Collaborative Testing Services, Inc.

Paper & PaperboardTesting Program

Summary Report #277G-August 2015

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:

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.

Key for Web Summary Reports (Page 2 of 2)

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.

TAPPI-CTS 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	F	Samples	Hunter L, a, b Color Values L	a	b	Color Difference Values ΔL	Δa	Δb	ΔE	Instr Code
27PPKA	X	GA21	96.42	-0.79	2.69	0.06	2.14	0.12	2.14 X	HE
		GA22	96.48	1.35	2.81					
2F99WT		GA21	93.87	-0.81	3.63	0.31	0.01	-0.02	0.31	TC
		GA22	94.18	-0.80	3.60					
2JAE9E		GA21	94.51	-0.61	3.29	0.30	0.05	0.05	0.31	HE
		GA22	94.82	-0.56	3.34					
3D7KZ4		GA21	93.57	-0.21	3.17	0.38	-0.08	0.16	0.42	TM
		GA22	93.95	-0.30	3.33					
4DFV88		GA21	93.80	-0.85	3.59	0.34	0.04	-0.02	0.34	LS
		GA22	94.14	-0.80	3.58					
6QWBNC		GA21	93.37	-0.69	2.77	0.42	-0.08	-0.10	0.43	HH
		GA22	93.79	-0.77	2.67					
8JWNV3		GA21	94.11	-0.61	3.31	-0.32	-0.01	0.04	0.32	TS
		GA22	93.79	-0.62	3.35					
9GK923		GA21	95.05	-1.07	2.53	-1.62	0.23	-0.02	1.63 X	HH
		GA22	93.43	-0.83	2.52					
9YJLA4		GA21	93.75	-0.80	3.51	0.37	0.01	0.07	0.37	EH
		GA22	94.12	-0.80	3.58					
A9NTP3		GA21	94.01	-1.14	3.94	-0.66	-0.17	0.26	0.73	HG
		GA22	93.35	-1.31	4.20					
BCC4UX		GA21	94.82	-0.68	3.03	0.36	0.01	-0.05	0.36	XS
		GA22	95.17	-0.68	2.98					
CEJJZ4		GA21	93.44	-1.13	2.79	0.60	-0.15	0.01	0.62	HH
		GA22	94.03	-1.28	2.80					
EA3X63		GA21	93.55	-0.12	3.00	0.95	-0.08	0.05	0.96	TS
		GA22	94.50	-0.21	3.05					
KMKVCP		GA21	92.15	-0.67	2.48	0.82	-0.03	0.20	0.84	NE
		GA22	92.96	-0.70	2.68					
L2228P		GA21	92.84	0.10	2.88	0.39	-0.08	0.10	0.41	TS
		GA22	93.23	0.01	2.98					
LRVAUN		GA21	93.84	0.22	2.51	-1.04	-0.20	-0.18	1.08	TS
		GA22	92.79	0.02	2.33					
P8E2A7		GA21	94.03	-0.93	3.55	0.34	0.00	0.09	0.35	TC
		GA22	94.36	-0.92	3.64					

TAPPI-CTS 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	F	Samples	Hunter L, a, b Color Values L	a	b	Color Difference Values ΔL	Δa	Δb	ΔE	Instr Code
Q73LDK		GA21	95.01	-0.74	3.53	0.29	0.01	0.04	0.29	EH
		GA22	95.30	-0.73	3.57					
UFWZQD		GA21	94.17	-0.65	3.29	0.34	-0.01	0.12	0.36	MK
		GA22	94.51	-0.66	3.41					
UMXB7J		GA21	94.24	-0.18	3.10	-0.79	-0.06	0.07	0.80	TS
		GA22	93.45	-0.25	3.17					
UP4T4E		GA21	93.89	-0.72	3.35	0.32	-0.03	0.12	0.34	TC
		GA22	94.21	-0.75	3.47					
VG6NNH		GA21	95.95	-0.64	3.41	0.24	0.00	0.14	0.28	MI
		GA22	96.19	-0.64	3.55					
VTVNXX		GA21	95.14	-0.75	3.21	0.30	0.00	0.06	0.31	LS
		GA22	95.44	-0.75	3.27					
VUQ8ZY		GA21	94.11	-0.59	3.32	0.35	-0.05	0.09	0.37	XX
		GA22	94.46	-0.64	3.41					

Summary Statistics

Grand Means							
GA21	94.151	-0.621	3.162	0.130	-0.030	0.056	0.532
GA22	94.278	-0.651	3.220				
Stnd Dev Btwn Labs							
GA21	0.923	0.358	0.391	0.608	0.087	0.096	0.335
GA22	0.936	0.332	0.434				

Statistics based on 23 of 24 reporting participants

Comments assigned on Data Flags for Test #350

27PPKA (X) - Extreme data for a values for Sample GA22. Inconsistent within L values for Sample GA21. Large delta a and delta E.

Instrument Code List as Reported by the Labs

(EH) - Datacolor Elrepho SF450

(HE) - Hunter LabScan

(HG) - Hunter ColorQUEST

(HH) - Hunter D25DP - 9000

(LS) - L & W Elrepho SE 070

(MI) - Macbeth Color i 5

(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

(XX) - Instrument make/model not specified by lab

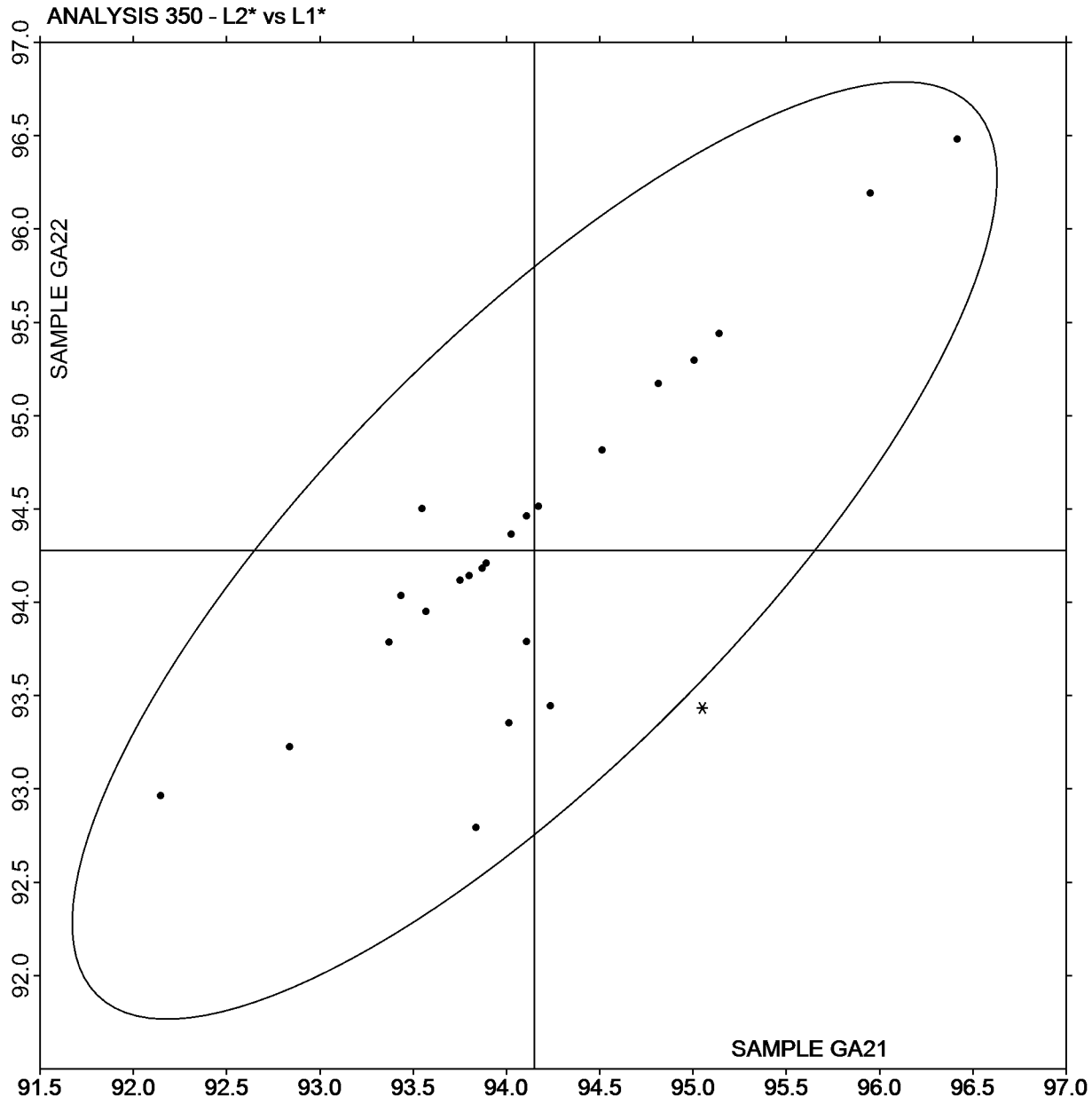
TAPPI-CTS Interlaboratory Testing Program

Analysis 350

Color & Color Difference - Near White Papers - C/2deg obs **Hunter L,a,b - Illuminant C - 2 Degree Observer**

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

Plot of L values GA22 v L values GA21



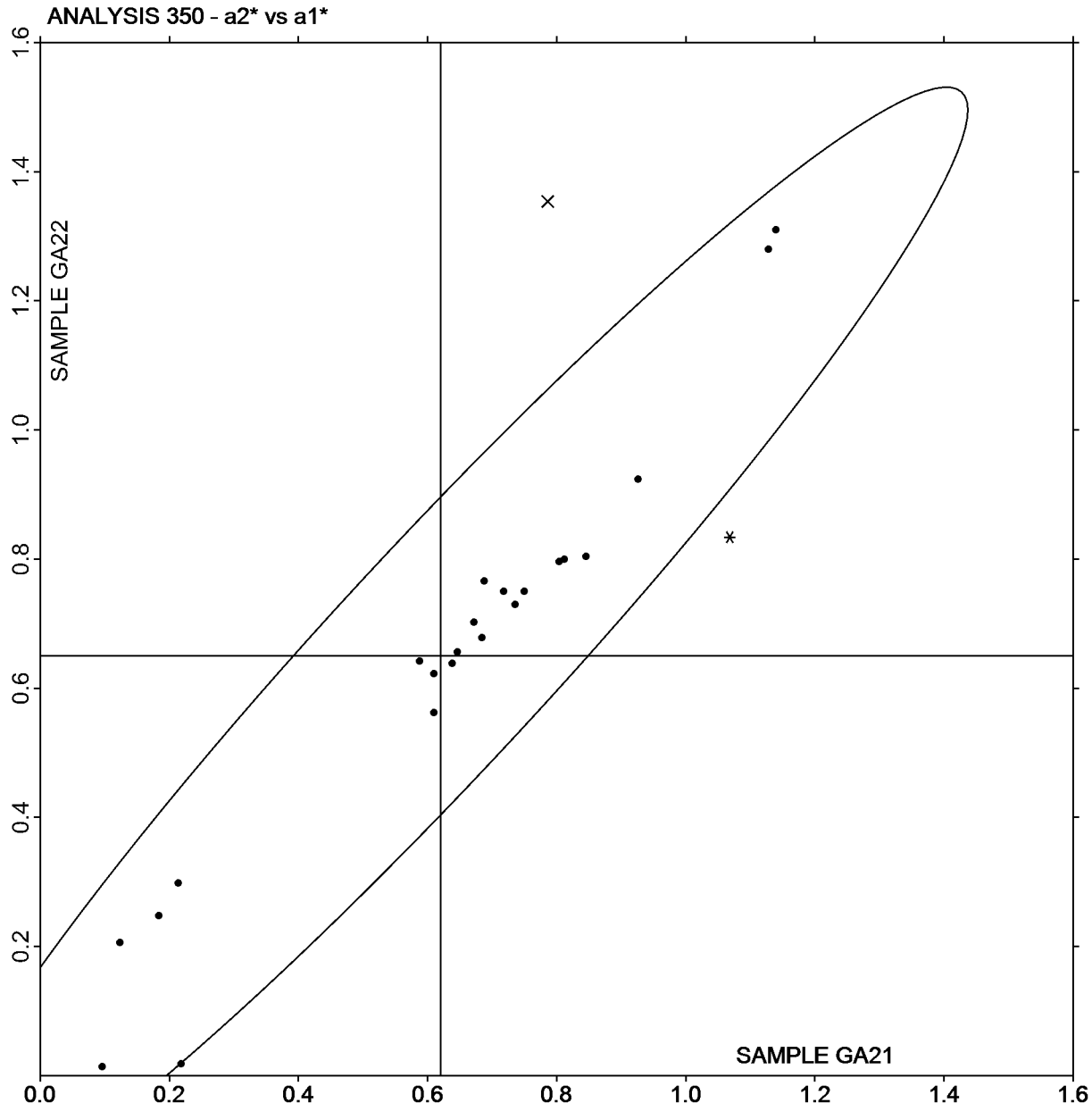
TAPPI-CTS Interlaboratory Testing Program

Analysis 350

Color & Color Difference - Near White Papers - C/2deg obs **Hunter L,a,b - Illuminant C - 2 Degree Observer**

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

Plot of a values GA22 v a values GA21

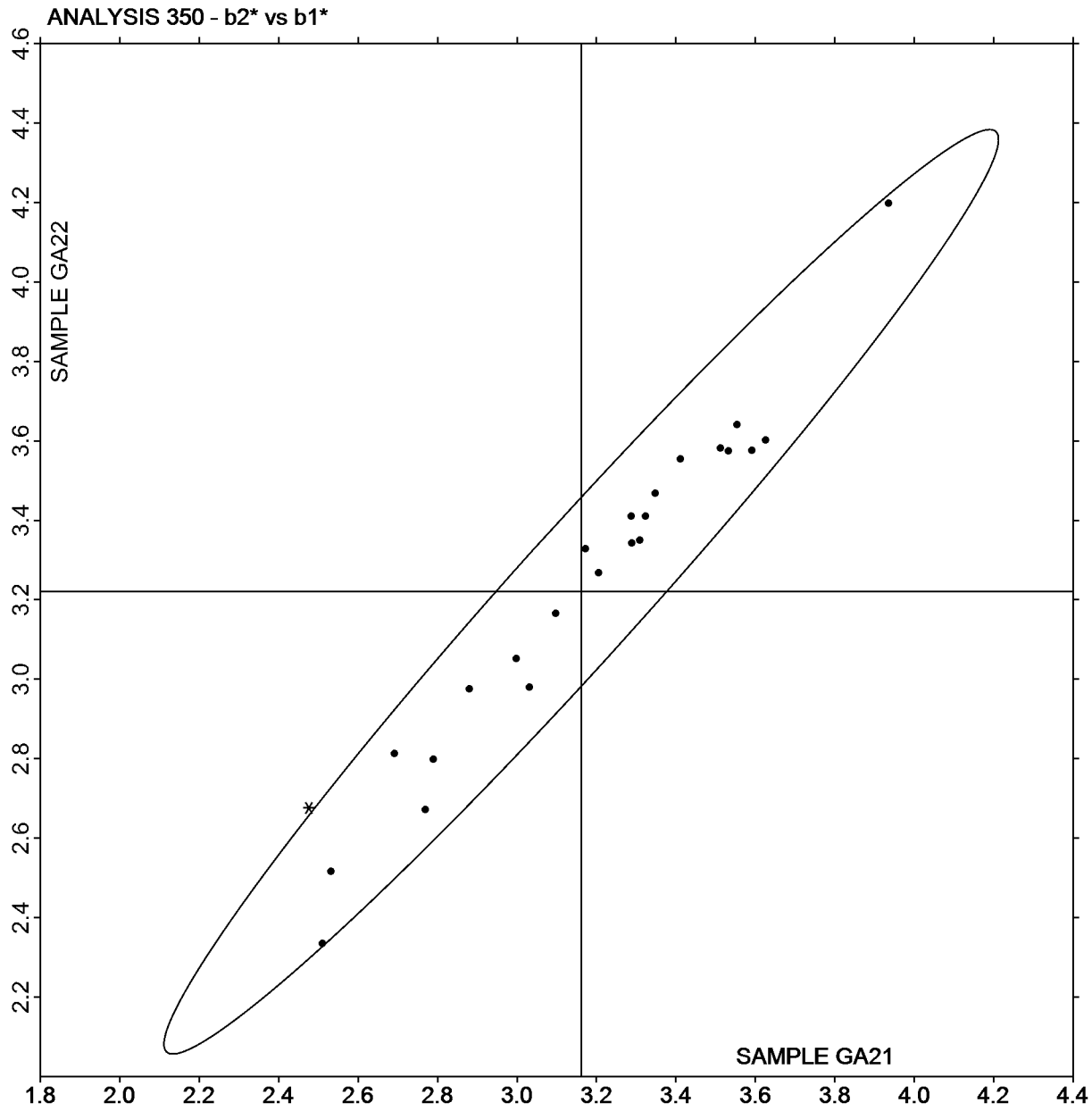


TAPPI-CTS Interlaboratory Testing Program

Analysis 350

Color & Color Difference - Near White Papers - C/2deg obs **Hunter L,a,b - Illuminant C - 2 Degree Observer**

Plot of b values GA22 v b values GA21



TAPPI-CTS Interlaboratory Testing Program

Analysis 351

Color & Color Difference - Near White Papers - D65/10deg obs | **Hunter L,a,b - Illuminant D65 - 10 Degree Observer**

2BY339	GA21	94.12	-0.71	3.63	0.35	0.05	-0.07	0.36	LS
	GA22	94.48	-0.66	3.55					
2JAE9E	GA21	94.48	-0.61	3.33	0.33	0.05	0.08	0.35	HE
	GA22	94.81	-0.57	3.41					
7N6UPN	GA21	95.25	-0.65	3.76	0.28	0.06	0.12	0.30	HT
	GA22	95.53	-0.59	3.87					
7RR483	GA21	95.15	-0.65	3.48	0.26	0.04	0.04	0.27	EH
	GA22	95.41	-0.60	3.53					
83MWTX	GA21	95.07	-0.73	3.74	0.33	0.03	0.00	0.33	TC
	GA22	95.40	-0.71	3.74					
CFVACT	GA21	95.16	-0.75	3.74	0.26	0.05	0.05	0.27	TC
	GA22	95.42	-0.70	3.79					
E67AQF	GA21	94.78	-0.54	2.97	0.27	0.04	0.11	0.30	HV
	GA22	95.05	-0.49	3.08					
FVGTJR	GA21	95.41	-0.60	3.67	0.25	0.04	0.09	0.27	NF
	GA22	95.66	-0.56	3.76					
G2YPFD	GA21	93.60	-0.68	3.29	0.15	0.05	-0.14	0.21	TC
	GA22	93.75	-0.63	3.16					
HQT6TB	GA21	95.02	-0.54	3.95	0.09	0.04	0.11	0.14	NG
	GA22	95.11	-0.50	4.06					
HUV2KQ	GA21	95.20	-0.70	3.30	0.20	0.00	0.04	0.20	EF
	GA22	95.40	-0.70	3.34					
LT82M7	GA21	95.84	-0.52	3.31	0.27	0.01	-0.10	0.29	XP
	GA22	96.11	-0.51	3.21					
P3NRY8	GA21	95.02	-0.67	3.65	0.30	0.04	0.01	0.30	EH
	GA22	95.32	-0.63	3.66					
RVXB6L	GA21	93.82	-0.75	3.48	0.29	0.04	0.02	0.29	TC
	GA22	94.11	-0.71	3.50					
VPE6BH	GA21	95.26	-0.64	3.62	0.33	0.04	-0.02	0.33	HT
	GA22	95.59	-0.60	3.60					
VTVNXX	GA21	95.14	-0.76	3.22	0.32	-0.01	0.12	0.34	LS
	GA22	95.46	-0.77	3.34					
VXBYB2	GA21	94.96	-0.66	3.68	0.28	0.03	0.06	0.28	LS
	GA22	95.23	-0.64	3.74					
XCM89B	GA21	93.95	-0.61	3.63	0.20	0.01	0.00	0.20	XM
	GA22	94.15	-0.60	3.62					

TAPPI-CTS Interlaboratory Testing Program

Analysis 351

Color & Color Difference - Near White Papers - D65/10deg obs | **Hunter L,a,b - Illuminant D65 - 10 Degree Observer**

XDDF9E	GA21	94.28	-0.66	3.30	0.51	0.06	0.15	0.53 X	HE
	GA22	94.79	-0.60	3.44					
YF23N9	GA21	95.10	0.59	3.78	0.27	-0.05	0.08	0.28	NG
	GA22	95.36	0.54	3.87					
YQY8AU	GA21	95.14	-0.61	3.84	0.27	0.05	0.02	0.27	NG
	GA22	95.41	-0.56	3.86					
YZM7ZY	GA21	93.78	-0.54	3.39	0.34	0.04	0.08	0.35	XX
	GA22	94.12	-0.50	3.48					

Summary Statistics

Grand Means							
GA21	94.797	-0.590	3.534	0.279	0.032	0.039	0.295
GA22	95.076	-0.558	3.573				
Stnd Dev Btwn Labs							
GA21	0.609	0.274	0.243	0.081	0.026	0.074	0.076
GA22	0.606	0.257	0.255				

Statistics based on 22 of 22 reporting participants

Instrument Code List as Reported by the Labs

(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

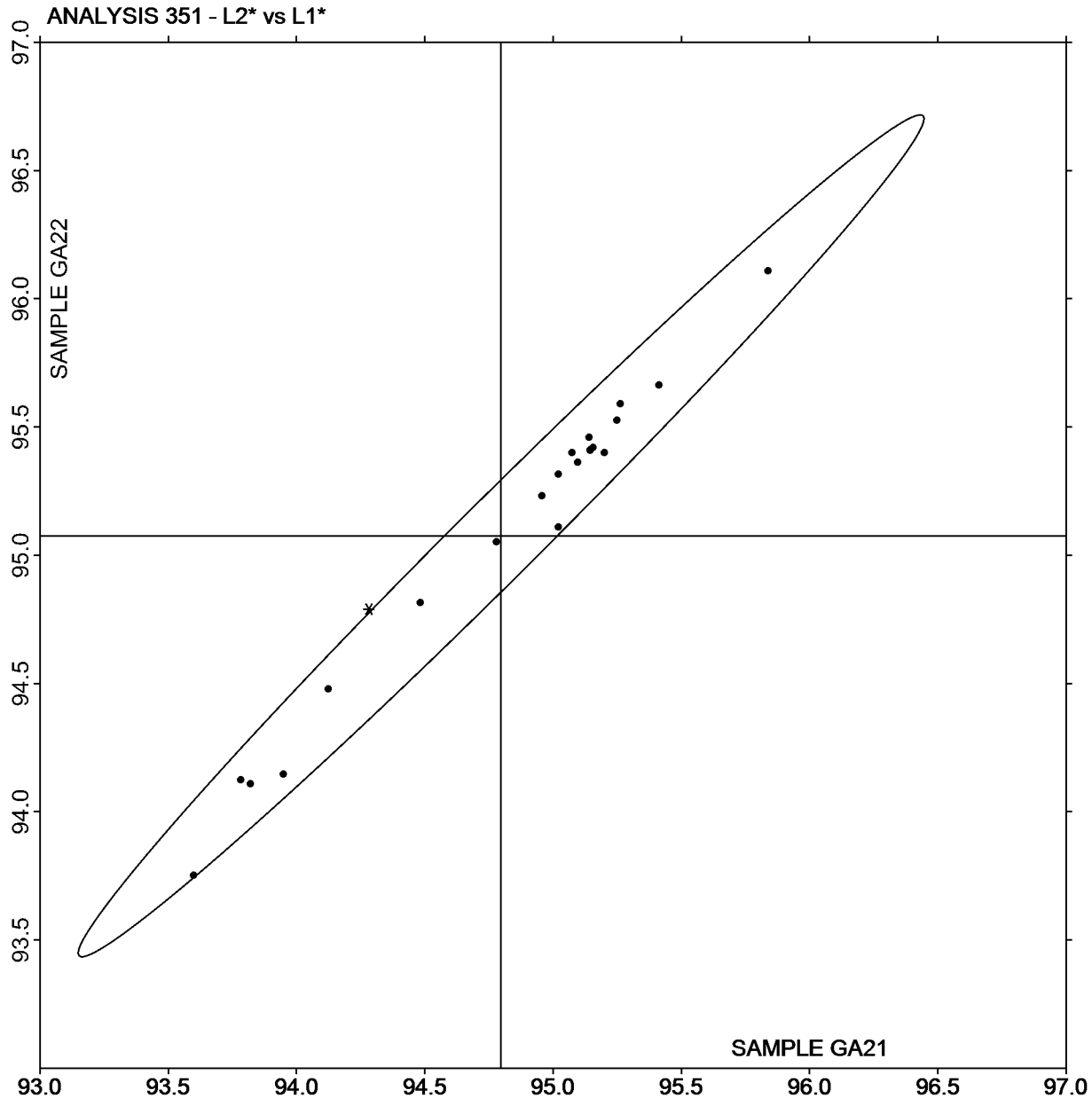
TAPPI-CTS Interlaboratory Testing Program

Analysis 351

Color & Color Difference - Near White Papers - D65/10deg obs **Hunter L,a,b - Illuminant D65 - 10 Degree Observer**

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

Plot of L values GA22 v L values GA21



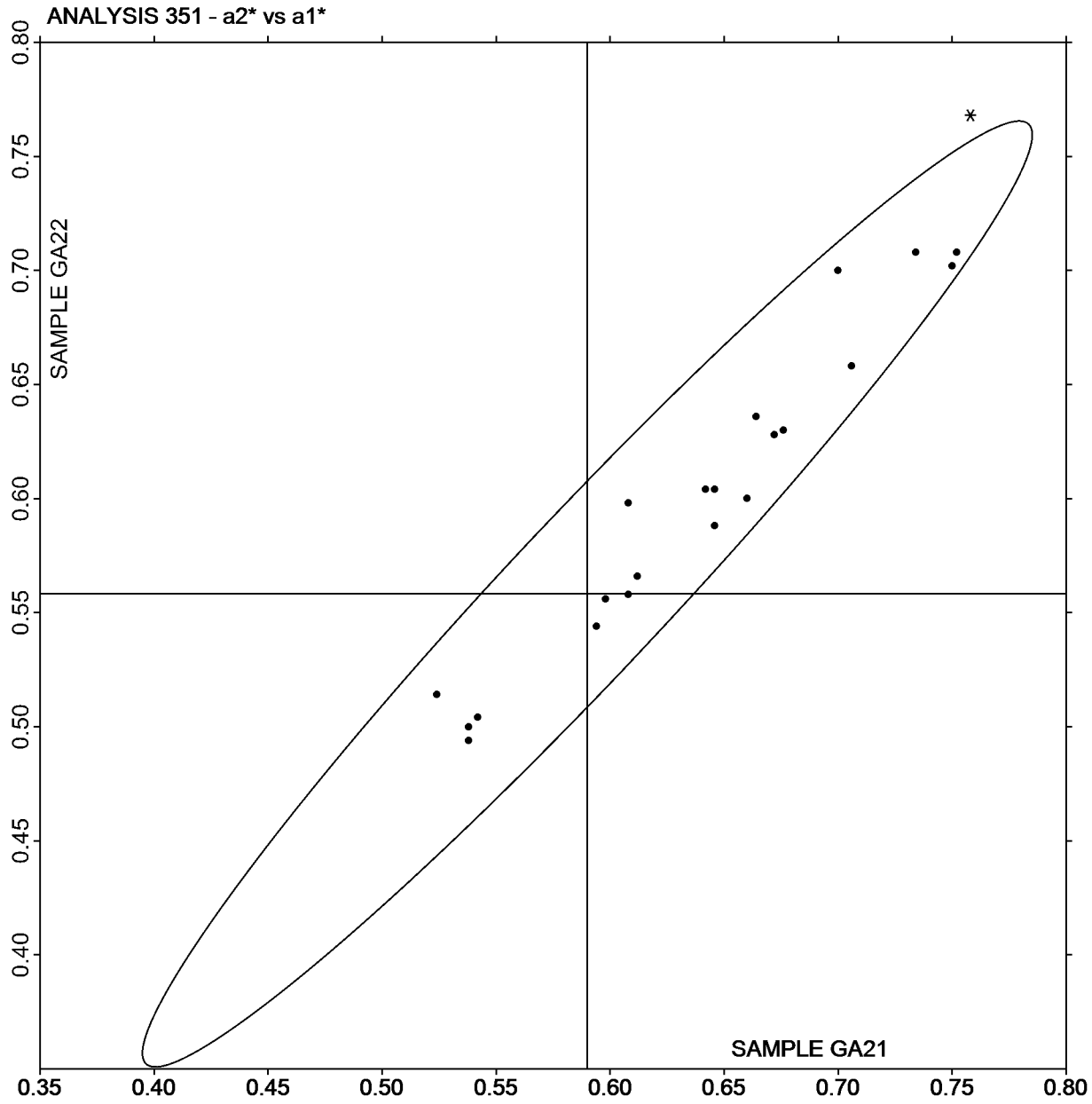
TAPPI-CTS Interlaboratory Testing Program

Analysis 351

Color & Color Difference - Near White Papers - D65/10deg obs **Hunter L,a,b - Illuminant D65 - 10 Degree Observer**

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

Plot of a values GA22 v a values GA21

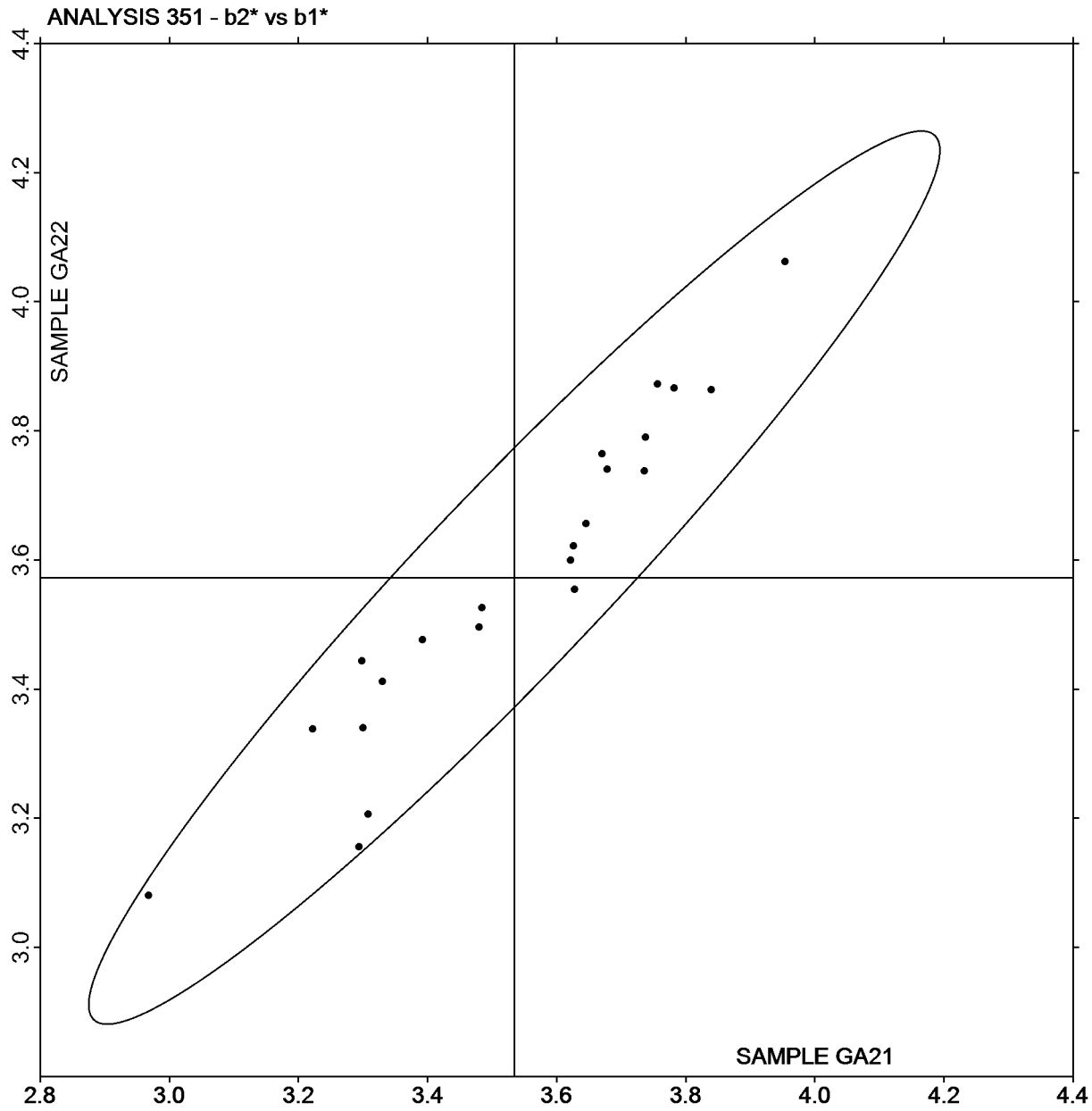


TAPPI-CTS Interlaboratory Testing Program

Analysis 351

Color & Color Difference - Near White Papers - D65/10deg obs **Hunter L,a,b - Illuminant D65 - 10 Degree Observer**

Plot of b values GA22 v b values GA21



Paper & Paperboard Interlaboratory Testing Program

Analysis 360

Thickness (Caliper), Printing papers

WebCode	Data Flag	Sample GV21 Lab Mean	Sample GV21 Diff from Grand Mean	Sample GV21 CPV	Sample GV22 Lab Mean	Sample GV22 Diff from Grand Mean	Sample GV22 CPV	Instr Code
2F99WT		4.649	0.069	1.00	3.886	0.096	1.36	PP
2Q9RF9		4.667	0.087	1.27	3.908	0.118	1.67	LW
3D7KZ4		4.618	0.038	0.55	3.773	-0.017	-0.24	TA
3HDB4A		4.617	0.037	0.54	3.773	-0.017	-0.24	TM
4CKD77		4.669	0.089	1.29	3.819	0.029	0.41	PP
4DFV88		4.566	-0.014	-0.20	3.769	-0.021	-0.30	LW
4YVG69		4.550	-0.030	-0.44	3.670	-0.120	-1.69	TM
64PWU8		4.551	-0.029	-0.42	3.747	-0.043	-0.61	TM
67TTDA		4.592	0.012	0.18	3.771	-0.019	-0.26	EM
6H6V2T		4.428	-0.152	-2.21	3.628	-0.161	-2.27	FR
72WCM2		4.572	-0.008	-0.12	3.801	0.011	0.16	PP
79CYEH		4.513	-0.067	-0.97	3.733	-0.057	-0.80	EM
7N6UPN	X	11.747	7.167	104.11	9.844	6.054	85.34	EM
8C7F6H		4.704	0.124	1.80	3.850	0.060	0.85	XX
8JWNV3		4.599	0.019	0.28	3.813	0.023	0.33	EM
8MNXXN	*	4.430	-0.150	-2.18	3.600	-0.190	-2.67	XX
BCC4UX		4.540	-0.040	-0.58	3.750	-0.040	-0.56	TM
BZM63V		4.610	0.030	0.44	3.795	0.006	0.08	MS
C78MXH		4.536	-0.044	-0.64	3.761	-0.029	-0.40	TA
CFVACT		4.555	-0.025	-0.36	3.759	-0.031	-0.43	LW
DK32XC		4.543	-0.037	-0.54	3.778	-0.012	-0.17	XX
E67AQF		4.514	-0.066	-0.96	3.772	-0.018	-0.25	TA
EA3X63		4.492	-0.088	-1.28	3.726	-0.064	-0.90	LA
EY2MJY		4.524	-0.056	-0.81	3.765	-0.025	-0.35	EM
F6MZXR		4.626	0.046	0.67	3.822	0.032	0.46	LA
FVGTJR		4.600	0.020	0.29	3.860	0.071	0.99	TM
GXXLNQ		4.639	0.059	0.86	3.831	0.041	0.58	LW
H9DU9X		4.584	0.004	0.06	3.826	0.036	0.51	LW
HQT6TB		4.577	-0.003	-0.04	3.826	0.036	0.51	XX
JBVDKF		4.698	0.118	1.71	3.945	0.156	2.19	LW
KQ6NNT		4.524	-0.056	-0.82	3.778	-0.012	-0.17	LW
LDF4KB		4.480	-0.100	-1.45	3.689	-0.101	-1.42	TA
LRVAUN		4.431	-0.149	-2.17	3.670	-0.119	-1.68	TM
LT82M7		4.530	-0.050	-0.73	3.740	-0.050	-0.70	TM
N6Y3KR		4.660	0.080	1.16	3.876	0.086	1.22	EM
N74YKL		4.664	0.084	1.22	3.831	0.041	0.58	PP
NJUVMK		4.678	0.098	1.42	3.850	0.060	0.85	TM
P8UKT4		4.643	0.063	0.92	3.793	0.003	0.05	XX
PNZLPQ		4.474	-0.106	-1.54	3.704	-0.086	-1.21	EM
Q73LDK		4.579	-0.001	-0.02	3.776	-0.014	-0.20	MT
QHXTGF		4.614	0.034	0.49	3.815	0.025	0.36	EM
R3XFD6		4.618	0.038	0.55	3.823	0.033	0.47	EM
RJ4UFK		4.615	0.035	0.50	3.891	0.101	1.42	LW

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

WebCode	Data Flag	Sample GV21 Lab Mean	Sample GV21 Diff from Grand Mean	Sample GV21 CPV	Sample GV22 Lab Mean	Sample GV22 Diff from Grand Mean	Sample GV22 CPV	Instr Code
RREW2K		4.640	0.060	0.88	3.840	0.050	0.71	LW
RVXB6L		4.638	0.058	0.84	3.920	0.130	1.84	TA
RYX6G6		4.567	-0.013	-0.19	3.777	-0.013	-0.18	PP
U2VNVE		4.628	0.048	0.70	3.850	0.060	0.85	TM
UFWZQD	X	4.914	0.334	4.85	4.121	0.331	4.67	PP
UP4T4E		4.570	-0.010	-0.14	3.713	-0.077	-1.08	TA
UQU24H		4.573	-0.007	-0.10	3.805	0.016	0.22	LW
VG6NNH		4.515	-0.065	-0.94	3.771	-0.019	-0.26	TA
VPE6BH		4.628	0.048	0.70	3.837	0.047	0.67	EM
VUQ8ZY		4.550	-0.030	-0.44	3.840	0.050	0.71	XX
WNLJ4D		4.554	-0.026	-0.38	3.766	-0.024	-0.33	TM
XCM89B		4.547	-0.033	-0.48	3.843	0.053	0.74	LW
XDDF9E		4.624	0.044	0.64	3.830	0.040	0.57	TM
XEQ3RE		4.567	-0.013	-0.19	3.748	-0.042	-0.59	TA
XT6DAA	*	4.390	-0.190	-2.76	3.590	-0.200	-2.81	TM
XULA4U		4.575	-0.005	-0.07	3.774	-0.016	-0.22	TA
YEK6W9		4.660	0.080	1.16	3.800	0.010	0.15	LW
YF23N9		4.592	0.012	0.18	3.811	0.022	0.31	LW
YQY8AU		4.637	0.057	0.83	3.794	0.004	0.06	XX
Z87LCA		4.649	0.069	1.01	3.871	0.081	1.14	EM

Summary Statistics

	Sample GV21	Sample GV22
Grand Means	4.5800 mils	3.7897 mils
SD Btwn Labs	0.0688 mils	0.0709 mils

Statistics based on 61 of 63 reporting participants

Comments on assigned Data Flags for Test #360

7N6UPN (X) - Extreme data.

UFWZQD (X) - Systematic error (data for both samples are high).

Instrument Code List as Reported by the Labs

(EM) - Emveco
(FR) - Frank Instruments
(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

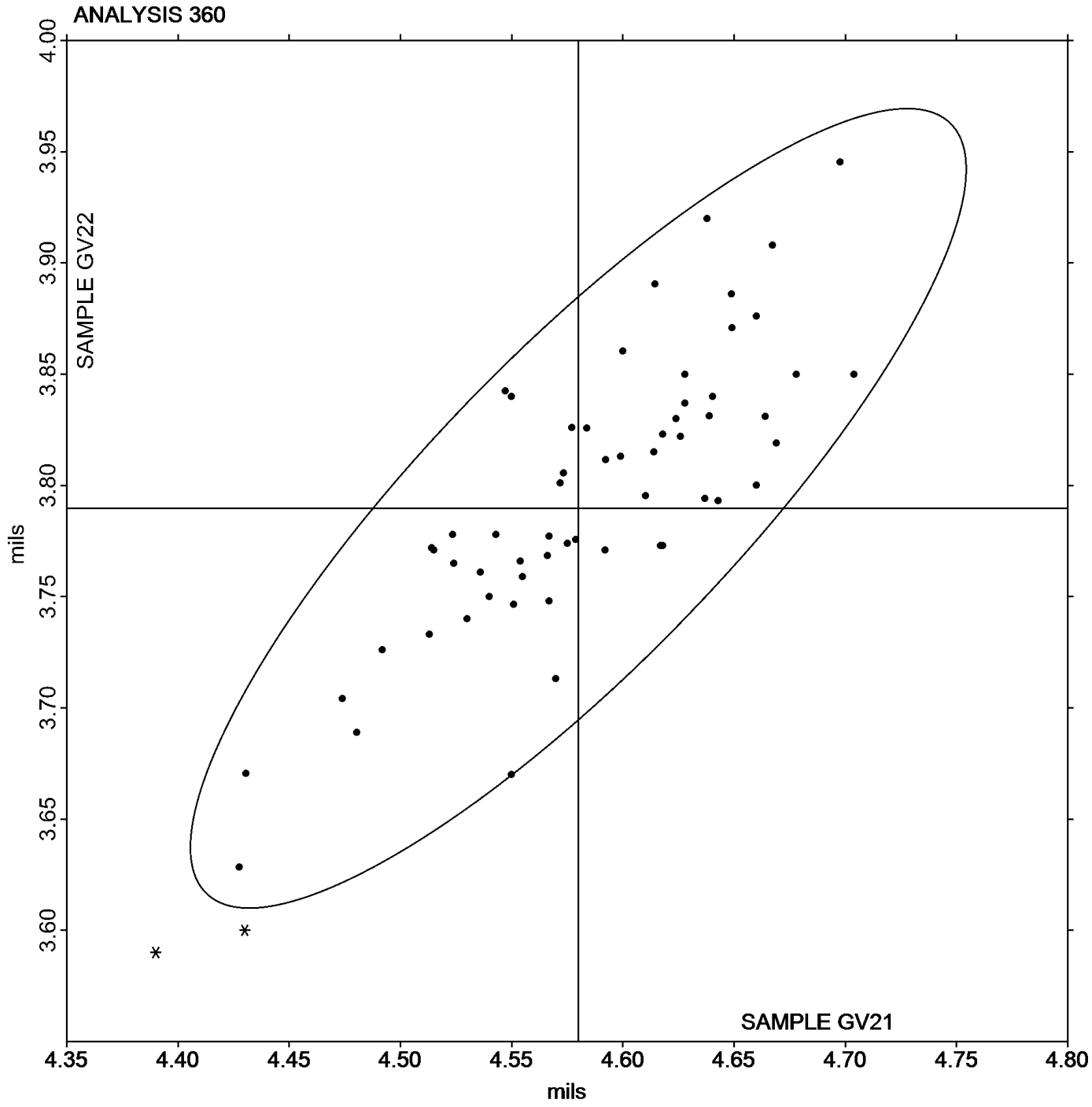
Paper & Paperboard Interlaboratory Testing Program

Analysis 360

Thickness (Caliper), Printing papers

Grand Mean Sample **GV21** = 4.5800 mils

Grand Mean Sample **GV22** = 3.7897 mils



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

WebCode	Data Flag	Sample GY21 Lab Mean	Sample GY21 Diff from Grand Mean	Sample GY21 CPV	Sample GY22 Lab Mean	Sample GY22 Diff from Grand Mean	Sample GY22 CPV	Instr Code
27PPKA		9.469	-0.061	-0.56	14.05	-0.08	-0.57	LA
29QWG8		9.496	-0.034	-0.31	14.07	-0.06	-0.43	TM
2A4JZ8	X	9.583	0.053	0.49	13.94	-0.19	-1.33	XX
2JAE9E		9.504	-0.026	-0.24	14.05	-0.09	-0.59	EM
2Q9RF9		9.687	0.157	1.45	14.40	0.27	1.83	XX
4TTHF4		9.508	-0.022	-0.20	14.13	-0.01	-0.05	XX
4YVG69		9.500	-0.030	-0.27	14.13	0.00	-0.03	TM
6QWBNC		9.766	0.236	2.18	14.49	0.35	2.44	EM
6X2A2M		9.455	-0.075	-0.69	14.09	-0.04	-0.28	PP
79CYEH		9.427	-0.103	-0.95	14.02	-0.12	-0.81	EM
7RR483		9.668	0.138	1.28	14.27	0.14	0.94	EM
9GK923		9.492	-0.038	-0.35	14.09	-0.04	-0.31	EM
AL8K7W		9.655	0.125	1.16	14.28	0.15	1.02	TM
C78MXH		9.510	-0.020	-0.18	14.16	0.02	0.16	TA
CEJJZ4		9.608	0.078	0.72	14.17	0.03	0.22	EM
D6NZYZ		9.555	0.025	0.23	14.14	0.01	0.04	TA
D7JJ4M		9.430	-0.100	-0.92	14.05	-0.08	-0.58	TA
EPY3JR		9.450	-0.080	-0.74	13.93	-0.20	-1.41	LA
G2YPFD		9.477	-0.053	-0.49	14.05	-0.08	-0.56	TA
GLLD8T		9.365	-0.165	-1.52	13.90	-0.23	-1.61	LA
H9DU9X		9.488	-0.041	-0.38	14.09	-0.04	-0.27	LW
JEVNGF		9.731	0.201	1.86	14.36	0.22	1.55	TM
P3NRY8		9.680	0.150	1.39	14.29	0.16	1.08	LA
QAXFBL		9.570	0.040	0.37	14.04	-0.09	-0.65	TM
QX7T6Q		9.630	0.100	0.93	14.34	0.20	1.41	TM
U3LNBX		9.390	-0.140	-1.29	13.96	-0.17	-1.19	LA
VCTP8J		9.510	-0.020	-0.18	14.05	-0.08	-0.58	TA
VG6NNH		9.436	-0.094	-0.87	14.04	-0.10	-0.68	TA
VTVNXX		9.563	0.033	0.31	14.08	-0.05	-0.35	TM
WNLJ4D		9.546	0.016	0.15	14.12	-0.02	-0.11	TM
WVGT7V		9.668	0.138	1.28	14.34	0.21	1.42	LW
XLB9HT		9.400	-0.130	-1.20	13.95	-0.18	-1.27	TM
XT6DAA		9.300	-0.230	-2.12	13.91	-0.22	-1.54	TM
YW6N6A	*	9.484	-0.045	-0.42	14.26	0.12	0.84	XX
ZJVHE8		9.616	0.086	0.80	14.25	0.11	0.79	LA
ZP4N9R		9.505	-0.025	-0.23	14.15	0.02	0.12	PP

Summary Statistics

	Sample GY21	Sample GY22
Grand Means	9.5296 mils	14.134 mils
SD Btwn Labs	0.1083 mils	0.145 mils

Statistics based on 35 of 36 reporting participants

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

Comments on assigned Data Flags for Test #361

2A4JZ8 (X) - Inconsistent in testing between samples.

Instrument Code List as Reported by the Labs

(EM) - Emveco

(LW) - L & W

(TA) - Thwing-Albert

(XX) - Instrument make/model not specified by lab

(LA) - L & W Autoline

(PP) - Technidyne Profile/Plus

(TM) - TMI

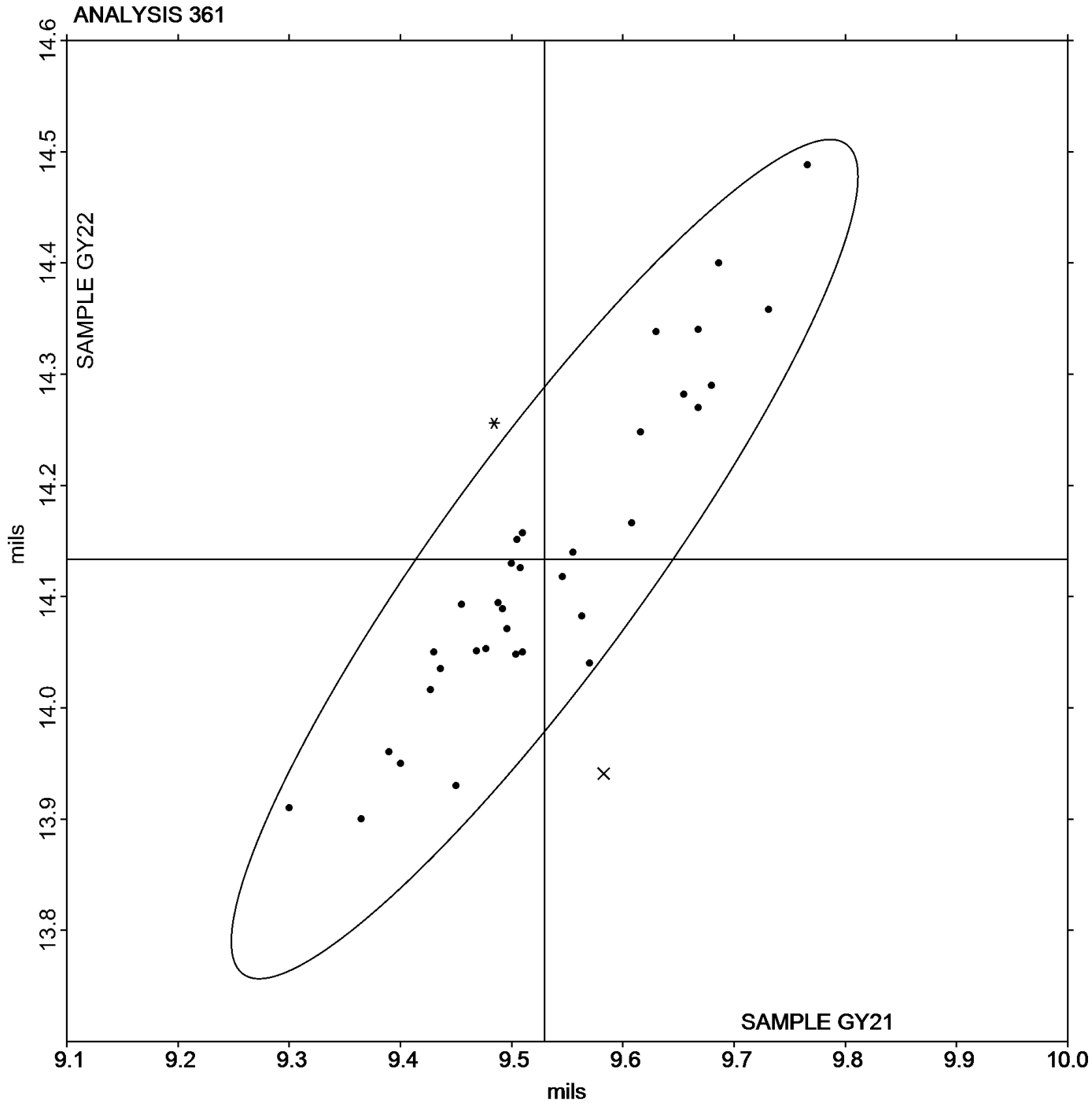
Paper & Paperboard Interlaboratory Testing Program

Analysis 361

Thickness (Caliper), Packaging papers

Grand Mean Sample **GY21** = 9.5296 mils

Grand Mean Sample **GY22** = 14.134 mils



Paper & Paperboard Interlaboratory Testing Program

Analysis 364

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

WebCode	Data Flag	Sample GD21 Lab Mean	Sample GD21 Diff from Grand Mean	Sample GD21 CPV	Sample GD22 Lab Mean	Sample GD22 Diff from Grand Mean	Sample GD22 CPV	Instr Code
2Q9RF9		0.5760	0.0331	0.45	0.5560	-0.0165	-0.37	TL
8JWNV3		0.5994	0.0565	0.77	0.5836	0.0112	0.25	XX
BCC4UX	X	0.3678	-0.1752	-2.40	0.3288	-0.2437	-5.51	XX
GLLD8T		0.4516	-0.0914	-1.25	0.5502	-0.0223	-0.50	TA
N6Y3KR		0.6048	0.0619	0.85	0.5584	-0.0141	-0.32	TM
NDPNQP		0.5804	0.0375	0.51	0.6128	0.0404	0.91	IT
PHXFAM		0.4862	-0.0568	-0.78	0.5460	-0.0265	-0.60	TA
U3LNBX		0.4350	-0.1080	-1.48	0.5160	-0.0565	-1.28	TA
YF23N9		0.6102	0.0673	0.92	0.6566	0.0842	1.90	TM

Summary Statistics

	Sample GD21	Sample GD22
Grand Means	0.54295 COF	0.57245 COF
SD Btwn Labs	0.07295 COF	0.04421 COF

Statistics based on 8 of 9 reporting participants

Comments on assigned Data Flags for Test #364

BCC4UX (X) - Data for both samples are low.

Instrument Code List as Reported by the Labs

(IT) - IMASS SP-2100

(TA) - Thwing-Albert Friction Tester

(TL) - TMI 32-90 Lab Master/Slip and Friction

(TM) - TMI 32-06 Monitor/Slip and Friction

(XX) - Instrument make/model not specified by lab

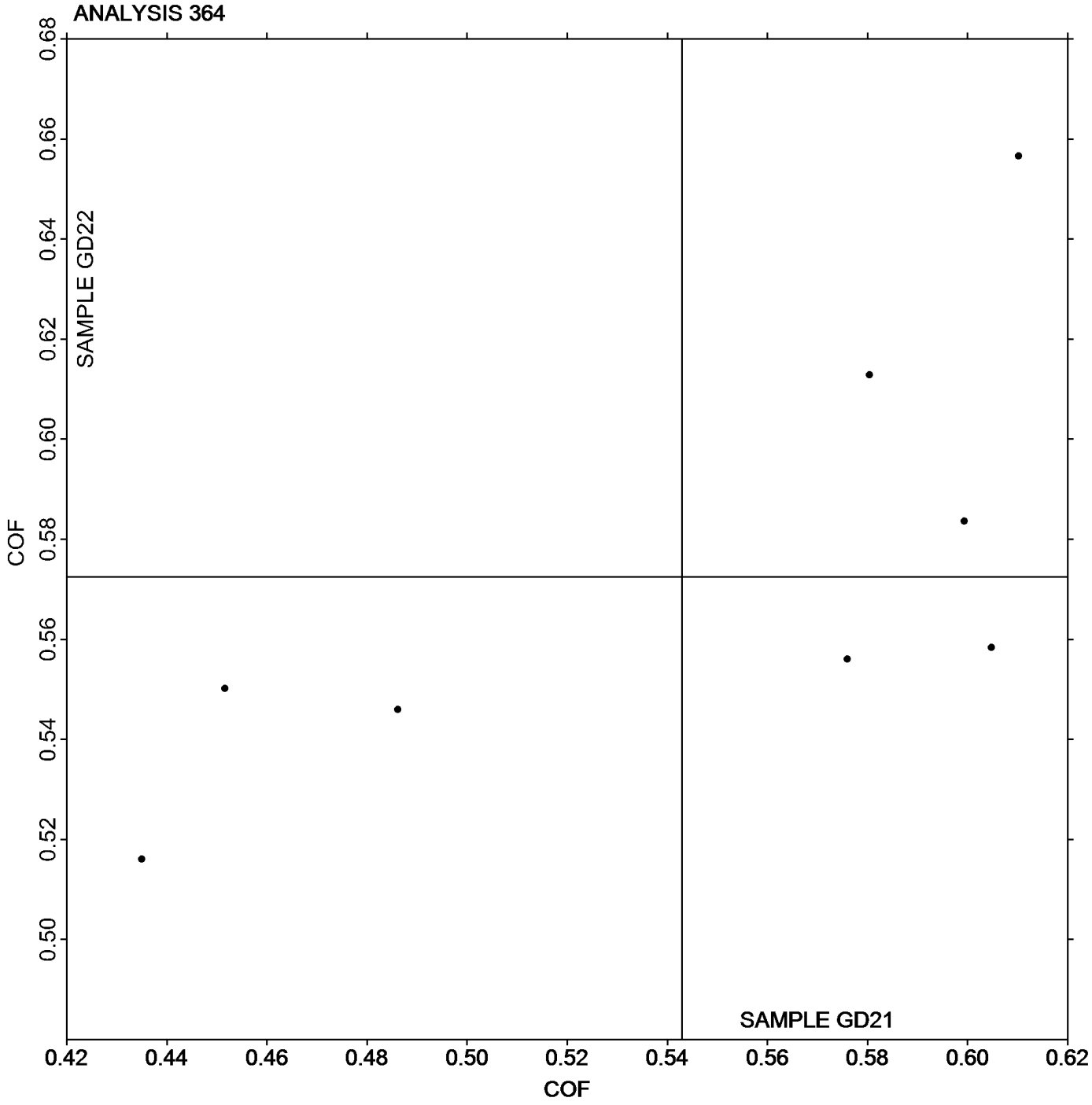
Paper & Paperboard Interlaboratory Testing Program

Analysis 364

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

Grand Mean Sample **GD21** = 0.54295 COF

Grand Mean Sample **GD22** = 0.57245 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
Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers

WebCode	Data Flag	Sample GD21 Lab Mean	Sample GD21 Diff from Grand Mean	Sample GD21 CPV	Sample GD22 Lab Mean	Sample GD22 Diff from Grand Mean	Sample GD22 CPV	Instr Code
2Q9RF9		0.5660	0.1505	1.90	0.5100	0.0856	1.12	TL
3D7KZ4		0.3412	-0.0743	-0.94	0.3348	-0.0896	-1.17	TA
BCC4UX		0.2830	-0.1325	-1.67	0.2818	-0.1426	-1.87	XX
EY2MJY		0.3796	-0.0359	-0.45	0.3814	-0.0430	-0.56	TA
FBQNUD		0.3618	-0.0537	-0.68	0.3698	-0.0546	-0.72	TM
L2228P		0.3980	-0.0175	-0.22	0.4664	0.0420	0.55	TA
NDPNQP		0.4702	0.0547	0.69	0.4970	0.0726	0.95	IR
PHXFAM		0.3878	-0.0277	-0.35	0.4384	0.0140	0.18	TA
U3LNBX		0.4248	0.0093	0.12	0.4472	0.0228	0.30	TA
Y4N3RE		0.4084	-0.0071	-0.09	0.4068	-0.0176	-0.23	TM
Y79YCY		0.4282	0.0127	0.16	0.4113	-0.0131	-0.17	TA
YF23N9		0.5366	0.1211	1.53	0.5484	0.1240	1.62	TM

Summary Statistics

	Sample GD21	Sample GD22
Grand Means	0.41546 COF	0.42444 COF
SD Btwn Labs	0.07916 COF	0.07635 COF

Statistics based on 12 of 12 reporting participants

Analysis Notes:

3D7KZ4 - Determination #4, Sample GD21, appears to have a misplaced decimal point. Data corrected by CTS.

Instrument Code List as Reported by the Labs

(IR) - IMASS SP-2000

(TA) - Thwing-Albert Friction Tester

(TL) - TMI 32-90 Lab Master/Slip and Friction

(TM) - TMI 32-06 Monitor/Slip and Friction

(XX) - Instrument make/model not specified by lab

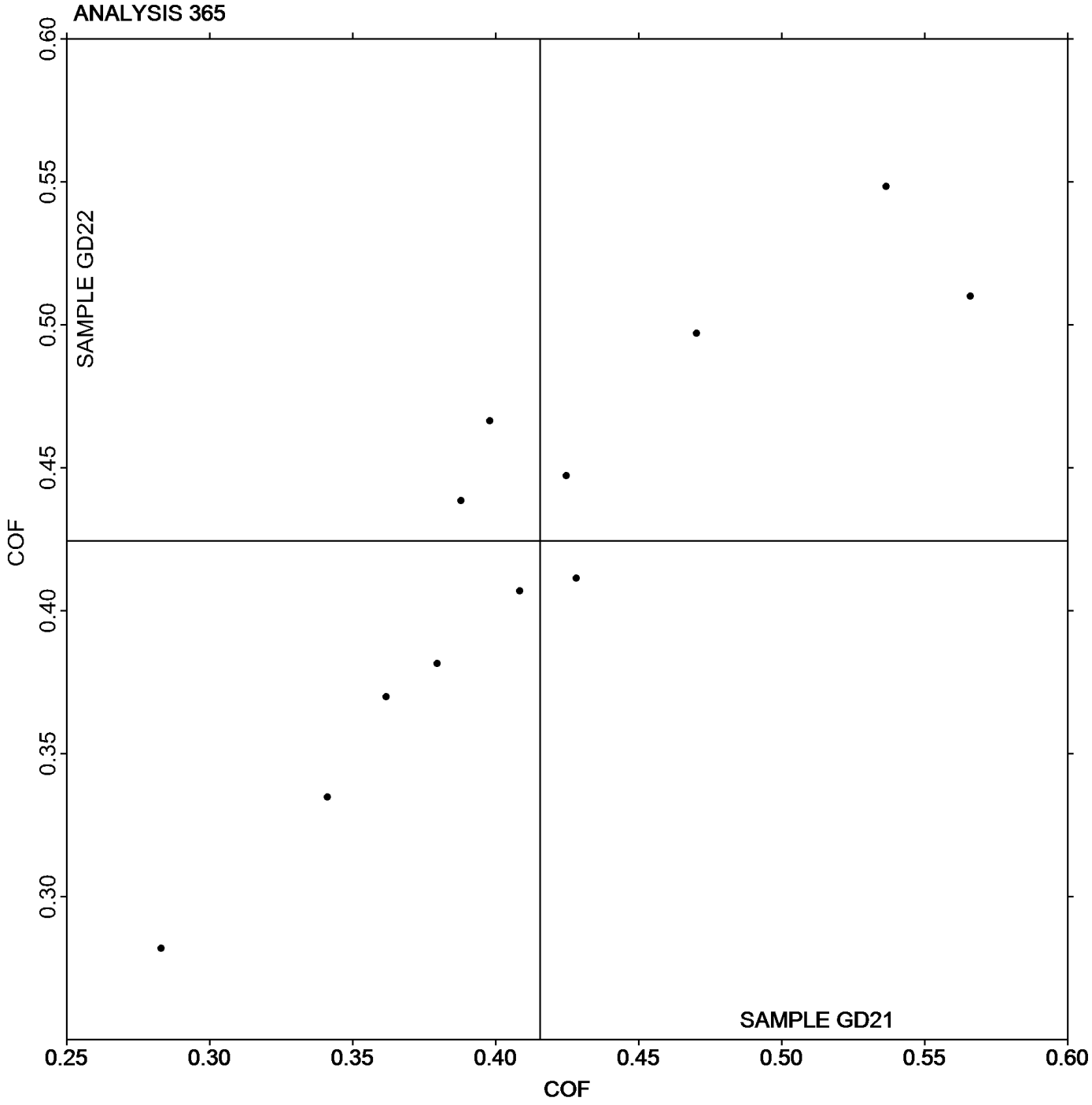
Paper & Paperboard Interlaboratory Testing Program

Analysis 365

Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers

Grand Mean Sample **GD21** = 0.41546 COF

Grand Mean Sample **GD22** = 0.42444 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

WebCode	Data Flag	Sample GE21 Lab Mean	Sample GE21 Diff from Grand Mean	Sample GE21 CPV	Sample GE22 Lab Mean	Sample GE22 Diff from Grand Mean	Sample GE22 CPV	Instr Code
2A4JZ8		18.14	-0.38	-0.31	36.44	2.60	1.23	LW
2Q9RF9		18.21	-0.31	-0.25	32.72	-1.12	-0.53	LP
4CKD77		17.92	-0.60	-0.49	33.13	-0.71	-0.34	HG
4DFV88		18.27	-0.25	-0.21	32.20	-1.64	-0.78	LP
4TTHF4		17.72	-0.80	-0.65	33.16	-0.68	-0.32	XX
6ABMG3		19.80	1.27	1.03	35.96	2.12	1.00	TN
6X2A2M		17.89	-0.63	-0.51	32.27	-1.58	-0.75	PP
72WCM2		18.51	-0.01	-0.01	35.97	2.12	1.01	PP
7N6UPN		21.15	2.63	2.14	37.64	3.80	1.80	HG
8C7F6H		20.10	1.58	1.28	38.36	4.52	2.14	XX
8MNXXN		19.01	0.49	0.40	34.55	0.71	0.34	WG
9GK923		16.58	-1.94	-1.58	32.52	-1.32	-0.63	PP
BCC4UX	*	15.80	-2.72	-2.21	32.50	-1.34	-0.64	GS
E67AQF		17.79	-0.73	-0.59	33.08	-0.76	-0.36	PP
EA3X63		18.70	0.18	0.14	33.01	-0.83	-0.39	LA
EJ67UZ		16.77	-1.75	-1.42	33.16	-0.68	-0.32	LP
EPBZNV		19.44	0.92	0.75	34.80	0.96	0.45	TL
EPY3JR		19.30	0.78	0.63	33.50	-0.34	-0.16	LA
F6MZXR		18.88	0.35	0.29	33.77	-0.07	-0.03	LA
FVGTJR		17.05	-1.47	-1.20	30.02	-3.82	-1.81	XX
G2YPFD		19.28	0.76	0.62	36.42	2.58	1.22	PP
GLLD8T		16.14	-2.38	-1.94	30.01	-3.83	-1.82	LA
GXXLNQ		18.51	-0.01	-0.01	33.85	0.01	0.00	LP
H9DU9X		19.50	0.98	0.79	31.99	-1.85	-0.88	PP
HUV2KQ		18.54	0.02	0.01	32.86	-0.98	-0.47	LP
JBVDKF	*	18.01	-0.51	-0.42	28.99	-4.85	-2.30	LP
JLYL9R		18.34	-0.18	-0.15	34.32	0.48	0.23	XX
LRVAUN		18.25	-0.27	-0.22	30.88	-2.96	-1.40	LW
N6Y3KR		18.83	0.31	0.25	33.03	-0.82	-0.39	PP
N74YKL		18.32	-0.20	-0.16	34.32	0.48	0.23	HG
NJUVMK		17.42	-1.10	-0.90	32.27	-1.57	-0.75	HG
PHXFAM		19.79	1.27	1.03	34.61	0.77	0.36	WG
Q73LDK		16.68	-1.84	-1.49	31.58	-2.27	-1.07	RE
QHXTGF		16.56	-1.96	-1.59	31.42	-2.42	-1.15	GL
R3XFD6		19.72	1.20	0.97	35.83	1.99	0.94	HG
RVXB6L		20.43	1.91	1.55	37.30	3.46	1.64	HG
RYX6G6		20.03	1.51	1.23	33.29	-0.55	-0.26	HG
U3LNBX		19.78	1.26	1.02	36.39	2.55	1.21	LA
UP4T4E		19.40	0.88	0.71	36.24	2.40	1.14	PP
VPE6BH		16.87	-1.65	-1.34	32.58	-1.26	-0.60	PP
VUQ8ZY		19.71	1.19	0.97	35.01	1.17	0.55	XX
WNLJ4D		18.30	-0.22	-0.18	32.90	-0.94	-0.45	PP
WVGT7V		17.43	-1.09	-0.88	32.72	-1.12	-0.53	TL

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

WebCode	Data Flag	Sample GE21 Lab Mean	Sample GE21 Diff from Grand Mean	Sample GE21 CPV	Sample GE22 Lab Mean	Sample GE22 Diff from Grand Mean	Sample GE22 CPV	Instr Code
XCM89B		18.30	-0.22	-0.18	34.10	0.26	0.12	LW
XLB9HT		19.30	0.78	0.63	36.58	2.74	1.30	TL
YVUWYD		20.21	1.69	1.37	35.96	2.12	1.00	GA
ZP4N9R		19.86	1.33	1.08	36.41	2.57	1.22	PP

Summary Statistics

	Sample GE21	Sample GE22
Grand Means	18.522 sec/100 cc	33.843 sec/100 cc
SD Btwn Labs	1.230 sec/100 cc	2.110 sec/100 cc

Statistics based on 47 of 47 reporting participants

Analysis Notes:

GLLD8T - Data appears to be transposed between samples. Data Switched by CTS.

Instrument Code List as Reported by the Labs

(GA) - Gurley Precision #4340 Automatic Densometer
(GL) - Gurley #4110
(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

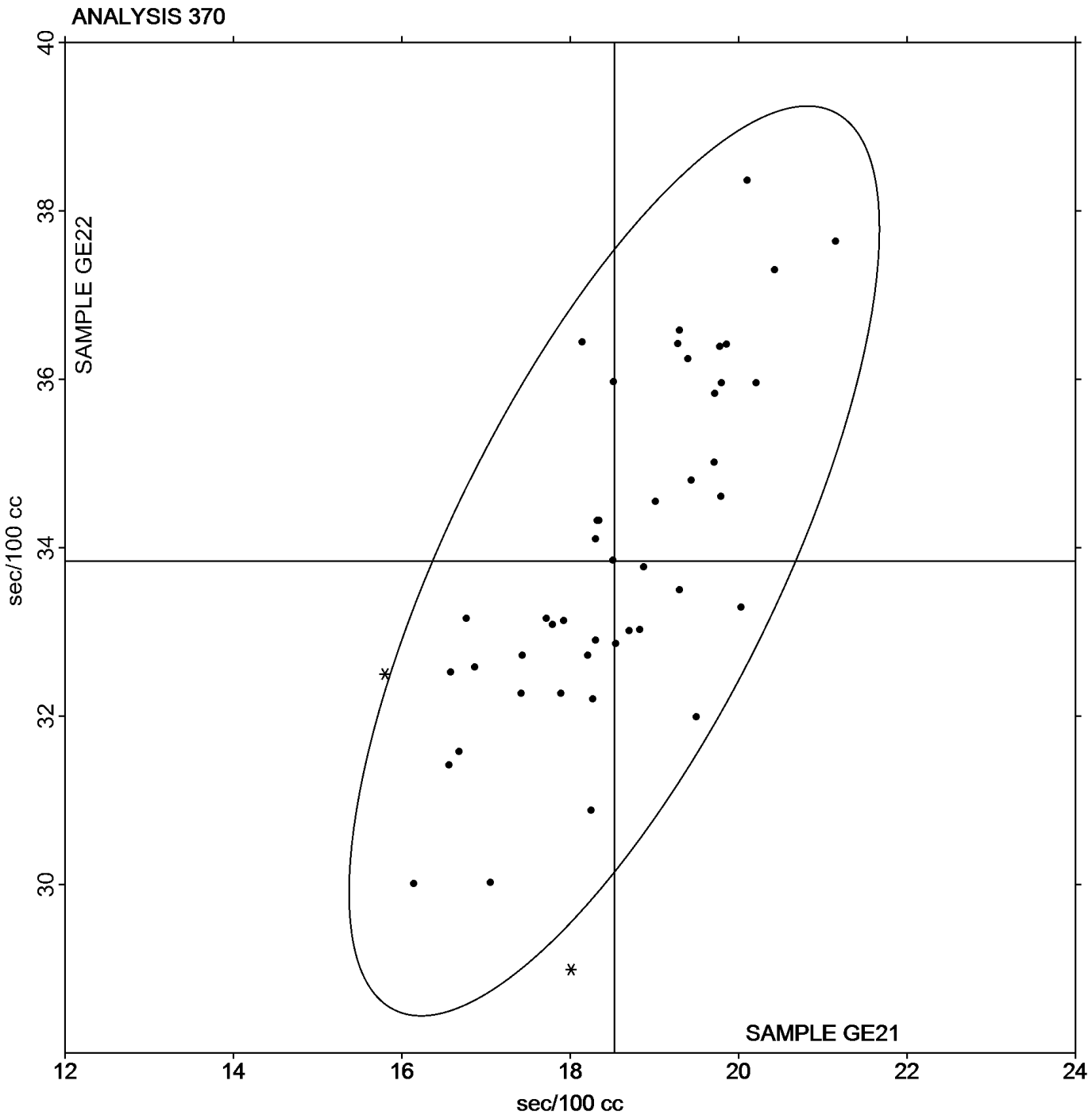
Paper & Paperboard Interlaboratory Testing Program

Analysis 370

Air Resistance - Gurley Oil Type

Grand Mean Sample **GE21** = 18.522 sec/100 cc

Grand Mean Sample **GE22** = 33.843 sec/100 cc



Paper & Paperboard Interlaboratory Testing Program
Analysis 372
Porosity - Sheffield Type - Sheffield Units for 3/4 inch Diameter Orifice

WebCode	Data Flag	Sample GE21 Lab Mean	Sample GE21 Diff from Grand Mean	Sample GE21 CPV	Sample GE22 Lab Mean	Sample GE22 Diff from Grand Mean	Sample GE22 CPV	Instr Code
4294N9		144.1	-2.9	-0.29	79.94	-9.41	-1.15	GA
8KMWV7		136.7	-10.3	-1.04	82.21	-7.14	-0.88	LP
9GK923		162.7	15.7	1.59	104.70	15.35	1.88	SH
BCC4UX		142.7	-4.3	-0.43	100.20	10.85	1.33	SH
CFVACT		145.1	-1.9	-0.19	85.40	-3.95	-0.48	HM
KLCJWA	*	171.7	24.7	2.50	85.40	-3.95	-0.48	VM
LT82M7		139.2	-7.8	-0.78	87.00	-2.35	-0.29	TT
RVXB6L		150.4	3.4	0.35	87.30	-2.05	-0.25	TT
U2VNVE		135.0	-12.0	-1.21	86.20	-3.15	-0.39	TT
UH3G9H		149.9	2.9	0.30	108.10	18.75	2.30	TT
UP4T4E		147.7	0.7	0.07	91.50	2.15	0.26	HM
VG6NNH		148.3	1.3	0.13	89.80	0.45	0.06	XX
VUQ8ZY		135.6	-11.4	-1.15	81.75	-7.60	-0.93	XX
WNLJ4D		155.1	8.1	0.82	86.50	-2.85	-0.35	PP
XDVKQC		139.5	-7.5	-0.75	83.92	-5.43	-0.67	LP
YEK6W9	X	227.0	80.0	8.08	143.10	53.75	6.60	LP
YFGNXA		147.8	0.9	0.09	89.66	0.31	0.04	PP

Summary Statistics

	Sample GE21	Sample GE22
Grand Means	146.97 Sheffield Units	89.349 Sheffield Units
SD Btwn Labs	9.91 Sheffield Units	8.147 Sheffield Units

Statistics based on 16 of 17 reporting participants

YEK6W9 (X) - Extreme data.

Analysis Notes:

9GK923 - Determination #2, Sample GE21, appears to have a misplaced decimal point. Data corrected by CTS.

Instrument Code List as Reported by the Labs

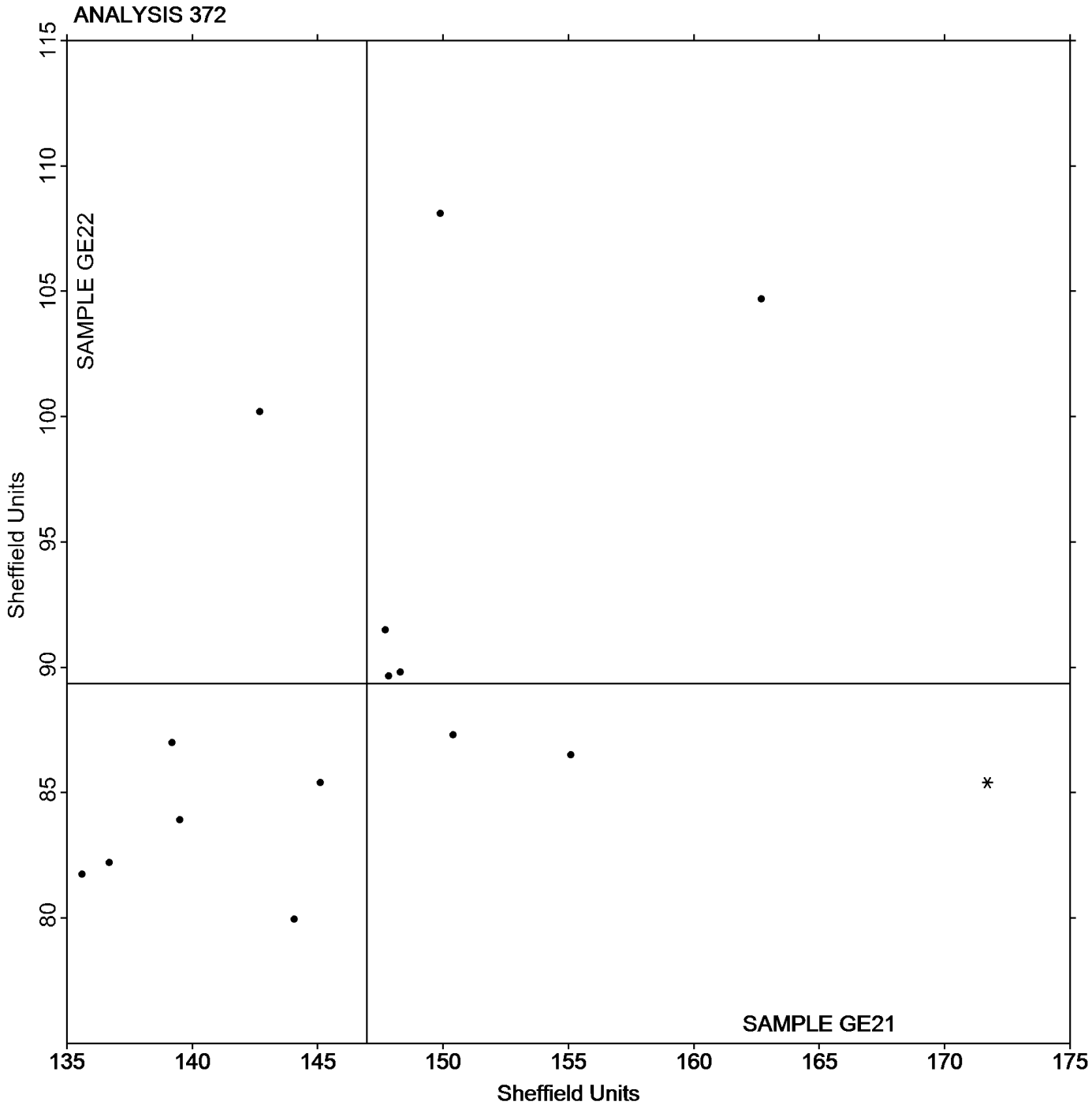
(GA) - Gurley Precision #4340 Automatic Densometer
(HM) - Technidyne - Hagerty Model #538
(LP) - L & W Densometer, Air Permeance
(PP) - Technidyne Profile/Plus
(SH) - Sheffield
(TT) - TMI Monitor/Smoothness II, Model 58-24
(VM) - Valmet PaperLab (was Kajaani/Robotest)
(XX) - Instrument make/model not specified by lab

Paper & Paperboard Interlaboratory Testing Program

Analysis 372

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

Grand Mean Sample **GE21** = 146.97 Sheffield Units Grand Mean Sample **GE22** = 89.349 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

WebCode	Data Flag	Sample GJ21 Lab Mean	Sample GJ21 Diff from Grand Mean	Sample GJ21 CPV	Sample GJ22 Lab Mean	Sample GJ22 Diff from Grand Mean	Sample GJ22 CPV
27PPKA		0.7270	-0.0471	-0.61	0.8310	-0.0945	-1.33
2JAE9E		0.6980	-0.0761	-0.99	0.9330	0.0075	0.11
3D7KZ4		0.7920	0.0179	0.23	0.9480	0.0225	0.32
67TTDA		0.7970	0.0229	0.30	0.9170	-0.0085	-0.12
6QWBNC		0.6940	-0.0801	-1.04	0.9390	0.0135	0.19
6X2A2M		0.7850	0.0109	0.14	0.9610	0.0355	0.50
79CYEH		0.8190	0.0449	0.58	0.9050	-0.0205	-0.29
7RR483		0.7910	0.0169	0.22	0.9730	0.0475	0.67
8C7F6H	X	2.0050	1.2309	15.95	2.5790	1.6535	23.21
9GK923		0.7190	-0.0551	-0.71	0.8280	-0.0975	-1.37
9YJLA4		0.7100	-0.0641	-0.83	0.9550	0.0295	0.41
CEJJZ4		0.7890	0.0149	0.19	0.9620	0.0365	0.51
E67AQF		0.8890	0.1149	1.49	1.0600	0.1345	1.89
FAV7RC		0.9190	0.1449	1.88	1.0270	0.1015	1.42
GKCACG		0.8000	0.0259	0.34	0.9270	0.0015	0.02
L2228P		0.7000	-0.0741	-0.96	0.7810	-0.1445	-2.03
LT82M7	X	1.2030	0.4289	5.56	1.2100	0.2845	3.99
MENFZQ		0.6990	-0.0751	-0.97	0.8750	-0.0505	-0.71
P3NRY8		0.7300	-0.0441	-0.57	0.8700	-0.0555	-0.78
PHXFAM	*	0.9130	0.1389	1.80	0.9130	-0.0125	-0.18
R3XFD6		0.8740	0.0999	1.29	1.0380	0.1125	1.58
RREW2K		0.7690	-0.0051	-0.07	0.8810	-0.0445	-0.62
RVXB6L		0.7430	-0.0311	-0.40	0.9380	0.0125	0.18
RYX6G6		0.7320	-0.0421	-0.55	1.0020	0.0765	1.07
UFWZQD		0.8840	0.1099	1.42	0.9730	0.0475	0.67
VTVNXX		0.5980	-0.1761	-2.28	0.7820	-0.1435	-2.01
VXBYB2		0.7960	0.0219	0.28	0.9650	0.0395	0.55
Z87LCA		0.8530	0.0789	1.02	0.9940	0.0685	0.96
ZJVHE8		0.6990	-0.0751	-0.97	0.8790	-0.0465	-0.65
ZP4N9R		0.7560	-0.0181	-0.23	0.8570	-0.0685	-0.96

Summary Statistics

	Sample GJ21	Sample GJ22
Grand Means	0.77411 Microns	0.92550 Microns
SD Btwn Labs	0.07717 Microns	0.07125 Microns

Statistics based on 28 of 30 reporting participants

Comments on assigned Data Flags for Test #376

8C7F6H (X) - Extreme data.

LT82M7 (X) - Data for both samples are high.

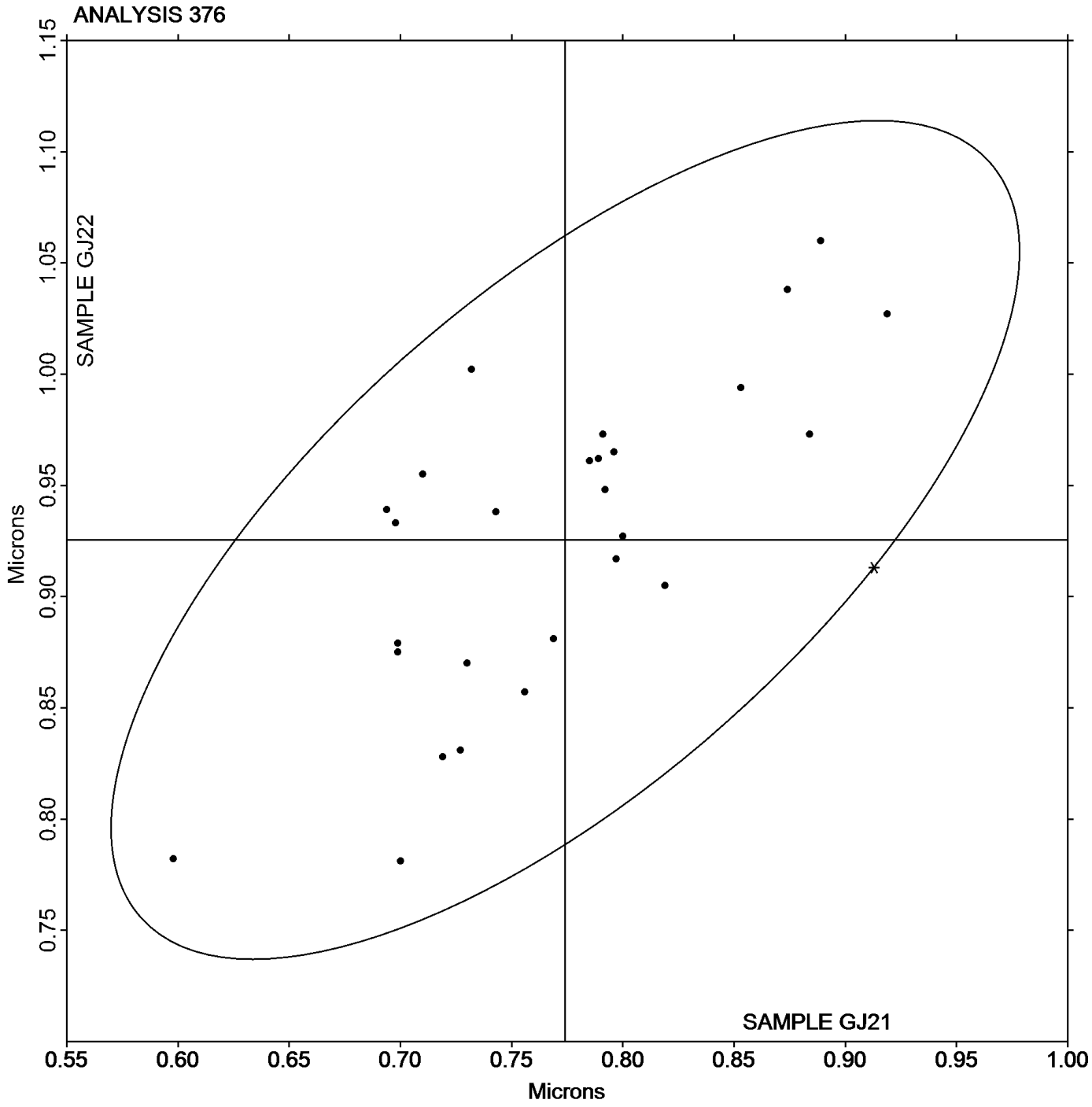
Paper & Paperboard Interlaboratory Testing Program

Analysis 376

Roughness - Print Surf Method - 0.5 to 4.0 Microns

Grand Mean Sample **GJ21** = 0.77411 Microns

Grand Mean Sample **GJ22** = 0.92550 Microns



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

WebCode	Data Flag	Sample GK21 Lab Mean	Sample GK21 Diff from Grand Mean	Sample GK21 CPV	Sample GK22 Lab Mean	Sample GK22 Diff from Grand Mean	Sample GK22 CPV
2Q9RF9		2.988	-0.077	-0.30	3.834	-0.142	-0.30
8JWNV3		3.062	-0.003	-0.01	3.890	-0.086	-0.18
EA3X63		2.917	-0.148	-0.58	3.714	-0.262	-0.56
G2YPFD		2.948	-0.117	-0.45	3.923	-0.053	-0.11
GKCACG		3.585	0.520	2.02	4.847	0.871	1.86
H9DU9X		3.029	-0.036	-0.14	3.891	-0.085	-0.18
JEVNGF		2.760	-0.305	-1.19	3.140	-0.836	-1.78
KLCJWA		3.422	0.357	1.39	4.577	0.601	1.28
N6Y3KR		3.115	0.050	0.19	4.141	0.165	0.35
PHXFAM		2.823	-0.242	-0.94	3.799	-0.177	-0.38

Summary Statistics

	Sample GK21	Sample GK22
Grand Means	3.0649 Microns	3.9756 Microns
SD Btwn Labs	0.2571 Microns	0.4695 Microns

Statistics based on 10 of 10 reporting participants

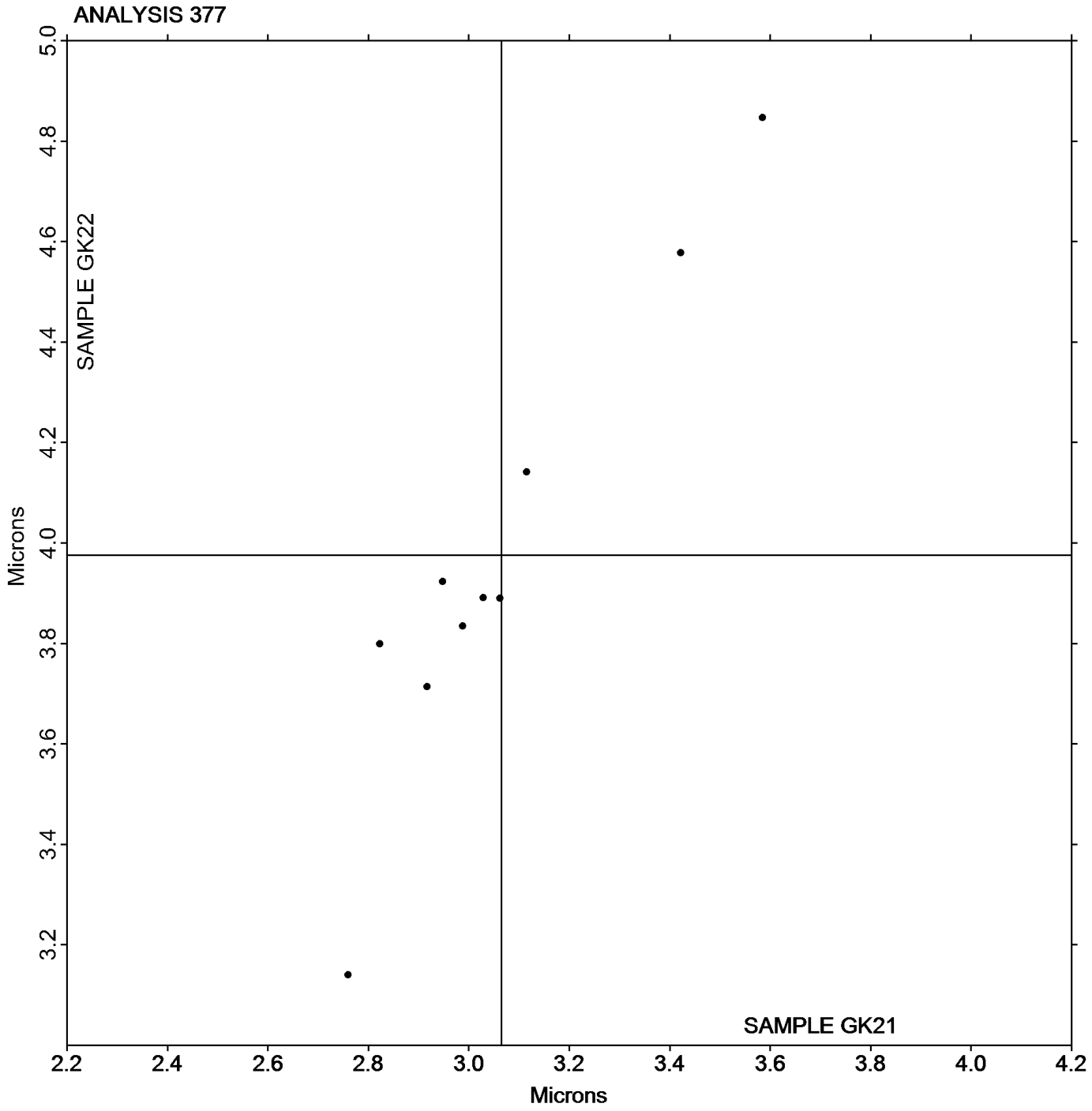
Paper & Paperboard Interlaboratory Testing Program

Analysis 377

Roughness - Print Surf Method - 2.5 to 6.0 Microns

Grand Mean Sample **GK21** = 3.0649 Microns

Grand Mean Sample **GK22** = 3.9756 Microns



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

WebCode	Data Flag	Sample GL21 Lab Mean	Sample GL21 Diff from Grand Mean	Sample GL21 CPV	Sample GL22 Lab Mean	Sample GL22 Diff from Grand Mean	Sample GL22 CPV	Instr Code
2JAE9E		117.8	-12.9	-1.36	144.1	-6.4	-0.86	PP
2Q9RF9		134.4	3.7	0.39	157.7	7.2	0.96	LW
3D7KZ4		131.8	1.1	0.11	145.7	-4.8	-0.65	HM
3NXFR4		134.4	3.7	0.39	153.9	3.4	0.45	MP
4294N9		123.1	-7.6	-0.80	139.6	-10.9	-1.46	GA
4CKD77	X	149.9	19.2	2.02	137.7	-12.8	-1.72	PP
6QWBNC		146.8	16.1	1.69	147.6	-2.9	-0.38	PP
6X2A2M		128.2	-2.5	-0.26	151.1	0.6	0.08	PP
72WCM2		130.6	-0.1	-0.01	159.1	8.6	1.16	PP
7N6UPN		123.2	-7.5	-0.79	152.4	1.9	0.25	HM
7RR483		140.1	9.4	0.99	152.9	2.4	0.32	LA
8C7F6H		142.8	12.1	1.27	148.2	-2.3	-0.31	XX
8JWNV3		128.4	-2.3	-0.24	141.3	-9.2	-1.23	HM
8KMWV7		124.3	-6.4	-0.68	150.7	0.2	0.02	PP
8MNXXN		128.6	-2.1	-0.22	145.1	-5.4	-0.73	PG
9GK923		116.7	-14.0	-1.48	151.2	0.7	0.09	PP
AF2QB2		131.0	0.3	0.03	160.9	10.4	1.39	GA
AL8K7W		137.1	6.4	0.67	148.4	-2.1	-0.28	PP
BCC4UX	*	152.1	21.4	2.25	173.0	22.5	3.01	XX
CEJJZ4		140.7	10.0	1.05	160.9	10.4	1.40	PP
CFVACT		129.8	-0.9	-0.10	157.6	7.1	0.95	HM
D6NZYZ		110.3	-20.4	-2.15	147.5	-3.1	-0.41	PP
DK32XC		138.3	7.6	0.80	149.5	-1.0	-0.14	XX
E67AQF		129.7	-1.0	-0.11	152.9	2.4	0.32	PP
EA3X63		127.5	-3.2	-0.34	149.7	-0.8	-0.11	LA
EWDYDZ		144.4	13.7	1.44	163.4	12.9	1.73	TS
F6MZXR		129.4	-1.3	-0.14	138.0	-12.5	-1.68	LA
G2YPFD		118.3	-12.4	-1.31	140.7	-9.8	-1.32	PP
H9DU9X		118.7	-12.0	-1.27	152.0	1.5	0.20	PP
HQT6TB		122.1	-8.6	-0.91	157.2	6.7	0.90	XX
HUV2KQ		119.7	-11.0	-1.16	146.4	-4.1	-0.55	LW
L2228P		132.6	1.9	0.20	152.4	1.9	0.25	HM
LRVAUN		126.4	-4.3	-0.45	147.6	-2.9	-0.39	SH
LT82M7		133.7	3.0	0.31	143.7	-6.8	-0.91	TT
N6Y3KR		129.2	-1.5	-0.16	155.1	4.6	0.61	PP
N74YKL		130.1	-0.6	-0.06	150.3	-0.2	-0.03	HM
N7NF3A	X	167.8	37.1	3.90	179.4	28.9	3.87	TT
NJUVMK		135.1	4.4	0.46	149.4	-1.1	-0.15	TS
P3NRY8		121.4	-9.3	-0.98	139.3	-11.2	-1.51	LA
P8UKT4		129.5	-1.2	-0.13	142.0	-8.5	-1.14	LA
PHXFAM		148.8	18.1	1.90	162.3	11.8	1.58	XX
QHXTGF		130.1	-0.7	-0.07	155.1	4.6	0.62	PP
QX7T6Q		144.7	14.0	1.48	153.9	3.4	0.46	GA

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

WebCode	Data Flag	Sample GL21 Lab Mean	Sample GL21 Diff from Grand Mean	Sample GL21 CPV	Sample GL22 Lab Mean	Sample GL22 Diff from Grand Mean	Sample GL22 CPV	Instr Code
RVXB6L		134.9	4.2	0.44	153.0	2.5	0.33	SH
RYX6G6		124.9	-5.8	-0.61	155.1	4.6	0.61	HM
TAEBTY	X	106.9	-23.8	-2.51	120.7	-29.8	-4.00	TS
U2VNVE		125.0	-5.7	-0.60	144.8	-5.7	-0.77	TT
UP4T4E		135.1	4.4	0.46	145.5	-5.0	-0.68	PP
VCTP8J		123.6	-7.1	-0.75	145.7	-4.8	-0.64	PP
VG6NNH		122.8	-7.9	-0.83	146.6	-3.9	-0.52	HM
VPE6BH		137.4	6.7	0.70	148.5	-2.0	-0.27	SH
VTVNXX	*	156.9	26.2	2.76	168.5	18.0	2.41	TT
VUQ8ZY		121.9	-8.8	-0.93	136.4	-14.1	-1.89	XX
VXBYB2		122.9	-7.8	-0.82	147.8	-2.7	-0.36	TT
WNLJ4D		125.9	-4.8	-0.51	143.9	-6.6	-0.89	HM
XCM89B		126.7	-4.0	-0.42	144.2	-6.3	-0.85	TS
XT6DAA		142.8	12.1	1.27	163.0	12.5	1.67	GL
YEK6W9	X	226.1	95.4	10.04	225.3	74.8	10.02	LW
YF23N9		136.0	5.3	0.56	150.3	-0.2	-0.03	PP
YFGNXA		119.7	-11.0	-1.16	145.1	-5.4	-0.72	PP
YQY8AU		123.8	-6.9	-0.73	147.9	-2.6	-0.35	PP
Z87LCA		130.5	-0.2	-0.02	156.6	6.1	0.82	XX
ZJVHE8		147.8	17.1	1.80	156.9	6.4	0.86	LA
ZP4N9R		122.2	-8.6	-0.90	141.2	-9.3	-1.25	PP

Summary Statistics

	Sample GL21	Sample GL22
Grand Means	130.71 Sheffield	150.51 Sheffield
SD Btwn Labs	9.50 Sheffield	7.46 Sheffield

Statistics based on 60 of 64 reporting participants

Comments on assigned Data Flags for Test #378

4CKD77 (X) - Inconsistent in testing between samples.

N7NF3A (X) - Data for both samples are high.

TAEBTY (X) - Data for Sample GL22 are low.

YEK6W9 (X) - Extreme data.

H9DU9X - One determination removed from the Lab Mean of Sample GL21 per Grubb's Test at 1% risk (TAPPI 1205).

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

Instrument Code List as Reported by the Labs

(GA) - Gurley Precision #4340 Automatic Densometer

(GL) - Giddings and Lewis Sheffield

(HM) - Technidyne - Hagerty Model #538

(LA) - L & W Roughness Sheffield - Autoline

(LW) - L & W Roughness Tester

(MP) - Metso Paperlab

(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

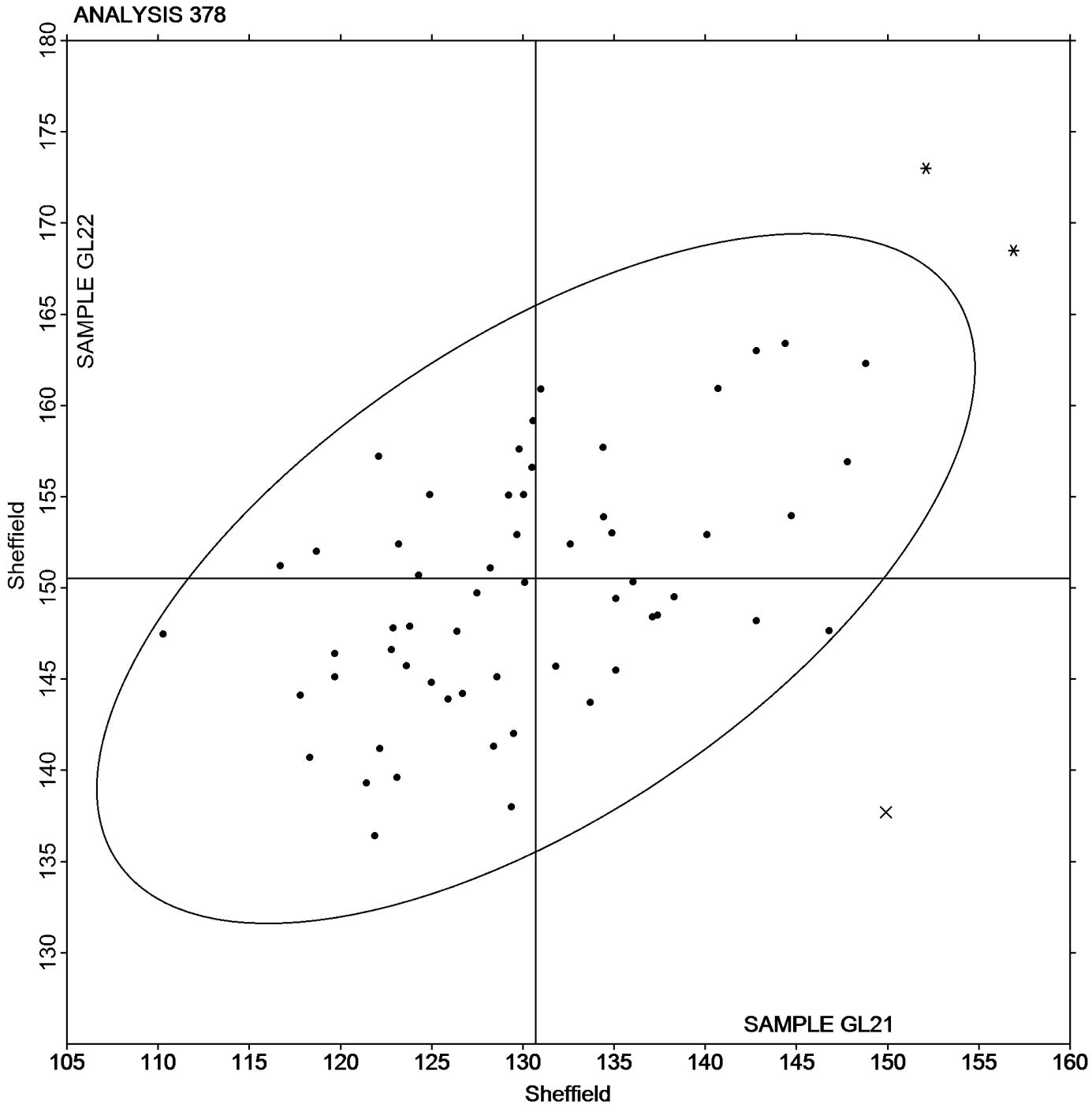
Paper & Paperboard Interlaboratory Testing Program

Analysis 378

Roughness - Sheffield Type

Grand Mean Sample **GL21** = 130.71 Sheffield

Grand Mean Sample **GL22** = 150.51 Sheffield



Paper & Paperboard Interlaboratory Testing Program
Analysis 382
Moisture in Paper

WebCode	Data Flag	Sample GM21 Lab Mean	Sample GM21 Diff from Grand Mean	Sample GM21 CPV	Sample GM22 Lab Mean	Sample GM22 Diff from Grand Mean	Sample GM22 CPV
4DFV88		4.002	-0.651	-1.59	3.944	-0.860	-2.02
6HM2ZJ	X	95.440	90.787	222.08	95.238	90.434	212.68
8JWNV3		4.160	-0.493	-1.21	4.660	-0.144	-0.34
AL8K7W		4.619	-0.034	-0.08	4.775	-0.029	-0.07
BZM63V		4.450	-0.203	-0.50	4.585	-0.219	-0.52
JEVNGF		4.740	0.087	0.21	4.860	0.056	0.13
KMKVCP		4.730	0.077	0.19	4.780	-0.024	-0.06
N6Y3KR		4.548	-0.105	-0.26	4.811	0.006	0.01
Q73LDK		4.796	0.144	0.35	4.896	0.091	0.21
VTVNXX		5.410	0.757	1.85	5.660	0.856	2.01
YLPURV		5.073	0.420	1.03	5.075	0.270	0.64

Summary Statistics

	Sample GM21	Sample GM22
Grand Means	4.6528 Percent	4.8045 Percent
SD Btwn Labs	0.4088 Percent	0.4252 Percent

Statistics based on 10 of 11 reporting participants

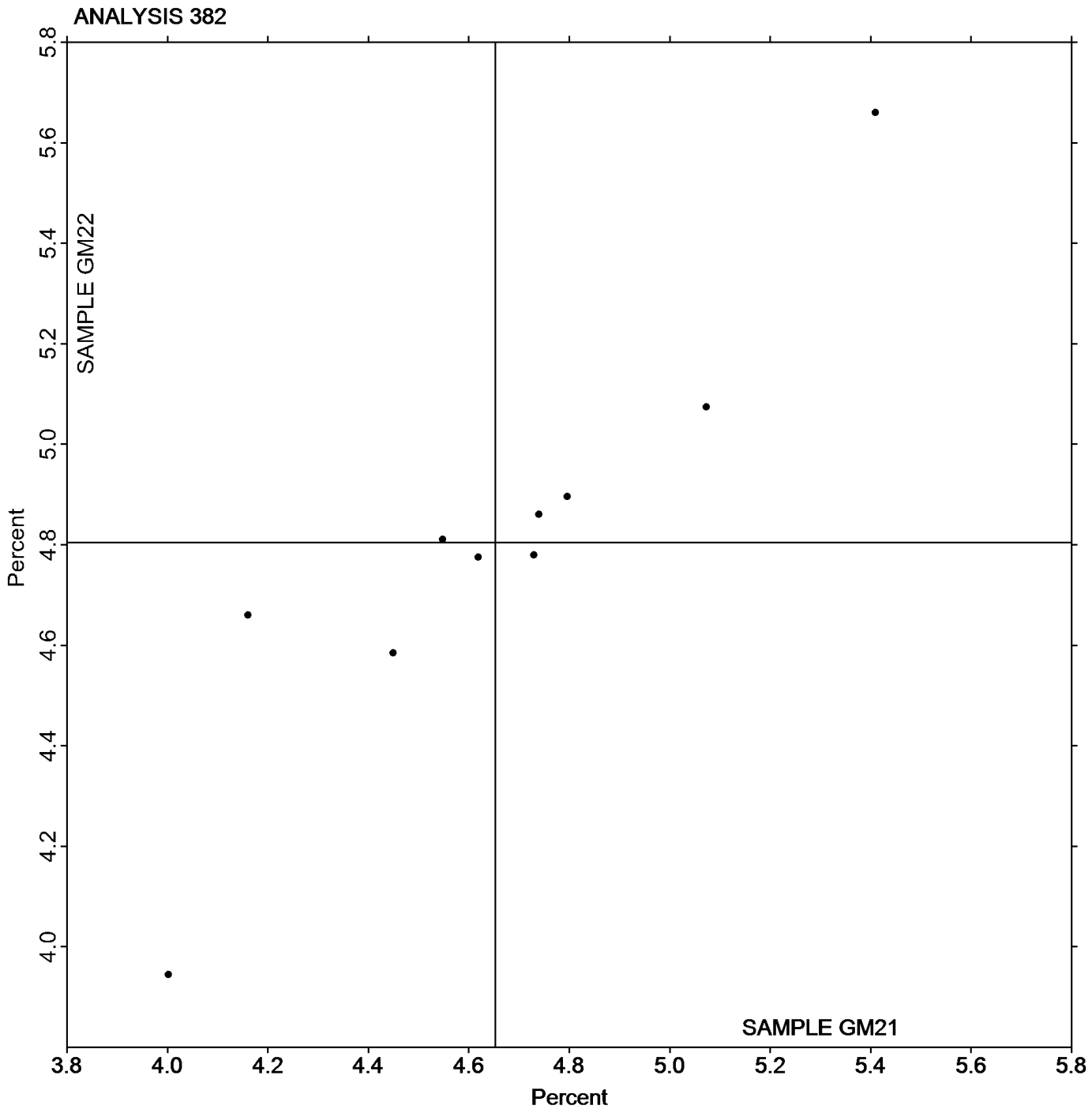
Comments on assigned Data Flags for Test #382

6HM2ZJ (X) - Extreme data.

Paper & Paperboard Interlaboratory Testing Program
Analysis 382
Moisture in Paper

Grand Mean Sample **GM21** = 4.6528 Percent

Grand Mean Sample **GM22** = 4.8045 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 384
Opacity (89% Reflectance Backing) - Fine Papers

WebCode	Data Flag	Sample GN21 Lab Mean	Sample GN21 Diff from Grand Mean	Sample GN21 CPV	Sample GN22 Lab Mean	Sample GN22 Diff from Grand Mean	Sample GN22 CPV
2F99WT		93.05	0.10	0.24	87.16	0.37	0.63
2TZYEC		92.90	-0.05	-0.14	86.50	-0.29	-0.49
3D7KZ4		92.76	-0.20	-0.50	86.32	-0.47	-0.81
72WCM2		93.18	0.23	0.57	86.81	0.02	0.03
79CYEH		93.19	0.24	0.60	87.29	0.50	0.86
7N6UPN		92.70	-0.25	-0.64	86.73	-0.06	-0.10
8JWNV3		92.88	-0.07	-0.18	87.06	0.27	0.46
8MNXXN		92.01	-0.94	-2.37	85.60	-1.20	-2.05
9YJLA4		93.02	0.07	0.17	86.96	0.17	0.29
BCC4UX		93.12	0.17	0.42	86.50	-0.29	-0.50
DK32XC		93.32	0.37	0.92	87.18	0.39	0.66
E67AQF		93.29	0.34	0.84	86.54	-0.25	-0.43
EA3X63		93.03	0.08	0.20	87.68	0.89	1.53
F6MZXR		92.35	-0.60	-1.52	86.20	-0.59	-1.01
FVGTJR		93.28	0.33	0.82	86.93	0.14	0.24
H9DU9X		92.96	0.00	0.01	87.06	0.27	0.46
HQT6TB		92.78	-0.17	-0.43	87.20	0.41	0.70
L2228P		92.98	0.03	0.07	86.51	-0.28	-0.48
LT82M7		93.43	0.48	1.20	87.26	0.47	0.80
N6Y3KR		93.05	0.09	0.24	87.45	0.66	1.13
NJUVMK		93.38	0.43	1.07	87.04	0.25	0.43
P8E2A7	X	93.75	0.80	2.01	88.99	2.20	3.77
QHXTGF		92.89	-0.06	-0.16	86.10	-0.69	-1.19
R3XFD6		92.95	0.00	-0.01	86.72	-0.07	-0.12
RVXB6L		93.37	0.42	1.06	87.09	0.30	0.51
U2VNVE	X	93.29	0.34	0.85	89.24	2.45	4.20
UFWZQD		92.97	0.02	0.04	86.79	0.00	0.00
UP4T4E		93.14	0.19	0.47	86.76	-0.03	-0.05
VG6NNH		93.01	0.06	0.14	86.65	-0.14	-0.24
VPE6BH		93.36	0.41	1.02	87.27	0.48	0.82
VUQ8ZY	*	92.48	-0.47	-1.19	85.26	-1.53	-2.63
WNLJ4D		92.79	-0.16	-0.41	86.71	-0.08	-0.14
XCM89B	*	92.00	-0.95	-2.40	86.27	-0.52	-0.89
XDDF9E		92.62	-0.33	-0.84	86.38	-0.41	-0.71
XLB9HT		93.05	0.10	0.24	87.64	0.85	1.46
XT6DAA	*	93.97	1.02	2.56	88.28	1.49	2.56
YF23N9		92.60	-0.35	-0.89	86.31	-0.49	-0.83
YQY8AU		93.17	0.22	0.55	87.07	0.28	0.48
Z87LCA		92.24	-0.71	-1.79	85.99	-0.80	-1.37

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

Summary Statistics

	Sample GN21	Sample GN22
Grand Means	92.953 Percent	86.791 Percent
SD Btwn Labs	0.398 Percent	0.583 Percent

Statistics based on 37 of 39 reporting participants

P8E2A7 (X) - Data for Sample GN22 are high.

U2VNVE (X) - Data for Sample GN22 are high.

Analysis Notes:

DK32XC - One determination removed from the Lab Mean of Sample GN22 per Grubb's Test at 1% risk (TAPPI 1205).

E67AQF - One determination removed from the Lab Mean of Sample GN21 per Grubb's Test at 1% risk (TAPPI 1205).

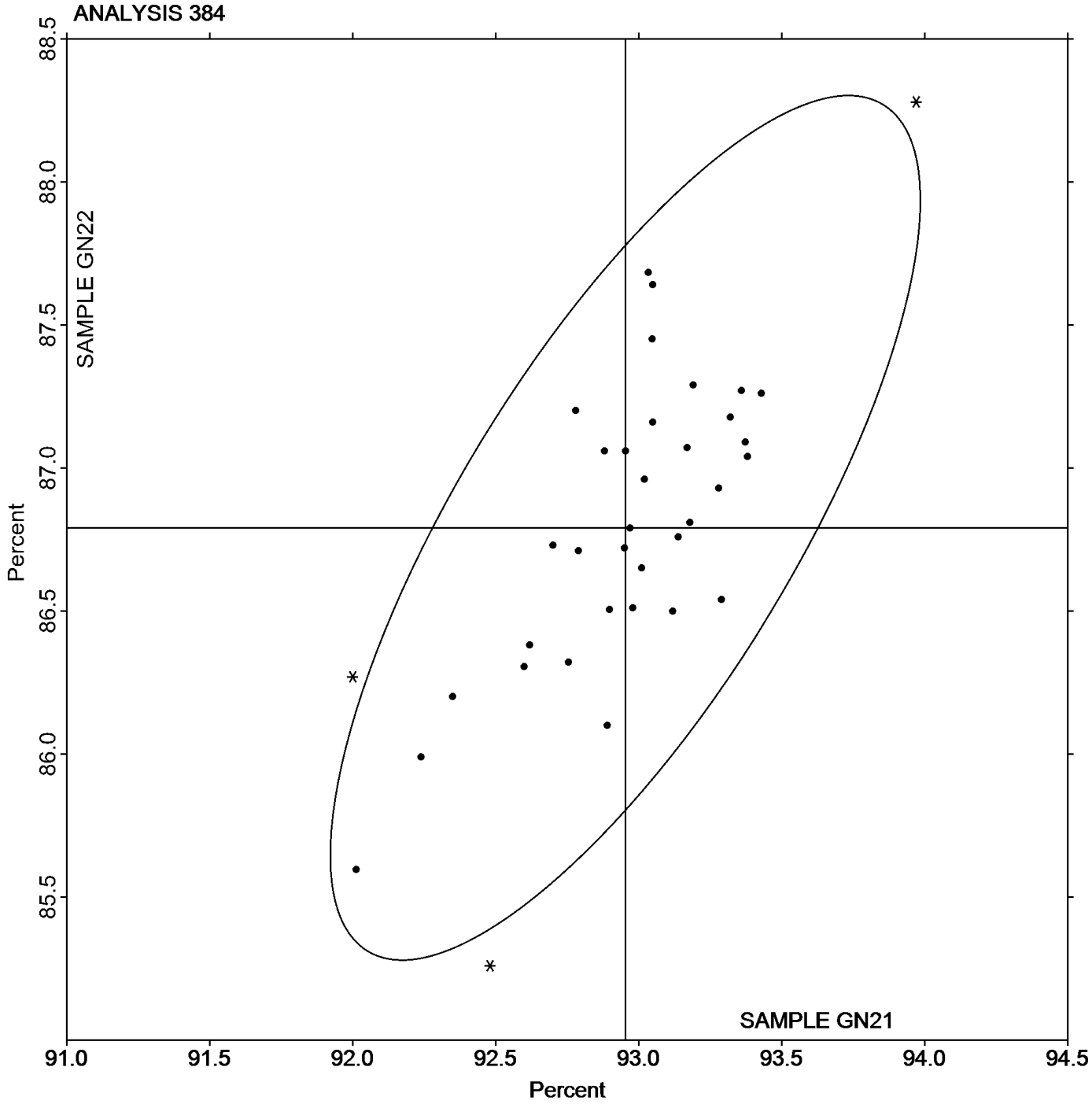
Paper & Paperboard Interlaboratory Testing Program

Analysis 384

Opacity (89% Reflectance Backing) - Fine Papers

Grand Mean Sample **GN21** = 92.953 Percent

Grand Mean Sample **GN22** = 86.791 Percent



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

WebCode	Data Flag	Sample GP21 Lab Mean	Sample GP21 Diff from Grand Mean	Sample GP21 CPV	Sample GP22 Lab Mean	Sample GP22 Diff from Grand Mean	Sample GP22 CPV
2A4JZ8		93.57	-0.10	-1.14	89.18	0.10	0.59
3D7KZ4		93.85	0.18	2.07	89.05	-0.03	-0.20
4DFV88		93.68	0.01	0.11	88.99	-0.09	-0.58
4TTHF4		93.54	-0.13	-1.48	89.15	0.07	0.42
83MWTX		93.69	0.02	0.29	89.42	0.34	2.07
CFVACT		93.66	-0.01	-0.08	88.99	-0.09	-0.57
JBVDKF		93.61	-0.06	-0.65	88.93	-0.15	-0.95
KQ6NNT		93.71	0.04	0.49	89.17	0.08	0.52
LLA8XK		93.56	-0.11	-1.24	89.27	0.19	1.16
Q73LDK	X	95.87	2.20	25.75	93.85	4.77	29.33
RJ4UFK		93.77	0.10	1.20	88.87	-0.22	-1.35
UP4T4E		93.72	0.05	0.61	88.85	-0.24	-1.46
XEQ3RE		93.68	0.02	0.18	89.12	0.04	0.22
YEK6W9		93.71	0.04	0.52	89.21	0.12	0.76
Z87LCA		93.59	-0.08	-0.89	88.98	-0.10	-0.63

Summary Statistics

	Sample GP21	Sample GP22
Grand Means	93.667 Percent	89.085 Percent
SD Btwn Labs	0.086 Percent	0.163 Percent

Statistics based on 14 of 15 reporting participants

Comments on assigned Data Flags for Test #386

Q73LDK (X) - Extreme data.

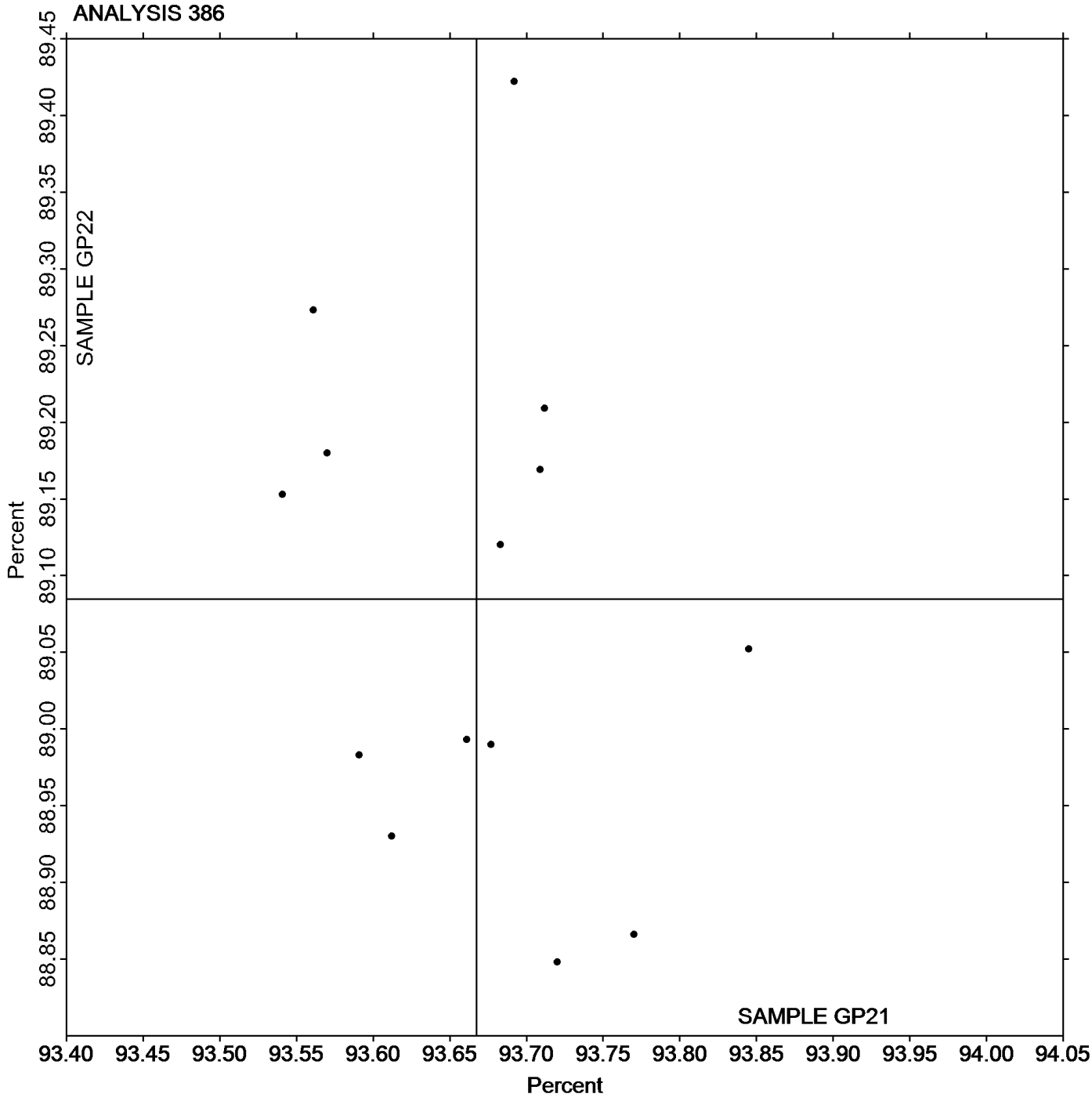
Paper & Paperboard Interlaboratory Testing Program

Analysis 386

Opacity (Paper Backing) - Fine Papers and Newsprint

Grand Mean Sample **GP21** = 93.667 Percent

Grand Mean Sample **GP22** = 89.085 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

WebCode	Data Flag	Sample GR21 Lab Mean	Sample GR21 Diff from Grand Mean	Sample GR21 CPV	Sample GR22 Lab Mean	Sample GR22 Diff from Grand Mean	Sample GR22 CPV	Instr Code
2F99WT		83.29	-1.56	-1.15	85.05	-0.48	-0.47	TT
2JAE9E		85.13	0.27	0.20	85.64	0.10	0.10	TT
3D7KZ4		83.52	-1.34	-0.99	85.68	0.15	0.14	TS
3HDB4A		85.73	0.87	0.65	86.23	0.69	0.68	HG
6QWBNC		84.89	0.04	0.03	86.34	0.80	0.79	HD
72WCM2		83.19	-1.66	-1.23	84.59	-0.95	-0.92	TT
8MNXXN		85.43	0.58	0.43	84.76	-0.78	-0.76	TS
BCC4UX	*	88.41	3.56	2.63	88.84	3.30	3.23	PE
BZM63V		84.34	-0.51	-0.38	84.90	-0.63	-0.62	XX
CEJJZ4		84.80	-0.05	-0.04	86.76	1.23	1.20	HD
D6NZYZ		83.77	-1.08	-0.80	85.00	-0.53	-0.52	TS
DK32XC		85.78	0.92	0.68	85.46	-0.07	-0.07	XX
EA3X63		85.10	0.25	0.18	86.56	1.03	1.01	TS
FVGTJR		85.04	0.19	0.14	84.80	-0.73	-0.72	TS
HQT6TB		83.88	-0.98	-0.72	85.30	-0.23	-0.23	XX
JEVNGF		87.01	2.16	1.60	86.18	0.64	0.63	TS
L2228P		83.31	-1.54	-1.14	83.71	-1.83	-1.79	TS
NJUVMK		84.00	-0.85	-0.63	85.56	0.03	0.03	TS
R3XFD6		83.74	-1.11	-0.82	85.31	-0.22	-0.22	TT
U2VNVE		86.45	1.60	1.18	86.00	0.47	0.46	TT
UFWZQD		84.59	-0.27	-0.20	85.05	-0.49	-0.48	MK
UP4T4E		83.63	-1.22	-0.90	85.15	-0.38	-0.37	TS
VCTP8J		83.17	-1.68	-1.24	85.32	-0.22	-0.21	TS
VG6NNH		85.49	0.64	0.47	85.97	0.43	0.42	GM
VUQ8ZY		86.49	1.64	1.21	87.08	1.54	1.51	XX
VXBYB2		84.86	0.01	0.01	84.13	-1.41	-1.38	TT
WNLJ4D		84.49	-0.36	-0.27	84.68	-0.86	-0.84	XS
XLB9HT		87.65	2.80	2.07	86.70	1.17	1.14	TS
YQY8AU		84.93	0.07	0.05	84.63	-0.91	-0.89	XX
Z87LCA		83.47	-1.38	-1.02	84.66	-0.88	-0.86	TT

Summary Statistics

	Sample GR21	Sample GR22
Grand Means	84.851 Percent	85.533 Percent
SD Btwn Labs	1.354 Percent	1.023 Percent

Statistics based on 30 of 30 reporting participants

Paper & Paperboard Interlaboratory Testing Program
Analysis 390
Directional Brightness

Instrument Code List as Reported by the Labs

(GM) - Gretag Macbeth Color i5

(HG) - Hunter Labscan / XE

(PE) - Photovolt 577

(TT) - Technidyne Brightimeter Micro S4-M

(XX) - Instrument make/model not specified by lab

(HD) - Hunter D25DP - 9000

(MK) - Macbeth Color-Eye 7000 Spectrophotometer

(TS) - Technidyne Brightimeter Micro S-5

(XS) - X-Rite 938 Spectrodensitometer

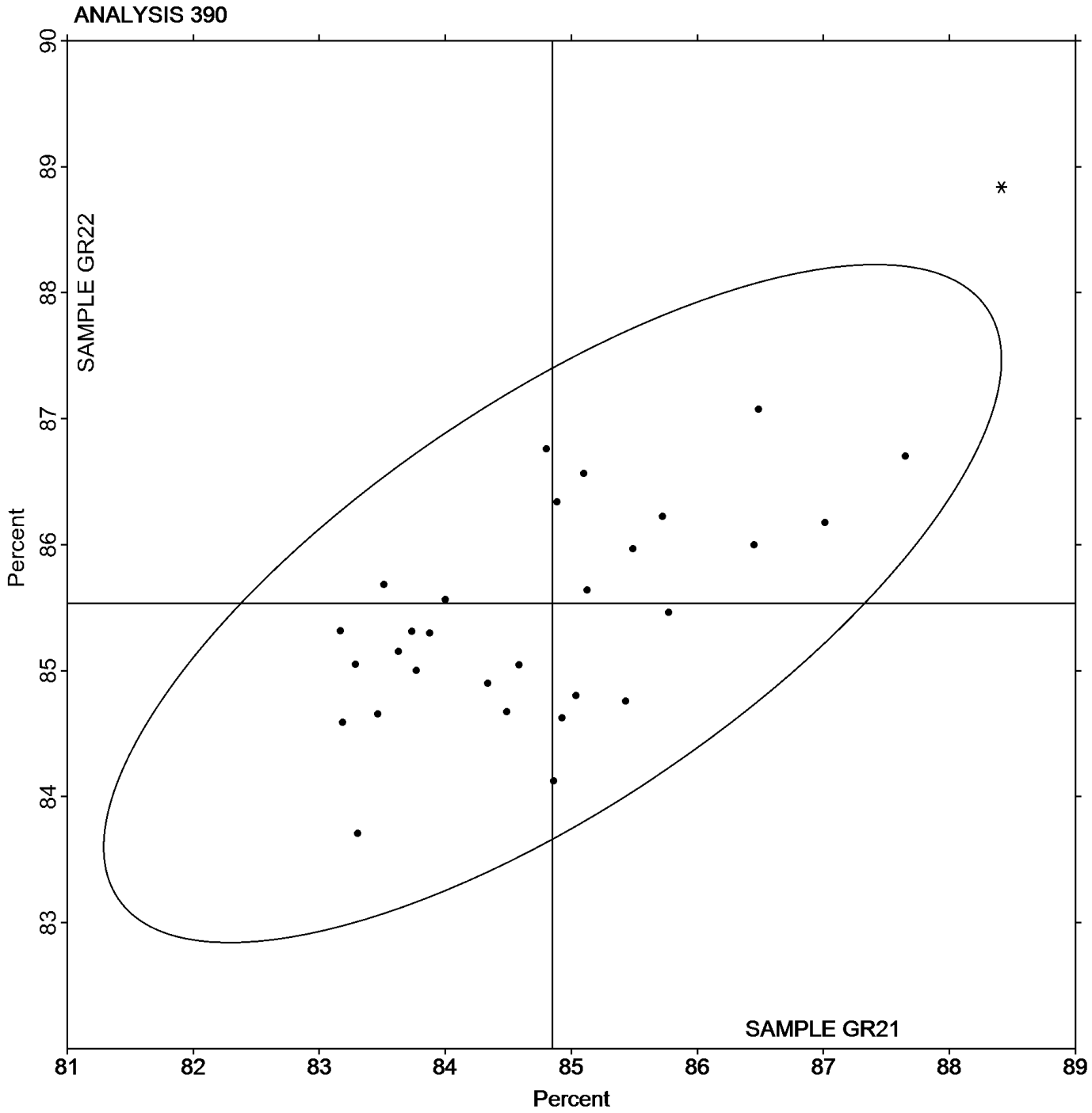
Paper & Paperboard Interlaboratory Testing Program

Analysis 390

Directional Brightness

Grand Mean Sample **GR21** = 84.851 Percent

Grand Mean Sample **GR22** = 85.533 Percent



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

WebCode	Data Flag	Sample GZ21 Lab Mean	Sample GZ21 Diff from Grand Mean	Sample GZ21 CPV	Sample GZ22 Lab Mean	Sample GZ22 Diff from Grand Mean	Sample GZ22 CPV	Instr Code
2F99WT		93.88	-0.03	-0.04	90.24	0.13	0.34	TT
79CYEH		94.20	0.29	0.41	90.18	0.07	0.18	TT
7N6UPN		92.44	-1.46	-2.06	89.15	-0.96	-2.52	HT
9YJLA4		93.88	-0.03	-0.04	90.10	-0.01	-0.03	PP
DK32XC		95.18	1.27	1.78	90.70	0.59	1.55	XX
F6MZXR		94.18	0.27	0.38	90.12	0.01	0.03	TT
H9DU9X		94.14	0.23	0.32	90.27	0.16	0.42	TS
LT82M7		94.76	0.85	1.20	90.60	0.49	1.28	TT
N6Y3KR		93.48	-0.43	-0.60	89.71	-0.40	-1.05	TS
NJUVMK		93.67	-0.24	-0.34	89.75	-0.36	-0.95	TS
P3NRY8		93.64	-0.27	-0.38	90.12	0.01	0.03	TT
UMXB7J		94.06	0.15	0.21	90.38	0.27	0.72	TS
VG6NNH		92.45	-1.46	-2.05	90.01	-0.10	-0.25	GM
VPE6BH	X	95.08	1.17	1.65	93.79	3.68	9.65	HT
VTVNXX	X	97.00	3.09	4.34	93.61	3.50	9.16	EF
XCM89B		94.08	0.17	0.24	89.88	-0.23	-0.60	TS
Y79YCY		93.96	0.06	0.08	90.54	0.43	1.13	TS
YF23N9		94.54	0.63	0.89	90.01	-0.10	-0.27	TS

Summary Statistics

	Sample GZ21	Sample GZ22
Grand Means	93.908 Percent	90.110 Percent
SD Btwn Labs	0.711 Percent	0.382 Percent

Statistics based on 16 of 18 reporting participants

VPE6BH (X) - Extreme data for Sample GZ22.

VTVNXX (X) - Extreme data.

Analysis Notes:

DK32XC - One determination removed from the Lab Mean of Sample GZ21 per Grubb's Test at 1% risk (TAPPI 1205).

Instrument Code List as Reported by the Labs

(EF) - L & W Datacolor Elrepho

(GM) - Gretag Macbeth Color i5

(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

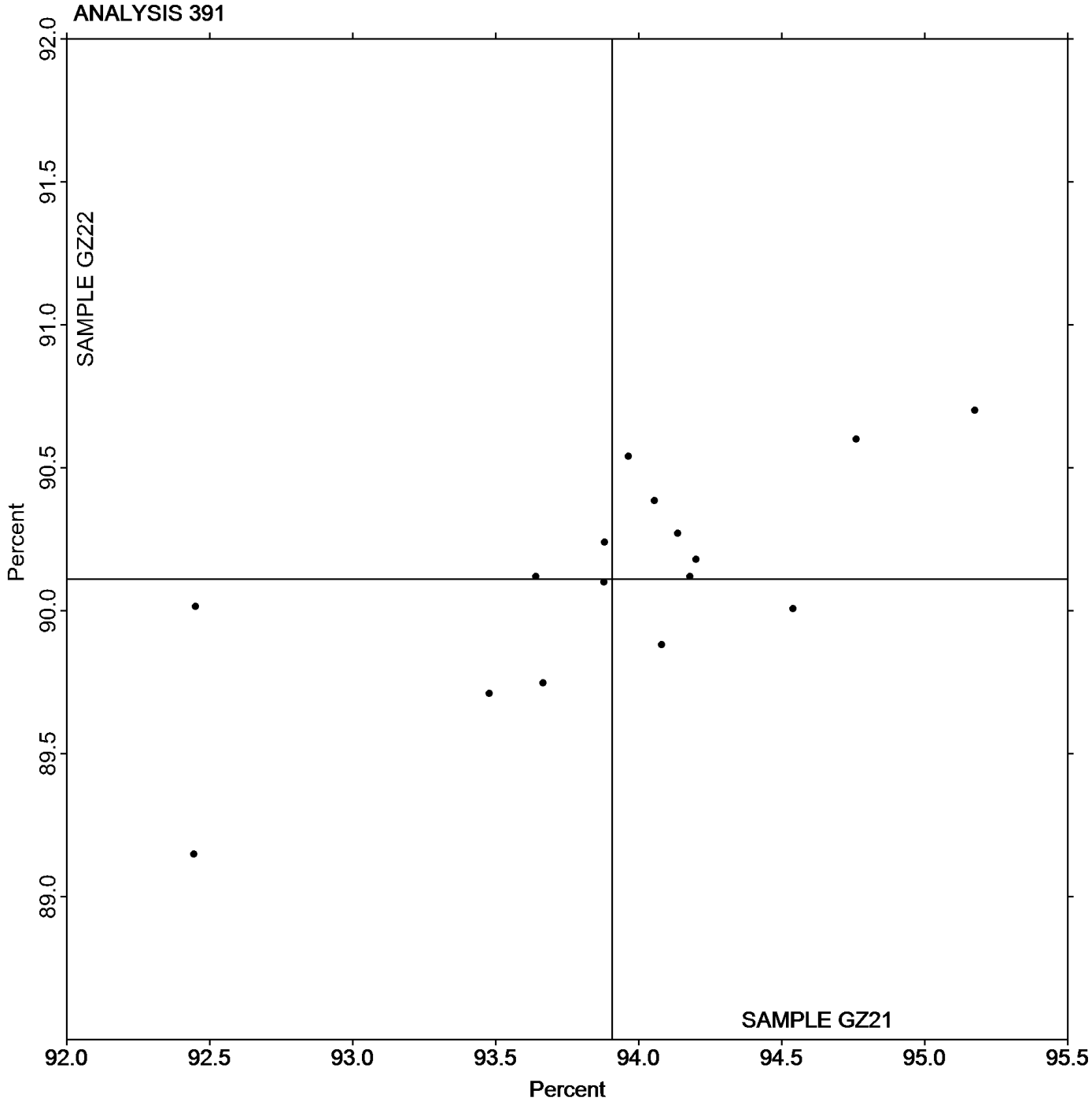
Paper & Paperboard Interlaboratory Testing Program

Analysis 391

Directional Brightness of Fluorescent Samples

Grand Mean Sample **GZ21** = 93.908 Percent

Grand Mean Sample **GZ22** = 90.110 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

WebCode	Data Flag	Sample GR21 Lab Mean	Sample GR21 Diff from Grand Mean	Sample GR21 CPV	Sample GR22 Lab Mean	Sample GR22 Diff from Grand Mean	Sample GR22 CPV	Instr Code
2BY339		84.36	0.55	2.27	84.88	0.57	2.51	LA
2F99WT		83.82	0.01	0.06	84.24	-0.08	-0.34	TC
2JAE9E	X	85.25	1.44	5.93	85.56	1.25	5.51	TL
3D7KZ4		83.91	0.11	0.43	84.39	0.08	0.34	TM
4DFV88		83.68	-0.13	-0.54	84.26	-0.05	-0.23	LS
67TTDA		83.55	-0.26	-1.06	84.12	-0.19	-0.83	TC
6X2A2M		83.83	0.02	0.09	84.42	0.11	0.48	TC
83MWTX		83.46	-0.35	-1.45	84.18	-0.13	-0.58	TC
BZM63V		83.70	-0.11	-0.44	84.21	-0.10	-0.44	EE
CFVACT		83.66	-0.15	-0.62	84.31	0.00	0.00	TC
EA3X63		83.77	-0.04	-0.17	84.31	0.00	0.00	TC
EJ67UZ		84.08	0.27	1.11	84.52	0.20	0.89	TC
EY2MJY		83.86	0.05	0.22	84.28	-0.04	-0.16	TC
G2YPFD		83.76	-0.05	-0.20	84.06	-0.25	-1.10	TC
GKCACG		83.41	-0.39	-1.62	84.07	-0.24	-1.05	TC
HUV2KQ		84.18	0.37	1.51	84.60	0.29	1.27	EF
KQ6NNT		83.66	-0.15	-0.62	84.16	-0.15	-0.68	TM
LDF4KB		83.79	-0.02	-0.06	84.21	-0.10	-0.46	TC
LLA8XK	X	83.45	-0.35	-1.45	83.49	-0.83	-3.64	TC
PNZLPQ	*	83.59	-0.22	-0.91	83.86	-0.45	-2.00	TC
Q73LDK		83.30	-0.51	-2.09	83.91	-0.40	-1.77	EG
RREW2K		83.89	0.08	0.35	84.36	0.04	0.19	TC
RVXB6L		83.80	-0.01	-0.05	84.23	-0.08	-0.37	TC
UP4T4E		84.17	0.36	1.47	84.58	0.27	1.19	TC
URQGFE		83.72	-0.09	-0.36	84.21	-0.10	-0.46	TC
VTVNXX		84.03	0.22	0.89	84.60	0.29	1.27	LA
VXBYB2		84.01	0.20	0.84	84.56	0.25	1.10	EG
YEK6W9		84.02	0.21	0.86	84.49	0.18	0.77	TC
Z87LCA	X	84.62	0.81	3.34	85.35	1.03	4.55	TM
ZP4N9R		83.83	0.02	0.09	84.41	0.10	0.45	PP

Summary Statistics

	Sample GR21	Sample GR22
Grand Means	83.808 Percent	84.312 Percent
SD Btwn Labs	0.243 Percent	0.227 Percent

Statistics based on 27 of 30 reporting participants

Paper & Paperboard Interlaboratory Testing Program
Analysis 392
Diffuse Brightness

Comments on assigned Data Flags for Test #392

2JAE9E (X) - Systematic error (data for both samples are low).

LLA8XK (X) - Inconsistent in testing between samples, data for Sample GR22 are low.

Z87LCA (X) - Systematic error (data for both samples are high). Inconsistent within the determinations for Sample GR21.

3D7KZ4 - One determination removed from the Lab Mean of Sample GR21 per Grubb's Test at 1% risk (TAPPI 1205).

Instrument Code List as Reported by the Labs

(EE) - Datacolor Elrepho 2000

(EF) - Datacolor Elrepho 3000

(EG) - Datacolor Elrepho 450X

(LA) - L & W Elrepho - Autoline

(LS) - L & W Elrepho SE 070

(PP) - Technidyne Profile/Plus

(TC) - Technidyne Color Touch Series

(TL) - Technidyne Technibrite TB-1

(TM) - Technidyne Technibrite Micro TB-1C

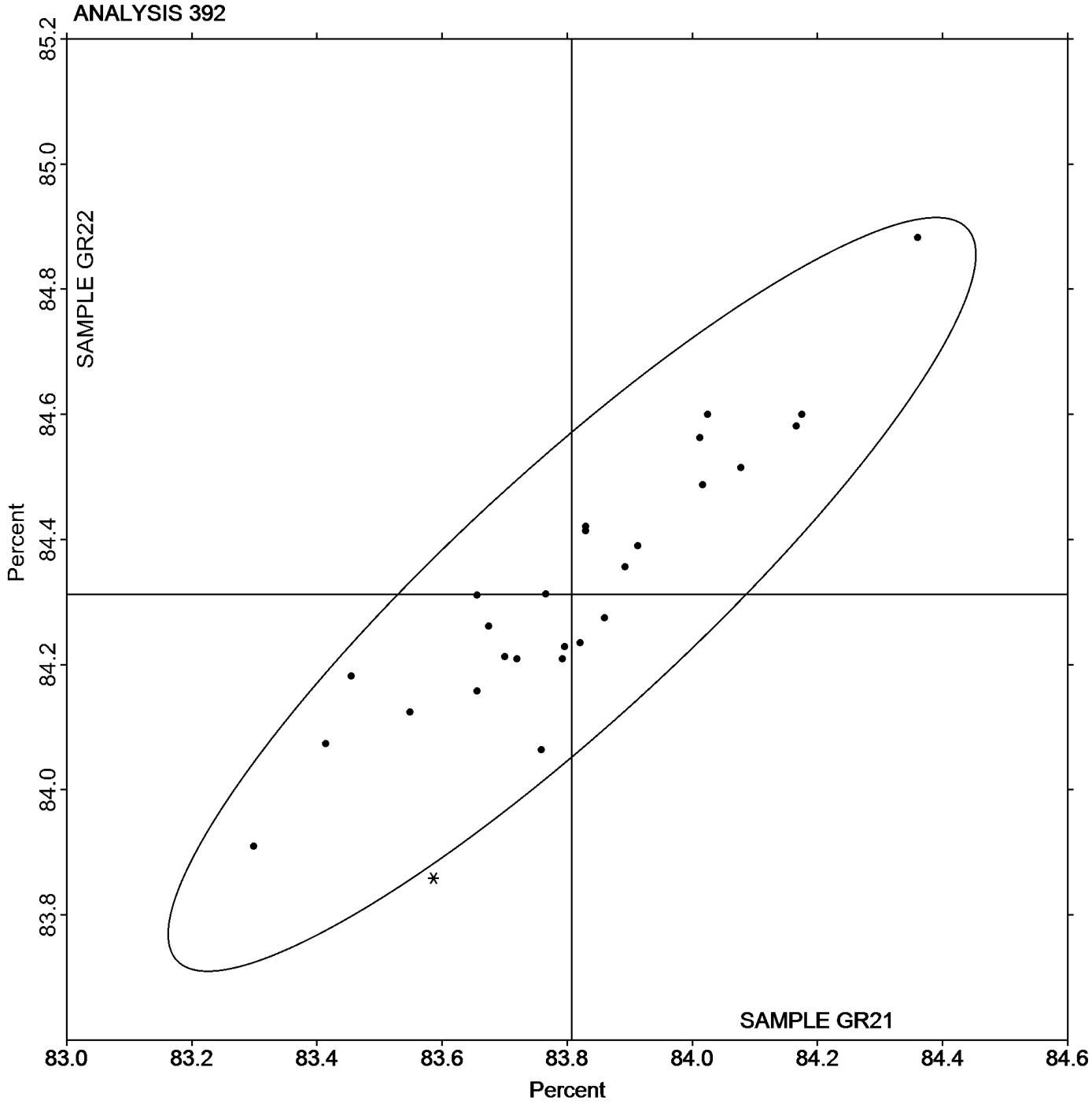
Paper & Paperboard Interlaboratory Testing Program

Analysis 392

Diffuse Brightness

Grand Mean Sample **GR21** = 83.808 Percent

Grand Mean Sample **GR22** = 84.312 Percent



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

WebCode	Data Flag	Sample GZ21 Lab Mean	Sample GZ21 Diff from Grand Mean	Sample GZ21 CPV	Sample GZ22 Lab Mean	Sample GZ22 Diff from Grand Mean	Sample GZ22 CPV	Instr Code
2F99WT		6.380	-0.074	-0.16	7.720	0.355	0.56	TT
79CYEH		6.400	-0.054	-0.12	7.220	-0.145	-0.23	TT
7N6UPN		6.688	0.234	0.52	7.158	-0.207	-0.33	HT
9YJLA4		6.192	-0.262	-0.59	7.126	-0.239	-0.38	PP
DK32XC		6.016	-0.438	-0.98	6.752	-0.613	-0.97	XX
F6MZXR		6.340	-0.114	-0.25	7.140	-0.225	-0.35	TT
H9DU9X		6.460	0.006	0.01	7.622	0.257	0.41	TS
N6Y3KR		6.134	-0.320	-0.72	7.058	-0.307	-0.48	TS
NJUVMK		5.922	-0.532	-1.19	6.806	-0.559	-0.88	TS
P3NRY8		6.560	0.106	0.24	7.340	-0.025	-0.04	TT
UMXB7J		6.074	-0.380	-0.85	7.078	-0.287	-0.45	TS
VG6NNH		7.376	0.922	2.07	8.284	0.919	1.45	GM
VPE6BH	X	0.316	-6.138	-13.74	0.402	-6.963	-10.98	HT
VTVNXX	X	9.210	2.756	6.17	10.580	3.215	5.07	EF
Y79YCY		7.384	0.930	2.08	9.038	1.673	2.64	TS
YF23N9		6.424	-0.030	-0.07	6.768	-0.597	-0.94	TS

Summary Statistics

	Sample GZ21	Sample GZ22
Grand Means	6.4536 Percent	7.3650 Percent
SD Btwn Labs	0.4467 Percent	0.6342 Percent

Statistics based on 14 of 16 reporting participants

Comments on assigned Data Flags for Test #394

VPE6BH (X) - Extreme data.

VTVNXX (X) - Extreme data.

Instrument Code List as Reported by the Labs

(EF) - Datacolor Elrepho 3000

(GM) - Gretag Macbeth Color i5

(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

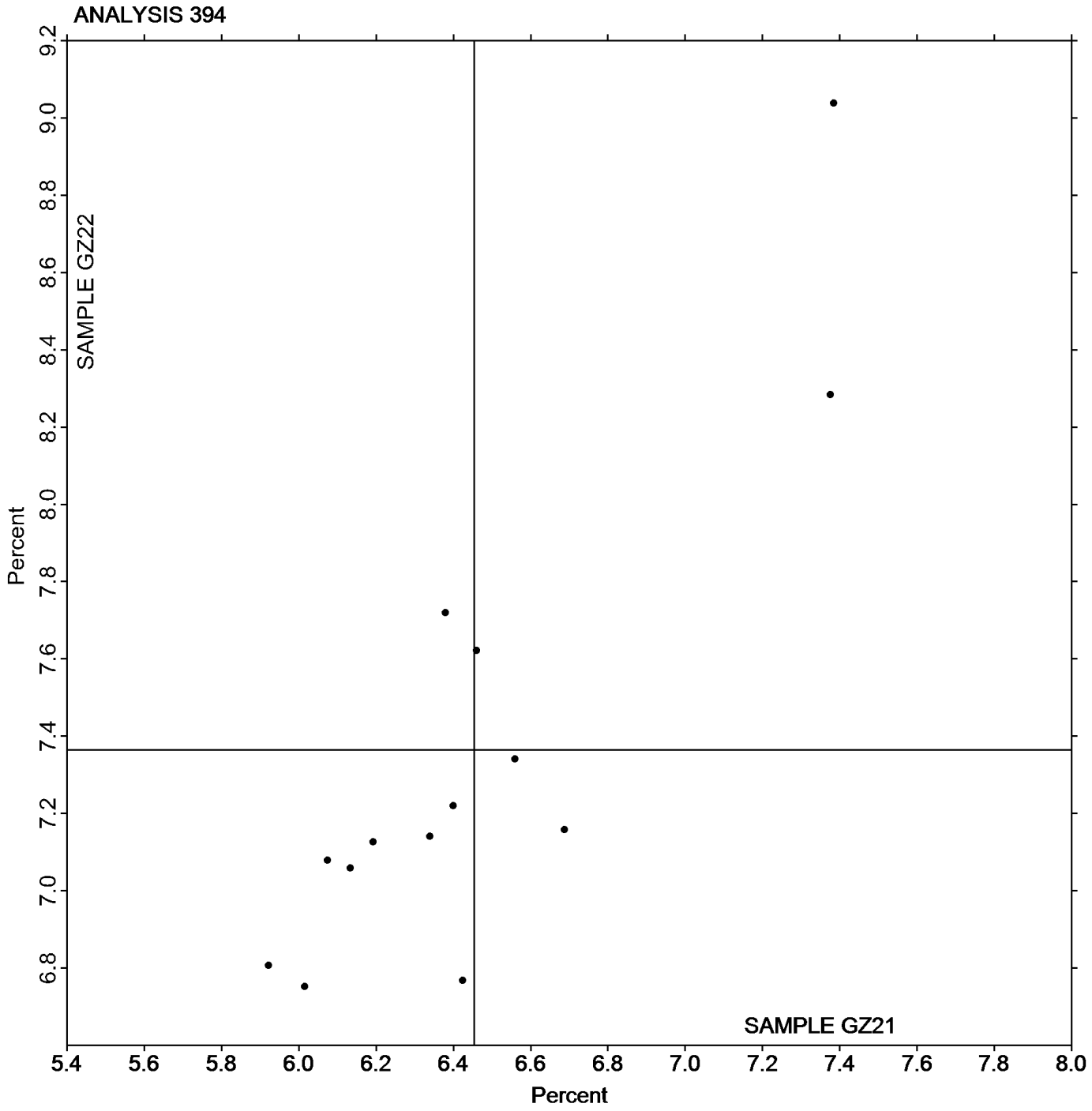
Paper & Paperboard Interlaboratory Testing Program

Analysis 394

Fluorescent Component of Directional Brightness

Grand Mean Sample **GZ21** = 6.4536 Percent

Grand Mean Sample **GZ22** = 7.3650 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

WebCode	Data Flag	Sample GT21 Lab Mean	Sample GT21 Diff from Grand Mean	Sample GT21 CPV	Sample GT22 Lab Mean	Sample GT22 Diff from Grand Mean	Sample GT22 CPV	Instr Code
2JAE9E		74.50	-1.16	-0.33	73.00	-1.49	-0.57	GS
3D7KZ4		74.01	-1.65	-0.47	73.85	-0.64	-0.24	TH
6QWBNC		75.76	0.10	0.03	73.90	-0.59	-0.23	TH
79CYEH		77.19	1.53	0.43	75.49	1.00	0.39	XX
7RR483		76.26	0.60	0.17	75.15	0.66	0.26	TH
9GK923		74.03	-1.63	-0.46	71.89	-2.60	-1.00	GM
9YJLA4		76.29	0.63	0.18	75.28	0.79	0.31	PP
CEJJZ4		78.11	2.45	0.69	75.68	1.19	0.46	TH
GKCACG		74.21	-1.45	-0.41	72.81	-1.68	-0.64	ZH
P3NRY8	*	86.20	10.54	2.97	79.10	4.61	1.78	LA
Q73LDK		75.97	0.31	0.09	75.09	0.60	0.23	TH
R3XFD6		75.15	-0.51	-0.14	76.52	2.03	0.78	TH
UFWZQD		75.03	-0.63	-0.18	75.39	0.90	0.35	PP
VXBYB2		71.70	-3.96	-1.12	74.81	0.32	0.12	GM
Z87LCA		76.93	1.27	0.36	76.66	2.18	0.84	TG
ZJVHE8	*	69.23	-6.43	-1.81	67.15	-7.34	-2.82	LA

Summary Statistics

	Sample GT21	Sample GT22
Grand Means	75.661 Gloss Units	74.486 Gloss Units
SD Btwn Labs	3.544 Gloss Units	2.598 Gloss Units

Statistics based on 16 of 16 reporting participants

Instrument Code List as Reported by the Labs

(GM) - BYK-Gardner micro-gloss
(GS) - BYK-Gardner Glossgard II
(LA) - L & W Gloss - Autoline 300
(PP) - Technidyne Profile/Plus
(TG) - Technidyne T480
(TH) - Technidyne T480A
(XX) - Instrument make/model not specified by lab
(ZH) - Zehntner ZLR 1050

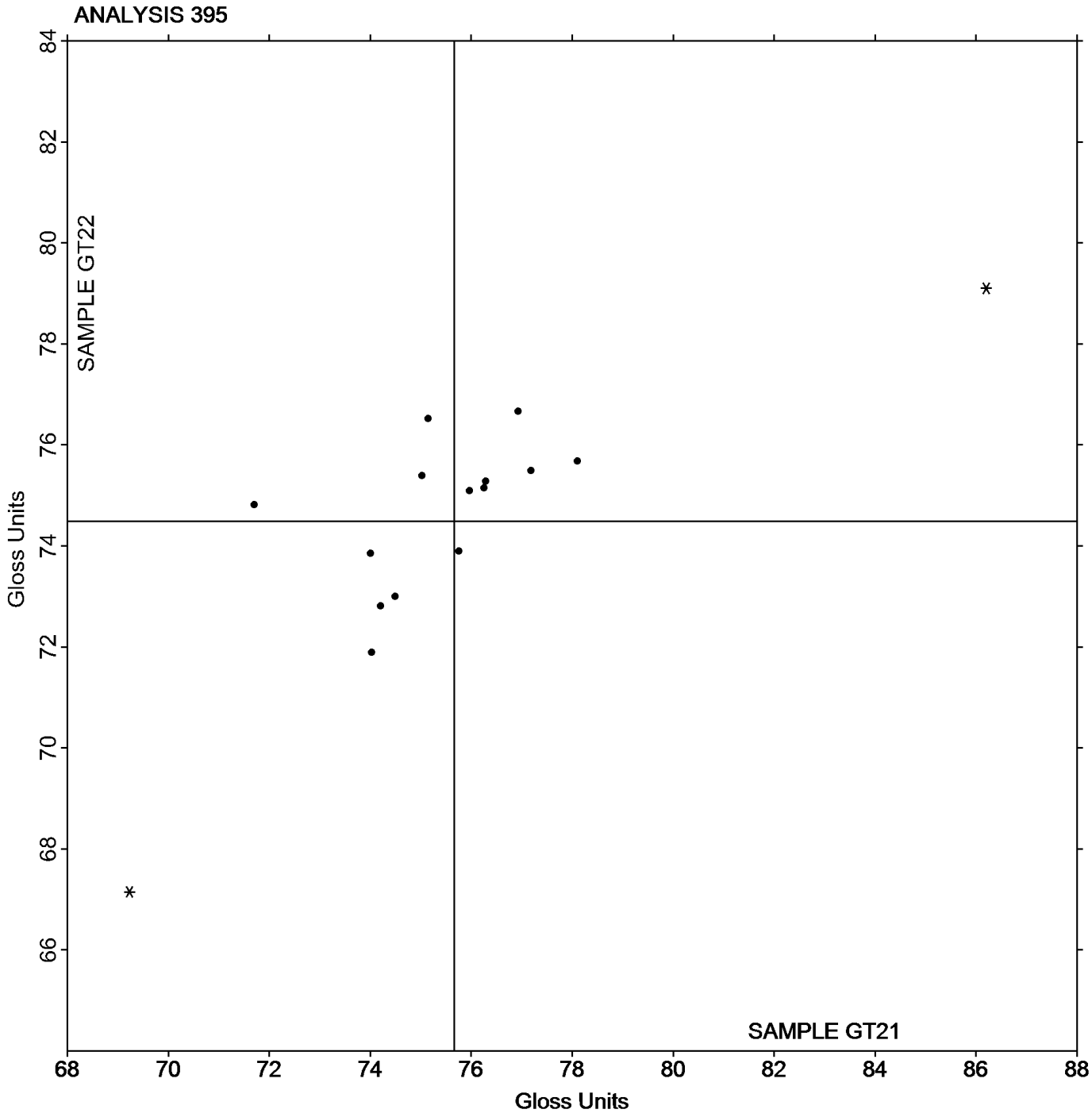
Paper & Paperboard Interlaboratory Testing Program

Analysis 395

Specular Gloss at 75 Degrees - High Range

Grand Mean Sample **GT21** = 75.661 Gloss Units

Grand Mean Sample **GT22** = 74.486 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

WebCode	Data Flag	Sample GU21 Lab Mean	Sample GU21 Diff from Grand Mean	Sample GU21 CPV	Sample GU22 Lab Mean	Sample GU22 Diff from Grand Mean	Sample GU22 CPV	Instr Code
79CYEH		43.25	-0.44	-0.47	26.65	-0.19	-0.36	XX
8JWNV3		43.34	-0.35	-0.37	25.91	-0.93	-1.78	PP
G2YPFD		44.84	1.15	1.23	27.51	0.67	1.29	TH
RVXB6L		42.73	-0.96	-1.02	26.87	0.03	0.07	TH
VTVNXX		45.19	1.50	1.61	26.61	-0.23	-0.43	TG
WNLJ4D		43.13	-0.56	-0.60	27.27	0.43	0.83	TH
Z87LCA		43.34	-0.35	-0.37	27.03	0.20	0.38	TG

Summary Statistics

	Sample GU21	Sample GU22
Grand Means	43.688 Gloss Units	26.836 Gloss Units
SD Btwn Labs	0.935 Gloss Units	0.520 Gloss Units

Statistics based on 7 of 7 reporting participants

Instrument Code List as Reported by the Labs

(PP) - Technidyne Profile/Plus

(TH) - Technidyne T480A

(TG) - Technidyne T480

(XX) - Instrument make/model not specified by lab

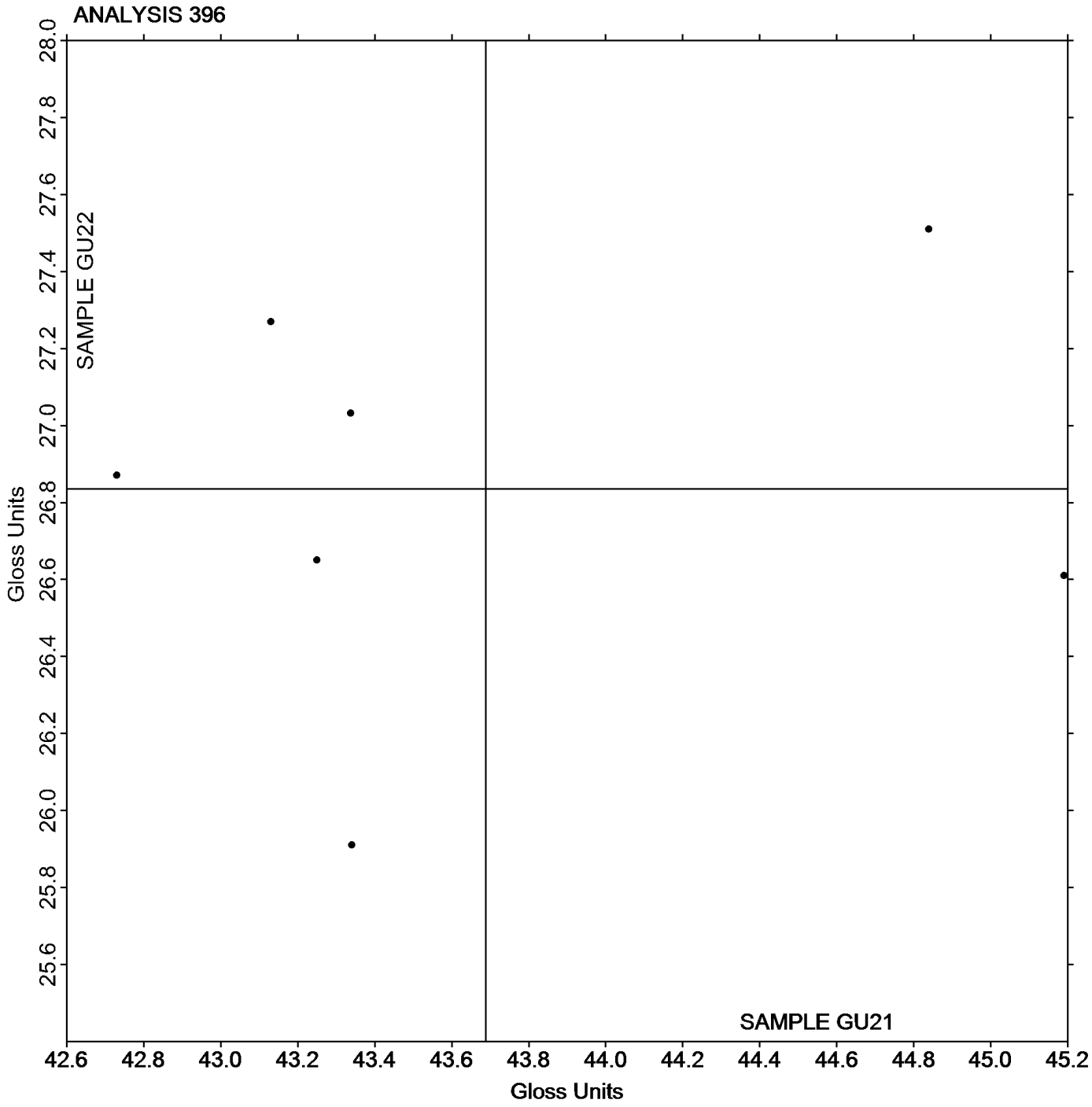
Paper & Paperboard Interlaboratory Testing Program

Analysis 396

Specular Gloss at 75 Degrees - Low Range

Grand Mean Sample **GU21** = 43.688 Gloss Units

Grand Mean Sample **GU22** = 26.836 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)

WebCode	Data Flag	Sample GW21 Lab Mean	Sample GW21 Diff from Grand Mean	Sample GW21 CPV	Sample GW22 Lab Mean	Sample GW22 Diff from Grand Mean	Sample GW22 CPV
29QWG8		101.2	0.7	1.51	86.61	0.40	0.80
2A4JZ8		100.1	-0.4	-0.86	86.02	-0.18	-0.37
3HDB4A		100.1	-0.4	-0.95	85.58	-0.62	-1.25
4DFV88		100.0	-0.5	-1.06	86.06	-0.14	-0.29
4TTHF4		100.3	-0.3	-0.60	85.24	-0.96	-1.92
4YVG69		101.3	0.8	1.63	87.20	1.00	1.98
6377KM		100.4	-0.1	-0.24	86.42	0.21	0.43
6H6V2T		100.5	-0.1	-0.17	86.20	0.00	-0.01
7N6UPN		100.4	-0.1	-0.20	85.99	-0.21	-0.43
AL8K7W		100.4	-0.1	-0.23	86.20	0.00	-0.01
BZM63V		100.6	0.0	0.04	86.42	0.22	0.43
CFVACT		100.7	0.2	0.40	86.31	0.10	0.20
FVGTJR		100.1	-0.4	-0.92	85.96	-0.25	-0.50
HQT6TB		101.1	0.5	1.11	86.90	0.70	1.39
P8UKT4	X	102.8	2.2	4.80	86.79	0.59	1.17
Q73LDK		100.2	-0.3	-0.70	86.11	-0.09	-0.19
RJ4UFK		101.3	0.8	1.63	86.67	0.46	0.93
RVXB6L		100.8	0.2	0.49	86.25	0.05	0.10
U3LNBX		99.9	-0.6	-1.36	85.90	-0.30	-0.61
URQGFE		100.4	-0.2	-0.33	86.47	0.27	0.53
VG6NNH		100.5	0.0	-0.01	86.05	-0.15	-0.30
VPE6BH		100.6	0.1	0.17	85.65	-0.56	-1.11
VTVNXX		100.4	-0.1	-0.28	86.00	-0.20	-0.41
WNLJ4D		100.2	-0.3	-0.63	85.86	-0.35	-0.69
XCM89B		100.0	-0.6	-1.25	86.11	-0.09	-0.19
XDDF9E		100.4	-0.1	-0.24	85.40	-0.80	-1.60
XF4ENX	*	101.9	1.4	3.02	86.62	0.41	0.82
YCER7U		100.6	0.0	0.07	85.98	-0.23	-0.45
YQY8AU	X	100.8	0.2	0.53	86.22	0.02	0.04
YW6N6A	*	100.5	0.0	-0.04	87.55	1.35	2.69
YZM7ZY	X	90.6	-9.9	-21.29	77.41	-8.79	-17.53

Summary Statistics

	Sample GW21	Sample GW22
Grand Means	100.53 g/sq m	86.205 g/sq m
SD Btwn Labs	0.47 g/sq m	0.502 g/sq m

Statistics based on 28 of 31 reporting participants

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

Comments on assigned Data Flags for Test #398

P8UKT4 (X) - Data for Sample GW21 are high.

YQY8AU (X) - Data appear to be off by a factor of .01; data converted by CTS (x100).

YZM7ZY (X) - Extreme data.

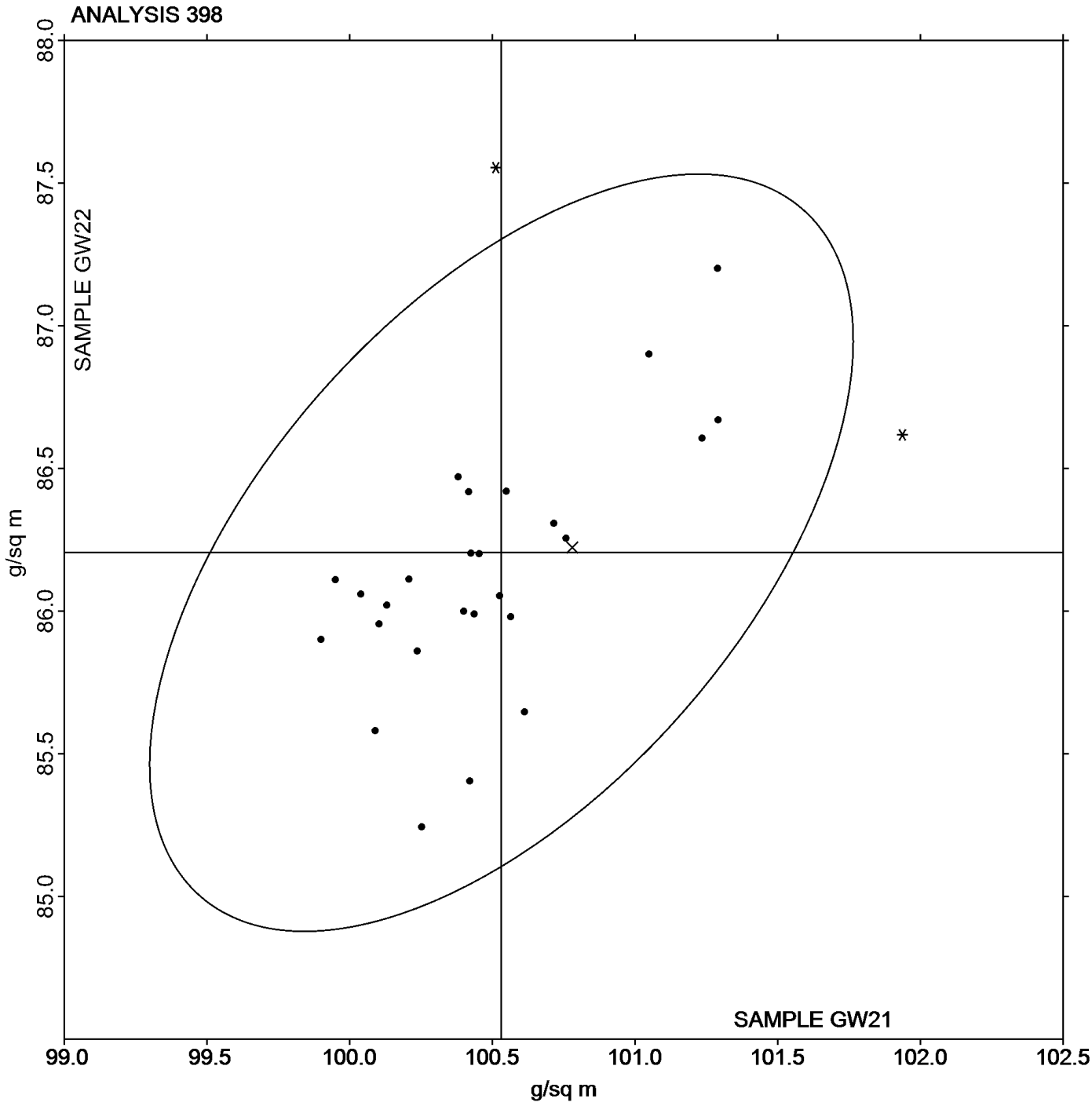
Paper & Paperboard Interlaboratory Testing Program

Analysis 398

Grammage (Mass per Unit Area)

Grand Mean Sample **GW21** = 100.53 g/sq m

Grand Mean Sample **GW22** = 86.205 g/sq m



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

WebCode	Data Flag	Sample GX21 Lab Mean	Sample GX21 Diff from Grand Mean	Sample GX21 CPV	Sample GX22 Lab Mean	Sample GX22 Diff from Grand Mean	Sample GX22 CPV
2F99WT		109.6	-2.2	-0.07	106.5	1.2	0.04
2Q9RF9		63.6	-48.2	-1.62	59.8	-45.5	-1.44
3D7KZ4		116.9	5.1	0.17	103.5	-1.8	-0.06
4CKD77		120.8	9.0	0.30	105.9	0.6	0.02
72WCM2		154.1	42.3	1.42	173.3	68.0	2.15
8JWNV3		83.8	-28.0	-0.94	96.2	-9.1	-0.29
9GK923		109.8	-2.0	-0.07	92.5	-12.8	-0.40
BCC4UX		117.6	5.9	0.20	109.3	4.0	0.13
C78MXH		140.2	28.4	0.96	118.8	13.5	0.43
D6NZYZ		110.3	-1.5	-0.05	101.2	-4.1	-0.13
E67AQF		155.7	44.0	1.48	125.6	20.3	0.64
EA3X63		127.0	15.3	0.51	127.3	22.0	0.70
H9DU9X		76.2	-35.6	-1.20	68.8	-36.5	-1.16
HQT6TB		109.5	-2.3	-0.08	129.2	23.9	0.76
L2228P		85.6	-26.2	-0.88	67.5	-37.8	-1.19
LT82M7		121.1	9.3	0.31	133.1	27.8	0.88
N6Y3KR		50.8	-61.0	-2.05	43.3	-61.9	-1.96
NJUVMK		169.7	57.9	1.95	178.5	73.2	2.32
QHXTGF		115.8	4.0	0.14	113.0	7.7	0.24
RVXB6L		122.7	11.0	0.37	128.1	22.9	0.72
UFWZQD		60.2	-51.6	-1.74	53.6	-51.7	-1.64
VCTP8J		113.4	1.6	0.05	101.0	-4.3	-0.14
VG6NNH		108.0	-3.8	-0.13	94.4	-10.9	-0.34
VUQ8ZY		76.5	-35.3	-1.19	70.1	-35.1	-1.11
XCM89B		156.1	44.3	1.49	122.7	17.4	0.55
XT6DAA		137.0	25.2	0.85	129.7	24.4	0.77
Y4N3RE		122.5	10.8	0.36	103.2	-2.1	-0.07
YF23N9		100.8	-11.0	-0.37	87.6	-17.7	-0.56
YFGNXA		124.9	13.1	0.44	113.4	8.1	0.26
YQY8AU		134.8	23.0	0.77	140.2	34.9	1.10
YVUWYD		70.0	-41.8	-1.41	66.6	-38.7	-1.22

Summary Statistics

	Sample GX21	Sample GX22
Grand Means	111.77 Seconds	105.28 Seconds
SD Btwn Labs	29.72 Seconds	31.62 Seconds

Statistics based on 31 of 31 reporting participants

Paper & Paperboard Interlaboratory Testing Program

Analysis 399

Sizing Test (Hercules Type)

Grand Mean Sample **GX21** = 111.77 Seconds

Grand Mean Sample **GX22** = 105.28 Seconds