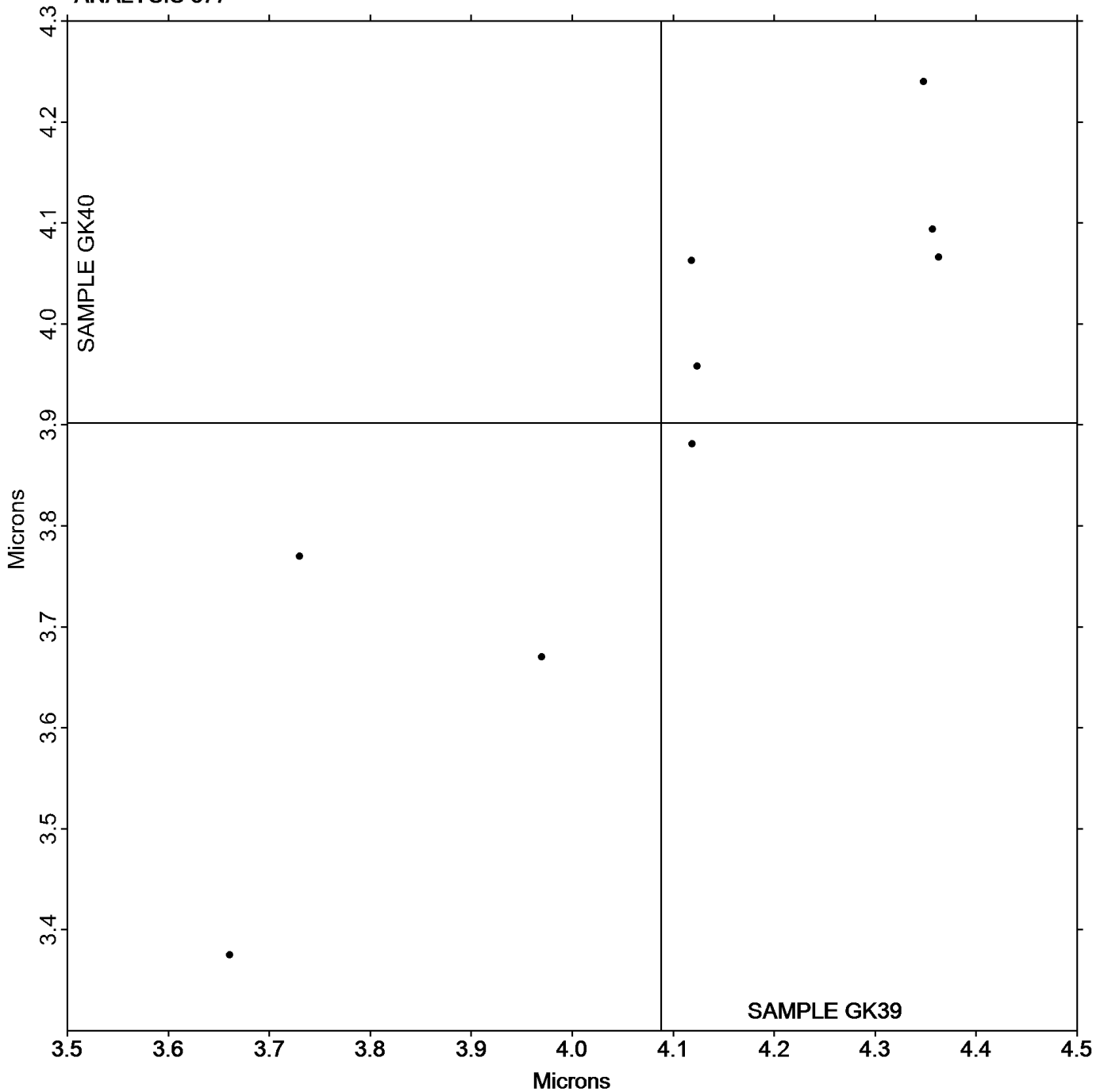
Paper & Paperboard Interlaboratory Testing Program
Analysis 377
Roughness - Print Surf Method - 2.5 to 6.0 Microns

Report #286G
February 2017

Grand Mean Sample **GK39** = 4.0878 Microns

Grand Mean Sample **GK40** = 3.9019 Microns

ANALYSIS 377



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**

Report #286G
February 2017

WebCode	Data Flag	Sample GL39			Sample GL40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FK6NQ		233.6	1.9	0.17	97.90	3.90	0.50	TS
4R72YN	X	176.3	-55.4	-5.05	93.90	-0.10	-0.01	TS
6N2VWM		245.7	14.0	1.28	106.40	12.40	1.59	PG
6V43FW	X	209.5	-22.2	-2.02	116.20	22.20	2.84	TS
7EXXQY		221.0	-10.7	-0.98	101.00	7.00	0.90	SH
8B9B9V	*	204.0	-27.7	-2.53	93.30	-0.70	-0.09	GL
8JL6LC		252.0	20.3	1.85	92.10	-1.90	-0.24	GA
8ZNYWH		237.4	5.7	0.52	103.90	9.90	1.27	GA
9GCEYU	X	219.9	-11.8	-1.07	172.20	78.19	10.01	PP
9YUDYL		222.6	-9.1	-0.83	104.80	10.80	1.38	TT
AGA76Z		234.2	2.5	0.23	94.90	0.90	0.11	LW
BWFPGX		249.0	17.3	1.58	92.90	-1.10	-0.14	HM
CRJHBU		239.7	8.0	0.73	93.80	-0.20	-0.03	HM
CWCM4X		232.0	0.3	0.03	94.50	0.50	0.06	LA
CYFHLF		232.7	1.0	0.09	101.18	7.18	0.92	PP
D2L3AF		250.9	19.2	1.75	89.80	-4.20	-0.54	HM
DAT2HG		228.2	-3.5	-0.32	83.03	-10.98	-1.40	PP
DBCLRV		237.9	6.2	0.56	91.35	-2.65	-0.34	HM
EMWKXN		237.1	5.4	0.49	104.90	10.90	1.39	LA
ETL3CY		247.4	15.7	1.43	105.00	11.00	1.41	GL
FA93F4		222.2	-9.5	-0.87	86.54	-7.47	-0.96	PP
FV88JW		250.7	19.0	1.73	100.80	6.80	0.87	TS
G8XFJB		226.8	-4.9	-0.45	84.05	-9.95	-1.27	PP
GYNTRA	X	277.3	45.6	4.16	137.80	43.80	5.60	TT
J2LBKM		226.2	-5.5	-0.50	94.40	0.40	0.05	HM
J86EP4		230.6	-1.1	-0.10	88.70	-5.30	-0.68	PP
JJK7GJ		237.8	6.1	0.56	99.80	5.80	0.74	GA
KELCWN		243.4	11.7	1.07	90.70	-3.30	-0.42	PP
KXDDQ6		226.3	-5.4	-0.49	99.50	5.50	0.70	HM
KYW6ZP		217.4	-14.3	-1.31	83.55	-10.45	-1.34	LA
LV7HHL	X	194.1	-37.6	-3.43	108.90	14.90	1.91	TS
M4ECCE		236.0	4.3	0.39	96.49	2.48	0.32	PP
MG3FF6		226.1	-5.6	-0.51	91.08	-2.93	-0.37	PP
MLWD8G	*	241.0	9.3	0.85	114.70	20.70	2.65	TT
MTJ3TC		220.4	-11.3	-1.03	84.71	-9.30	-1.19	SH
MY4ZHY		225.2	-6.5	-0.59	85.70	-8.30	-1.06	HM
NZWCUD		216.3	-15.4	-1.41	83.06	-10.94	-1.40	PP
P7X8T4		231.3	-0.4	-0.04	91.68	-2.33	-0.30	PP
PRX7EH		226.8	-4.9	-0.45	92.80	-1.20	-0.15	PP
RUFM4		228.1	-3.6	-0.33	91.70	-2.30	-0.29	PP
RVMRVU		234.4	2.7	0.25	89.90	-4.10	-0.53	XX



**Paper & Paperboard Interlaboratory Testing Program
Analysis 378
Roughness - Sheffield Type**

**Report #286G
February 2017**

WebCode	Data Flag	Sample GL39			Sample GL40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
T8VR8E		245.9	14.2	1.30	94.46	0.46	0.06	PP
TG8LLG		228.2	-3.5	-0.32	84.70	-9.30	-1.19	PP
VKEYEY		226.8	-4.9	-0.45	88.20	-5.80	-0.74	TS
VKW3Q7		235.2	3.5	0.32	82.41	-11.59	-1.48	PP
VYGKJA		245.9	14.2	1.30	93.90	-0.10	-0.01	PP
WAU2R8	*	226.4	-5.3	-0.48	111.30	17.30	2.21	XX
WDDYGH		230.2	-1.5	-0.14	97.60	3.60	0.46	TT
WGAMXP	X	153.8	-77.9	-7.11	172.90	78.90	10.10	XX
WLPFQ4		239.0	7.3	0.67	106.10	12.10	1.55	XX
WQHE4D		225.6	-6.1	-0.56	81.72	-12.29	-1.57	XX
XALGG9		225.9	-5.8	-0.53	94.00	0.00	0.00	LW
Y34BFV		210.1	-21.6	-1.97	93.30	-0.70	-0.09	TS
Y3LHJR		246.1	14.4	1.31	96.67	2.67	0.34	PP
YHXXLN		217.4	-14.3	-1.30	89.60	-4.40	-0.56	LA
YUEKYV		210.6	-21.1	-1.92	82.50	-11.50	-1.47	LW
ZC6DXX		228.0	-3.7	-0.34	100.60	6.60	0.84	TT
ZMK6L9		234.6	2.9	0.26	90.54	-3.47	-0.44	PP

Sample GL39		Summary Statistics	Sample GL40	
Grand Means	231.70 Sheffield		94.004 Sheffield	
SD Btwn Labs	10.96 Sheffield		7.815 Sheffield	
Statistics based on 52 of 58 reporting participants				

Comments on Assigned Data Flags for Test #378

- LV7HHL (X) - Data for sample GL39 are low.
- 9GCEYU (X) - Extreme Data for Sample GL40.
- 6V43FW (X) - Data for sample GL40 are high.
- GYNTRA (X) - Data for both samples are high.
- 4R72YN (X) - Data for sample GL39 are low.
- WGAMXP (X) - Extreme Data.

JJK7GJ - One determination removed from the Lab Mean of Sample GL39 per Grubb's Test at 1% risk (TAPPI 1205).



Paper & Paperboard Interlaboratory Testing Program
Analysis 378
Roughness - Sheffield Type

Report #286G
February 2017

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	PG	Precision Gage Smoothcheck
PP	Technidyne Profile/Plus	SH	Sheffield (Bendix Precisionaire)
TS	TMI Monitor/Smoothness, Model 58-02	TT	TMI Monitor/Smoothness II, Model 58-24
XX	Instrument make/model not specified by lab		



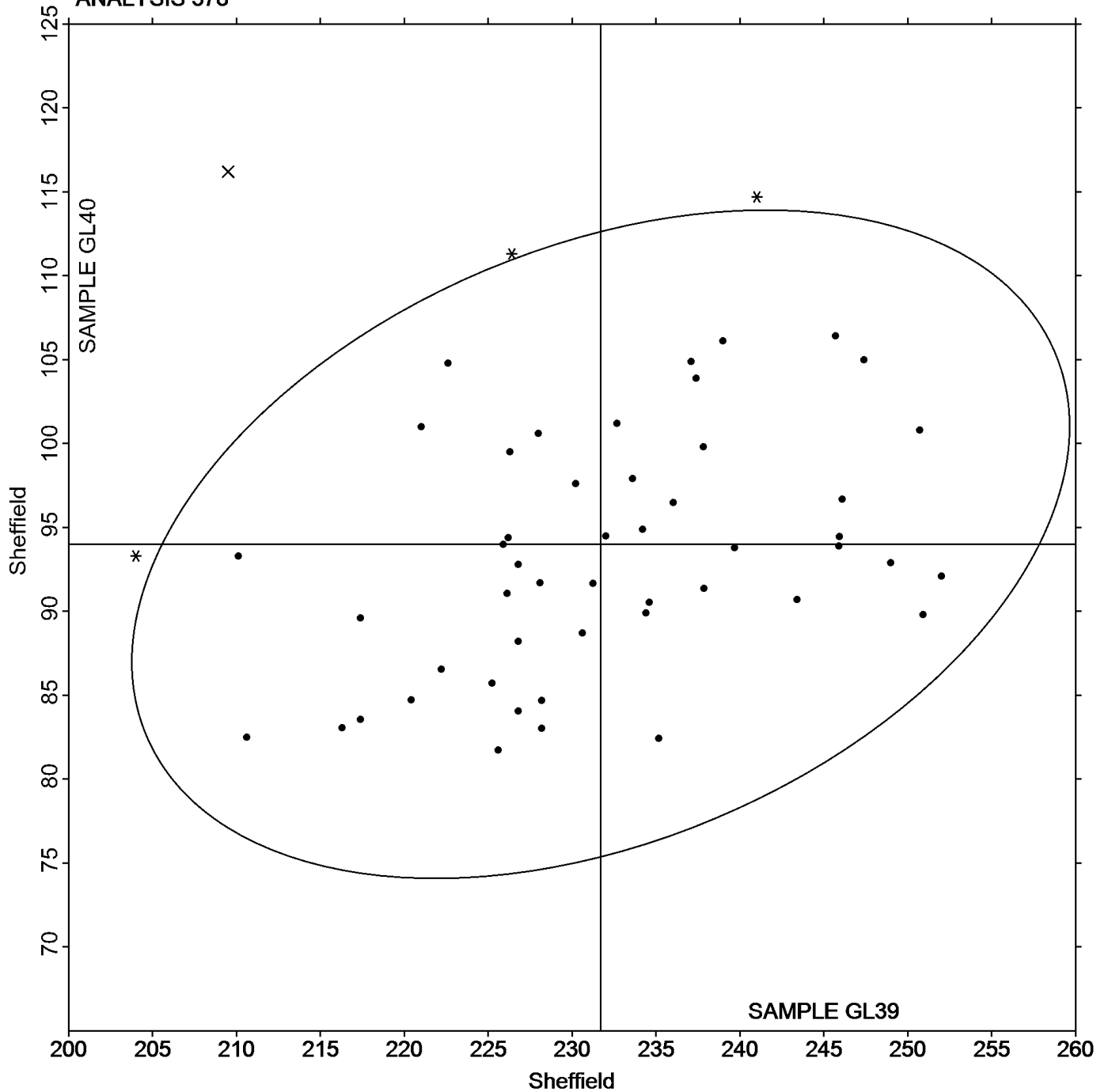
Paper & Paperboard Interlaboratory Testing Program
Analysis 378
Roughness - Sheffield Type

Report #286G
February 2017

Grand Mean Sample **GL39** = 231.70 Sheffield

Grand Mean Sample **GL40** = 94.004 Sheffield

ANALYSIS 378





**Paper & Paperboard Interlaboratory Testing Program
Analysis 382
Moisture in Paper**

**Report #286G
February 2017**

WebCode	Data Flag	Sample GM39			Sample GM40		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
49UECF		4.590	0.098	0.19	4.560	0.068	0.18
4WZ2DJ		4.282	-0.210	-0.41	4.198	-0.294	-0.76
7PVY6N		4.408	-0.084	-0.17	4.611	0.119	0.31
BWFPGX		4.370	-0.122	-0.24	3.930	-0.562	-1.45
GYNTRA		5.460	0.968	1.90	5.170	0.678	1.76
QPQ9ML		4.213	-0.280	-0.55	4.319	-0.173	-0.45
T8FBAZ		4.591	0.099	0.19	4.588	0.096	0.25
VFMLHH		3.550	-0.942	-1.85	4.132	-0.360	-0.93
Y3LHJR		5.065	0.573	1.13	5.023	0.532	1.38
ZVG39B		4.394	-0.098	-0.19	4.385	-0.107	-0.28

		Summary Statistics	
	Sample GM39		Sample GM40
Grand Means	4.4922 Percent		4.4916 Percent
SD Btwn Labs	0.5084 Percent		0.3863 Percent
Statistics based on 10 of 10 reporting participants			



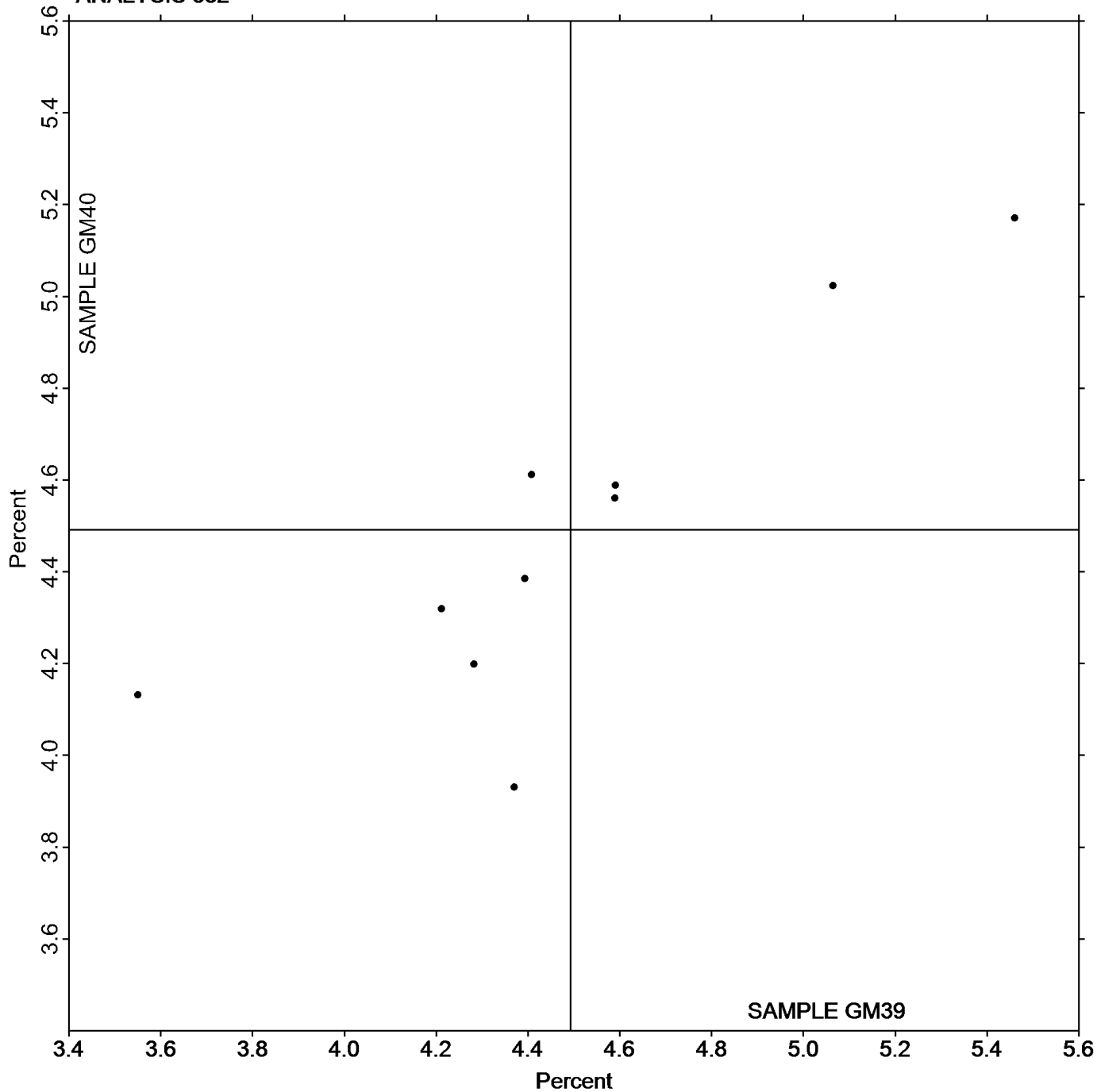
Paper & Paperboard Interlaboratory Testing Program
Analysis 382
Moisture in Paper

Report #286G
February 2017

Grand Mean Sample **GM39** = 4.4922 Percent

Grand Mean Sample **GM40** = 4.4916 Percent

ANALYSIS 382



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**

Report #286G
February 2017

WebCode	Data Flag	Sample GN39			Sample GN40		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2FK6NQ		92.90	-0.81	-1.64	93.33	-0.04	-0.11
346FMZ		93.32	-0.39	-0.79	92.51	-0.86	-2.12
4KQHGA		93.35	-0.37	-0.74	93.39	0.02	0.04
6N2VWM		93.19	-0.52	-1.05	93.23	-0.14	-0.36
7EXXQY		93.77	0.06	0.12	93.36	-0.01	-0.04
8J2HR2		93.78	0.06	0.13	93.48	0.11	0.27
9YUDYL	*	94.60	0.89	1.80	94.44	1.07	2.61
BWFPGX		93.29	-0.43	-0.86	93.29	-0.08	-0.20
CYFHLF		93.62	-0.09	-0.19	93.29	-0.08	-0.21
D2L3AF		93.39	-0.32	-0.65	93.30	-0.07	-0.18
DBCLRV		93.05	-0.66	-1.34	92.50	-0.87	-2.15
EMWKXN		93.59	-0.12	-0.25	93.43	0.06	0.14
ETL3CY	*	95.06	1.35	2.73	94.13	0.76	1.85
FV88JW		93.75	0.04	0.08	93.22	-0.15	-0.38
G8XFJB		93.95	0.23	0.47	93.31	-0.06	-0.15
GEFQT6		93.72	0.01	0.02	93.56	0.19	0.45
H7GKD9	*	94.57	0.86	1.74	93.28	-0.09	-0.23
J2LBKM		93.76	0.05	0.10	93.12	-0.25	-0.63
J86EP4		93.69	-0.02	-0.04	93.31	-0.06	-0.16
KXDDQ6		93.71	0.00	0.00	93.37	0.00	-0.01
KYW6ZP		93.11	-0.60	-1.22	92.83	-0.54	-1.34
MLWD8G		93.53	-0.18	-0.37	92.92	-0.45	-1.12
MTJ3TC		93.70	-0.01	-0.02	93.69	0.32	0.77
PRX7EH		94.53	0.82	1.65	93.56	0.18	0.44
QNQDV3		93.11	-0.60	-1.22	92.96	-0.41	-1.02
RVMRVU		94.51	0.80	1.62	93.86	0.49	1.19
T7YBTW		93.22	-0.50	-1.01	93.09	-0.29	-0.71
T8VR8E		93.68	-0.03	-0.06	93.44	0.06	0.15
UHVFB		94.12	0.41	0.83	93.64	0.27	0.65
WAU2R8	X	96.90	3.19	6.45	101.11	7.74	18.98
WEKGD	X	92.30	-1.41	-2.85	91.70	-1.67	-4.11
WGAMXP	*	94.07	0.36	0.73	94.31	0.94	2.30
XHHE7W		93.91	0.20	0.40	93.45	0.08	0.18
Y3LHJR		93.66	-0.05	-0.10	93.64	0.27	0.66
ZC6DXX		93.88	0.17	0.35	93.46	0.08	0.20
ZMK6L9		93.62	-0.09	-0.18	93.13	-0.25	-0.61
ZYH7XC		93.22	-0.49	-1.00	93.29	-0.08	-0.21



**Paper & Paperboard Interlaboratory Testing Program
Analysis 384**

**Report #286G
February 2017**

Opacity (89% Reflectance Backing) - Fine Papers

	Sample GN39	Summary Statistics	Sample GN40
Grand Means	93.712 Percent		93.375 Percent
SD Btwn Labs	0.494 Percent		0.407 Percent
Statistics based on 35 of 37 reporting participants			

Comments on Assigned Data Flags for Test #384

WAU2R8 (X) - Extreme Data.

WEKGDT (X) - Data for both samples are low.

ZC6DXX - One determination removed from the Lab Mean of Sample GN39 per Grubb's Test at 1% risk (TAPPI 1205).



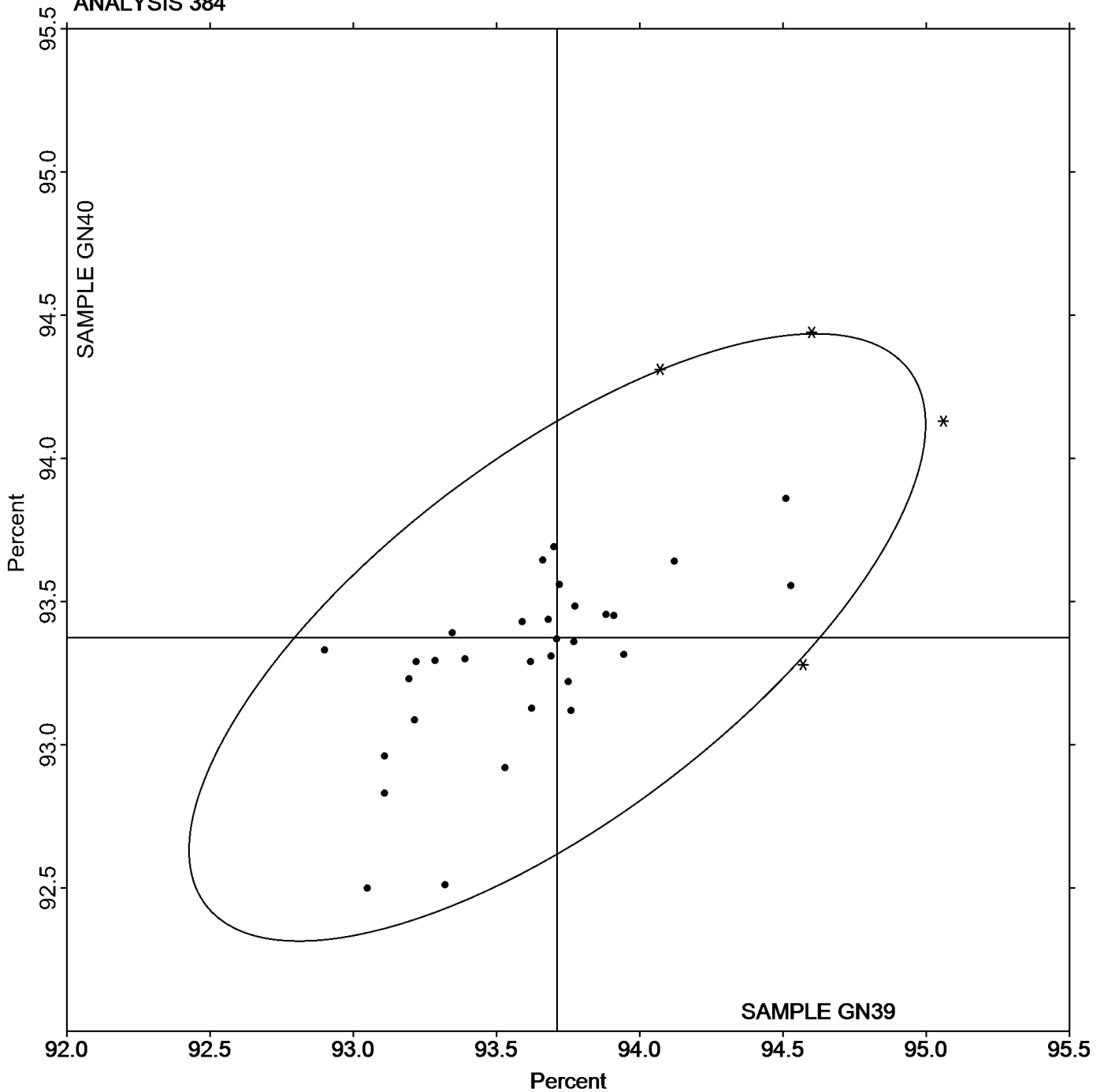
Paper & Paperboard Interlaboratory Testing Program
Analysis 384
Opacity (89% Reflectance Backing) - Fine Papers

Report #286G
February 2017

Grand Mean Sample **GN39** = 93.712 Percent

Grand Mean Sample **GN40** = 93.375 Percent

ANALYSIS 384





**Paper & Paperboard Interlaboratory Testing Program
Analysis 386
Opacity (Paper Backing) - Fine Papers and Newsprint**

**Report #286G
February 2017**

WebCode	Data Flag	Sample GP39			Sample GP40		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2AVPVD		94.46	0.08	0.31	93.39	0.05	0.64
2Q4GZ4		94.55	0.17	0.65	93.29	-0.05	-0.76
4XEMN7		94.26	-0.12	-0.47	93.20	-0.14	-1.99
8FKY6L	X	85.89	-8.50	-33.10	91.93	-1.42	-19.73
B784HH		94.69	0.31	1.21	93.30	-0.04	-0.59
BRLTTR		94.37	-0.02	-0.06	93.36	0.01	0.19
C24UM7		94.33	-0.05	-0.21	93.37	0.03	0.35
CRJHBU		94.13	-0.25	-0.97	93.26	-0.09	-1.22
DBCLRV		93.66	-0.72	-2.79	93.33	-0.02	-0.24
F2B9KQ		94.49	0.11	0.44	93.50	0.15	2.06
N3YCTP		94.24	-0.14	-0.54	93.33	-0.01	-0.20
NA3DV6		94.56	0.18	0.71	93.43	0.08	1.12
PRX7EH	X	93.85	-0.53	-2.08	94.38	1.04	14.41
TALQKC		94.56	0.18	0.69	93.36	0.01	0.19
VFMLHH		94.51	0.13	0.51	93.39	0.04	0.62
VJ674X		94.52	0.14	0.54	93.34	-0.01	-0.16

		Summary Statistics	
	Sample GP39		Sample GP40
Grand Means	94.381 Percent		93.347 Percent
SD Btwn Labs	0.257 Percent		0.072 Percent
Statistics based on 14 of 16 reporting participants			

Comments on Assigned Data Flags for Test #386

PRX7EH (X) - Extreme Data for Sample GP40.

8FKY6L (X) - Extreme Data.

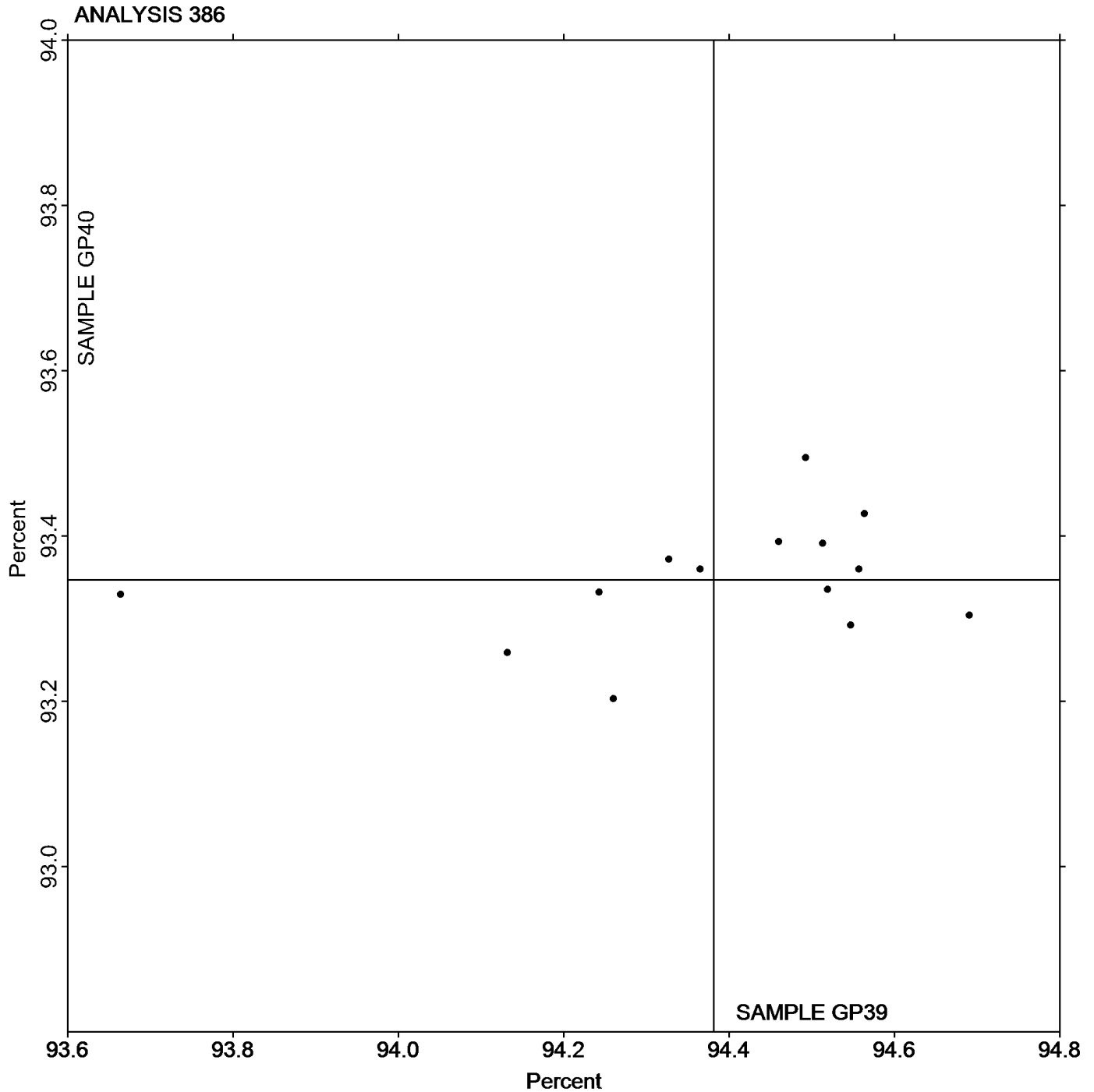


Paper & Paperboard Interlaboratory Testing Program
Analysis 386
Opacity (Paper Backing) - Fine Papers and Newsprint

Report #286G
February 2017

Grand Mean Sample **GP39** = 94.381 Percent

Grand Mean Sample **GP40** = 93.347 Percent



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**

Report #286G
February 2017

WebCode	Data Flag	Sample GR39			Sample GR40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
6N2VWM		85.64	1.05	1.04	85.10	1.10	1.00	TS
8B9B9V	X	82.60	-1.99	-1.98	82.61	-1.38	-1.25	TS
9GCEYU	X	90.83	6.23	6.18	97.48	13.49	12.22	HD
AGA76Z		83.93	-0.67	-0.66	83.28	-0.72	-0.65	TT
CYFHLF		85.83	1.23	1.22	85.28	1.28	1.16	TT
DBCLRV		83.49	-1.10	-1.10	82.68	-1.31	-1.19	TT
EMWKXN		84.53	-0.06	-0.06	83.93	-0.07	-0.07	TS
FV88JW		84.18	-0.42	-0.42	83.53	-0.47	-0.43	TS
H7GKD9		83.69	-0.91	-0.90	83.21	-0.78	-0.71	TT
J2LBKM		84.70	0.11	0.10	84.20	0.20	0.18	XS
J86EP4		85.74	1.14	1.13	85.09	1.09	0.99	XX
KXDDQ6		83.65	-0.94	-0.94	83.03	-0.97	-0.88	TT
M4ECCE		84.89	0.30	0.30	84.36	0.36	0.33	HD
MG3FF6		83.86	-0.73	-0.73	83.30	-0.70	-0.63	TS
MJRPRR	*	87.08	2.48	2.46	86.86	2.87	2.60	TS
MLWD8G		85.95	1.36	1.34	85.23	1.23	1.11	TS
MTJ3TC		83.39	-1.21	-1.20	82.85	-1.15	-1.04	TA
NZWCUD		83.51	-1.08	-1.07	82.79	-1.21	-1.09	TS
PRX7EH		83.51	-1.08	-1.07	82.74	-1.26	-1.14	TS
QNQDV3	*	85.60	1.01	1.00	85.45	1.45	1.32	TS
R6U6EJ		84.69	0.09	0.09	83.97	-0.03	-0.03	XX
RVMRVU		84.09	-0.51	-0.50	83.40	-0.60	-0.54	XX
T7YBTW		85.53	0.93	0.92	84.91	0.92	0.83	TS
T8VR8E		83.55	-1.04	-1.04	82.79	-1.21	-1.10	TS
TG8LLG		85.70	1.11	1.10	85.24	1.24	1.12	TT
VKW3Q7		83.68	-0.91	-0.90	82.98	-1.02	-0.92	TS
WAU2R8	X	90.92	6.33	6.27	90.38	6.39	5.79	PE
WEKGDT		84.21	-0.39	-0.39	83.51	-0.49	-0.44	VM
ZYH7XC		84.88	0.28	0.28	84.25	0.25	0.22	MK

Sample GR39		Summary Statistics	Sample GR40	
Grand Means	84.595 Percent		83.997 Percent	
SD Btwn Labs	1.008 Percent		1.104 Percent	
Statistics based on 26 of 29 reporting participants				

Comments on Assigned Data Flags for Test #390

- 9GCEYU (X) - Extreme Data.
- WAU2R8 (X) - Extreme Data.
- 8B9B9V (X) - Inconsistent in testing between samples.



Paper & Paperboard Interlaboratory Testing Program
Analysis 390
Directional Brightness

Report #286G
February 2017

Key to Instrument Codes Reported by Participants

HD	Hunter D25DP - 9000	MK	Macbeth Color-Eye 7000 Spectrophotometer
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)	XS	X-Rite 938 Spectrodensitometer
XX	Instrument make/model not specified by lab		



Paper & Paperboard Interlaboratory Testing Program

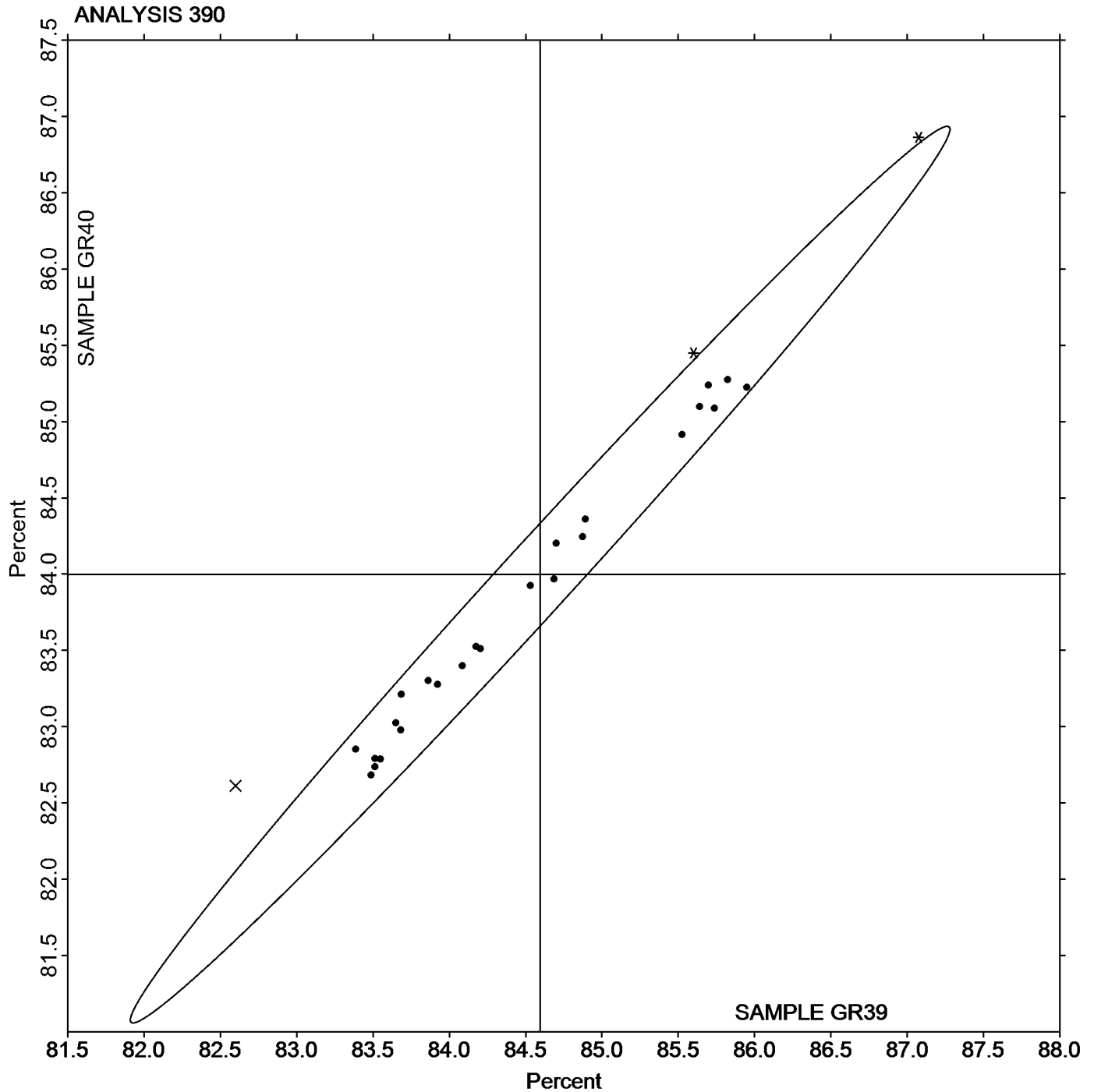
Analysis 390

Directional Brightness

Report #286G
February 2017

Grand Mean Sample **GR39** = 84.595 Percent

Grand Mean Sample **GR40** = 83.997 Percent





**Paper & Paperboard Interlaboratory Testing Program
Analysis 391
Directional Brightness of Fluorescent Samples**

Report #286G
February 2017

WebCode	Data Flag	Sample GZ39			Sample GZ40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2FK6NQ		90.96	-0.04	-0.05	97.10	-0.53	-0.51	TS
4KQHGA		90.76	-0.24	-0.30	97.42	-0.21	-0.20	TS
7EXXQY		89.60	-1.40	-1.72	95.90	-1.73	-1.66	HT
8J2HR2		92.34	1.34	1.65	98.34	0.72	0.69	TS
9YUDYL		91.14	0.14	0.17	97.90	0.27	0.26	TT
D2L3AF		89.61	-1.39	-1.71	96.10	-1.52	-1.47	HT
FV88JW		91.08	0.08	0.10	97.53	-0.10	-0.10	TS
G8XFJB		90.81	-0.19	-0.23	97.42	-0.20	-0.20	TS
GEFQT6	X	85.74	-5.26	-6.47	91.88	-5.75	-5.53	TT
GYNTRA	*	91.94	0.94	1.15	100.30	2.67	2.57	EF
KYW6ZP		90.98	-0.02	-0.03	97.86	0.23	0.23	TT
WGAMXP		92.34	1.34	1.65	98.34	0.72	0.69	XX
XHHE7W		90.83	-0.17	-0.21	97.60	-0.02	-0.02	PP
Y3LHJR		90.79	-0.21	-0.26	97.51	-0.12	-0.11	TS
ZMK6L9		90.84	-0.16	-0.20	97.44	-0.19	-0.18	TS

Sample GZ39		Summary Statistics		Sample GZ40	
Grand Means	91.003 Percent			97.626 Percent	
SD Btwn Labs	0.813 Percent			1.039 Percent	
Statistics based on 14 of 15 reporting participants					

Comments on Assigned Data Flags for Test #391

GEFQT6 (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

EF	L & W Datacolor Elrepho	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

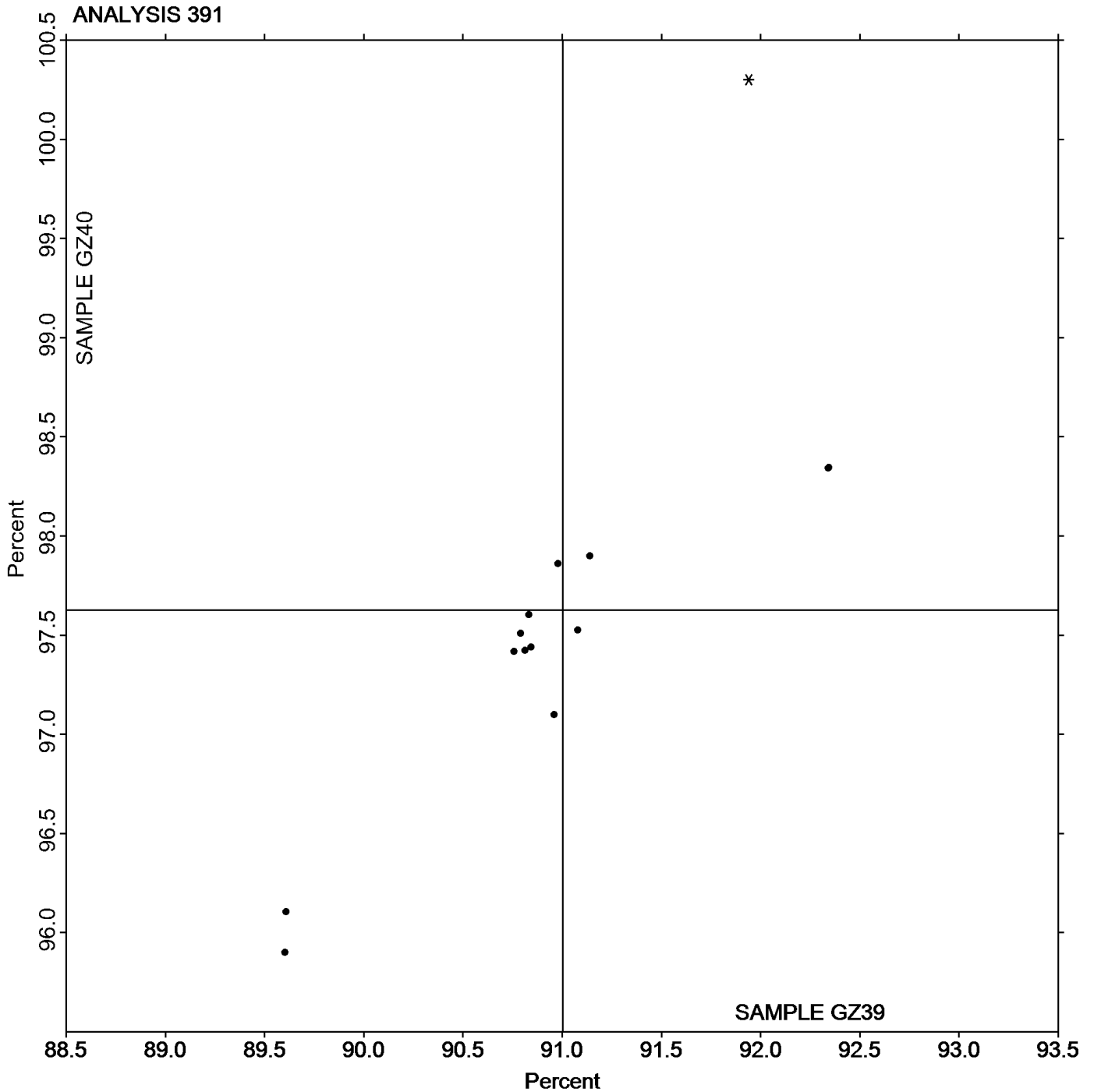


Paper & Paperboard Interlaboratory Testing Program
Analysis 391
Directional Brightness of Fluorescent Samples

Report #286G
February 2017

Grand Mean Sample **GZ39** = 91.003 Percent

Grand Mean Sample **GZ40** = 97.626 Percent



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**

Report #286G
February 2017

WebCode	Data Flag	Sample GR39			Sample GR40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2Q4GZ4		83.66	-0.33	-0.99	82.98	-0.41	-1.82	EG
3T2K6V		84.20	0.22	0.65	83.52	0.13	0.60	TC
4MDXAQ		84.04	0.06	0.19	83.41	0.02	0.09	TC
4XEMN7	*	83.13	-0.86	-2.60	83.00	-0.39	-1.76	TC
AGA76Z		84.12	0.14	0.42	83.43	0.04	0.18	EG
BRLTTR		84.08	0.10	0.29	83.43	0.04	0.17	TM
C24UM7		83.98	0.00	0.01	83.50	0.11	0.51	LS
CRJHBU		83.83	-0.16	-0.47	83.30	-0.09	-0.40	TC
DAT2HG		84.28	0.30	0.92	83.60	0.21	0.93	TC
DBCLRV		84.39	0.41	1.25	83.70	0.31	1.39	TC
EH89WZ		83.96	-0.02	-0.06	83.24	-0.15	-0.66	TC
EMWKXN		83.90	-0.08	-0.24	83.21	-0.18	-0.79	TC
F2B9KQ		84.45	0.47	1.42	83.80	0.41	1.85	TC
GYNTRA		83.48	-0.51	-1.53	83.24	-0.15	-0.68	LA
HTUCUA		84.19	0.21	0.63	83.54	0.14	0.65	TC
KXDDQ6		83.91	-0.07	-0.21	83.18	-0.21	-0.95	LT
MG3FF6		84.00	0.02	0.06	83.59	0.20	0.89	TC
NA3DV6		84.18	0.20	0.59	83.70	0.30	1.36	TC
PRX7EH	X	85.57	1.59	4.83	83.97	0.58	2.59	TM
R6U6EJ		84.17	0.19	0.57	83.48	0.09	0.41	EE
RUFM4		84.23	0.24	0.74	83.60	0.21	0.94	PP
TALQKC		83.92	-0.06	-0.20	83.17	-0.22	-0.97	LA
TG8LLG		84.13	0.14	0.44	83.36	-0.03	-0.12	TL
VFMLHH		83.94	-0.04	-0.13	83.26	-0.13	-0.57	LS
XFCUHW		83.32	-0.66	-2.01	83.00	-0.39	-1.76	TC
XR4JBB		84.17	0.19	0.58	83.46	0.06	0.29	TC
YQQBM9	X	84.91	0.93	2.82	84.36	0.97	4.33	LA
YUEKYV		84.24	0.26	0.78	83.58	0.18	0.83	EF
ZAZPH9		84.00	0.02	0.06	83.38	-0.01	-0.05	TC
ZC6DXX		84.31	0.33	1.00	83.59	0.19	0.87	TC
ZMNRYP		83.28	-0.71	-2.14	83.07	-0.32	-1.44	TC

Sample GR39		Summary Statistics	Sample GR40	
Grand Means	83.981 Percent		83.390 Percent	
SD Btwn Labs	0.330 Percent		0.224 Percent	
Statistics based on 29 of 31 reporting participants				

Comments on Assigned Data Flags for Test #392

YQQBM9 (X) - Data for both samples are high.

PRX7EH (X) - Data for sample GR39 are high. Inconsistent within the determinations of both samples.



Paper & Paperboard Interlaboratory Testing Program
Analysis 392
Diffuse Brightness

Report #286G
February 2017

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
PP	Technidyne Profile/Plus	TC	Technidyne Color Touch Series
TL	Technidyne Technibrite TB-1	TM	Technidyne Technibrite Micro TB-1C

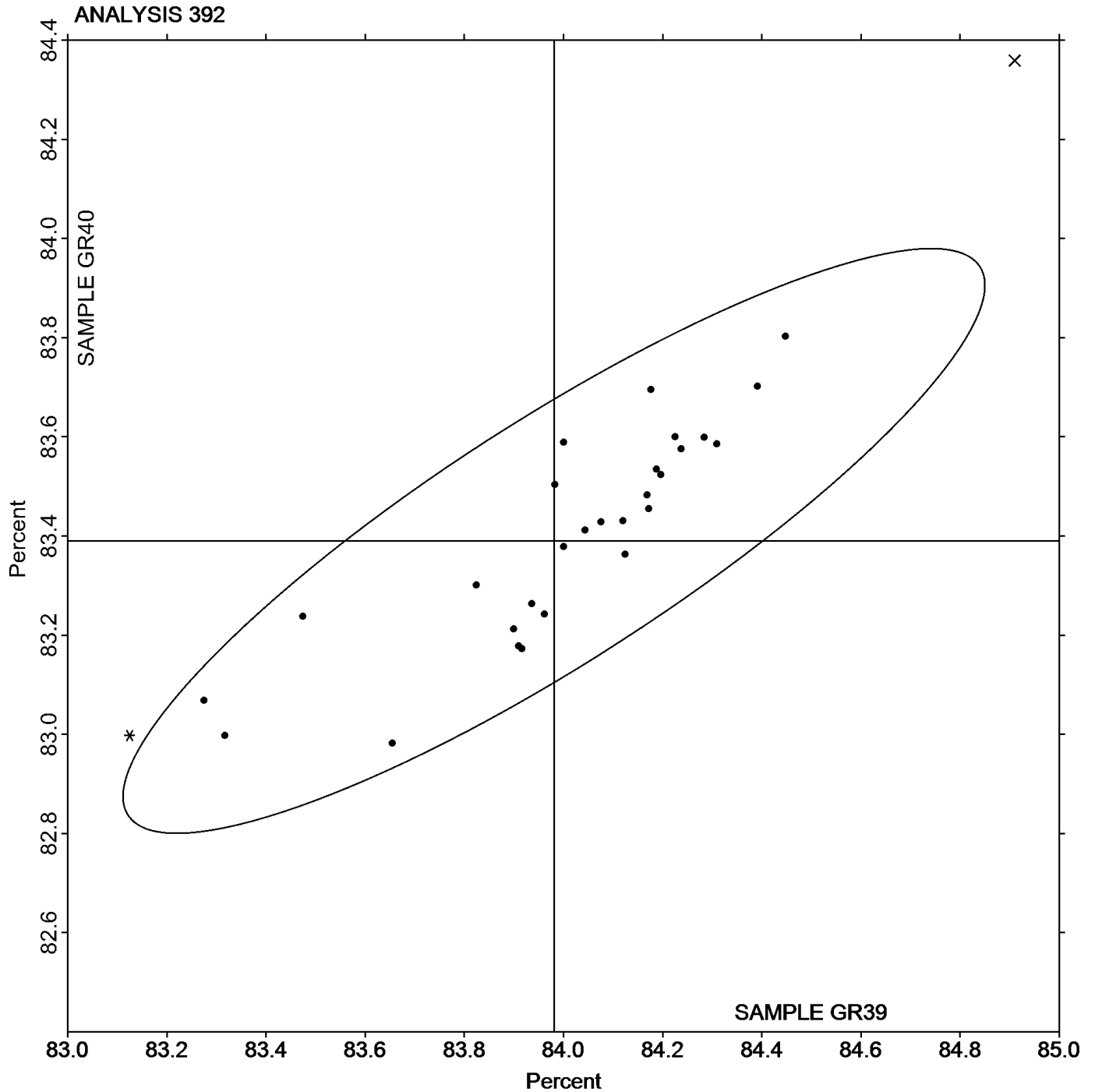


Paper & Paperboard Interlaboratory Testing Program
Analysis 392
Diffuse Brightness

Report #286G
February 2017

Grand Mean Sample **GR39** = 83.981 Percent

Grand Mean Sample **GR40** = 83.390 Percent





**Paper & Paperboard Interlaboratory Testing Program
Analysis 394
Fluorescent Component of Directional Brightness**

**Report #286G
February 2017**

WebCode	Data Flag	Sample GZ39			Sample GZ40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4KQHGA		3.484	-0.113	-0.44	7.972	-0.141	-0.46	TS
8J2HR2		3.712	0.115	0.45	8.346	0.233	0.76	TS
FV88JW		3.454	-0.143	-0.55	7.870	-0.243	-0.80	TS
G8XFJB		3.660	0.063	0.25	8.208	0.095	0.31	TS
GYNTRA	X	5.142	1.545	6.00	11.456	3.343	10.93	EF
KYW6ZP		4.040	0.443	1.72	8.580	0.467	1.53	TT
WGAMXP		3.116	-0.481	-1.87	7.552	-0.561	-1.83	XX
XHHE7W		3.552	-0.045	-0.17	8.224	0.111	0.36	PP
Y3LHJR		3.814	0.217	0.84	8.308	0.195	0.64	TS
ZMK6L9		3.540	-0.057	-0.22	7.960	-0.153	-0.50	TS

Sample GZ39		Summary Statistics		Sample GZ40	
Grand Means	3.5969 Percent			8.1133 Percent	
SD Btwn Labs	0.2575 Percent			0.3059 Percent	
Statistics based on 9 of 10 reporting participants					

Comments on Assigned Data Flags for Test #394

GYNTRA (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

EF	Datacolor Elrepho 3000	PP	Technidyne Profile/Plus
TS	Technidyne Brightimeter Micro S-5	TT	Technidyne Brightimeter Micro S4-M
XX	Instrument make/model not specified by lab		

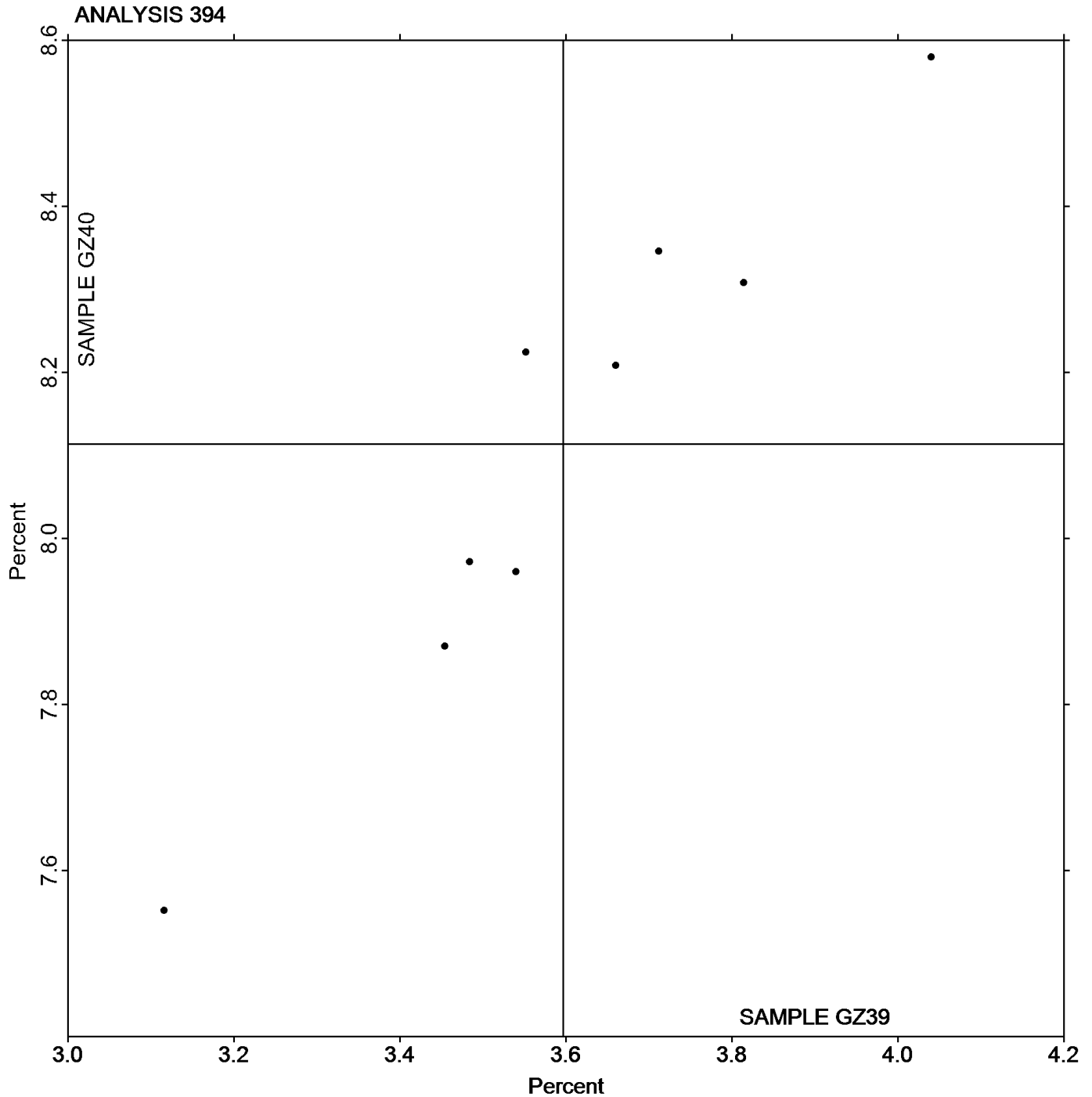


Paper & Paperboard Interlaboratory Testing Program
Analysis 394
Fluorescent Component of Directional Brightness

Report #286G
February 2017

Grand Mean Sample **GZ39** = 3.5969 Percent

Grand Mean Sample **GZ40** = 8.1133 Percent



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 395
Specular Gloss at 75 Degrees - High Range**

Report #286G
February 2017

WebCode	Data Flag	Sample GT39			Sample GT40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4KQHGA	*	67.36	-0.16	-0.15	78.59	1.88	1.52	LA
9GCEYU		67.49	-0.03	-0.03	77.55	0.84	0.68	TH
AGA76Z		68.52	1.00	0.89	77.15	0.44	0.36	TH
C24UM7		67.05	-0.47	-0.42	76.73	0.02	0.02	LB
CWCM4X		68.44	0.92	0.82	77.67	0.96	0.78	LA
DBCLRV		69.62	2.10	1.87	78.74	2.03	1.65	TG
EH89WZ		66.09	-1.43	-1.28	74.89	-1.82	-1.47	ZH
GEFQT6		69.36	1.83	1.63	77.32	0.61	0.50	TG
H7GKD9		68.00	0.48	0.43	76.59	-0.12	-0.09	TH
KELCWN		67.57	0.05	0.04	76.46	-0.25	-0.20	GM
LV7HHL		65.65	-1.87	-1.67	74.69	-2.02	-1.63	XX
M4ECCE		67.87	0.35	0.31	77.54	0.83	0.67	TH
PRX7EH		67.64	0.12	0.10	76.68	-0.03	-0.02	TH
T7YBTW		67.24	-0.28	-0.25	76.23	-0.48	-0.39	LA
TG8LLG		65.40	-2.12	-1.89	74.55	-2.16	-1.74	GS
WEKGDT		67.48	-0.04	-0.04	76.24	-0.47	-0.38	VM
XHHE7W		68.01	0.49	0.43	77.73	1.02	0.83	PP
ZYH7XC		66.63	-0.89	-0.80	75.36	-1.35	-1.09	PP

Sample GT39		Summary Statistics	Sample GT40	
Grand Means	67.523 Gloss Units		76.706 Gloss Units	
SD Btwn Labs	1.121 Gloss Units		1.236 Gloss Units	
Statistics based on 18 of 18 reporting participants				

Key to Instrument Codes Reported by Participants

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

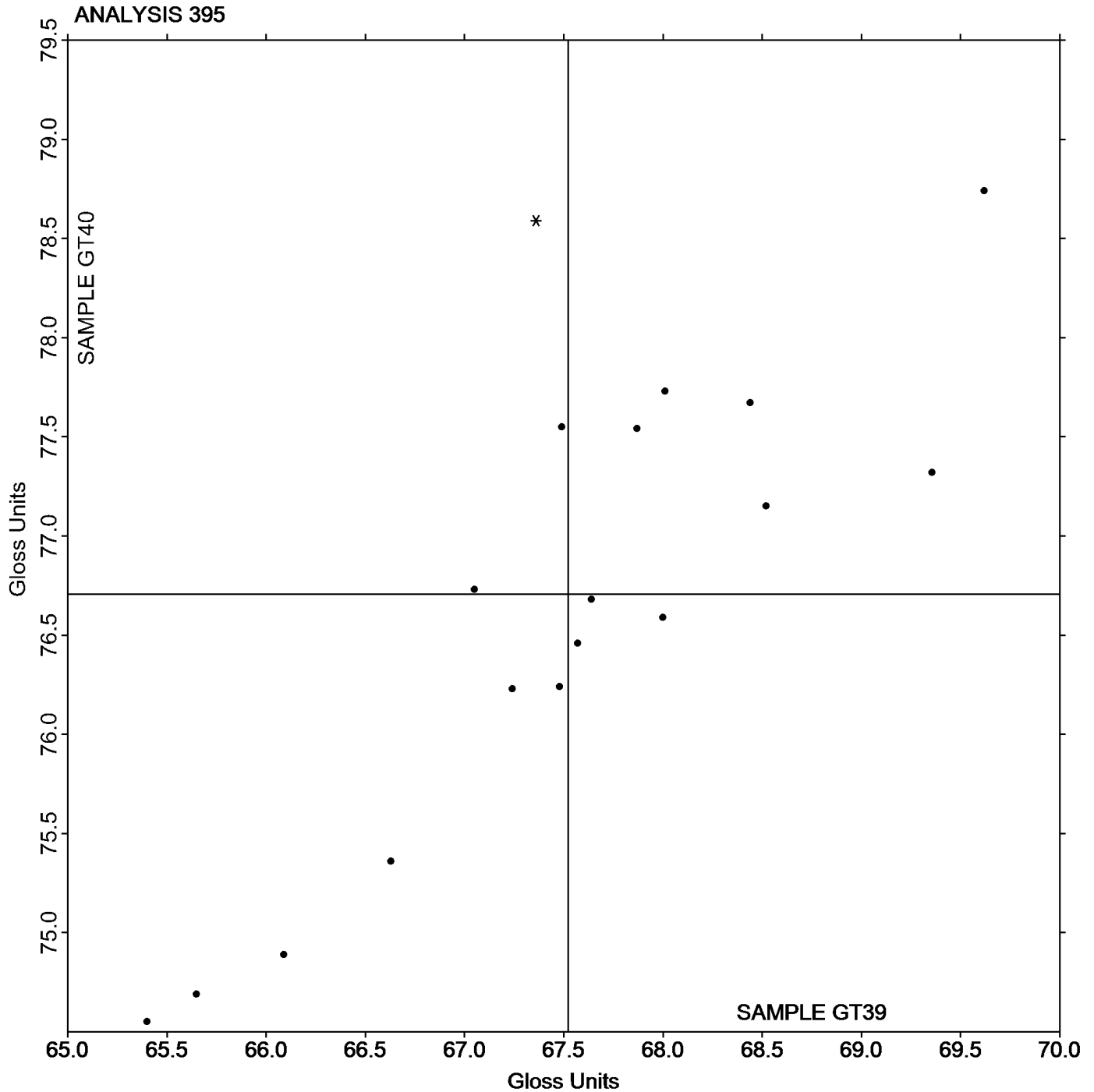


Paper & Paperboard Interlaboratory Testing Program
Analysis 395
Specular Gloss at 75 Degrees - High Range

Report #286G
February 2017

Grand Mean Sample **GT39** = 67.523 Gloss Units

Grand Mean Sample **GT40** = 76.706 Gloss Units



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**

**Report #286G
February 2017**

WebCode	Data Flag	Sample GU39			Sample GU40			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
BWFPGX		41.97	-1.03	-0.88	26.17	-0.47	-0.87	PP
C24UM7	X	40.72	-2.28	-1.95	40.91	14.27	26.32	LA
DBCLRV		42.83	-0.17	-0.15	27.01	0.37	0.67	TG
GYNTRA		43.78	0.78	0.67	26.26	-0.38	-0.70	TG
J2LBKM		43.79	0.79	0.67	26.10	-0.54	-1.00	TH
MG3FF6		41.82	-1.18	-1.01	27.19	0.55	1.01	TH
MTJ3TC		43.70	0.70	0.60	26.75	0.10	0.19	TH
QPQ9ML		41.42	-1.58	-1.35	26.16	-0.48	-0.89	XX
ZC6DXX		44.70	1.70	1.45	27.49	0.85	1.57	TH

Sample GU39		Summary Statistics	Sample GU40	
Grand Means	43.001 Gloss Units		26.640 Gloss Units	
SD Btwn Labs	1.171 Gloss Units		0.542 Gloss Units	
Statistics based on 8 of 9 reporting participants				

Comments on Assigned Data Flags for Test #396

C24UM7 (X) - Extreme Data for Sample GU40.

Key to Instrument Codes Reported by Participants

LA	L & W Gloss - Autoline 300	PP	Technidyne Profile/Plus
TG	Technidyne T480	TH	Technidyne T480A
XX	Instrument make/model not specified by lab		

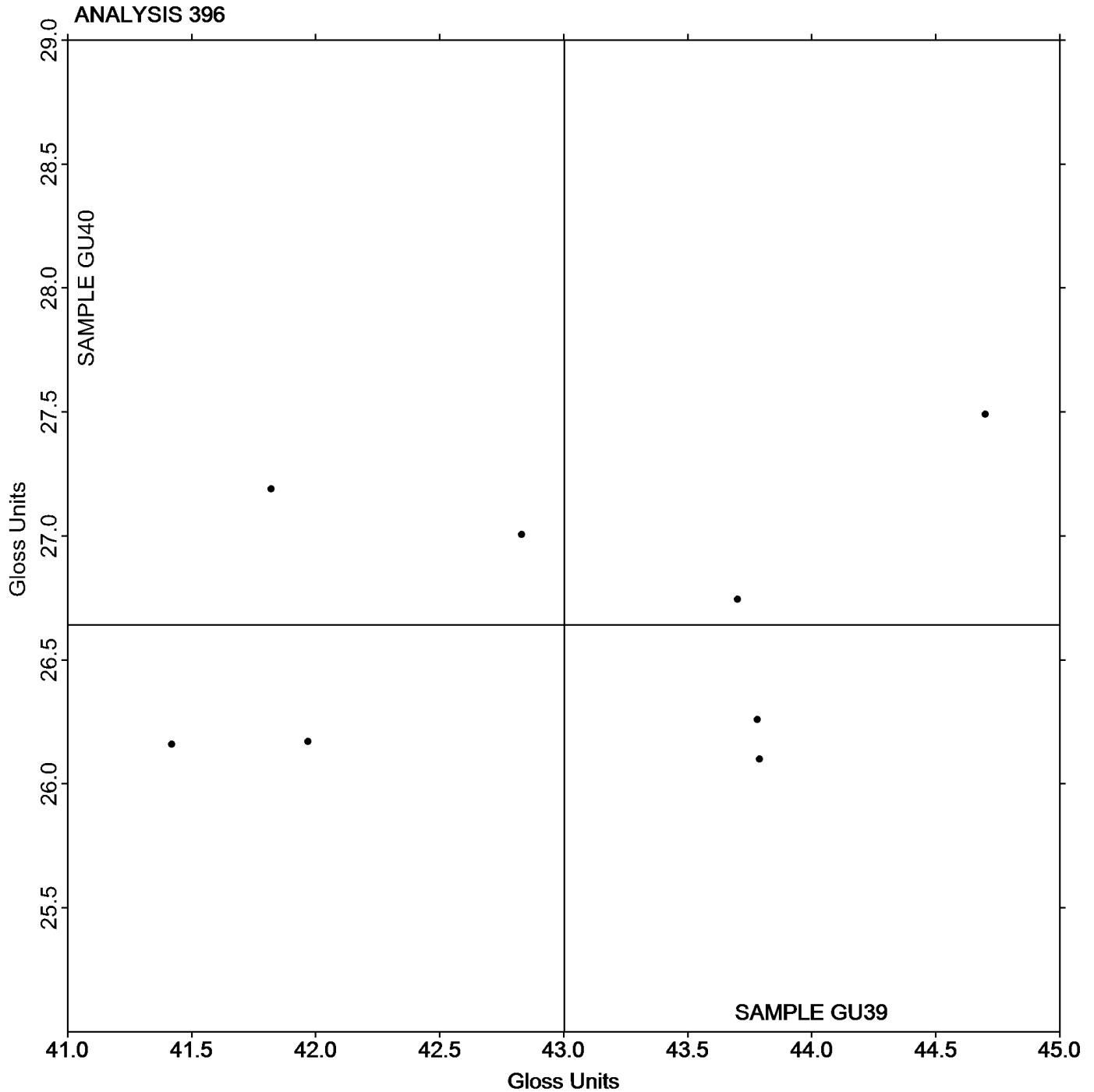


Paper & Paperboard Interlaboratory Testing Program
Analysis 396
Specular Gloss at 75 Degrees - Low Range

Report #286G
February 2017

Grand Mean Sample **GU39** = 43.001 Gloss Units

Grand Mean Sample **GU40** = 26.640 Gloss Units



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)**

Report #286G
February 2017

WebCode	Data Flag	Sample GW39			Sample GW40		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2FK6NQ		72.16	-0.24	-0.50	85.54	-0.31	-0.68
346FMZ		71.73	-0.67	-1.40	85.84	-0.01	-0.01
7EXXQY		72.27	-0.13	-0.28	86.03	0.18	0.41
8J2HR2		72.62	0.22	0.46	86.37	0.52	1.16
B784HH		72.81	0.41	0.86	86.34	0.50	1.10
C24UM7		72.24	-0.16	-0.33	85.46	-0.38	-0.85
CRJHBU		72.10	-0.30	-0.63	85.85	0.00	0.00
D2L3AF		72.11	-0.29	-0.60	85.55	-0.30	-0.67
DP88UG	X	73.10	0.70	1.47	87.91	2.06	4.57
FAPWHY	*	72.48	0.08	0.17	84.83	-1.02	-2.25
GYNTRA		71.70	-0.70	-1.46	85.30	-0.55	-1.21
J2LBKM		72.73	0.33	0.68	86.15	0.31	0.68
J86EP4		72.37	-0.03	-0.07	85.68	-0.17	-0.37
KFE6R7		72.63	0.23	0.48	86.24	0.39	0.86
MTJ3TC	*	71.10	-1.30	-2.70	85.14	-0.71	-1.57
QCFV4Z		72.39	-0.01	-0.02	85.27	-0.58	-1.28
QPQ9ML		72.87	0.47	0.97	86.16	0.31	0.69
R6U6EJ		72.68	0.28	0.59	86.41	0.56	1.25
RRAPBK		72.47	0.07	0.15	85.74	-0.11	-0.24
RVMRVU		72.29	-0.11	-0.23	85.70	-0.15	-0.32
T8FBAZ	*	73.71	1.31	2.74	86.04	0.19	0.42
VFMLHH		72.50	0.10	0.21	85.92	0.07	0.16
VRT32R		72.51	0.11	0.23	85.60	-0.25	-0.55
YFBJXD		72.75	0.35	0.74	86.32	0.47	1.05
YHXXLN		72.68	0.28	0.59	86.78	0.93	2.06
ZC6DXX		72.52	0.12	0.25	86.14	0.29	0.64
ZVG39B		71.97	-0.43	-0.90	85.63	-0.21	-0.47

	Sample GW39	Summary Statistics	Sample GW40
Grand Means	72.399 g/sq m		85.847 g/sq m
SD Btwn Labs	0.479 g/sq m		0.452 g/sq m
Statistics based on 26 of 27 reporting participants			

Comments on Assigned Data Flags for Test #398

DP88UG (X) - Data for sample GW40 are high. Inconsistent within the determinations of sample GW40.



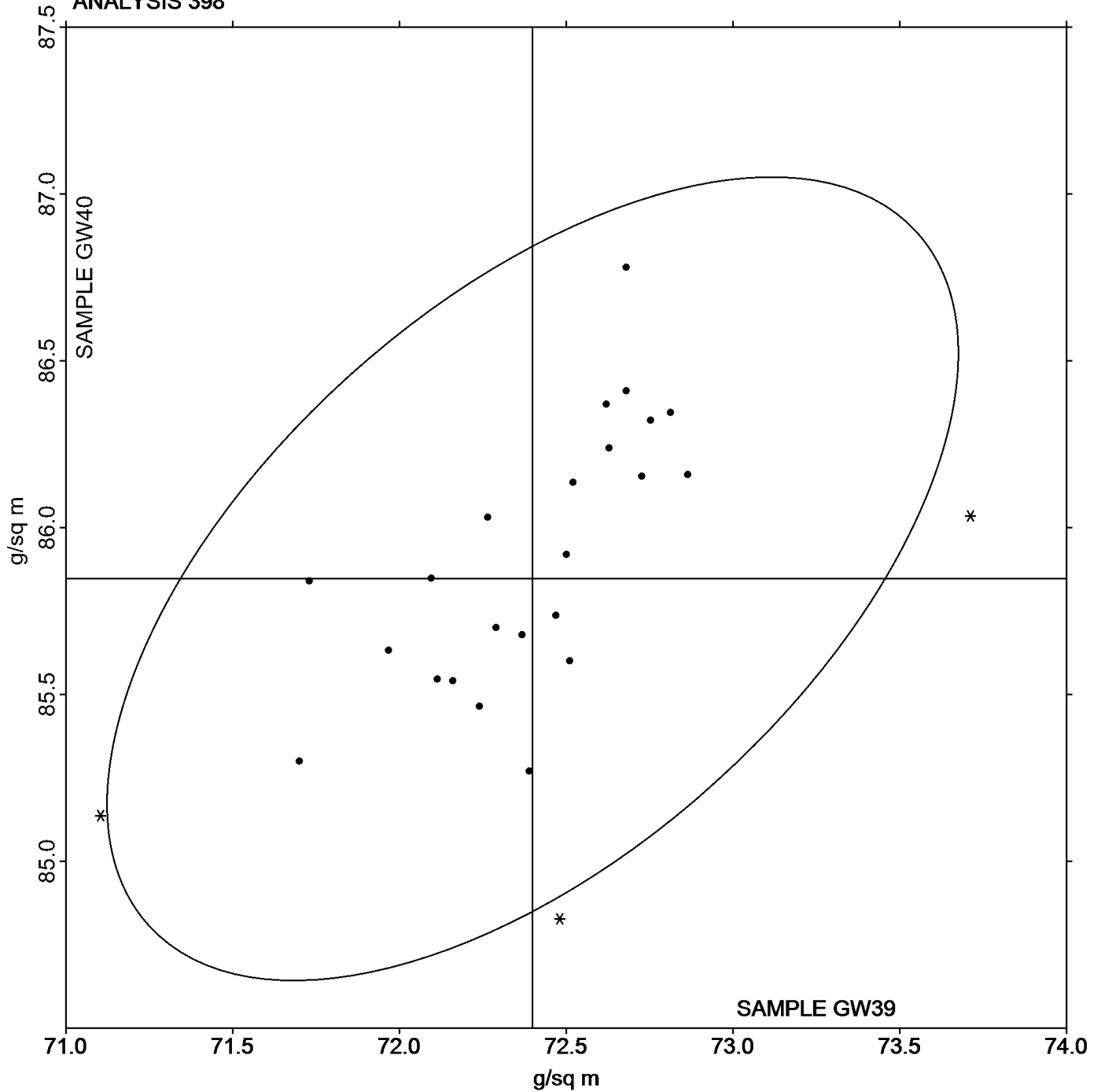
Paper & Paperboard Interlaboratory Testing Program
Analysis 398
Grammage (Mass per Unit Area)

Report #286G
February 2017

Grand Mean Sample **GW39** = 72.399 g/sq m

Grand Mean Sample **GW40** = 85.847 g/sq m

ANALYSIS 398





**Paper & Paperboard Interlaboratory Testing Program
Analysis 399
Sizing Test (Hercules Type)**

Report #286G
February 2017

WebCode	Data Flag	Sample GX39			Sample GX40		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2FK6NQ		12.80	-6.19	-0.96	11.40	-10.38	-1.24
38LZ8V		21.73	2.74	0.43	27.56	5.78	0.69
4KQHGA		16.24	-2.75	-0.43	17.07	-4.71	-0.56
9YUDYL		9.30	-9.69	-1.50	12.10	-9.68	-1.16
BWFPGX		9.81	-9.18	-1.43	13.40	-8.38	-1.00
CYFHLF		15.59	-3.40	-0.53	21.91	0.13	0.02
DTP9BH		21.00	2.01	0.31	31.80	10.02	1.20
EMWKXN		18.49	-0.50	-0.08	16.99	-4.79	-0.57
ETL3CY		22.96	3.97	0.62	19.04	-2.74	-0.33
FV88JW		19.81	0.82	0.13	17.72	-4.06	-0.49
G8XFJB		14.21	-4.78	-0.74	13.31	-8.47	-1.01
H7GKD9		13.53	-5.46	-0.85	16.36	-5.42	-0.65
J86EP4		28.21	9.22	1.43	29.70	7.92	0.95
KELCWN		15.90	-3.09	-0.48	24.90	3.12	0.37
KXDDQ6		20.71	1.72	0.27	18.10	-3.68	-0.44
MLWD8G		9.10	-9.89	-1.54	15.10	-6.68	-0.80
NZWCUD	*	29.59	10.60	1.65	44.16	22.38	2.68
QJX7G2		21.12	2.13	0.33	25.14	3.36	0.40
RVMRVU	X	3.60	-15.39	-2.39	513.60	491.82	58.85
T7YBTW		10.64	-8.35	-1.30	14.96	-6.82	-0.82
T8VR8E		27.28	8.29	1.29	23.31	1.53	0.18
VKW3Q7		25.60	6.61	1.03	35.85	14.07	1.68
WAU2R8		18.70	-0.29	-0.05	16.16	-5.62	-0.67
XALGG9		22.71	3.72	0.58	27.84	6.06	0.73
Y3LHJR		16.90	-2.09	-0.32	19.56	-2.22	-0.27
ZC6DXX		24.43	5.44	0.84	23.07	1.29	0.15
ZMK6L9		32.80	13.81	2.14	36.80	15.02	1.80
ZYH7XC		13.62	-5.37	-0.83	14.71	-7.07	-0.85

	Sample GX39	Summary Statistics	Sample GX40
Grand Means	18.992 Seconds		21.778 Seconds
SD Btwn Labs	6.440 Seconds		8.357 Seconds
Statistics based on 27 of 28 reporting participants			

Comments on Assigned Data Flags for Test #399

RVMRVU (X) - Extreme Data for Sample GX40.



Paper & Paperboard Interlaboratory Testing Program
Analysis 399
Sizing Test (Hercules Type)

Report #286G
February 2017

Grand Mean Sample **GX39** = 18.992 Seconds

Grand Mean Sample **GX40** = 21.778 Seconds

ANALYSIS 399

