



## Paper & Paperboard Testing Program

### Summary Report #268G-February 2014

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## **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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21331 Gentry Drive  
Sterling, Virginia 20166 USA  
+1-571-434-1925  
FAX #: +1-571-434-1937  
paper@cts-interlab.com

(Toll-free fax within the U.S.: 1-866-fax-2cts)  
Office Hours: 8:00 a.m. - 4:30 p.m. ET

## Key for Web Summary Reports (Page 1 of 2)

<b>WebCode</b>	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.
<b>Lab Mean</b>	The average of the values obtained for each sample by the participant.
<b>Grand Mean</b>	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.
<b><math>\Delta E</math></b>	The calculated total color difference between the two samples. For the Hunter L,a,b analyses it is calculated in Hunter units ( $\Delta E$ ). For the L*,a*,b* analyses it is calculated in CIELAB units ( $\Delta E^*$ ).
<b>Difference from Grand Mean</b>	The difference of the LAB MEAN from the GRAND MEAN.
<b>Between-Lab Standard Deviation</b>	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).
<b>Comparative Performance Value</b>	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.
<b>Inst Code</b>	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.
<b>Data Flag</b>	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	<b>CAUTION</b> - 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	<b>STOP</b> - 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	<b>PROCEED</b> - 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.

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### 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.

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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.

## Instrument Manufacturer Contacts

If your data results have been flagged with an "X" and you suspect that the problem is with your instrument (and not your testing procedure), CTS urges you to contact the appropriate instrument manufacturer. CTS has asked manufacturers to supply a contact person who is familiar with the Paper, Paperboard & Corrugated Fiberboard Interlaboratory Program. The listed service contact should be able to work with you on evaluating your results and determining possible causes of the problem.

### **Technidyne Corp., Hagerty Div.**

George Hagerty  
287 Dix Ave. P.O. Box 4741  
Queensbury, NY 12804  
Phone: (518) 793-2834  
FAX #: (518) 792-1796

### **Thwing Albert Instrument Co.**

Jack Mirkowski, Service Contact  
David Zarrilli, Sales Contact  
10960 Dutton Road  
Philadelphia, PA 19154  
Phone: (215) 637-0100  
FAX #: (215) 632-8370

### **Huygen Corporation**

Richard Wade  
P.O. Box 316  
Waconda, IL 60084  
Phone: (815) 455-2200  
FAX #: (815) 455-2300

### **Lorentzen & Wettre USA Inc.**

Bill Crain, Technical Manager  
1055 Windward Ridge Pkwy  
Suite 160  
Alpharetta, GA 30005  
Phone: (770) 442-8015 ext 232  
FAX #: (770) 442-6792

### **Gurley Precision Instruments**

Martin Gordinier, Product Manager  
P.O. Box 88  
Troy, NY 12181-0088  
Phone: (800) 759-1844  
FAX #: (518) 274-0336

### **BYK-Gardner**

Randy Snavely  
9104 Guilford Road  
Columbia, MD 21046-2729  
Phone: (301) 483-6500  
FAX #: (301) 483-6555

### **Applied Paper Technology Inc.**

Vann Parker, President  
555 14th Street, NW  
Atlanta, GA 30318  
Phone: (404) 881-9801  
FAX #: (404) 881-0862  
appliedpapertech@mindspring.com

### **Technidyne Corporation**

Jeff Hobbs / Mike Lakins  
100 Quality Avenue  
New Albany, IN 47150-2272 USA  
Phone: (812) 948-2884  
FAX #: (812) 945-6847

### **Testing Machines Inc.**

Michael Foran, Technical Support Engineer  
2910 Expressway Drive South  
Islandia, NY 11722  
Phone: (631) 439-5400  
FAX #: (631) 439-5420

### **Hercules, Inc.**

Steven R. Boone  
7510 Baymeadows Way  
Jacksonville, FL 32256-7524  
Phone: (904) 732-3136  
FAX #: (904) 448-4995

### **Valmet Inc.**

Eeva Nettamo, Product Manager Paper Testing  
3100 Medlock Bridge Road - Suite 260  
Norcross, GA 30071  
Phone: (770) 448-0849  
FAX #: (770) 242-8386

### **Hunter Associates Lab, Inc.**

Mary Ellen Zuyus  
11491 Sunset Hills Road  
Reston, VA 22090  
Phone: (703) 471-6870 ext. 222  
FAX #: (703) 471-4237

### **Emveco Inc.**

Donald L. Stradley  
113 North Blaine, P.O. Box 16  
Newburg, OR 97132-0016  
Phone: (503) 538-8616  
FAX #: (503) 538-0912

## TAPPI-CTS Interlaboratory Testing Program

## Analysis 350

Color &amp; Color Difference - Near White Papers - C/2deg ob

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

Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	$\Delta L$	$\Delta a$	$\Delta b$	$\Delta E$	
22NV6B		GA03	93.46	-0.94	7.60	-2.66	1.07	-7.46	7.99	TP
		GA04	90.80	0.12	0.14					
46GH3G		GA03	92.82	-1.14	7.66	-3.24	1.36	-8.31	9.02	TB
		GA04	89.58	0.23	-0.65					
4ZQ827		GA03	92.79	-1.21	8.02	-2.69	1.20	-8.09	8.61	LS
		GA04	90.10	-0.01	-0.07					
962VKN		GA03	95.05	-1.00	7.98	-3.07	1.25	-8.32	8.96	XS
		GA04	91.98	0.24	-0.34					
9CL7DJ		GA03	94.57	-1.22	8.15	-2.14	1.26	-8.50	8.86	EH
		GA04	92.43	0.04	-0.35					
D3WZHM		GA03	93.32	-1.48	8.24	-2.08	0.88	-9.02	9.30	XX
		GA04	91.24	-0.60	-0.78					
DHREV9		GA03	92.79	0.54	6.65	-2.27	-1.10	-6.19	6.68	HH
		GA04	90.52	-0.56	0.46					
DHVRMB		GA03	92.91	-1.30	8.38	-2.81	1.63	-8.69	9.27	TM
		GA04	90.10	0.33	-0.31					
DTVLN2		GA03	93.34	-1.02	7.72	-2.62	1.21	-7.86	8.38	MK
		GA04	90.72	0.19	-0.14					
DZPHLC		GA03	94.40	-1.23	8.20	-2.21	1.34	-8.45	8.83	LS
		GA04	92.19	0.11	-0.25					
GLYZ8P		GA03	93.68	-1.29	8.23	-3.09	1.24	-8.44	9.07	TS
		GA04	90.59	-0.05	-0.21					
HEGQN8		GA03	93.51	-1.21	8.06	-1.74	1.10	-8.91	9.14	HE
		GA04	91.78	-0.10	-0.85					
HMBY9Y		GA03	93.79	0.65	4.47	-2.68	-1.10	-4.37	5.24	X HV
		GA04	91.11	-0.45	0.10					
HQC2WE		GA03	93.12	-2.37	9.40	-1.75	1.88	-10.41	10.72	HG
		GA04	91.37	-0.49	-1.00					
JBDHUG		GA03	93.50	-0.90	7.75	-2.41	1.79	-8.27	8.80	TS
		GA04	91.09	0.89	-0.52					
JLVZHA		GA03	93.05	-1.64	8.70	-2.91	2.06	-9.00	9.68	XX
		GA04	90.14	0.42	-0.31					
UBJABG		GA03	92.54	-1.08	7.11	-2.30	0.76	-7.29	7.69	HH
		GA04	90.24	-0.32	-0.19					

## Analysis 350

Color &amp; Color Difference - Near White Papers - C/2deg ob

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

Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code	
			L	a	b	$\Delta L$	$\Delta a$	$\Delta b$	$\Delta E$		
V97ZT4		GA03	92.90	-1.16	8.14	-2.52	1.72	-8.62	9.14	TS	
		GA04	90.38	0.56	-0.48						
VHGC8Y		GA03	94.30	-1.49	9.19	-1.83	1.85	-9.19	9.55	MI	
		GA04	92.47	0.36	0.00						
VLD8FZ		GA03	92.95	-1.18	7.95	-2.74	1.23	-8.01	8.56	TB	
		GA04	90.21	0.06	-0.06						
VQ4E3F		GA03	92.77	-1.30	7.99	-3.45	2.08	-8.95	9.81	TS	
		GA04	89.32	0.78	-0.96						
WXM36B		GA03	92.44	-1.25	7.32	-2.13	0.57	-7.51	7.83	HH	
		GA04	90.31	-0.68	-0.19						
X9YQX9	X	GA03	92.56	-0.33	5.67	-9.93	-0.01	-6.41	11.82	X	XX
		GA04	82.63	-0.34	-0.74						
YU2WXD		GA03	92.78	-1.52	8.19	-3.46	1.89	-8.64	9.50	TS	
		GA04	89.32	0.37	-0.45						
YUWKZV		GA03	94.67	-1.24	7.90	-2.16	1.28	-8.41	8.78	LA	
		GA04	92.51	0.05	-0.51						
YXWV2A		GA03	93.04	-1.36	8.28	-2.79	1.44	-8.38	8.94	TC	
		GA04	90.25	0.08	-0.10						

		Summary Statistics							
Grand Means									
	GA03	93.380	-1.102	7.806	-2.550	1.195	-8.211	8.734	
	GA04	90.830	0.047	-0.336					
Std Dev Btw Labs									
	GA03	0.716	0.603	0.995	0.492	0.793	1.116	1.071	
	GA04	0.959	0.410	0.353					
Statistics based on 25 of 26 reporting participants									

## Comments assigned on Data Flags for Test #350

X9YQX9 (X) - Low L values for Sample GA04. Inconsistent within L values for both samples. Inconsistent within b values for Sample GA03. Large delta L and delta E values.

## Analysis 350

Color &amp; Color Difference - Near White Papers - C/2deg ob

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

Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	$\Delta L$	$\Delta a$	$\Delta b$	$\Delta E$	

## Instrument Code List as Reported by the Labs

(EH) - Datacolor Elrepho SF450	(HE) - Hunter LabScan
(HG) - Hunter ColorQUEST	(HH) - Hunter D25DP - 9000
(HV) - Hunter Ultrascan XE	(LA) - L & W Elrepho AL300
(LS) - L & W Elrepho SE 070	(MI) - Macbeth Color i 5
(MK) - Macbeth Color-Eye 7000 Spectrophotometer	(TB) - Technidyne Technibrite TB-1C
(TC) - Technidyne Color Touch Series	(TM) - Technidyne Technibrite Micro TB-1C
(TP) - Technidyne Spectro Plus	(TS) - Technidyne Brightimeter Micro S-5
(XS) - X-Rite 938 Spectrodensitometer	(XX) - Instrument make/model not specified by lab

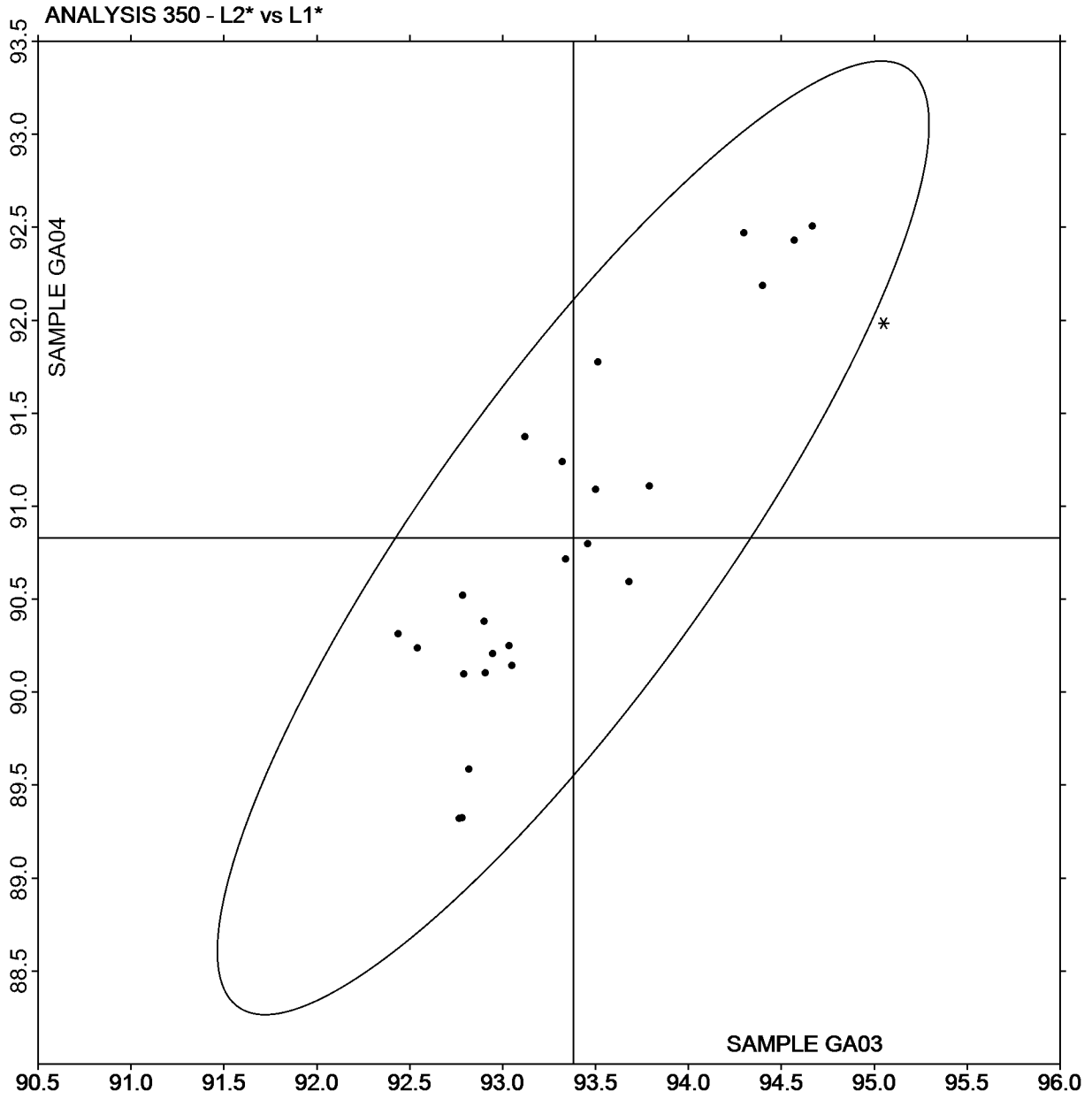


Analysis 350

Color & Color Difference - Near White Papers - C/2deg ob

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

Plot of L values GA04 v L values GA03

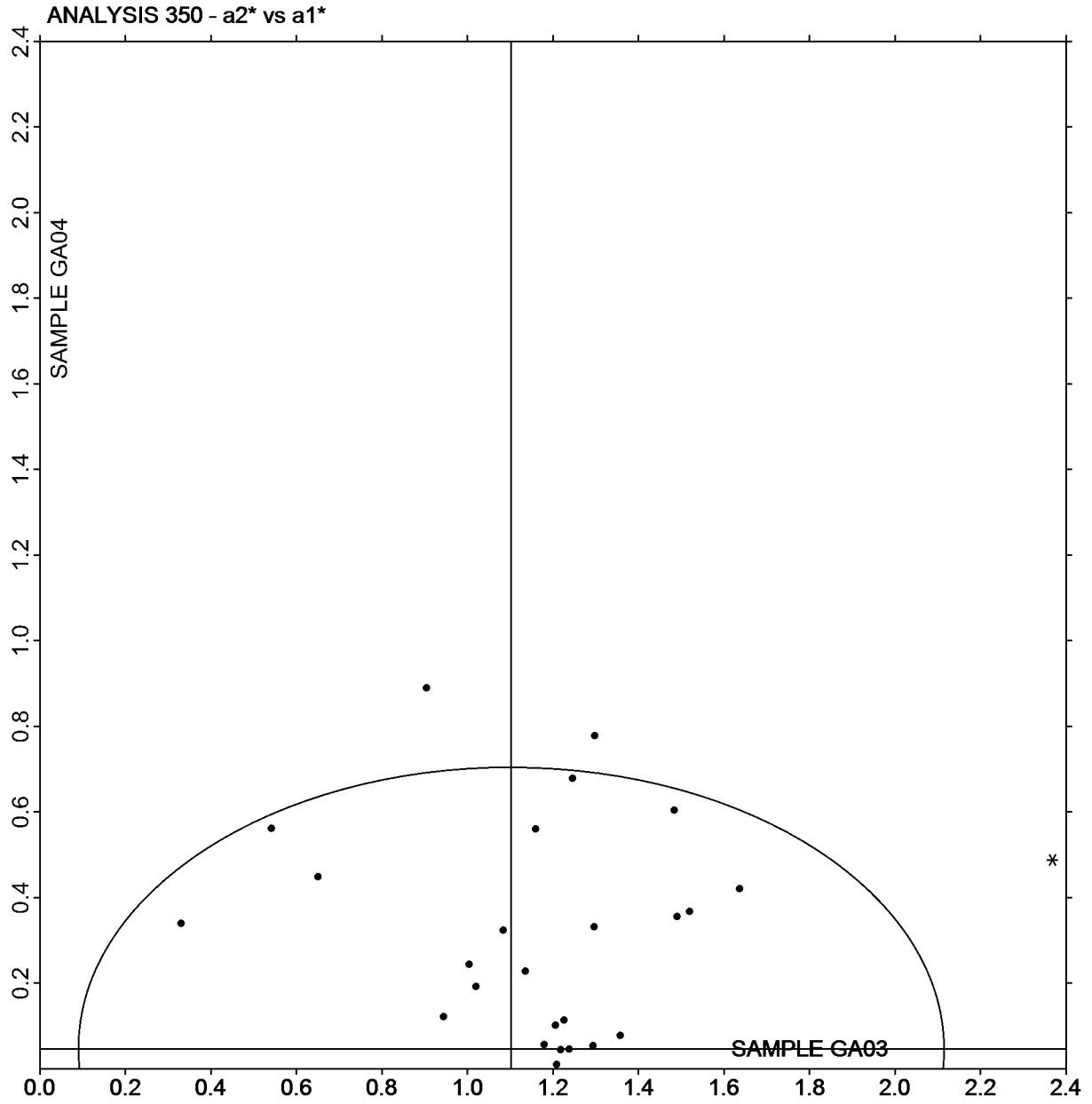


Analysis 350

Color & Color Difference - Near White Papers - C/2deg ob

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

Plot of a values GA04 v a values GA03

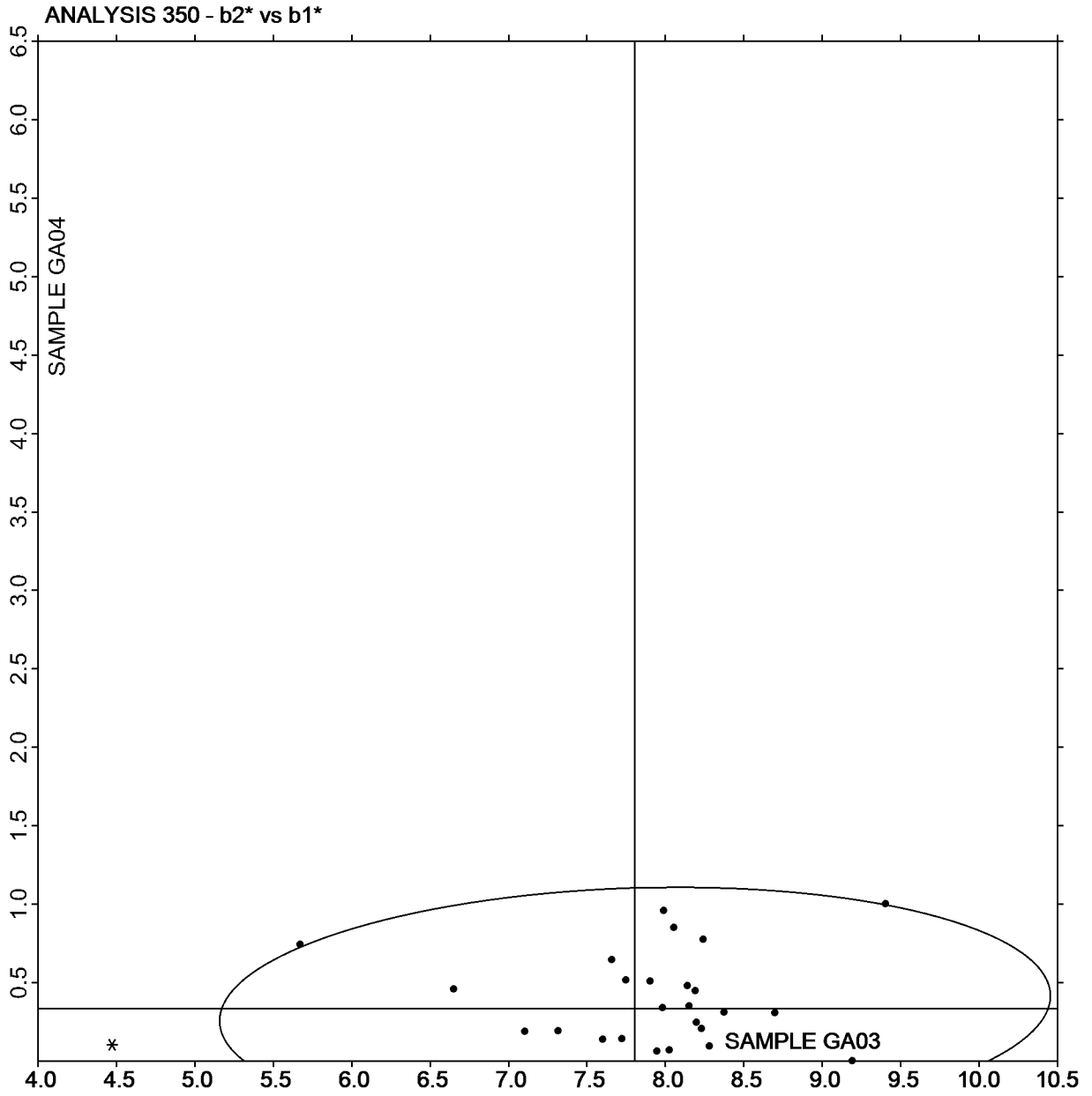


Analysis 350

Color & Color Difference - Near White Papers - C/2deg ob

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

Plot of b values GA04 v b values GA03



## Analysis 351

Color &amp; Color Difference - Near White Papers - D65/10deg

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

Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	$\Delta L$	$\Delta a$	$\Delta b$	$\Delta E$	
273CUR		GA03	94.32	0.27	7.98	-1.81	-0.94	-7.60	7.87	XX
		GA04	92.51	-0.67	0.37					
4C3GMB		GA03	93.23	0.54	6.40	-2.34	-1.18	-6.47	6.98	HE
		GA04	90.89	-0.63	-0.07					
BJW9M3		GA03	94.01	0.10	8.44	-1.44	-0.50	-8.34	8.48	EE
		GA04	92.57	-0.40	0.10					
DZPHLC		GA03	94.44	-1.22	8.19	-2.16	1.35	-8.37	8.75	LS
		GA04	92.28	0.13	-0.19					
EL938R		GA03	92.77	0.67	5.82	-3.49	-1.21	-5.93	6.99	XM
		GA04	89.27	-0.54	-0.11					
HK4NY4		GA03	93.58	0.81	4.31	-2.49	-1.18	-4.38	5.17	HV
		GA04	91.09	-0.37	-0.07					
HMBY9Y		GA03	93.77	0.64	4.51	-2.60	-1.06	-4.40	5.22	HV
		GA04	91.16	-0.41	0.11					
JALGVK		GA03	94.48	0.49	7.01	-1.77	-1.07	-6.78	7.09	NF
		GA04	92.71	-0.58	0.23					
JVZ4GQ		GA03	94.17	-0.10	9.69	-1.30	-0.49	-9.01	9.12	NG
		GA04	92.87	-0.59	0.68					
NRKBBU		GA03	94.50	0.44	6.61	-1.81	-1.04	-6.19	6.53	HT
		GA04	92.69	-0.60	0.42					
NXUKQ3		GA03	94.16	0.01	8.59	-1.76	-0.62	-8.29	8.50	EH
		GA04	92.40	-0.61	0.29					
R3QCG9		GA03	94.04	0.05	8.56	-1.63	-0.44	-8.50	8.66	EH
		GA04	92.41	-0.39	0.07					
RQF2RX		GA03	94.24	0.31	7.86	-1.76	-0.98	-7.51	7.77	HE
		GA04	92.48	-0.67	0.36					
TMVFN4		GA03	92.81	0.60	6.31	-2.26	-1.11	-6.10	6.60	XX
		GA04	90.55	-0.51	0.21					
XA88NR		GA03	94.36	0.36	6.91	-1.80	-0.95	-6.56	6.87	HT
		GA04	92.56	-0.58	0.35					
XZZGXA		GA03	96.35	-0.83	8.02	-2.47	1.15	-8.38	8.81	XP
		GA04	93.88	0.32	-0.36					
YUC3YV		GA03	94.13	-0.03	8.67	-1.82	-0.51	-8.37	8.58	LS
		GA04	92.31	-0.54	0.30					

## Analysis 351

Color &amp; Color Difference - Near White Papers - D65/10deg

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

Web Code	F	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	$\Delta L$	$\Delta a$	$\Delta b$	$\Delta E$	
YZZNV9		GA03	94.40	0.68	6.36	-2.04	-1.24	-6.22	6.66	EF
		GA04	92.36	-0.56	0.14					

			Summary Statistics							
Grand Means										
	GA03	94.097	0.210	7.236						
	GA04	92.055	-0.456	0.158	-2.042	-0.666	-7.078	7.481		
Stnd Dev Btwn Labs										
	GA03	0.779	0.531	1.463						
	GA04	1.065	0.267	0.252	0.514	0.751	1.399	1.206		
Statistics based on 18 of 18 reporting participants										

## Instrument Code List as Reported by the Labs

(EE) - Datacolor Elrepho 2000

(EF) - Datacolor Elrepho 3000

(EH) - Datacolor Elrepho SF450

(HE) - Hunter LabScan

(HT) - Hunter UltraScan Vis

(HV) - Hunter Ultrascan XE

(LS) - L &amp; W Elrepho SE 070

(NF) - Minolta CM-3600d Spectrophotometer

(NG) - Minolta CM-3700d Spectrophotometer

(XM) - X-Rite CA-22

(XP) - X-Rite Spectrophotometer DTP

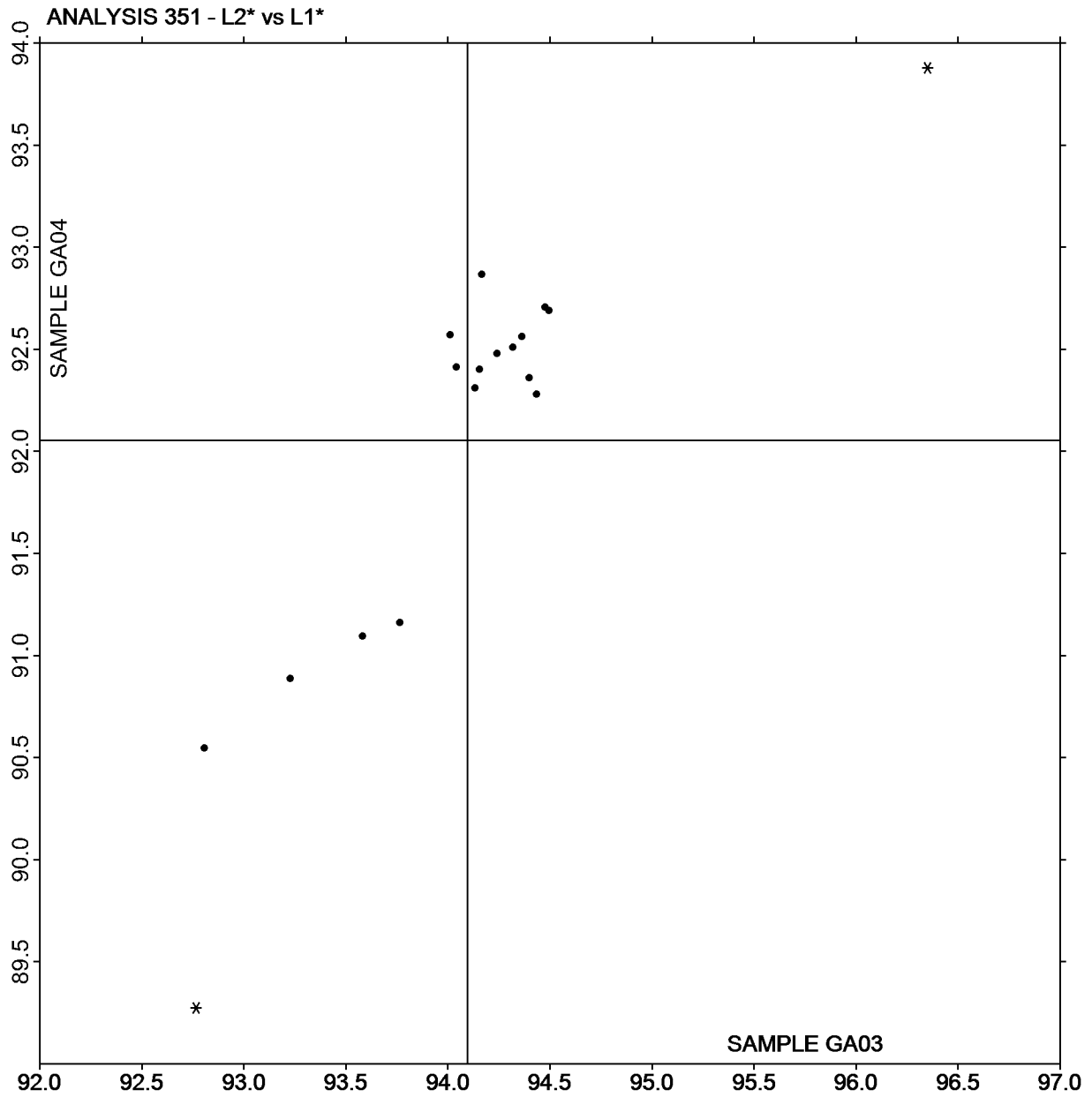
(XX) - Instrument make/model not specified by lab

Analysis 351

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

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

Plot of L values GA04 v L values GA03



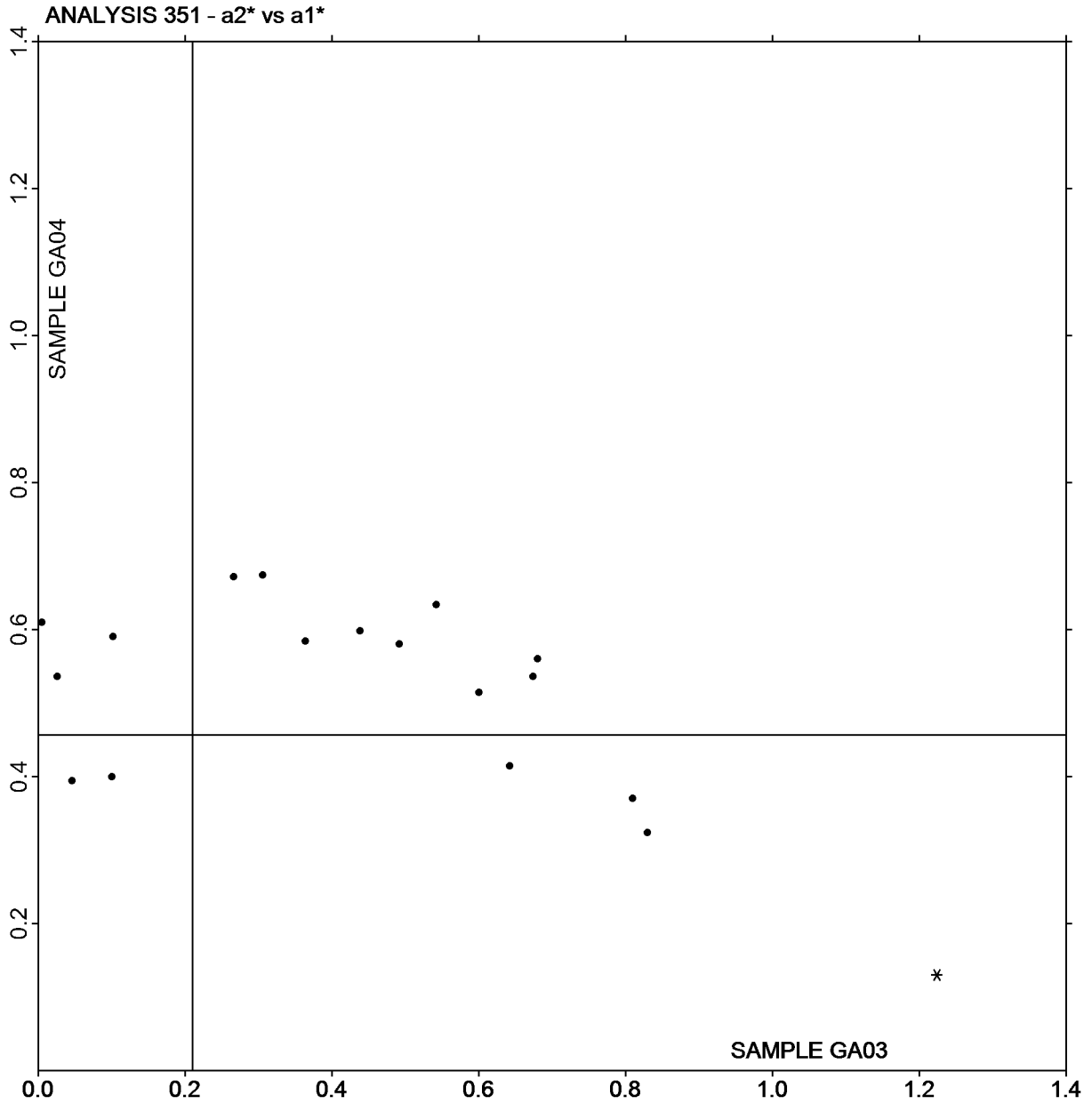
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Analysis 351

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

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

Plot of a values GA04 v a values GA03



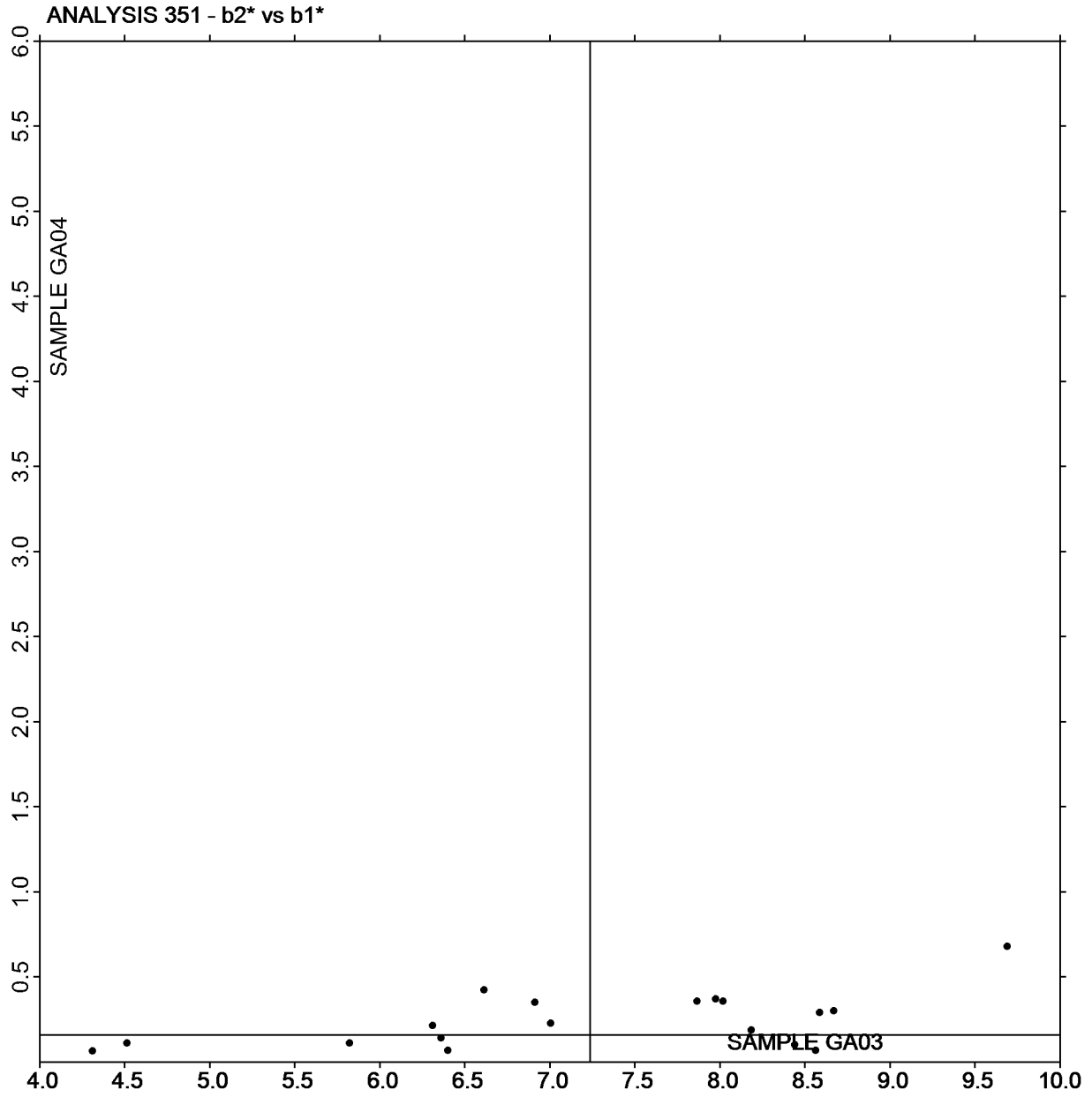
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Analysis 351

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

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

Plot of b values GA04 v b values GA03



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



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

WebCode	Data Flag	Sample GV03			Sample GV04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
47UAWJ		3.809	0.014	0.26	4.659	-0.033	-0.65	EM
4C3GMB		3.813	0.018	0.35	4.665	-0.027	-0.53	TM
4NXKVB	*	3.710	-0.085	-1.62	4.540	-0.152	-2.96	TM
4ZQ827		3.789	-0.006	-0.11	4.675	-0.017	-0.33	LW
63P3ZY		3.850	0.055	1.04	4.760	0.068	1.31	PP
6JCFC7		3.835	0.040	0.77	4.734	0.041	0.81	LW
82NR48		3.810	0.015	0.28	4.660	-0.032	-0.63	LW
8YGA8X		3.742	-0.053	-1.01	4.667	-0.025	-0.49	XX
962VKN		3.740	-0.055	-1.05	4.630	-0.062	-1.21	TM
9CL7DJ		3.742	-0.053	-1.01	4.671	-0.021	-0.42	TA
A22WRB		3.819	0.024	0.45	4.713	0.020	0.39	MS
ADVCNC		3.797	0.002	0.03	4.747	0.055	1.06	TM
AH4WGQ	X	3.600	-0.195	-3.71	4.520	-0.172	-3.35	TM
AMGE78		3.794	-0.001	-0.01	4.675	-0.017	-0.34	EM
APPU7D		3.864	0.069	1.31	4.742	0.050	0.96	TM
CEXWHP		3.850	0.055	1.04	4.731	0.038	0.74	LW
CFNBRM		3.752	-0.043	-0.82	4.671	-0.021	-0.42	TA
D3WZHM		3.890	0.095	1.80	4.800	0.108	2.09	XX
DCQ4UW		3.758	-0.037	-0.70	4.645	-0.047	-0.92	LW
DDFG99		3.750	-0.045	-0.86	4.610	-0.082	-1.60	XX
DHVRMB		3.805	0.010	0.19	4.726	0.034	0.65	LA
DTVLN2		3.870	0.075	1.42	4.780	0.088	1.70	EM
E3DMHG		3.728	-0.067	-1.27	4.646	-0.047	-0.91	TA
EDXTLK		3.750	-0.045	-0.86	4.652	-0.040	-0.78	PP
EL938R		3.791	-0.004	-0.07	4.693	0.001	0.01	LW
FFXEWN		3.785	-0.010	-0.19	4.711	0.018	0.35	LW
FXCVYH		3.706	-0.089	-1.70	4.603	-0.089	-1.74	PP
GLYZ8P		3.813	0.018	0.34	4.693	0.001	0.01	LA
HK4NY4		3.705	-0.090	-1.71	4.628	-0.064	-1.25	EM
HRMTCB		3.814	0.019	0.36	4.743	0.051	0.98	LW
JALGVK		3.867	0.072	1.37	4.694	0.001	0.03	TM
JLVZHA		3.808	0.013	0.25	4.746	0.054	1.05	XX
JVZ4GQ		3.692	-0.103	-1.96	4.622	-0.070	-1.37	LW
K3L8BE		3.732	-0.063	-1.20	4.646	-0.046	-0.90	EM
LCZW6Q		3.850	0.054	1.03	4.708	0.015	0.30	LW
NRKBBU		3.813	0.018	0.34	4.757	0.065	1.26	EM
NZHXH7		3.737	-0.058	-1.11	4.675	-0.017	-0.34	TM
PG2C4P		3.799	0.004	0.08	4.676	-0.017	-0.32	TM
PTUPER		3.808	0.013	0.24	4.692	0.000	-0.01	TM
QCE7UR		3.808	0.013	0.24	4.674	-0.018	-0.36	XX
QDEUVP	X	3.653	-0.142	-2.70	4.498	-0.194	-3.78	EM
QGHLPN		3.734	-0.061	-1.16	4.674	-0.018	-0.36	EM
QRFL89		3.840	0.045	0.85	4.736	0.044	0.85	LW

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

WebCode	Data Flag	Sample GV03			Sample GV04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
RKR4GP	*	3.900	0.105	1.99	4.710	0.018	0.34	TM
RQF2RX		3.747	-0.048	-0.92	4.646	-0.046	-0.90	LW
T84L2Q		3.799	0.004	0.07	4.696	0.004	0.07	PP
VHGC8Y		3.816	0.021	0.40	4.672	-0.020	-0.40	TA
VLD8FZ		3.860	0.065	1.23	4.757	0.065	1.27	LW
VQ4E3F		3.708	-0.087	-1.65	4.593	-0.099	-1.93	TM
XA88NR		3.862	0.067	1.27	4.753	0.061	1.18	EM
XJH33J		3.887	0.092	1.75	4.721	0.029	0.56	PP
XY7JUA		3.810	0.015	0.28	4.715	0.023	0.44	LA
XZZGXA		3.756	-0.039	-0.75	4.730	0.038	0.73	TM
YJD72Y		3.828	0.032	0.62	4.727	0.035	0.68	LW
YRKXEB		3.767	-0.028	-0.54	4.682	-0.010	-0.20	TA
YTXN3K	X	3.984	0.189	3.59	4.773	0.081	1.57	XX
YU2WXD		3.800	0.005	0.09	4.705	0.013	0.25	EM
YUWKZV		3.764	-0.031	-0.60	4.709	0.016	0.32	MT
YXWV2A		3.854	0.059	1.12	4.787	0.095	1.84	TA
Z9BAJ3	X	3.978	0.183	3.48	4.876	0.184	3.58	LW
ZNMM7G	X	4.043	0.248	4.71	4.917	0.225	4.37	LW
ZRYVZJ	X	5.566	1.771	33.67	5.527	0.835	16.22	EM

Summary Statistics			
	Sample GV03		Sample GV04
Grand Means	3.7952 mils		4.6924 mils
SD Btwn Labs	0.0526 mils		0.0515 mils
Statistics based on 56 of 62 reporting participants			

**Comments on assigned Data Flags for Test #360**

AH4WGQ (X) - Systematic error (data for both samples are low). Inconsistent within the determinations for Sample GV04.

QDEUVP (X) - Inconsistent in testing between samples, data for Sample GV04 are low. Inconsistent within the determinations for Sample GV03.

YTXN3K (X) - Inconsistent in testing between samples, data for Sample GV03 are high.

Z9BAJ3 (X) - Systematic error (data for both samples are high).

ZNMM7G (X) - Systematic error (data for both samples are high).

ZRYVZJ (X) - Extreme data.

**Paper & Paperboard Interlaboratory Testing Program**

**Analysis 360**

**Thickness (Caliper), Printing papers**

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**Instrument Code List as Reported by the Labs**

(EM) - Emveco

(LA) - L & W Autoline

(LW) - L & W

(MS) - Messmer

(MT) - Mitutoyo

(PP) - Technidyne Profile/Plus

(TA) - Thwing-Albert

(TM) - TMI

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

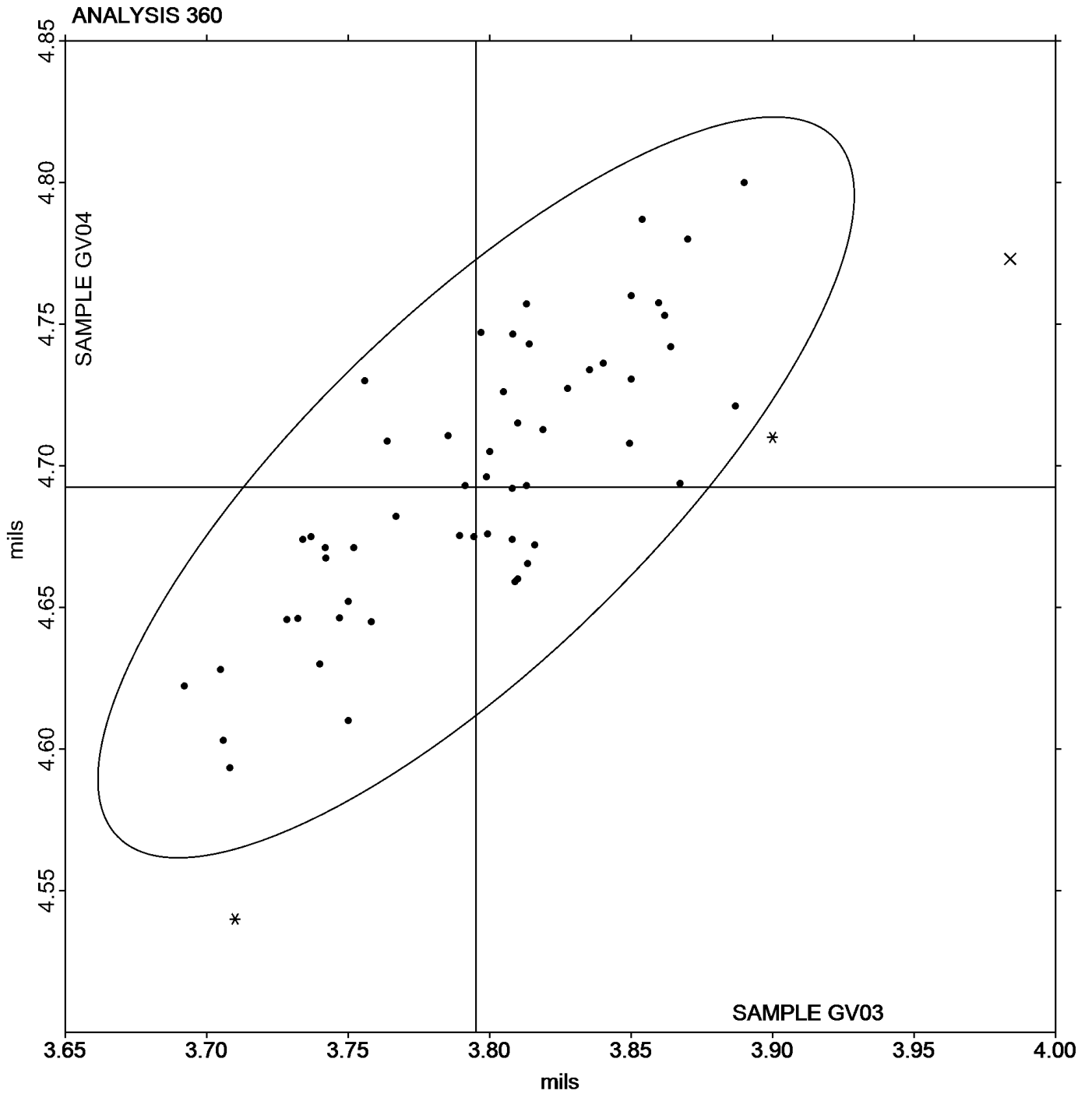
# Paper & Paperboard Interlaboratory Testing Program

## Analysis 360

### Thickness (Caliper), Printing papers

Grand Mean Sample **GV03** = 3.7952 mils

Grand Mean Sample **GV04** = 4.6924 mils



## Analysis 361

## Thickness (Caliper), Packaging papers

WebCode	Data Flag	Sample GY03			Sample GY04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
22NV6B		8.540	-0.091	-0.83	7.570	-0.026	-0.20	LW
3DCBE4		8.664	0.033	0.30	7.578	-0.018	-0.14	PP
4NXKVB		8.410	-0.221	-2.02	7.320	-0.276	-2.13	TM
67R24P	X	7.580	-1.051	-9.58	6.620	-0.976	-7.55	LA
6BJAGJ		8.435	-0.196	-1.79	7.313	-0.282	-2.18	TM
AH4WGQ		8.540	-0.091	-0.83	7.530	-0.066	-0.51	TM
C2PA6E		8.720	0.089	0.81	7.670	0.074	0.57	TA
C6T4TV		8.660	0.029	0.26	7.760	0.164	1.27	TM
CFNBRM		8.660	0.029	0.26	7.609	0.013	0.10	TA
CV3KK4		8.741	0.110	1.00	7.717	0.121	0.94	TM
D243EM		8.518	-0.113	-1.03	7.458	-0.138	-1.07	EM
D9LHWX		8.540	-0.091	-0.83	7.590	-0.006	-0.04	TM
DHREV9		8.499	-0.132	-1.21	7.530	-0.066	-0.51	EM
DZPHLC		8.732	0.101	0.92	7.685	0.089	0.69	TM
FFXEWN		8.669	0.038	0.35	7.591	-0.005	-0.04	LW
GHXWF3		8.600	-0.031	-0.29	7.445	-0.151	-1.17	TA
HEGQN8		8.579	-0.053	-0.48	7.453	-0.143	-1.11	LA
HMBY9Y		8.656	0.025	0.23	7.613	0.017	0.13	EM
JLVZHA		8.701	0.069	0.63	7.756	0.161	1.24	XX
M9TX9N		8.598	-0.033	-0.30	7.562	-0.034	-0.26	TM
MQEHZE		8.553	-0.078	-0.71	7.560	-0.036	-0.28	LA
NXUKQ3		8.680	0.049	0.44	7.640	0.044	0.34	LA
PTUPER		8.632	0.001	0.01	7.668	0.072	0.56	TM
Q4QZEL		8.795	0.164	1.49	7.756	0.160	1.24	XX
R3QCG9		8.801	0.170	1.55	7.817	0.221	1.71	EM
UAZQYH		8.604	-0.027	-0.25	7.551	-0.045	-0.35	LW
UBJABG		8.836	0.205	1.87	7.783	0.187	1.45	EM
V97ZT4		8.389	-0.242	-2.21	7.341	-0.255	-1.97	EM
VHGC8Y		8.699	0.068	0.62	7.567	-0.029	-0.22	TA
W268XE		8.605	-0.026	-0.24	7.565	-0.031	-0.24	TM
WXM36B		8.742	0.111	1.01	7.700	0.104	0.81	EM
WZ9QTH		8.709	0.077	0.71	7.736	0.141	1.09	LW
Y2P347		8.606	-0.025	-0.23	7.555	-0.041	-0.32	PP
ZLYCZA		8.720	0.089	0.81	7.669	0.074	0.57	XX

## Summary Statistics

## Sample GY03

## Sample GY04

Grand Means 8.6313 mils  
SD Btwn Labs 0.1097 mils

7.5957 mils  
0.1293 mils

Statistics based on 33 of 34 reporting participants

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

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**Comments on assigned Data Flags for Test #361**

67R24P (X) - Extreme data.

**Instrument Code List as Reported by the Labs**

(EM) - Emveco

(LA) - L & W Autoline

(LW) - L & W

(PP) - Technidyne Profile/Plus

(TA) - Thwing-Albert

(TM) - TMI

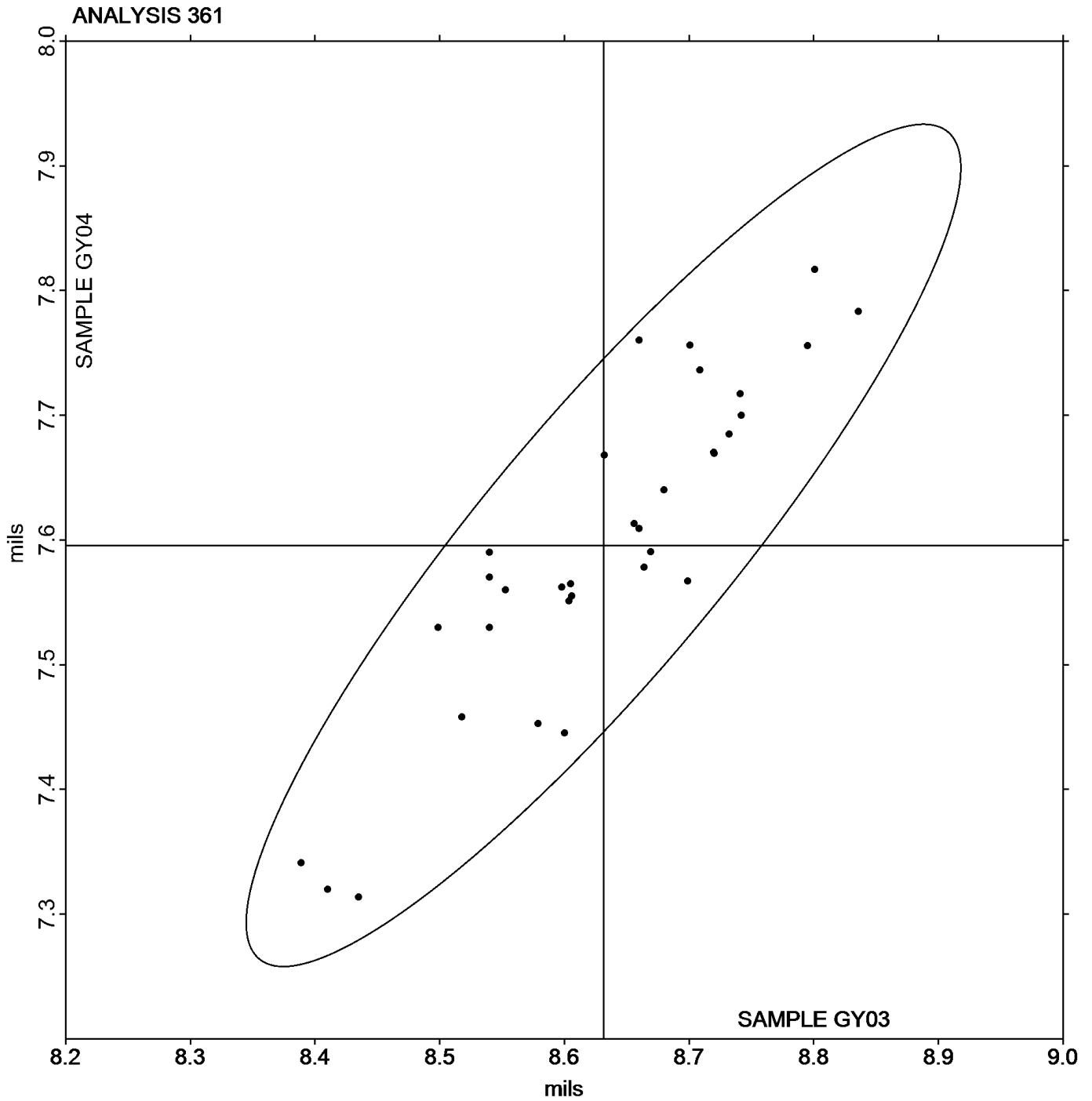
(XX) - Instrument make/model not specified by lab

Analysis 361

Thickness (Caliper), Packaging papers

Grand Mean Sample GY03 = 8.6313 mils

Grand Mean Sample GY04 = 7.5957 mils



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

**Coefficient of Static Friction - Horizontal Plane Method - Printing Papers**

WebCode	Data Flag	Sample GD03			Sample GD04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
89P6WB		0.5320	0.0363	0.43	0.5834	0.0611	0.64	TA
962VKN		0.3944	-0.1013	-1.21	0.3930	-0.1293	-1.36	XX
9CL7DJ		0.4780	-0.0177	-0.21	0.4960	-0.0263	-0.28	XX
JLVZHA		0.5720	0.0763	0.91	0.6418	0.1195	1.25	TM
JVZ4GQ		0.4240	-0.0717	-0.86	0.4358	-0.0865	-0.91	TM
MGT8WE		0.4166	-0.0791	-0.95	0.4496	-0.0727	-0.76	IT
XJH33J		0.4170	-0.0787	-0.94	0.4156	-0.1067	-1.12	TM
Y2W6Z7		0.4962	0.0005	0.01	0.5978	0.0755	0.79	TM
YU2WXD		0.6152	0.1195	1.43	0.5680	0.0457	0.48	XX
ZRYVZJ		0.6120	0.1163	1.39	0.6420	0.1197	1.26	TL

Summary Statistics			
	Sample GD03		Sample GD04
Grand Means	0.49574	COF	0.52230
SD Btwn Labs	0.08374	COF	0.09527
Statistics based on 10 of 10 reporting participants			

**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 |  |

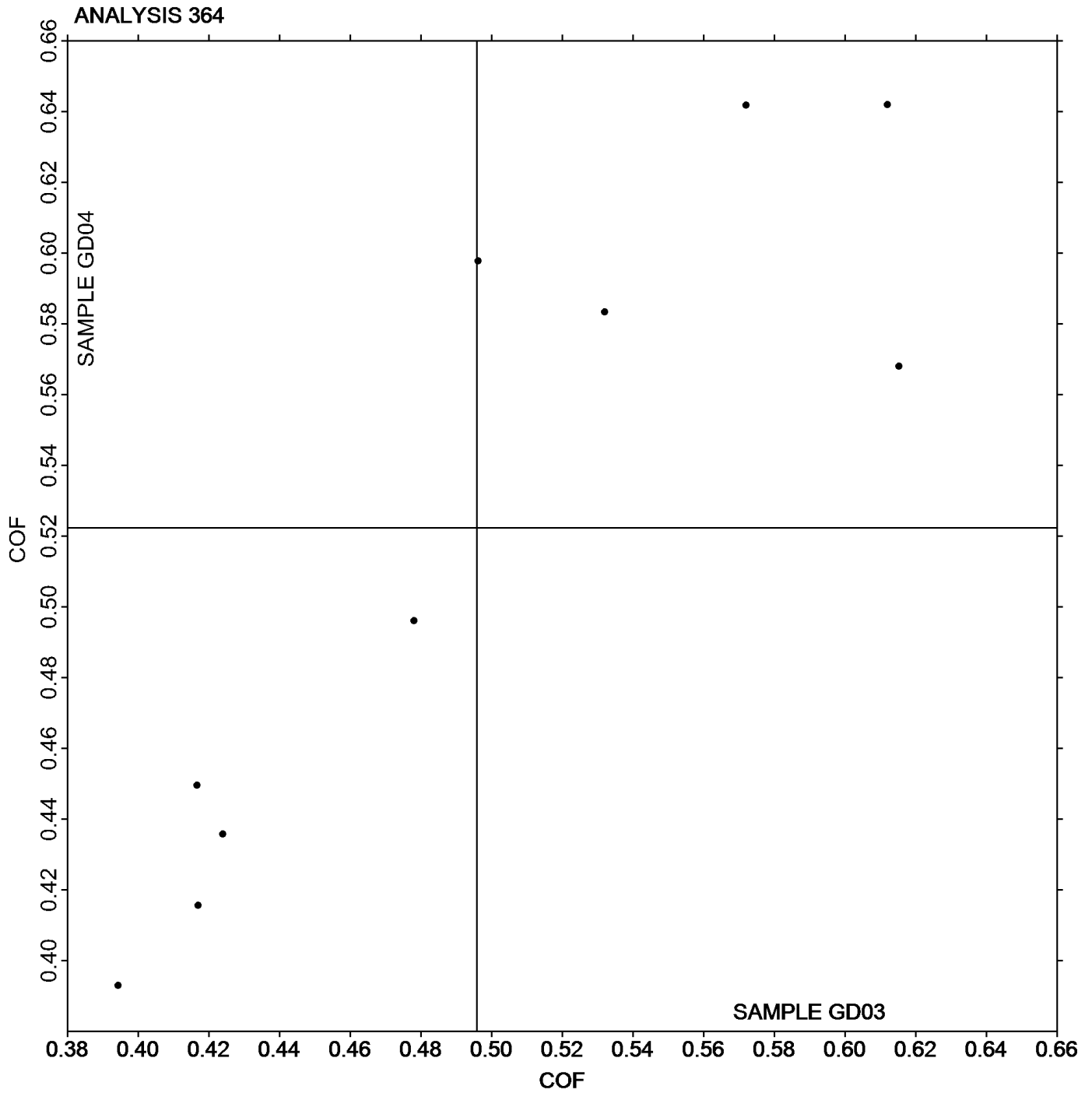


Analysis 364

Coefficient of Static Friction - Horizontal Plane Method - Printing Papers

Grand Mean Sample **GD03** = 0.49574 COF

Grand Mean Sample **GD04** = 0.52230 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 GD03			Sample GD04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
46GH3G		0.5010	0.0846	1.02	0.5444	0.0849	0.84	TA
89P6WB		0.4056	-0.0108	-0.13	0.4398	-0.0197	-0.19	TA
962VKN		0.3104	-0.1060	-1.28	0.3452	-0.1143	-1.13	XX
9CL7DJ		0.4660	0.0496	0.60	0.4660	0.0065	0.06	XX
A7RJJDG		0.4338	0.0174	0.21	0.4740	0.0145	0.14	TM
DHVRMB		0.3284	-0.0880	-1.07	0.3378	-0.1217	-1.20	TA
JLVZHA		0.5150	0.0986	1.19	0.5788	0.1193	1.18	TM
JVZ4GQ		0.3490	-0.0674	-0.82	0.3552	-0.1043	-1.03	TM
K3L8BE		0.3974	-0.0190	-0.23	0.4452	-0.0143	-0.14	TA
MGT8WE		0.3008	-0.1156	-1.40	0.3158	-0.1437	-1.42	IR
Y2W6Z7		0.3940	-0.0224	-0.27	0.5250	0.0655	0.65	TM
ZRYVZJ		0.5700	0.1536	1.86	0.6460	0.1865	1.85	TL
ZUNA9G		0.4420	0.0256	0.31	0.5002	0.0407	0.40	TM

**Summary Statistics**

**Sample GD03**

**Sample GD04**

Grand Means            0.41642 COF  
SD Btwn Labs            0.08254 COF

0.45949 COF  
0.10100 COF

Statistics based on 13 of 13 reporting participants

**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

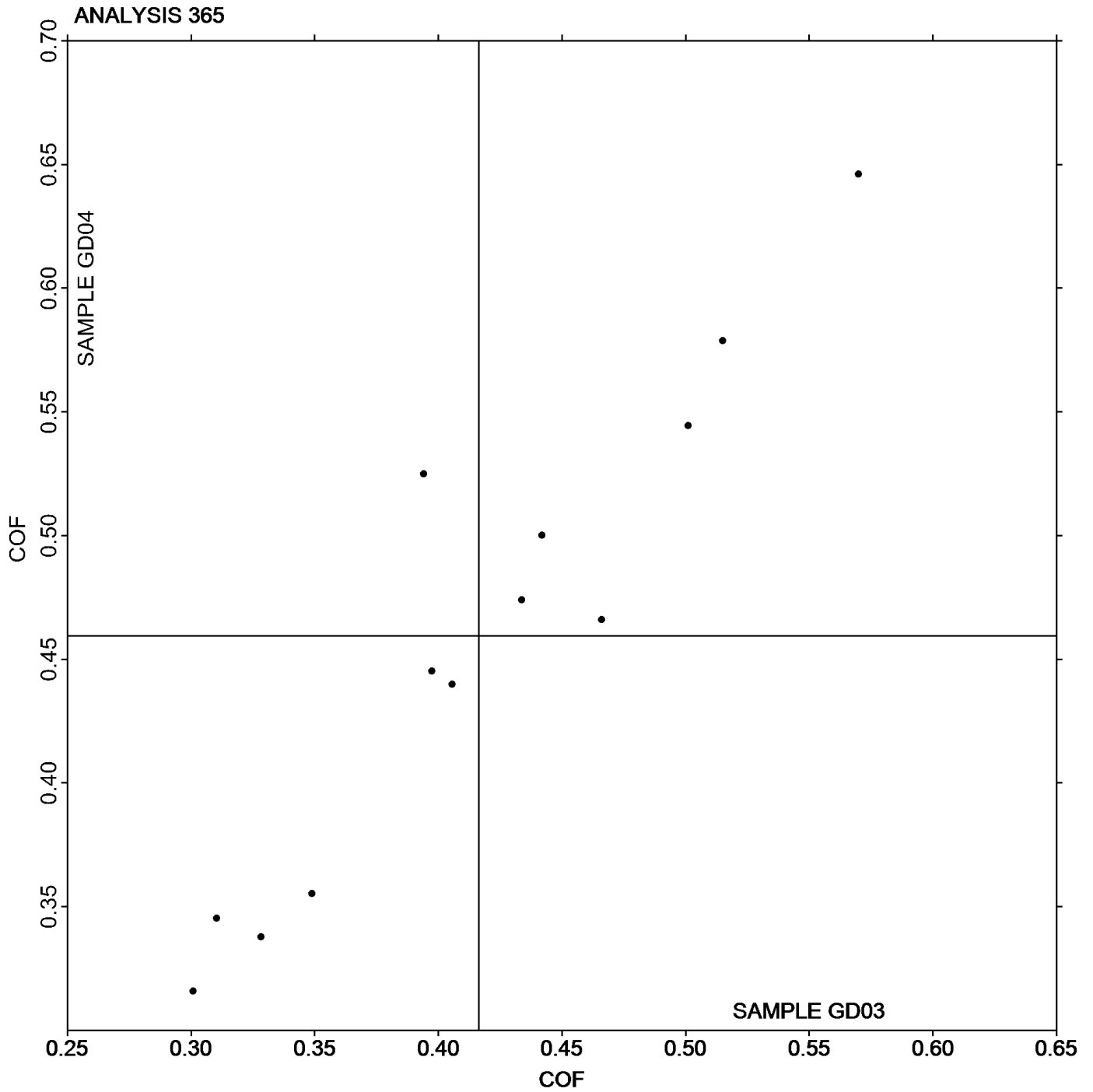
(XX) - Instrument make/model not specified by lab

Analysis 365

Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers

Grand Mean Sample **GD03** = 0.41642 COF

Grand Mean Sample **GD04** = 0.45949 COF



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

## Paper &amp; Paperboard Interlaboratory Testing Program

## Analysis 370

## Air Resistance - Gurley Oil Type

WebCode	Data Flag	Sample GE03			Sample GE04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DCBE4		12.40	0.78	1.00	11.86	0.46	0.77	PP
47UAWJ	*	9.80	-1.82	-2.33	9.61	-1.79	-3.02	XX
48LBWF		11.90	0.28	0.36	12.21	0.81	1.36	XX
4ZQ827		12.06	0.44	0.57	11.62	0.22	0.36	LP
63P3ZY		11.43	-0.19	-0.24	11.39	-0.02	-0.03	HG
67R24P		11.10	-0.52	-0.66	12.00	0.60	1.00	LA
6JCFC7		12.12	0.50	0.64	11.71	0.31	0.51	LP
6Y9FNE		11.50	-0.12	-0.15	12.15	0.75	1.26	TN
89P6WB		12.73	1.11	1.43	11.88	0.48	0.80	WG
962VKN		10.70	-0.92	-1.18	11.10	-0.30	-0.51	GS
9CL7DJ		13.32	1.70	2.18	12.01	0.61	1.02	XX
AEMDM9		11.57	-0.05	-0.06	11.57	0.17	0.28	XX
APPU7D		12.22	0.60	0.77	11.17	-0.23	-0.39	TN
C6T4TV	X	5.84	-5.78	-7.41	5.67	-5.73	-9.65	TL
D3WZHM		12.66	1.04	1.34	12.43	1.03	1.73	XX
D9LHWX		11.36	-0.26	-0.33	11.66	0.26	0.43	XX
DHREV9		11.92	0.30	0.39	11.55	0.15	0.25	PP
EDXTLK	X	16.74	5.12	6.56	15.76	4.36	7.33	LA
EFF8UE		11.26	-0.36	-0.46	11.37	-0.03	-0.06	WG
EL938R		11.80	0.18	0.23	11.60	0.20	0.33	LW
FFXEWN		11.70	0.08	0.10	11.20	-0.20	-0.34	TL
GLYZ8P		10.94	-0.68	-0.88	11.35	-0.05	-0.09	LA
HK4NY4		11.14	-0.48	-0.62	11.20	-0.21	-0.35	PP
JALGVK		10.46	-1.16	-1.49	10.73	-0.67	-1.13	XX
NRKBBU		11.96	0.34	0.43	11.62	0.22	0.36	HG
PTUPER		11.37	-0.25	-0.32	11.09	-0.31	-0.53	GA
Q4QZEL		12.30	0.68	0.87	11.20	-0.20	-0.34	XX
QRFL89		10.76	-0.86	-1.10	10.76	-0.64	-1.08	LP
RXYCY8		12.42	0.80	1.03	12.58	1.18	1.98	GA
T84L2Q		13.11	1.49	1.92	11.79	0.39	0.65	PP
TFWRYX		11.28	-0.34	-0.43	12.11	0.71	1.19	TL
UAZQYH		11.44	-0.17	-0.22	11.50	0.09	0.16	WG
UUTNE2		11.33	-0.29	-0.37	10.81	-0.60	-1.01	LP
VQ4E3F		11.74	0.12	0.16	11.25	-0.15	-0.26	LP
WZ9QTH		11.45	-0.17	-0.22	11.01	-0.39	-0.66	LW
XA88NR	X	9.76	-1.86	-2.38	11.77	0.37	0.62	GS
XJH33J		11.77	0.15	0.19	11.12	-0.29	-0.48	PP
XY7JUA		10.03	-1.59	-2.04	10.26	-1.14	-1.93	TL
Y2P347		11.62	0.00	0.00	10.92	-0.49	-0.82	PP
YJD72Y		11.06	-0.56	-0.71	11.04	-0.36	-0.61	LP
YUWKZV		9.91	-1.71	-2.19	10.21	-1.19	-2.01	RE
YXWV2A		12.37	0.75	0.96	12.02	0.62	1.04	HG
YZZNV9		12.08	0.46	0.59	11.31	-0.09	-0.16	LP

**Paper & Paperboard Interlaboratory Testing Program**

**Analysis 370**

**Air Resistance - Gurley Oil Type**

WebCode	Data Flag	Sample GE03			Sample GE04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
ZLYCZA		12.17	0.55	0.71	11.30	-0.10	-0.18	LW
ZRYVZJ		11.73	0.11	0.15	11.72	0.32	0.53	HG

Summary Statistics			
	Sample GE03		Sample GE04
Grand Means	11.619 sec/100 cc		11.404 sec/100 cc
SD Btwn Labs	0.780 sec/100 cc		0.594 sec/100 cc
Statistics based on 42 of 45 reporting participants			

**Comments on assigned Data Flags for Test #370**

C6T4TV (X) - Extreme data.

EDXTLK (X) - Extreme data.

XA88NR (X) - Inconsistent in testing between samples.

**Instrument Code List as Reported by the Labs**

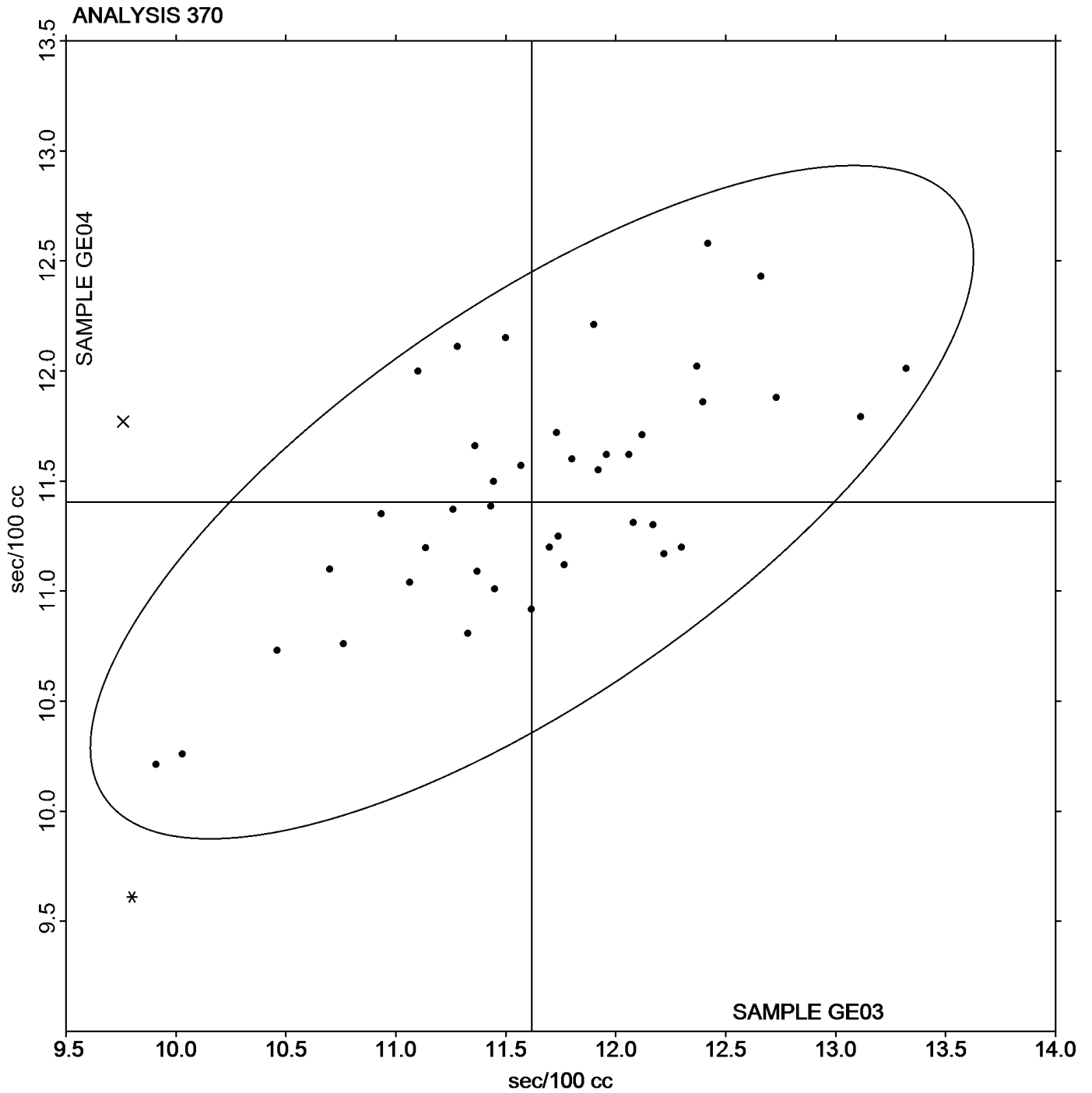
- |  |  |
|--|--|
| (GA) - Gurley Precision #4340 Automatic Densometer     | (GS) - Gurley-Hill S-P-S Tester #4190              |
| (HG) - Technidyne - Hagerty Model #1                   | (LA) - L & W Autoline                              |
| (LP) - L & W Densometer, Air Permeance                 | (LW) - L & W Type Gurley Densometer, Oil Flotation |
| (PP) - Technidyne Profile/Plus                         | (RE) - Regmed Gurley Densometer PGH-T              |
| (TL) - Teledyne Gurley Densometer #4110, Oil Flotation | (TN) - Teledyne Gurley S-P-S Tester #4190          |
| (WG) - W & LE Gurley Tester                            | (XX) - Instrument make/model not specified by lab  |

Analysis 370

Air Resistance - Gurley Oil Type

Grand Mean Sample **GE03** = 11.619 sec/100 cc

Grand Mean Sample **GE04** = 11.404 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 GE03			Sample GE04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
82NR48		204.4	-9.2	-0.48	205.8	-11.3	-0.65	LP
962VKN		166.5	-47.1	-2.48	183.7	-33.4	-1.93	SH
ADVCNC		224.7	11.1	0.59	223.9	6.8	0.39	SH
CHYZAC		216.3	2.7	0.14	222.7	5.6	0.32	TT
CQPNWU	X	160.9	-52.7	-2.78	96.8	-120.3	-6.95	HM
D3WZHM		202.4	-11.2	-0.59	203.2	-13.9	-0.80	XX
DHREV9		212.8	-0.8	-0.04	222.0	4.9	0.28	SH
JNYTC9		204.5	-9.1	-0.48	209.0	-8.1	-0.47	LP
KU6Z6U		217.5	3.9	0.21	224.6	7.5	0.43	PP
PTUPER		229.1	15.5	0.82	215.8	-1.3	-0.08	GA
PWBYL6		209.8	-3.8	-0.20	204.7	-12.4	-0.72	LP
RQF2RX		226.0	12.4	0.66	229.4	12.3	0.71	HM
U2ML7X		249.1	35.5	1.87	259.2	42.1	2.44	VM
VHGC8Y		227.9	14.3	0.76	239.2	22.1	1.28	XX
XXH84P		199.0	-14.5	-0.77	212.5	-4.6	-0.27	GA
XZZGXA		195.6	-18.0	-0.95	201.7	-15.4	-0.89	TT
YXWV2A		231.5	17.9	0.95	216.0	-1.1	-0.06	HM

Summary Statistics			
	Sample GE03		Sample GE04
Grand Means	213.57 Sheffield Units		217.08 Sheffield Units
SD Btwn Labs	18.95 Sheffield Units		17.30 Sheffield Units
Statistics based on 16 of 17 reporting participants			

**Comments on assigned Data Flags for Test #372**

CQPNWU (X) - Extreme data.

**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 |

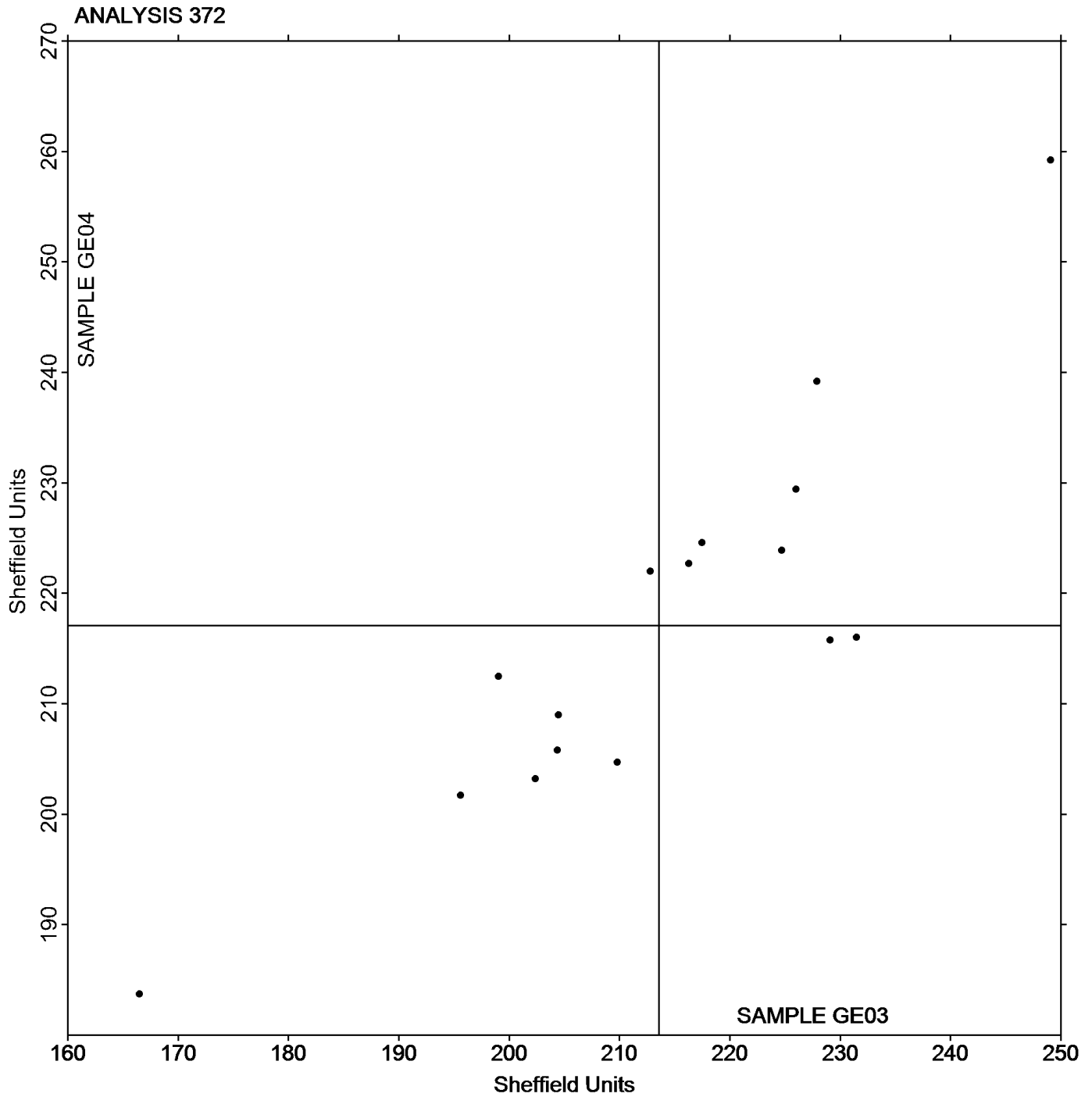
### Paper & Paperboard Interlaboratory Testing Program

#### Analysis 372

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

Grand Mean Sample **GE03** = 213.57 Sheffield Units

Grand Mean Sample **GE04** = 217.08 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 &amp; Paperboard Interlaboratory Testing Program

## Analysis 376

## Roughness - Print Surf Method - 0.5 to 4.0 Microns

WebCode	Data Flag	Sample GJ03			Sample GJ04		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
22NV6B	X	1.2600	0.5066	5.71	1.601	0.421	5.85
3DCBE4		0.7180	-0.0354	-0.40	1.190	0.010	0.14
46GH3G		0.6230	-0.1304	-1.47	1.109	-0.071	-0.99
68EJ8J		0.7430	-0.0104	-0.12	1.151	-0.029	-0.41
89P6WB		0.8160	0.0626	0.71	1.097	-0.083	-1.16
9CL7DJ		0.6690	-0.0844	-0.95	1.131	-0.049	-0.68
AMGE78		0.8655	0.1121	1.26	1.275	0.095	1.32
CEXWHP		0.7450	-0.0084	-0.09	1.193	0.013	0.18
CQPNWU		0.5520	-0.2014	-2.27	1.064	-0.116	-1.62
DCQ4UW		0.9810	0.2276	2.57	1.290	0.110	1.53
DHREV9		0.6910	-0.0624	-0.70	1.154	-0.026	-0.36
DHVRMB		0.8190	0.0656	0.74	1.320	0.140	1.94
DTVLN2	X	0.3500	-0.4034	-4.55	0.349	-0.831	-11.56
FXCVYH		0.7490	-0.0044	-0.05	1.221	0.041	0.57
HEGQN8		0.7680	0.0146	0.16	1.212	0.032	0.44
HK4NY4		0.7110	-0.0424	-0.48	1.180	0.000	0.00
HMBY9Y	X	0.5030	-0.2504	-2.82	0.482	-0.698	-9.71
KPQ96G		0.7670	0.0136	0.15	1.274	0.094	1.30
MB2Z7F		0.7830	0.0296	0.33	1.159	-0.021	-0.30
MQEHZE		0.6300	-0.1234	-1.39	1.021	-0.159	-2.21
NXUKQ3		0.7900	0.0366	0.41	1.140	-0.040	-0.56
PUJ4NP	X	1.1630	0.4096	4.62	1.244	0.064	0.89
QGHLPN	X	3.1020	2.3486	26.47	5.215	4.035	56.09
R3QCG9		0.8650	0.1116	1.26	1.239	0.059	0.82
UBJABG		0.7370	-0.0164	-0.18	1.201	0.021	0.29
V97ZT4		0.8590	0.1056	1.19	1.237	0.057	0.79
VQ4E3F		0.7250	-0.0284	-0.32	1.141	-0.039	-0.55
WXM36B		0.7120	-0.0414	-0.47	1.229	0.049	0.68
Y2P347		0.7460	-0.0074	-0.08	1.156	-0.024	-0.34
YUC3YV		0.7700	0.0166	0.19	1.122	-0.058	-0.81

## Sample GJ03

Grand Means 0.75338 Microns  
SD Btwn Labs 0.08874 Microns

## Summary Statistics

## Sample GJ04

1.1802 Microns  
0.0719 Microns

Statistics based on 25 of 30 reporting participants

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

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**Comments on assigned Data Flags for Test #376**

22NV6B (X) - Data for both samples are high.

DTVLN2 (X) - Extreme data.

HMBY9Y (X) - Extreme data.

PUJ4NP (X) - Data for Sample GJ03 are high. Inconsistent in testing within determinations for Sample GJ03.

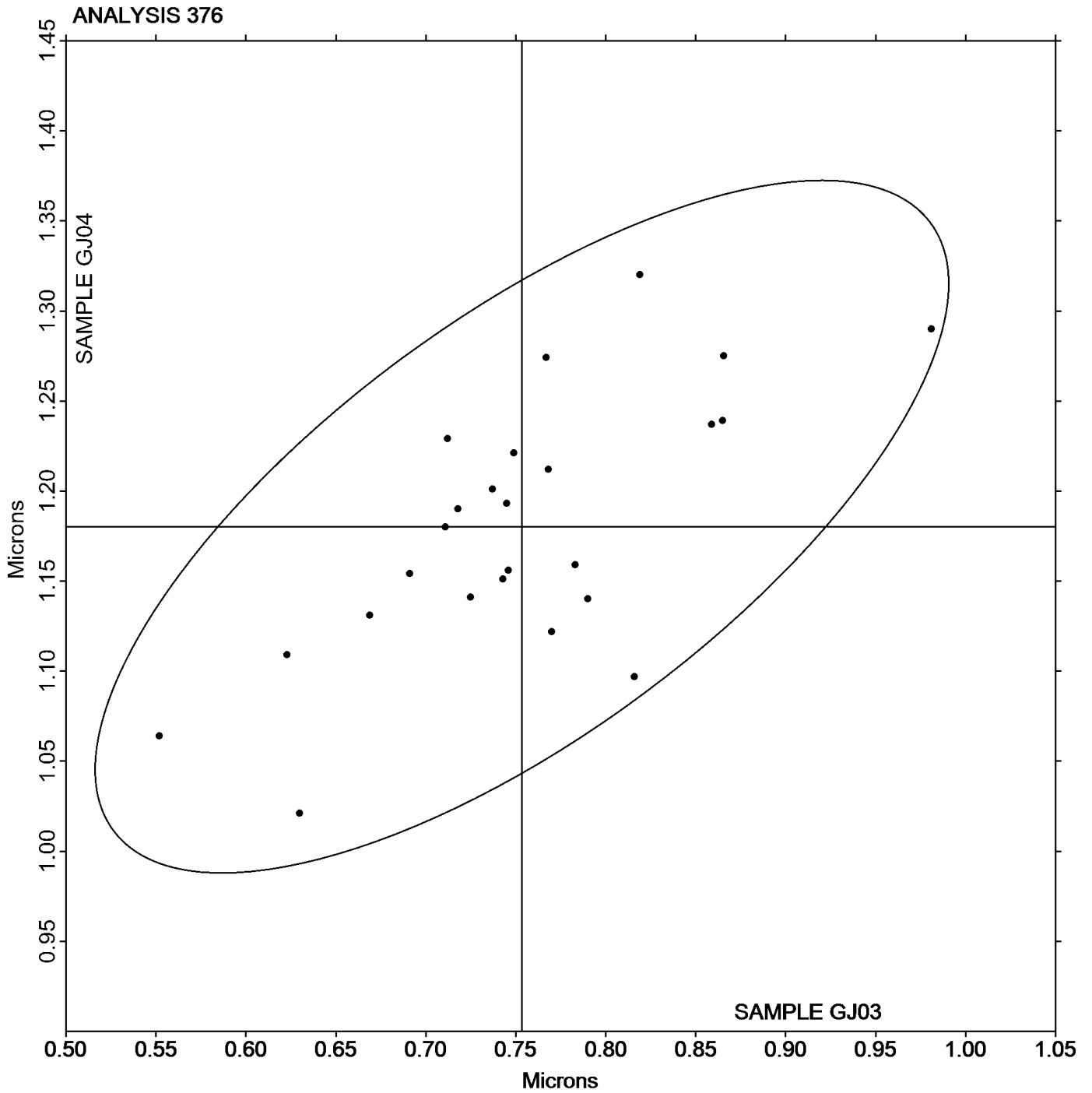
QGHLPN (X) - Extreme data.

Analysis 376

Roughness - Print Surf Method - 0.5 to 4.0 Microns

Grand Mean Sample **GJ03** = 0.75338 Microns

Grand Mean Sample **GJ04** = 1.1802 Microns



## Paper &amp; Paperboard Interlaboratory Testing Program

## Analysis 377

## Roughness - Print Surf Method - 2.5 to 6.0 Microns

WebCode	Data Flag	Sample GK03			Sample GK04		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
89P6WB		1.586	-0.202	-1.44	1.242	-0.175	-1.37
FFXEWN		1.678	-0.110	-0.78	1.327	-0.090	-0.70
GLYZ8P		1.630	-0.158	-1.12	1.355	-0.062	-0.49
KPQ96G		1.991	0.203	1.44	1.474	0.057	0.44
U2ML7X		1.978	0.190	1.34	1.705	0.288	2.24
VLD8FZ		1.774	-0.014	-0.10	1.404	-0.013	-0.10
XJH33J		1.798	0.010	0.07	1.453	0.036	0.28
YU2WXD		1.828	0.040	0.28	1.418	0.001	0.01
ZRYVZJ		1.833	0.045	0.32	1.378	-0.039	-0.31

## Summary Statistics

## Sample GK03

## Sample GK04

Grand Means            1.7884 Microns  
SD Btwn Labs            0.1410 Microns

1.4173 Microns  
0.1283 Microns

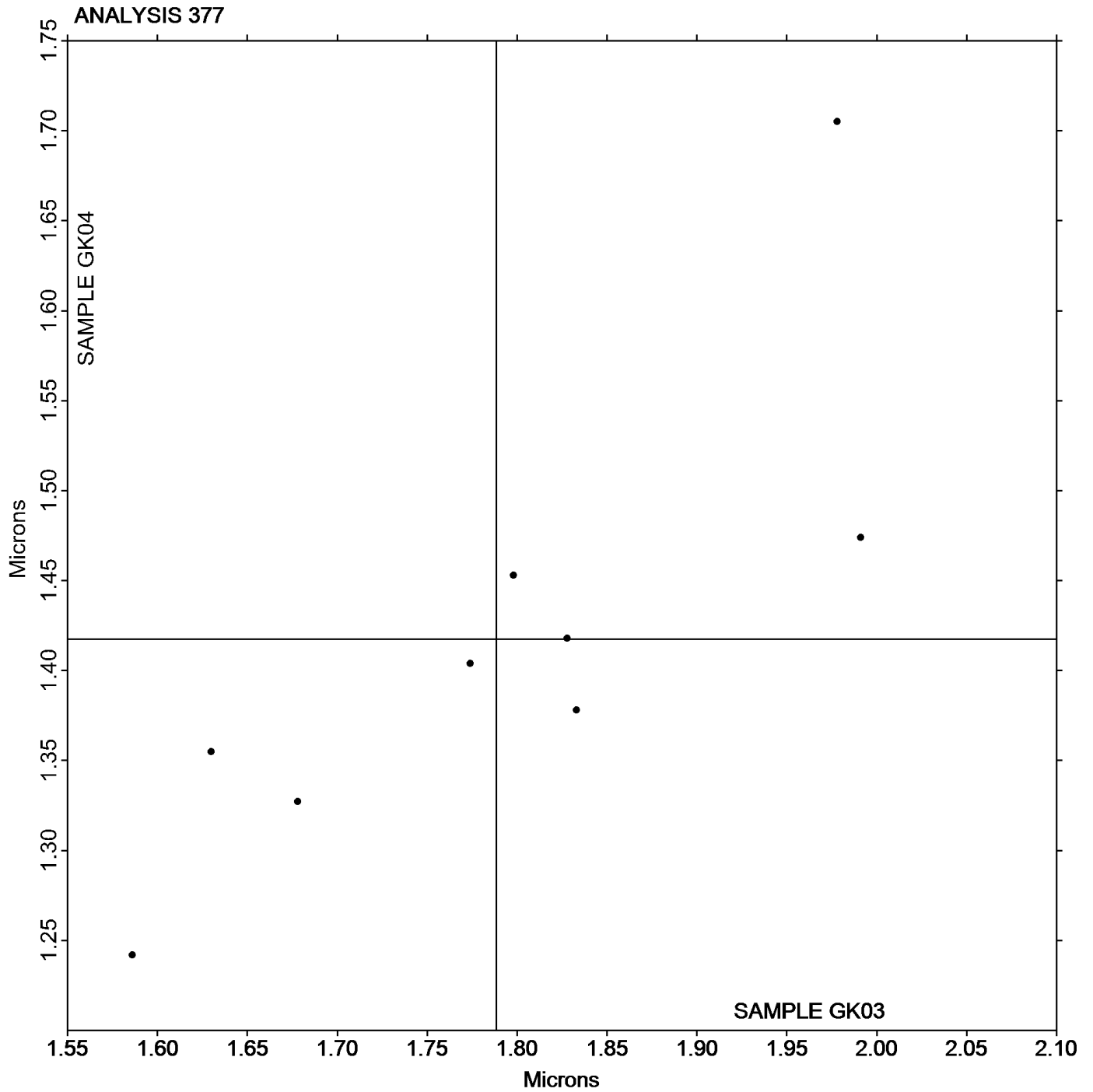
Statistics based on 9 of 9 reporting participants

Analysis 377

Roughness - Print Surf Method - 2.5 to 6.0 Microns

Grand Mean Sample **GK03** = 1.7884 Microns

Grand Mean Sample **GK04** = 1.4173 Microns



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

## Paper &amp; Paperboard Interlaboratory Testing Program

## Analysis 378

## Roughness - Sheffield Type

WebCode	Data Flag	Sample GL03			Sample GL04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
22NV6B		172.0	8.8	0.72	118.5	15.9	1.45	GL
3DCBE4		156.5	-6.6	-0.55	100.5	-2.1	-0.19	PP
3HP4K2		165.2	2.0	0.17	114.1	11.5	1.05	TT
46GH3G		174.6	11.4	0.94	99.9	-2.7	-0.25	HM
47UAWJ		162.2	-1.0	-0.08	100.4	-2.2	-0.20	PP
4NXKVB	*	197.0	33.8	2.77	134.5	31.9	2.91	GL
63P3ZY		169.6	6.4	0.53	96.8	-5.8	-0.53	HM
67R24P	X	306.2	143.0	11.73	276.0	173.4	15.85	LA
6YCYD4		167.7	4.5	0.37	101.6	-1.0	-0.09	GA
82NR48		163.5	0.3	0.03	107.1	4.5	0.41	LW
962VKN	*	180.8	17.6	1.45	131.0	28.4	2.60	XX
ADVCNC		159.8	-3.4	-0.28	101.4	-1.2	-0.11	SH
APPU7D	X	133.5	-29.7	-2.43	106.4	3.8	0.35	TS
B3RHX8		159.1	-4.1	-0.33	101.8	-0.8	-0.08	MP
CV3KK4	*	188.2	25.0	2.05	105.1	2.5	0.23	HM
D3WZHM	*	139.2	-24.0	-1.97	101.3	-1.3	-0.12	XX
DDFG99		148.7	-14.5	-1.19	96.7	-5.9	-0.54	LA
DHREV9		154.5	-8.7	-0.71	97.3	-5.3	-0.48	PP
DHVRMB		160.6	-2.6	-0.21	97.1	-5.5	-0.50	HM
DZPHLC		175.4	12.2	1.00	128.3	25.7	2.35	TT
EDXTLK		143.1	-20.1	-1.65	83.5	-19.1	-1.75	LA
EFF8UE		179.8	16.6	1.36	112.7	10.1	0.92	PG
EL938R		163.1	-0.1	-0.01	107.2	4.6	0.42	SH
FFXEWN		183.5	20.4	1.67	110.2	7.6	0.69	PP
FXCVYH		167.5	4.3	0.35	97.1	-5.5	-0.50	HM
GHXWF3		161.6	-1.5	-0.13	98.9	-3.7	-0.34	PP
GLYZ8P		150.4	-12.8	-1.05	95.2	-7.4	-0.68	LA
HK4NY4		154.7	-8.5	-0.70	96.9	-5.7	-0.52	PP
HMBY9Y		154.1	-9.0	-0.74	96.4	-6.2	-0.57	PP
HRMTCB		147.0	-16.2	-1.33	101.4	-1.2	-0.11	SH
JNYTC9		168.0	4.8	0.40	99.2	-3.4	-0.31	PP
JVZ4GQ	X	4.2	-159.0	-13.04	7.5	-95.1	-8.69	HM
KU6Z6U		153.4	-9.8	-0.80	93.9	-8.7	-0.80	PP
KWAEZ3	*	173.6	10.4	0.86	130.1	27.5	2.51	TS
M9TX9N		161.5	-1.7	-0.14	112.2	9.5	0.87	GA
MQEHZE		158.8	-4.4	-0.36	103.1	0.5	0.05	LA
NRKBBU	X	224.7	61.5	5.05	122.7	20.1	1.84	HM
NXUKQ3		162.4	-0.8	-0.07	98.1	-4.5	-0.41	LA
PTUPER		157.0	-6.2	-0.51	95.4	-7.2	-0.66	HM
QCE7UR		155.3	-7.9	-0.65	95.8	-6.8	-0.62	XX
R3QCG9		156.8	-6.4	-0.52	94.0	-8.6	-0.79	HM
RQF2RX		169.6	6.4	0.53	98.8	-3.8	-0.35	HM
T84L2Q		170.1	6.9	0.57	108.1	5.5	0.50	PP

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

WebCode	Data Flag	Sample GL03			Sample GL04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
U4FHQK	*	129.0	-34.2	-2.80	85.4	-17.2	-1.57	TS
UBJABG		159.8	-3.4	-0.28	100.9	-1.8	-0.16	PP
V97ZT4	X	162.5	-0.7	-0.06	132.5	29.9	2.73	TS
VHGC8Y		160.6	-2.6	-0.21	100.7	-1.9	-0.17	HM
VLD8FZ		186.8	23.6	1.94	106.6	4.0	0.37	HM
VQ4E3F		163.8	0.6	0.05	114.7	12.1	1.11	TS
WXM36B		170.7	7.5	0.62	108.5	5.9	0.54	PP
XA88NR		160.0	-3.2	-0.26	100.0	-2.6	-0.24	SH
XJH33J		163.6	0.4	0.04	99.5	-3.1	-0.29	PP
XXH84P		157.4	-5.8	-0.47	103.8	1.2	0.11	GA
XY7JUA	X	108.8	-54.4	-4.46	130.7	28.1	2.56	VM
XZZGXA	*	142.7	-20.5	-1.68	74.6	-28.0	-2.56	TT
Y2P347		165.9	2.7	0.23	94.4	-8.2	-0.75	PP
YTXN3K		161.2	-2.0	-0.16	99.4	-3.2	-0.29	PP
YU2WXD		165.4	2.2	0.18	94.9	-7.7	-0.70	HM
YUC3YV		178.5	15.3	1.26	112.0	9.4	0.86	TT
YXWV2A		166.8	3.6	0.30	96.7	-5.9	-0.54	HM
YZZNV9		158.1	-5.1	-0.42	94.3	-8.3	-0.76	XX
ZRYVZJ		161.5	-1.7	-0.14	97.9	-4.7	-0.43	HM

**Summary Statistics**

**Sample GL03**

**Sample GL04**

Grand Means                    163.18 Sheffield  
SD Btw Labs                    12.19 Sheffield

102.60 Sheffield  
10.94 Sheffield

Statistics based on 56 of 62 reporting participants

**Comments on assigned Data Flags for Test #378**

67R24P (X) - Extreme data.

APPU7D (X) - Inconsistent in testing between samples.

JVZ4GQ (X) - Extreme data.

NRKBBU (X) - Data for Sample GL03 are high. Inconsistent in testing within the determinations for both samples.

V97ZT4 (X) - Data for Sample GL04 are high. Inconsistent in testing within determinations for Sample GL04.

XY7JUA (X) - Data for Sample GL03 are low.

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

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**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	(VM) - Valmet PaperLab (was KajaaniRobotest)
(XX) - Instrument make/model not specified by lab	



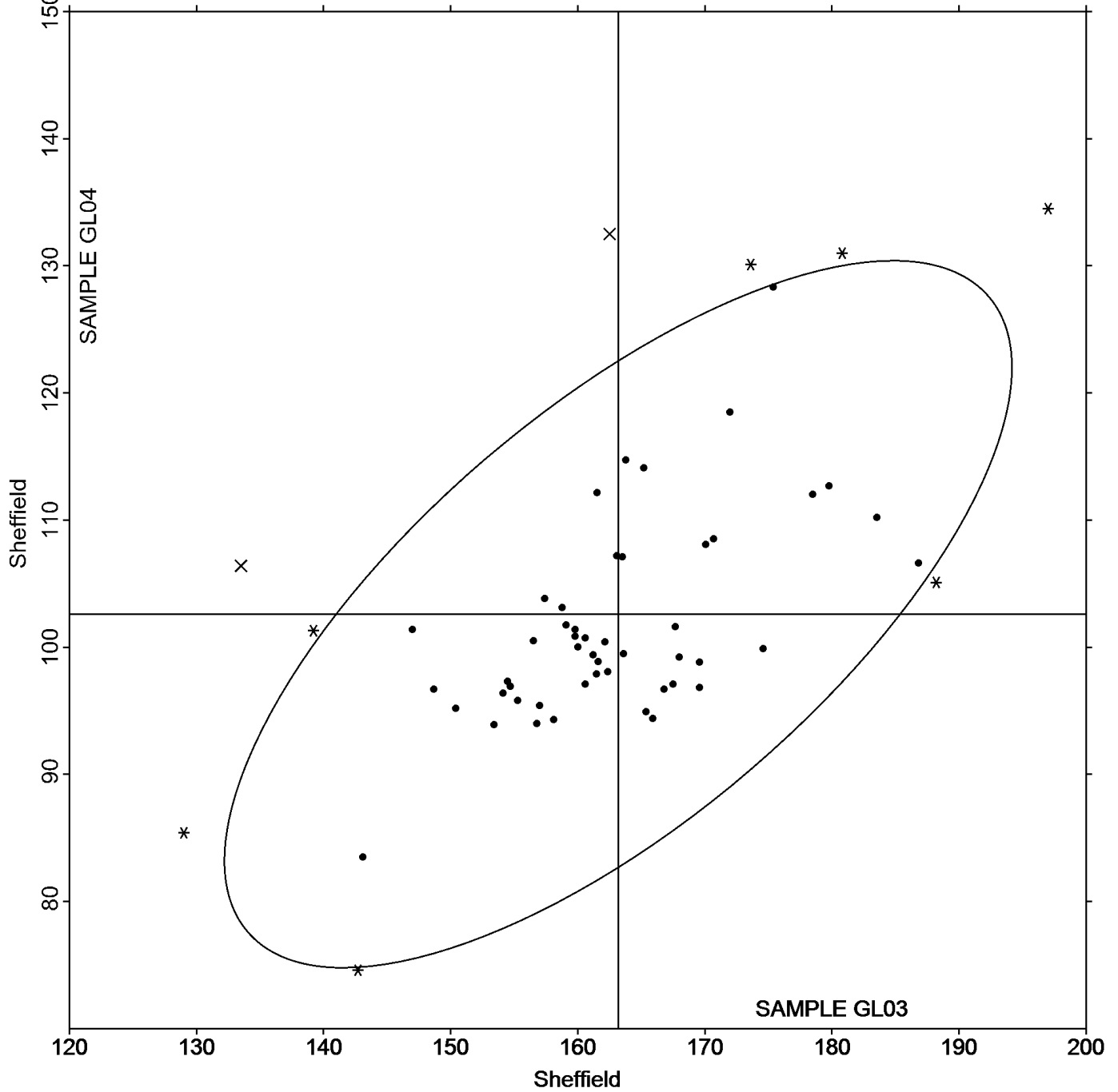
Analysis 378

Roughness - Sheffield Type

Grand Mean Sample **GL03** = 163.18 Sheffield

Grand Mean Sample **GL04** = 102.60 Sheffield

ANALYSIS 378



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

WebCode	Data Flag	Sample GM03			Sample GM04		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
4ZQ827		4.270	-0.512	-1.35	4.181	-0.450	-1.19
A22WRB		4.470	-0.312	-0.82	4.435	-0.196	-0.52
CV3KK4		4.851	0.069	0.18	4.749	0.118	0.31
DCQ4UW		4.610	-0.171	-0.45	4.585	-0.047	-0.12
DZPHLC	X	7.120	2.338	6.15	6.270	1.639	4.32
RUDFHV		5.430	0.648	1.71	5.194	0.563	1.48
X9YQX9		4.820	0.038	0.10	4.660	0.029	0.08
YU2WXD		4.610	-0.172	-0.45	4.160	-0.471	-1.24
YUWKZV		5.191	0.410	1.08	5.087	0.456	1.20

		Summary Statistics	
	Sample GM03		Sample GM04
Grand Means	4.7816 Percent		4.6314 Percent
SD Btwn Labs	0.3803 Percent		0.3789 Percent
Statistics based on 8 of 9 reporting participants			

**Comments on assigned Data Flags for Test #382**

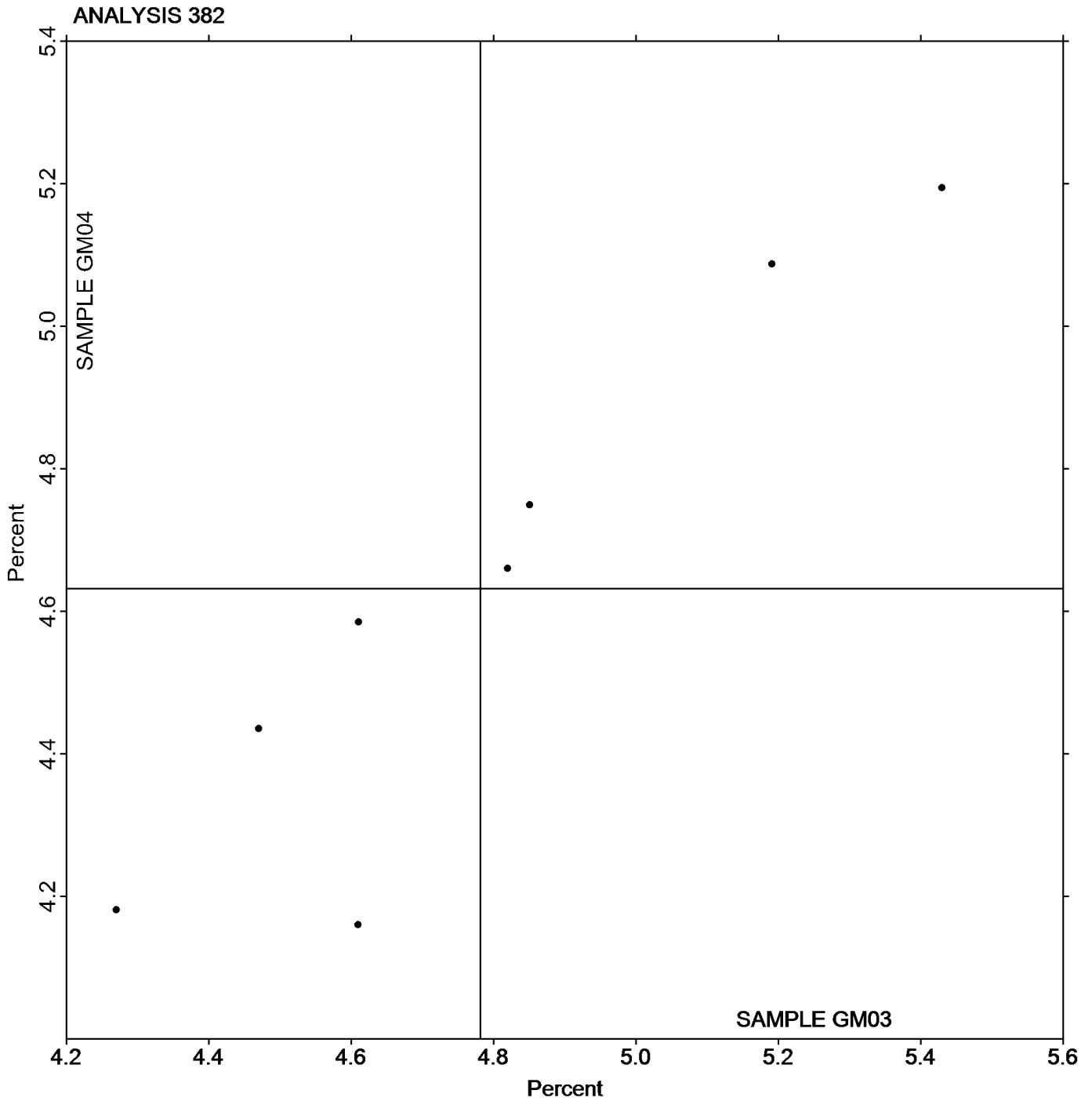
DZPHLC (X) - Extreme data.

# Paper & Paperboard Interlaboratory Testing Program

## Analysis 382 Moisture in Paper

Grand Mean Sample **GM03** = 4.7816 Percent

Grand Mean Sample **GM04** = 4.6314 Percent



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

## Paper &amp; Paperboard Interlaboratory Testing Program

## Analysis 384

## Opacity (89% Reflectance Backing) - Fine Papers

WebCode	Data Flag	Sample GN03			Sample GN04		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
46GH3G		86.94	0.16	0.27	93.71	0.31	0.77
47UAWJ		86.68	-0.10	-0.16	93.81	0.41	1.02
4C3GMB		87.53	0.75	1.25	94.20	0.80	1.99
4NXKVB		86.73	-0.05	-0.08	93.30	-0.10	-0.25
962VKN	X	81.29	-5.49	-9.11	91.69	-1.71	-4.26
9CL7DJ		86.65	-0.13	-0.21	93.29	-0.11	-0.27
ADVCNC		86.86	0.08	0.14	93.18	-0.22	-0.54
AMGE78		87.08	0.30	0.51	93.32	-0.08	-0.20
APPU7D		87.33	0.55	0.92	93.60	0.20	0.50
D3WZHM	*	85.80	-0.98	-1.62	92.35	-1.05	-2.61
D9LHWX		86.00	-0.78	-1.29	93.34	-0.06	-0.15
DHVRMB		87.42	0.65	1.08	94.02	0.62	1.54
DTVLN2		87.00	0.22	0.37	93.46	0.06	0.15
EDXTLK		85.90	-0.88	-1.45	93.04	-0.36	-0.90
EFF8UE		87.14	0.37	0.61	93.22	-0.19	-0.46
EL938R		87.13	0.35	0.58	93.15	-0.25	-0.62
FFXEWN		86.33	-0.45	-0.74	93.28	-0.12	-0.30
GLYZ8P	*	84.95	-1.83	-3.03	92.31	-1.09	-2.71
HK4NY4		86.73	-0.05	-0.08	93.30	-0.10	-0.25
HRMTCB		87.02	0.24	0.41	93.53	0.13	0.32
JALGVK		86.58	-0.19	-0.32	93.17	-0.23	-0.57
JVZ4GQ		87.41	0.63	1.05	94.04	0.64	1.60
NRKBBU		87.01	0.23	0.39	93.71	0.31	0.77
PTUPER		86.81	0.03	0.06	92.98	-0.42	-1.05
QCE7UR		87.14	0.36	0.61	93.69	0.29	0.72
T84L2Q		86.73	-0.05	-0.08	93.50	0.10	0.25
VDLLGU		85.50	-1.28	-2.12	93.13	-0.27	-0.67
VHGC8Y		86.34	-0.44	-0.72	93.09	-0.31	-0.77
VLD8FZ		87.49	0.71	1.18	93.89	0.49	1.22
XA88NR		86.67	-0.11	-0.17	93.54	0.14	0.35
XJH33J		86.94	0.17	0.28	93.38	-0.02	-0.04
XY7JUA		87.85	1.07	1.78	93.62	0.21	0.53
YTXN3K		86.93	0.15	0.26	93.45	0.05	0.12
YU2WXD		87.11	0.33	0.56	93.62	0.22	0.55
YXWV2A		86.63	-0.14	-0.24	93.39	-0.01	-0.02

## Sample GN03

## Summary Statistics

## Sample GN04

Grand Means 86.775 Percent  
SD Btwn Labs 0.602 Percent

93.400 Percent  
0.402 Percent

Statistics based on 34 of 35 reporting participants

**Comments on assigned Data Flags for Test #384**

962VKN (X) - Extreme data.

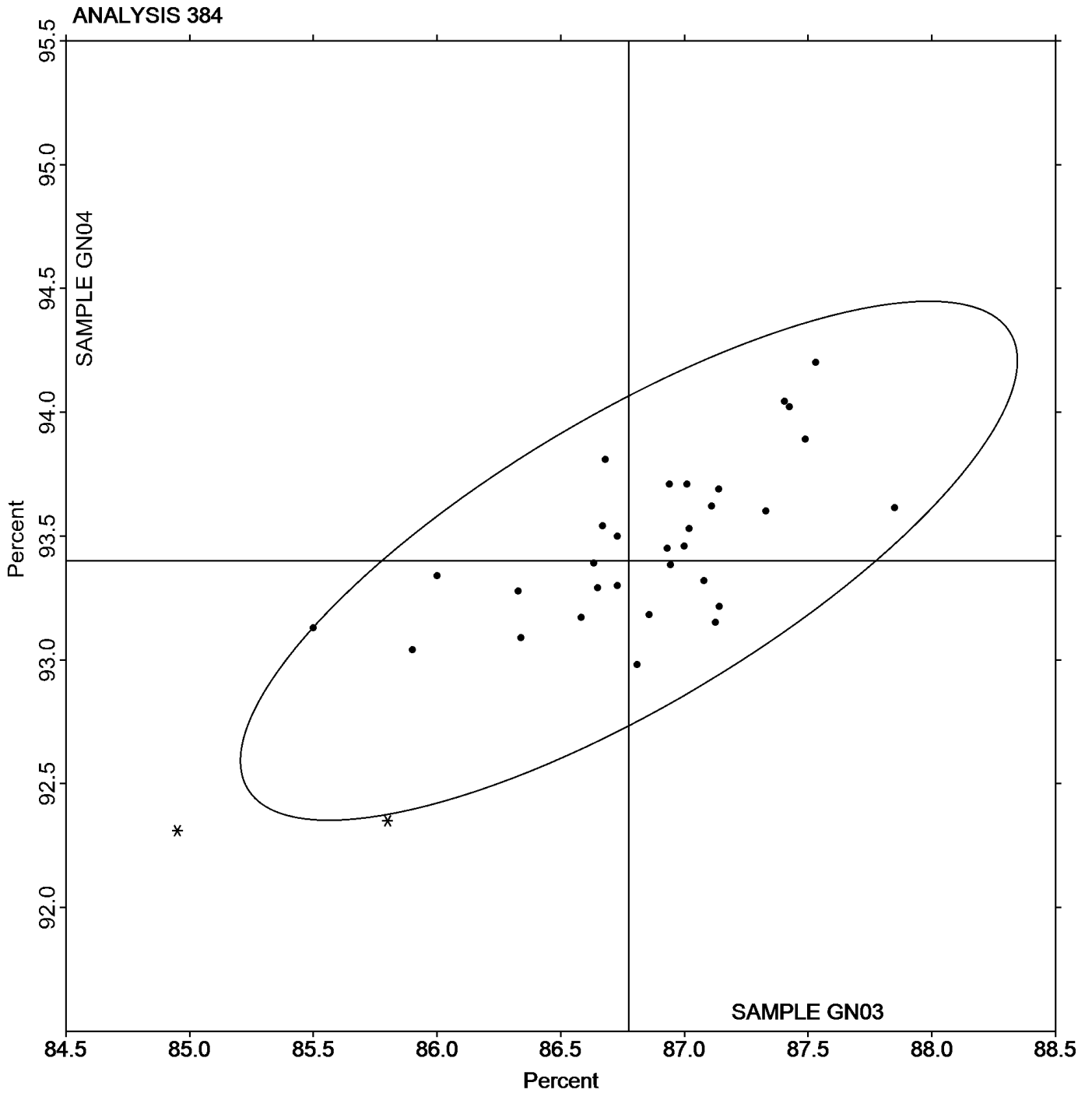
# Paper & Paperboard Interlaboratory Testing Program

## Analysis 384

### Opacity (89% Reflectance Backing) - Fine Papers

Grand Mean Sample **GN03** = 86.775 Percent

Grand Mean Sample **GN04** = 93.400 Percent



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

WebCode	Data Flag	Sample GP03			Sample GP04		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
273CUR		89.02	-0.01	-0.04	93.57	0.11	2.24
3TB3KR		89.00	-0.02	-0.14	93.53	0.07	1.54
4ZQ827		89.26	0.23	1.69	93.45	-0.01	-0.15
82NR48		88.93	-0.09	-0.68	93.34	-0.12	-2.56
8YGA8X		88.96	-0.06	-0.44	93.41	-0.05	-0.93
AMGE78		89.09	0.07	0.49	93.42	-0.04	-0.79
C6T4TV	X	73.78	-15.24	-110.95	83.29	-10.17	-209.26
DHVRMB		89.10	0.07	0.54	93.46	0.00	0.00
JLVZHA		89.15	0.12	0.89	93.43	-0.03	-0.66
LCZW6Q		89.06	0.03	0.24	93.49	0.03	0.63
Q4QZEL		88.97	-0.06	-0.40	93.47	0.01	0.24
QRFL89		88.83	-0.19	-1.41	93.47	0.01	0.22
RQF2RX		89.39	0.36	2.63	93.48	0.02	0.32
VLD8FZ		89.11	0.09	0.65	93.47	0.01	0.26
WZ9QTH		89.04	0.01	0.09	93.48	0.02	0.32
YJD72Y		88.87	-0.15	-1.11	93.41	-0.05	-1.07
YUWKZV		88.91	-0.12	-0.84	93.46	0.00	-0.07
YXWV2A		88.93	-0.10	-0.71	93.46	0.00	-0.07
Z9BAJ3		88.90	-0.13	-0.93	93.46	0.00	0.08
ZLYCZA		88.95	-0.07	-0.53	93.48	0.02	0.43

		Summary Statistics			
		Sample GP03		Sample GP04	
Grand Means		89.023	Percent	93.459	Percent
SD Btwn Labs		0.137	Percent	0.049	Percent
Statistics based on 19 of 20 reporting participants					

**Comments on assigned Data Flags for Test #386**

C6T4TV (X) - Extreme data.

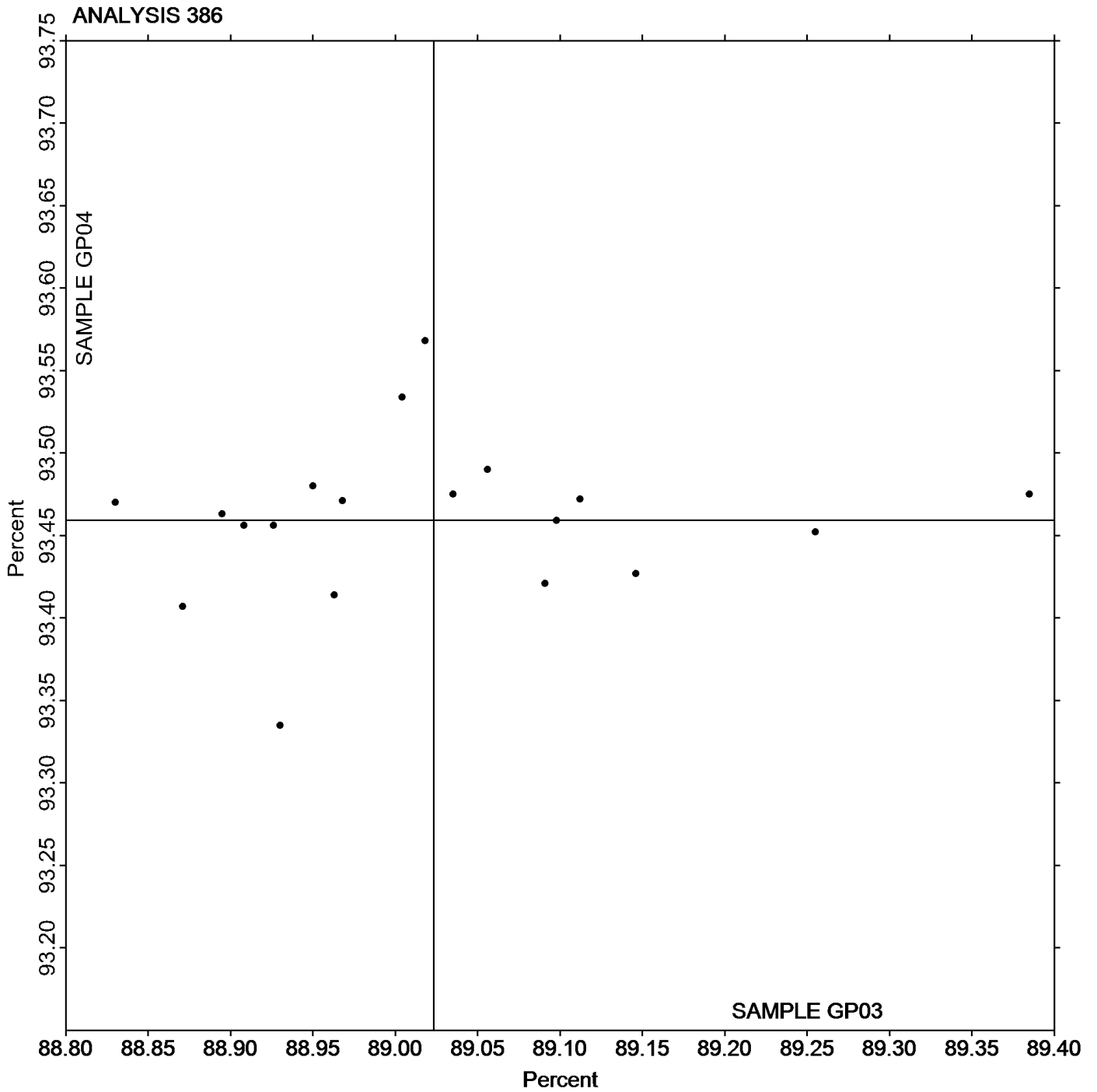
# Paper & Paperboard Interlaboratory Testing Program

## Analysis 386

### Opacity (Paper Backing) - Fine Papers and Newsprint

Grand Mean Sample **GP03** = 89.023 Percent

Grand Mean Sample **GP04** = 93.459 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 GR03			Sample GR04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
22NV6B		83.85	1.42	1.14	83.85	1.14	0.89	TT
46GH3G		81.65	-0.78	-0.63	81.98	-0.73	-0.57	TS
962VKN	*	85.75	3.32	2.66	85.70	2.99	2.33	PE
9CL7DJ		81.30	-1.13	-0.91	81.20	-1.51	-1.18	TT
A22WRB		82.53	0.09	0.08	82.55	-0.16	-0.13	XX
AMGE78		80.88	-1.55	-1.24	80.79	-1.92	-1.50	TT
APPU7D		81.54	-0.89	-0.72	81.69	-1.02	-0.80	PE
D3WZHM		84.49	2.06	1.65	84.50	1.79	1.40	XX
D9LHWX		83.48	1.04	0.84	83.95	1.24	0.97	TS
DHVRMB		80.66	-1.77	-1.42	80.78	-1.93	-1.51	TS
DTVLN2		82.66	0.22	0.18	82.74	0.03	0.02	XX
EFF8UE		83.35	0.92	0.74	84.07	1.36	1.06	TS
GHXWF3		81.03	-1.40	-1.12	80.94	-1.77	-1.38	TS
GLYZ8P		82.85	0.41	0.33	83.68	0.97	0.76	TS
HMBY9Y		82.33	-0.11	-0.09	83.34	0.63	0.49	TT
HRMTCB		80.69	-1.74	-1.40	81.08	-1.64	-1.28	TA
JALGVK		81.63	-0.80	-0.64	81.83	-0.89	-0.69	TS
NZHXH7		84.08	1.64	1.32	84.20	1.49	1.16	HG
PTUPER		81.63	-0.80	-0.64	82.78	0.07	0.05	XX
QCE7UR		82.41	-0.02	-0.02	82.39	-0.32	-0.25	XX
T84L2Q	X	81.71	-0.72	-0.58	83.70	0.99	0.77	TT
UBJABG		83.47	1.04	0.83	83.43	0.72	0.56	HD
V97ZT4		82.50	0.07	0.05	82.78	0.06	0.05	TS
VHGC8Y		82.02	-0.41	-0.33	82.55	-0.16	-0.12	GM
WXM36B		82.56	0.12	0.10	82.72	0.01	0.01	HD
YTXN3K		82.99	0.56	0.45	83.70	0.99	0.77	XX
YUC3YV		82.44	0.01	0.00	82.94	0.23	0.18	TT
YXWV2A		80.91	-1.52	-1.22	81.06	-1.65	-1.29	TS

Summary Statistics			
	Sample GR03		Sample GR04
Grand Means	82.431 Percent		82.710 Percent
SD Btwn Labs	1.249 Percent		1.282 Percent
Statistics based on 27 of 28 reporting participants			

**Comments on assigned Data Flags for Test #390**

T84L2Q (X) - Inconsistent in testing between samples.

**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 390**  
**Directional Brightness**

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**Instrument Code List as Reported by the Labs**

(GM) - Gretag Macbeth Color i5	(HD) - Hunter D25DP - 9000
(HG) - Hunter Labscan / XE	(PE) - Photovolt 577
(TA) - Technidyne, Diano, M.S. S-4	(TS) - Technidyne Brightimeter Micro S-5
(TT) - Technidyne Brightimeter Micro S4-M	(XX) - Instrument make/model not specified by lab

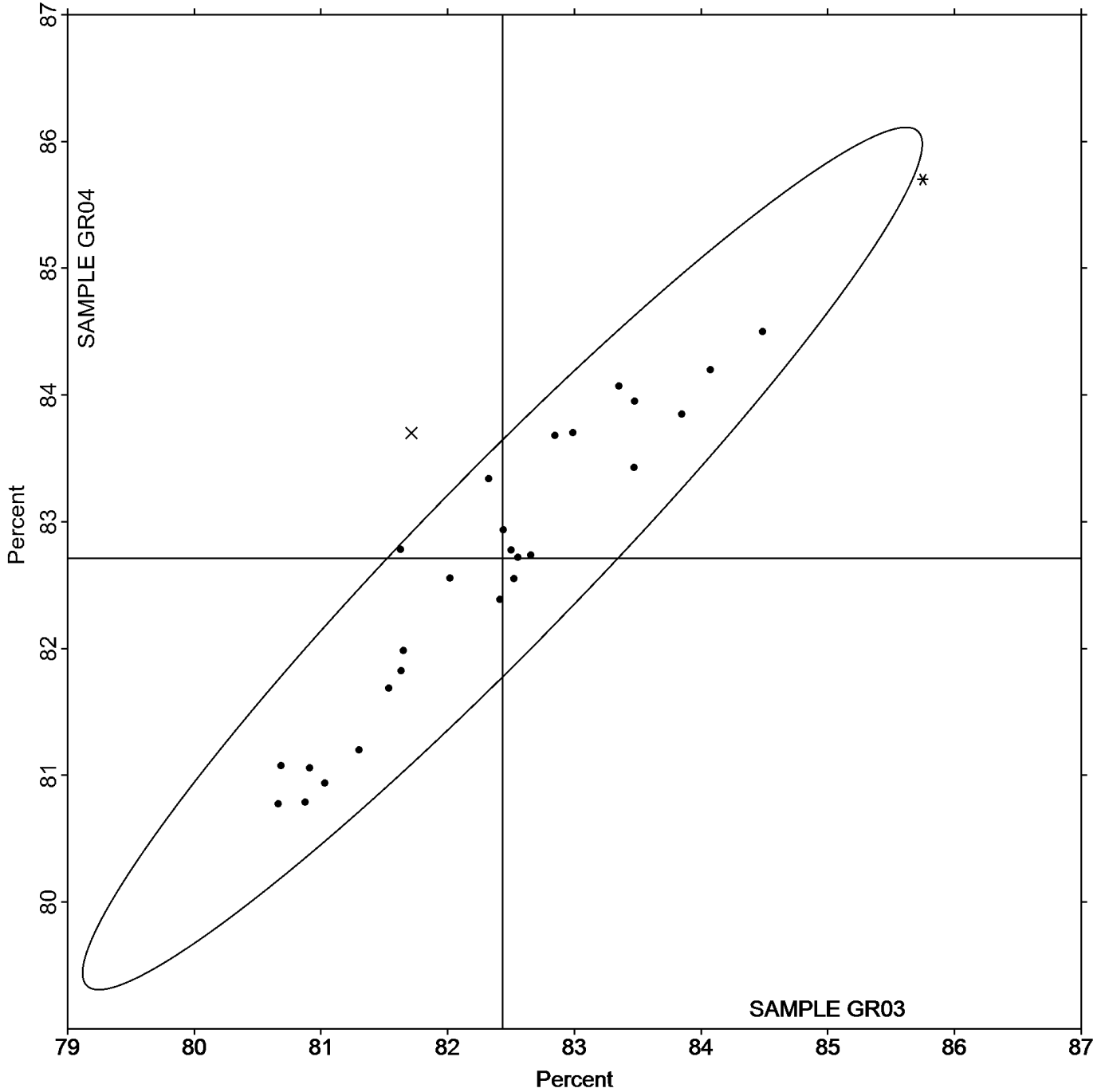
Analysis 390

Directional Brightness

Grand Mean Sample GR03 = 82.431 Percent

Grand Mean Sample GR04 = 82.710 Percent

ANALYSIS 390



**Paper & Paperboard Interlaboratory Testing Program**

**Analysis 391**

**Directional Brightness of Fluorescent Samples**

WebCode	Data Flag	Sample GZ03			Sample GZ04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
APPU7D		90.49	0.10	0.07	94.84	0.09	0.06	TS
DZPHLC		94.10	3.71	2.37	97.67	2.91	2.01	EF
EDXTLK		90.20	-0.19	-0.12	94.86	0.10	0.07	TT
EL938R		90.26	-0.13	-0.08	95.10	0.34	0.24	TS
FFXEWN		90.47	0.08	0.05	94.93	0.17	0.12	TS
JBDHUG		92.23	1.84	1.18	96.71	1.96	1.35	TS
JVZ4GQ		90.79	0.41	0.26	94.47	-0.28	-0.20	TS
NRKBBU		90.01	-0.38	-0.24	93.38	-1.38	-0.95	HT
NXUKQ3		90.24	-0.15	-0.09	95.04	0.28	0.19	TT
VHGC8Y		87.09	-3.30	-2.10	92.21	-2.55	-1.76	GM
VLD8FZ		90.24	-0.14	-0.09	94.76	0.00	0.00	TS
XA88NR		88.52	-1.87	-1.19	92.36	-2.40	-1.66	HT
XJH33J		90.43	0.05	0.03	94.81	0.06	0.04	TS
XZZGXA		90.34	-0.05	-0.03	95.46	0.70	0.48	TT

Summary Statistics			
	Sample GZ03		Sample GZ04
Grand Means	90.386 Percent		94.758 Percent
SD Btwn Labs	1.567 Percent		1.448 Percent
Statistics based on 14 of 14 reporting participants			

**Instrument Code List as Reported by the Labs**

- (EF) - L & W Datacolor Elrepho
- (GM) - Gretag Macbeth Color i5
- (HT) - Hunter UltraScan Vis
- (TS) - Technidyne Brightimeter Micro S-5
- (TT) - Technidyne Brightimeter Micro S4-M

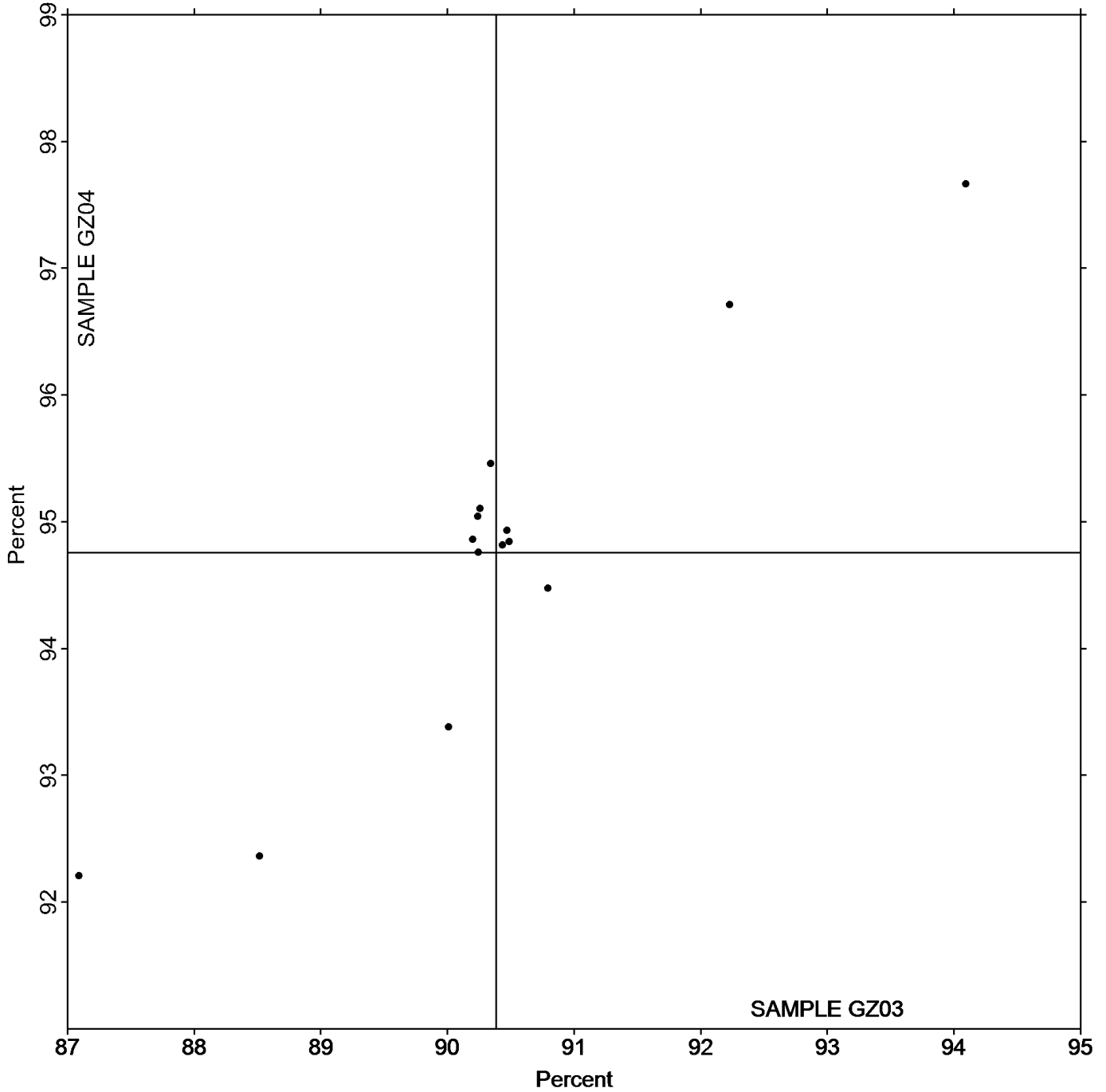
Analysis 391

Directional Brightness of Fluorescent Samples

Grand Mean Sample **GZ03** = 90.386 Percent

Grand Mean Sample **GZ04** = 94.758 Percent

ANALYSIS 391



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 GR03			Sample GR04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
273CUR		81.97	0.14	0.77	82.17	0.15	1.01	TC
3DCBE4		81.81	-0.03	-0.14	81.94	-0.08	-0.53	PP
3TB3KR		81.63	-0.21	-1.20	81.84	-0.18	-1.16	TC
4ZQ827		81.57	-0.27	-1.54	81.66	-0.36	-2.35	LS
82NR48		81.92	0.08	0.47	81.90	-0.12	-0.81	TC
A22WRB		82.13	0.29	1.64	82.12	0.10	0.65	EE
AEMDM9		81.85	0.01	0.07	82.10	0.08	0.52	TC
AMGE78		81.90	0.06	0.34	82.16	0.14	0.94	TM
BJW9M3	X	74.19	-7.65	-43.23	82.62	0.61	4.00	EE
C6T4TV	X	61.84	-20.00	-113.03	62.19	-19.83	-131.03	TM
CEXWHP		81.69	-0.15	-0.86	81.92	-0.10	-0.65	TC
DHVRMB		81.76	-0.07	-0.42	81.96	-0.06	-0.38	TM
DZPHLC		81.71	-0.12	-0.70	82.02	0.00	0.02	LA
E3DMHG		81.92	0.08	0.46	81.97	-0.04	-0.29	TC
GLYZ8P	*	81.55	-0.29	-1.66	82.03	0.01	0.06	TC
HMBY9Y		82.29	0.45	2.54	82.29	0.27	1.78	TL
JLVZHA		81.81	-0.03	-0.16	81.98	-0.04	-0.24	XX
K3L8BE		81.86	0.03	0.15	82.11	0.09	0.57	TC
KPQ96G		81.87	0.03	0.18	81.95	-0.07	-0.48	TC
LCZW6Q		81.84	0.00	0.01	82.05	0.03	0.20	TM
QDEUVP		82.14	0.30	1.70	82.33	0.31	2.06	TC
QGHLPN		81.93	0.09	0.51	82.18	0.16	1.06	TC
QZAQ3V		81.71	-0.13	-0.74	81.96	-0.06	-0.40	TC
RKR4GP		81.86	0.02	0.11	81.99	-0.03	-0.17	TC
RQF2RX		81.75	-0.09	-0.49	82.05	0.03	0.23	TC
VLD8FZ		81.88	0.04	0.24	82.05	0.03	0.23	TM
YUC3YV		81.61	-0.23	-1.27	81.74	-0.28	-1.86	EG
YUWKZV	X	82.83	0.99	5.59	82.99	0.97	6.40	LA
YXWV2A	X	81.85	0.02	0.09	92.32	10.31	68.09	TC
YZZNV9	X	80.71	-1.13	-6.36	81.79	-0.23	-1.52	EF

**Sample GR03****Summary Statistics****Sample GR04**

Grand Means            81.838 Percent  
SD Btwn Labs            0.177 Percent

82.018 Percent  
0.151 Percent

Statistics based on 25 of 30 reporting participants

**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 392**  
**Diffuse Brightness**

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**Comments on assigned Data Flags for Test #392**

BJW9M3 (X) - Extreme data.

C6T4TV (X) - Extreme data.

YUWKZV (X) - Extreme data.

YXWV2A (X) - Extreme data for Sample GR04.

YZZNV9 (X) - Extreme data for Sample GR03.

**Instrument Code List as Reported by the Labs**

(EE) - Datacolor Elrepho 2000

(EG) - Datacolor Elrepho 450X

(LS) - L & W Elrepho SE 070

(TC) - Technidyne Color Touch Series

(TM) - Technidyne Technibrite Micro TB-1C

(EF) - Datacolor Elrepho 3000

(LA) - L & W Elrepho - Autoline

(PP) - Technidyne Profile/Plus

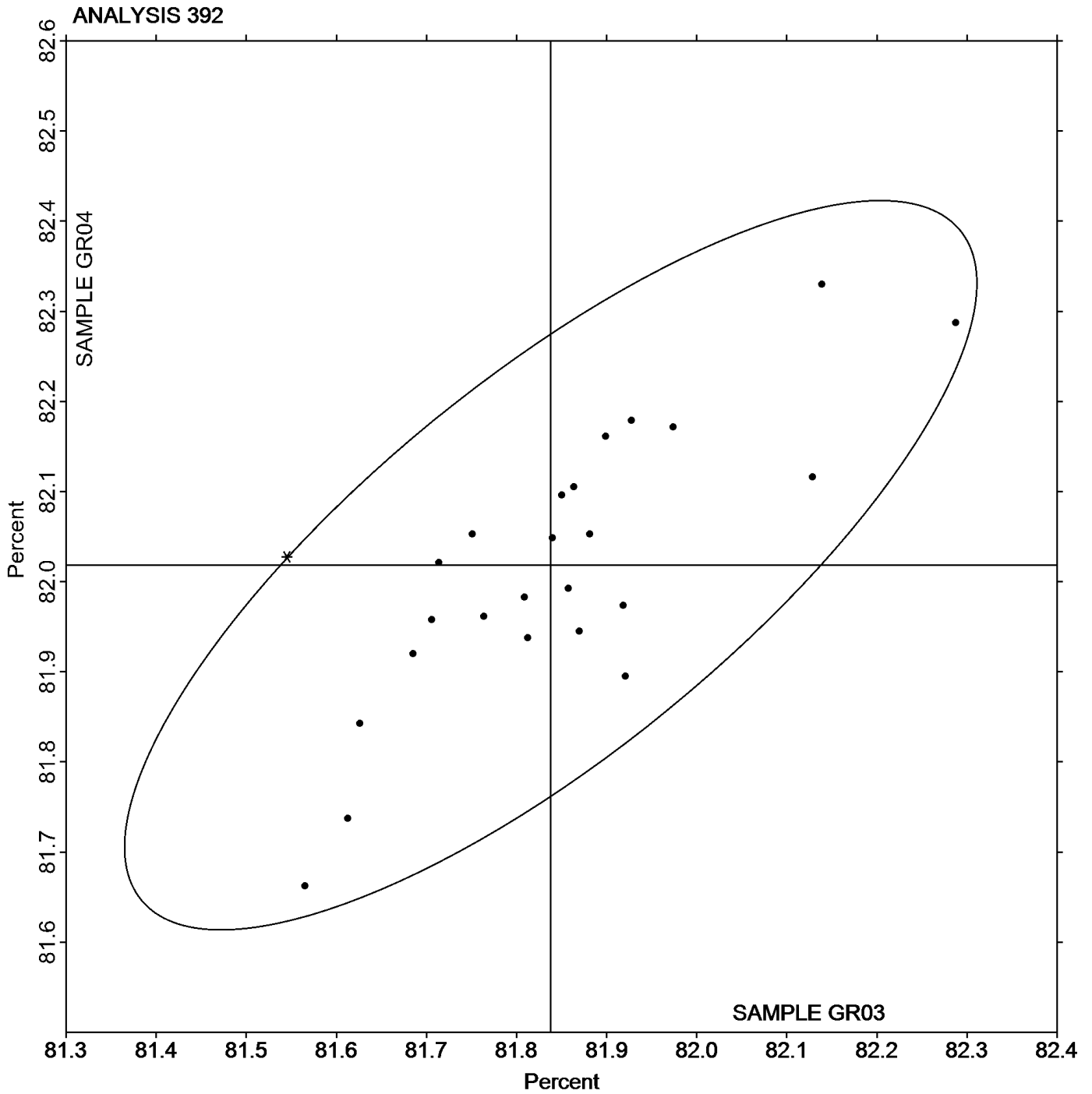
(TL) - Technidyne Technibrite TB-1

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

Analysis 392  
Diffuse Brightness

Grand Mean Sample GR03 = 81.838 Percent

Grand Mean Sample GR04 = 82.018 Percent





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

WebCode	Data Flag	Sample GZ03			Sample GZ04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
APPU7D		7.254	-0.053	-0.08	5.862	-0.289	-0.45	TS
DZPHLC	X	11.032	3.725	5.49	9.350	3.199	4.94	EF
EDXTLK		7.060	-0.247	-0.36	5.840	-0.311	-0.48	TT
FFXEWN		7.650	0.343	0.51	6.250	0.099	0.15	TS
JBDHUG		6.540	-0.767	-1.13	5.212	-0.939	-1.45	TS
JVZ4GQ		7.320	0.013	0.02	6.204	0.053	0.08	TS
NRKBBU		7.578	0.271	0.40	6.542	0.391	0.60	HT
NXUKQ3		7.240	-0.067	-0.10	6.400	0.249	0.38	TT
VHGC8Y		8.800	1.493	2.20	7.608	1.457	2.25	GM
VLD8FZ	X	46.034	38.727	57.11	47.452	41.301	63.78	TS
XA88NR		6.278	-1.029	-1.52	5.562	-0.589	-0.91	HT
XJH33J		7.354	0.047	0.07	6.028	-0.123	-0.19	TS

Summary Statistics			
	Sample GZ03		Sample GZ04
Grand Means	7.3074	Percent	6.1508
SD Btwn Labs	0.6781	Percent	0.6476
Statistics based on 10 of 12 reporting participants			

**Comments on assigned Data Flags for Test #394**

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

VLD8FZ (X) - Extreme data.

**Instrument Code List as Reported by the Labs**

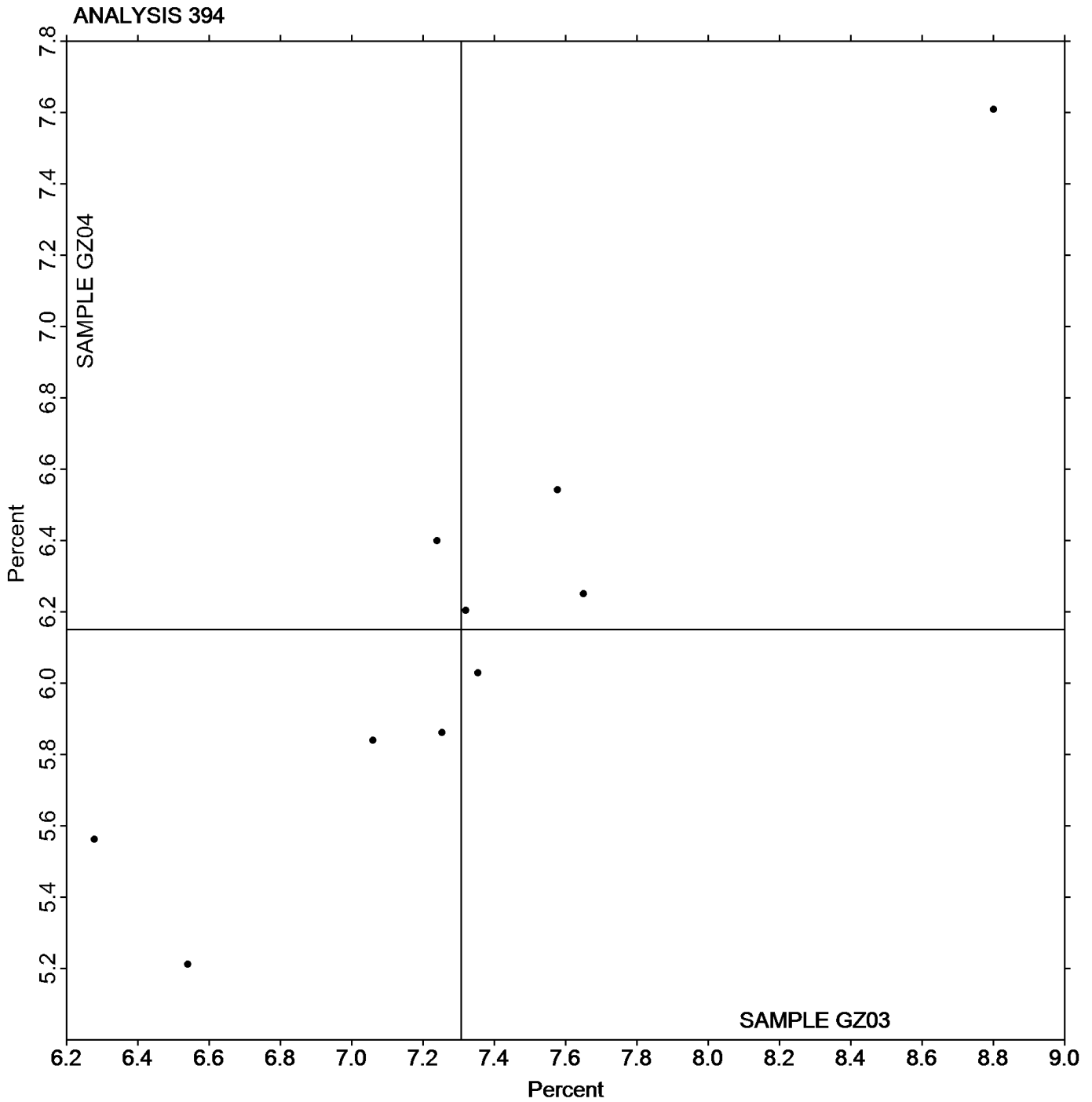
- |   |  |
|---|--|
| (EF) - Datacolor Elrepho 3000             | (GM) - Gretag Macbeth Color i5           |
| (HT) - Hunter UltraScan Vis               | (TS) - Technidyne Brightimeter Micro S-5 |
| (TT) - Technidyne Brightimeter Micro S4-M |  |

Analysis 394

Fluorescent Component of Directional Brightness

Grand Mean Sample GZ03 = 7.3074 Percent

Grand Mean Sample GZ04 = 6.1508 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 GT03			Sample GT04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
9CL7DJ		75.36	-0.20	-0.08	67.57	0.45	0.12	TG
AMGE78		77.69	2.13	0.81	70.61	3.49	0.93	TG
DHREV9		76.06	0.50	0.19	68.35	1.23	0.33	GM
DHVRMB		73.96	-1.60	-0.61	65.24	-1.88	-0.50	TH
DTVLN2		76.42	0.86	0.33	67.94	0.82	0.22	TG
HMBY9Y		80.06	4.50	1.72	72.94	5.82	1.55	GS
KPQ96G		75.46	-0.10	-0.04	66.41	-0.71	-0.19	ZH
MQEHZE		75.13	-0.43	-0.17	67.50	0.38	0.10	LA
NXUKQ3		81.10	5.54	2.12	69.40	2.28	0.61	LA
R3QCG9		74.50	-1.06	-0.41	66.88	-0.24	-0.06	TH
UBJABG		75.25	-0.31	-0.12	67.54	0.42	0.11	TH
V97ZT4		75.24	-0.32	-0.12	67.33	0.20	0.05	TH
VQ4E3F		73.80	-1.76	-0.67	70.77	3.65	0.97	TH
WXM36B		76.52	0.96	0.37	66.95	-0.17	-0.05	TH
YUC3YV		71.67	-3.89	-1.49	62.08	-5.04	-1.35	GM
YUWKZV	*	70.77	-4.79	-1.83	56.46	-10.66	-2.85	TH

Summary Statistics			
	Sample GT03		Sample GT04
Grand Means	75.562 Gloss Units		67.123 Gloss Units
SD Btwn Labs	2.616 Gloss Units		3.746 Gloss Units
Statistics based on 16 of 16 reporting participants			

**Instrument Code List as Reported by the Labs**

(GM) - BYK-Gardner micro-gloss  
 (LA) - L & W Gloss - Autoline 300  
 (TH) - Technidyne T480A

(GS) - BYK-Gardner Glossgard II  
 (TG) - Technidyne T480  
 (ZH) - Zehntner ZLR 1050

# Paper & Paperboard Interlaboratory Testing Program

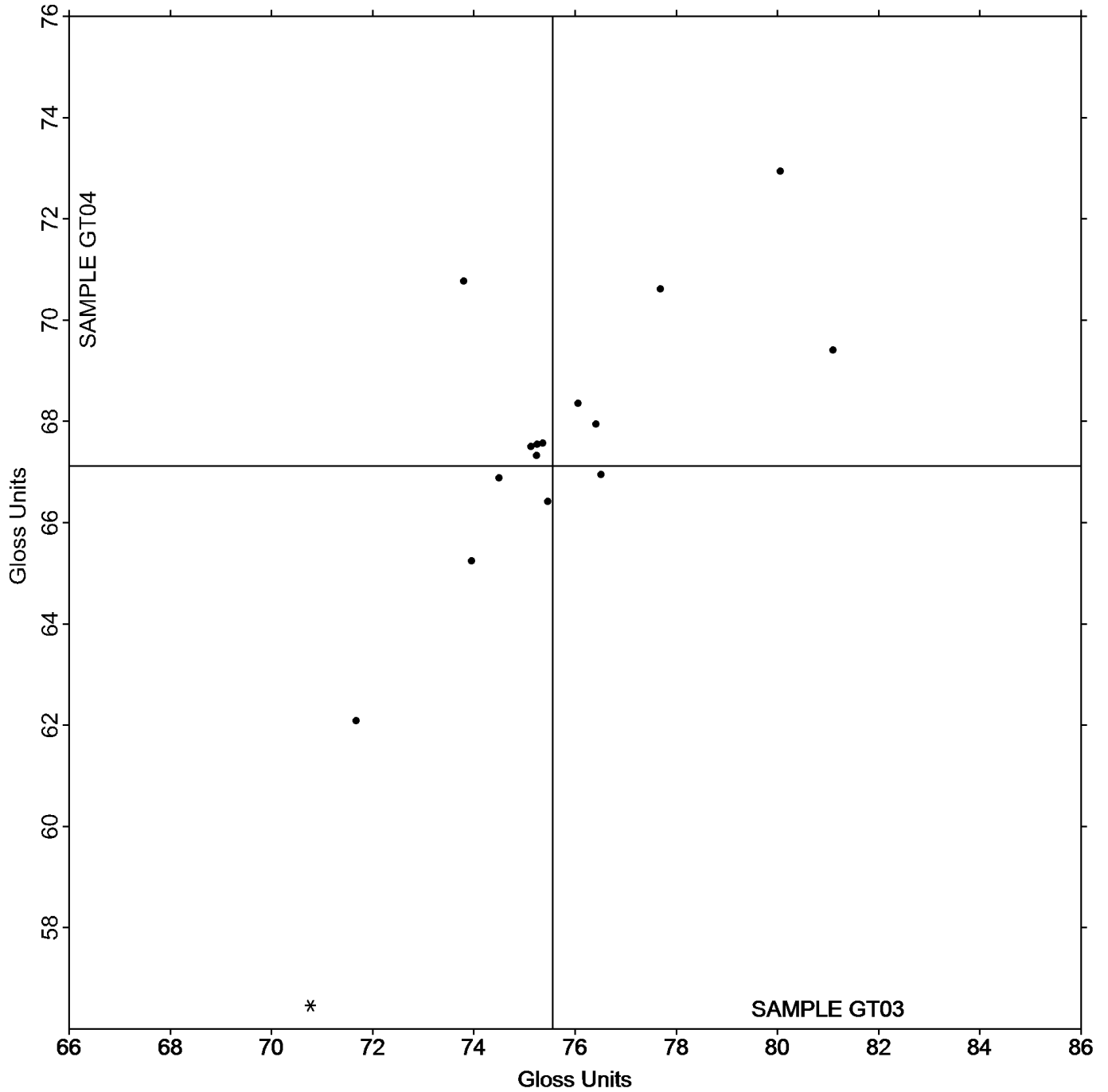
## Analysis 395

### Specular Gloss at 75 Degrees - High Range

Grand Mean Sample **GT03** = 75.562 Gloss Units

Grand Mean Sample **GT04** = 67.123 Gloss Units

#### ANALYSIS 395



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 GU03			Sample GU04			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
AMGE78		37.59	1.26	1.08	42.92	-0.15	-0.13	TG
DCQ4UW		34.92	-1.41	-1.20	44.31	1.24	1.10	XX
DZPHLC		37.53	1.20	1.02	44.18	1.11	0.98	TG
HRMTCB		35.08	-1.25	-1.06	42.97	-0.10	-0.09	TH
PTUPER		36.40	0.07	0.06	40.91	-2.16	-1.91	TH
VDLLGU		37.30	0.97	0.83	42.77	-0.30	-0.26	TG
YU2WXD		35.48	-0.85	-0.72	43.43	0.36	0.32	PP

		Summary Statistics	
	Sample GU03		Sample GU04
Grand Means	36.329 Gloss Units		43.070 Gloss Units
SD Btwn Labs	1.173 Gloss Units		1.132 Gloss Units
Statistics based on 7 of 7 reporting participants			

**Instrument Code List as Reported by the Labs**

(PP) - Technidyne Profile/Plus

(TG) - Technidyne T480

(TH) - Technidyne T480A

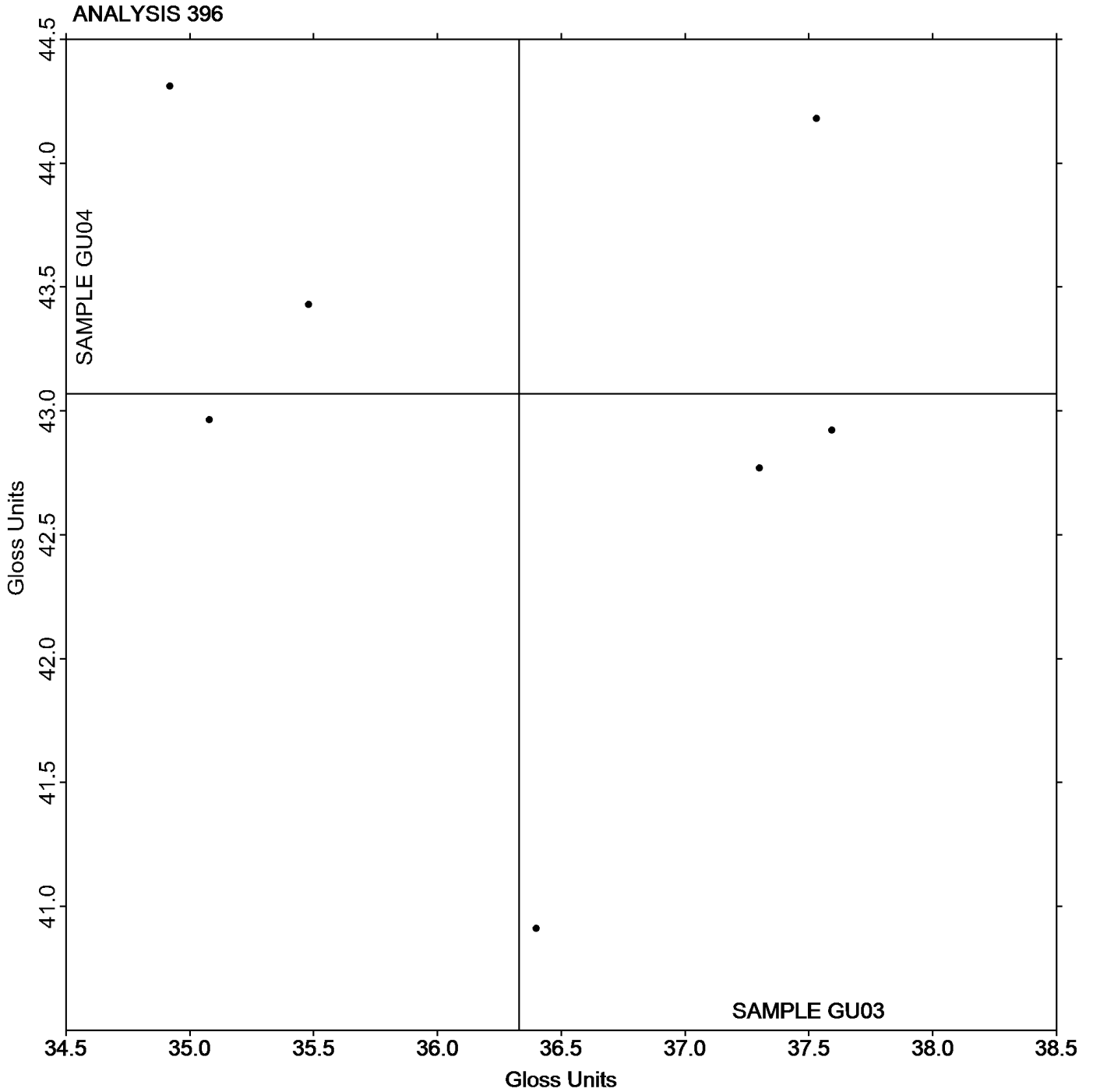
(XX) - Instrument make/model not specified by lab

Analysis 396

Specular Gloss at 75 Degrees - Low Range

Grand Mean Sample **GU03** = 36.329 Gloss Units

Grand Mean Sample **GU04** = 43.070 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 GW03			Sample GW04		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
4C3GMB		73.14	0.64	1.49	86.92	1.12	1.92
4ZQ827		72.68	0.18	0.42	86.06	0.26	0.45
6BJAGJ		72.02	-0.49	-1.14	85.61	-0.19	-0.33
A22WRB		73.02	0.52	1.21	86.95	1.15	1.98
AH4WGQ		72.54	0.04	0.09	85.60	-0.20	-0.34
CV3KK4		72.36	-0.14	-0.34	85.68	-0.12	-0.21
DCQ4UW		72.92	0.42	0.98	85.92	0.12	0.20
DDFG99	X	72.69	0.19	0.44	85.87	0.07	0.12
DZPHLC	X	55.82	-16.68	-39.10	66.27	-19.53	-33.52
EDBFZF		72.20	-0.30	-0.70	85.49	-0.31	-0.53
EL938R		72.04	-0.46	-1.08	85.12	-0.68	-1.17
FNPUH9	X	79.11	6.61	15.48	93.03	7.23	12.40
GFDZ2K		72.21	-0.30	-0.69	86.11	0.32	0.54
H8B87V	X	73.99	1.49	3.49	88.65	2.85	4.89
HRMTCB		72.32	-0.19	-0.44	85.67	-0.13	-0.22
JALGVK	X	72.83	0.33	0.77	80.89	-4.91	-8.42
NRKBBU		71.50	-1.00	-2.35	84.62	-1.18	-2.02
NZHXH7		72.22	-0.28	-0.66	84.99	-0.81	-1.39
PTUPER		72.40	-0.11	-0.25	85.59	-0.21	-0.35
Q4QZEL		72.80	0.30	0.70	86.35	0.55	0.95
QCE7UR	X	72.05	-0.45	-1.05	85.38	-0.42	-0.72
QZAQ3V		71.90	-0.60	-1.41	85.07	-0.73	-1.25
RQF2RX		72.81	0.31	0.72	86.03	0.23	0.39
TMVFN4		72.39	-0.11	-0.26	86.01	0.22	0.37
VHGC8Y		72.04	-0.46	-1.09	85.49	-0.31	-0.53
WZ9QTH		73.05	0.54	1.28	85.71	-0.09	-0.15
XA88NR		72.64	0.14	0.32	86.18	0.38	0.65
YTXN3K		72.62	0.12	0.27	85.08	-0.72	-1.23
YUWKZV		73.02	0.52	1.21	85.92	0.12	0.21
Z9BAJ3		73.06	0.56	1.30	86.72	0.92	1.58
ZLYCZA		72.68	0.18	0.42	86.08	0.28	0.48

**Sample GW03****Summary Statistics****Sample GW04**

Grand Means            72.502 g/sq m  
SD Btwn Labs            0.427 g/sq m

85.799 g/sq m  
0.583 g/sq m

Statistics based on 25 of 31 reporting participants

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

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DZPHLC (X) - Extreme data.

FNPUH9 (X) - Extreme data.

H8B87V (X) - Data for both samples are high.

JALGVK (X) - Extreme data for Sample GW04.

**Analysis Notes:**

4C3GMB - Data appears to be transposed between samples. Data Switched by CTS.

DDFG99 - Data appear to be off by a factor of .01; data converted by CTS (x100).

QCE7UR - Data appear to be off by a factor of .01; data converted by CTS (x100).

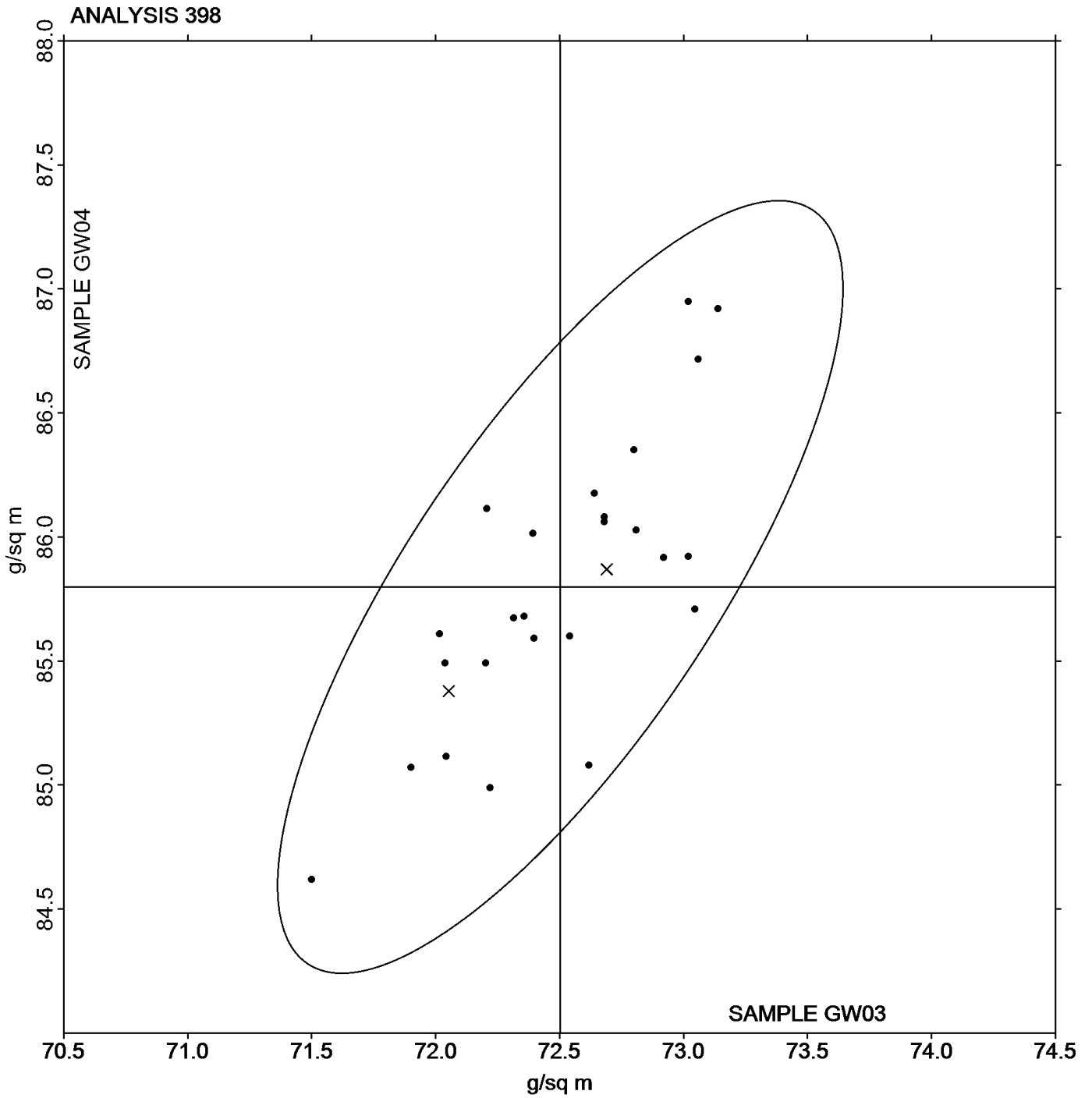


Analysis 398

Grammage (Mass per Unit Area)

Grand Mean Sample **GW03** = 72.502 g/sq m

Grand Mean Sample **GW04** = 85.799 g/sq m



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

WebCode	Data Flag	Sample GX03			Sample GX04		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
46GH3G		11.84	-5.30	-1.26	13.51	-3.45	-0.82
47UAWJ		18.20	1.06	0.25	17.00	0.04	0.01
4NXKVB	X	34.92	17.78	4.23	38.08	21.12	5.05
962VKN	*	24.10	6.96	1.66	26.00	9.04	2.16
A7RJDG		18.69	1.55	0.37	18.47	1.51	0.36
ADVCNC		18.01	0.87	0.21	17.29	0.33	0.08
APPU7D	*	29.90	12.76	3.03	28.50	11.54	2.76
CQPNWU		15.80	-1.34	-0.32	15.97	-0.99	-0.24
D3WZHM		11.27	-5.87	-1.40	11.35	-5.61	-1.34
DHREV9		18.30	1.16	0.28	17.70	0.74	0.18
DHVRMB		17.57	0.43	0.10	18.21	1.25	0.30
EL938R		18.00	0.86	0.20	17.30	0.34	0.08
FFXEWN		18.02	0.88	0.21	16.28	-0.68	-0.16
GHXWF3		14.45	-2.69	-0.64	16.43	-0.53	-0.13
GLYZ8P		18.67	1.53	0.36	19.79	2.83	0.68
HK4NY4		17.55	0.41	0.10	17.50	0.54	0.13
JVZ4GQ	X	39.34	22.20	5.28	37.60	20.64	4.93
KU6Z6U	*	7.91	-9.23	-2.19	6.41	-10.55	-2.52
QCE7UR		20.30	3.16	0.75	18.90	1.94	0.46
RXYCY8		16.02	-1.12	-0.27	15.63	-1.33	-0.32
T84L2Q	X	33.86	16.72	3.98	36.69	19.73	4.71
V97ZT4		20.19	3.05	0.73	18.68	1.72	0.41
VDLLGU		14.00	-3.14	-0.75	13.60	-3.36	-0.80
VHGC8Y		18.16	1.02	0.24	18.69	1.73	0.41
XJH33J		15.14	-2.00	-0.48	15.39	-1.57	-0.37
XY7JUA		16.38	-0.76	-0.18	14.72	-2.24	-0.53
XZZGXA		15.89	-1.25	-0.30	15.91	-1.05	-0.25
YTXN3K	X	21.40	4.26	1.01	28.19	11.23	2.68
YU2WXD		14.14	-3.00	-0.71	14.70	-2.26	-0.54
ZRYVZJ	M	No data reported for this sample			9.70	-7.26	-1.73

	Sample Sample	Summary Statistics	Gx04
Grand Means	17.140 Seconds		16.957 Seconds
SD Btwn Labs	4.205 Seconds		4.187 Seconds
Statistics based on 25 of 30 reporting participants			

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

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**Comments on assigned Data Flags for Test #399**

4NXKVB (X) - Systematic error (data for both samples are high). Inconsistent within the determinations for Sample GX03.

JVZ4GQ (X) - Systematic error (data for both samples are high). Inconsistent in testing within the determinations for both samples.

T84L2Q (X) - Systematic error (data for both samples are high). Inconsistent in testing within the determinations for both samples.

YTXN3K (X) - Inconsistent in testing between samples, data for Sample GX04 are high.

ZRYVZJ (M) - No data for Sample GX03.

Analysis 399

Sizing Test (Hercules Type)

Grand Mean Sample GX03 = 17.140 Seconds

Grand Mean Sample **GX04** = 16.957 Seconds

ANALYSIS 399

