Collaborative Testing Services, Inc.

Paper & Paperboard Testing Program

Summary Report #3162 G - February 2022

Introduction to the Paper & Paperboard Interlaboratory Program

Explanation of Tables and Definitions of Terms

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The CTS Paper & Paperboard Interlaboratory Program

In 1969, the National Bureau of Standards (now designated the National Institute for Standards and Technology) and the Technical Association of the Pulp and Paper Industry (TAPPI) developed an interlaboratory program for paper and paperboard testing. Since 1971, Collaborative Testing Services has operated the Collaborative Reference Program for Paper and Paperboard. With hundreds of organizations from around the world participating in these tests, this program has become one of the largest of its kind. The program allows laboratories to compare the performance of their testing with that of other participating laboratories, and provides a realistic picture of the state of paper testing.

About CTS

Founded in 1971, Collaborative Testing Services, Inc. (CTS) is a privately - owned company that specializes in interlaboratory tests for a variety of industrial sectors: rubber, plastics, fasteners and metals, CKPG, paper, color and wine, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality assurance objectives. Labs from the U.S., as well as more than 80 countries, currently participate in CTS programs.

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

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WebCode   Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Paper Report published on the CTS Web site. The WebCode for each analysis can be found on the datasheets and in the Performance Analysis Report mailed to each participant.

Lab Mean   The average of the values obtained for each sample by the participant.

Grand Mean   The average of the LAB MEANS for all included participants. Laboratories flagged with an X or an M (see DATA FLAG column) are excluded from the GRAND MEAN.

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

Difference from Grand Mean   The difference of the LAB MEAN from the GRAND MEAN.

Between-Lab Standard Deviation   An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).

Comparative Performance Value   An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.

Inst Code   A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section), if instruments are tracked.

Data Flag   DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

DATA FLAG	STATISTICALLY INCLUDED/EXCLUDED	ACTION REQUIRED
*	INCLUDED	**CAUTION** - review testing procedure and monitor future results. Results fall outside 95% ellipse but within a 99% ellipse that is calculated but not drawn.
X	EXCLUDED	**STOP** - immediate review of data and/or testing procedure is required. Results fall outside the 99% ellipse. See specific notes following each table for more information on why the data is excluded.
M	EXCLUDED	**PROCEED** - lab was unable to report data for at least one sample.

Graph - For each laboratory, the LAB MEAN for the first sample (x-axis) is plotted against the LAB MEAN for the second sample (y-axis) with each point representing a laboratory. The horizontal and vertical cross-hairs are the GRAND MEANS for each sample. When 20 or more laboratories are in the statistics, an ellipse is also drawn so that 95% of the time a randomly selected laboratory will be included inside the ellipse. Plotted data flags are explained on the previous page.

Common Problems Highlighted in Footnotes

1. *Extreme data* - The laboratory's results for one or both samples are so inconsistent with those of the other participants that the lab mean(s) fall outside the plot. The participant is advised to immediately review his data and/or testing procedure.

2. *Systematic bias* - The laboratory's results are either consistently high or low for both samples when compared to the other participants (the plotted point falls near the top or bottom of the ellipse). This indicates that the participant is performing the test with a constant bias. Causes of systematic errors include improper calibration, the particular make/model of equipment or a modification to the testing procedure.

3. *Inconsistency in testing between samples/sample sets* - The laboratory's results indicate that there are differences in the way the two samples tested (the plotted point falls to the side of the ellipse). This type of error may be attributed to the analyst deviating from the procedure when testing one of the samples or a material interaction occurrence with the instrument or room conditions. The inconsistency is reflected in the CPVs for the two samples, such as a +1.5 CPV for sample A and a -2.2 CPV for sample B. CTS also will specify if the laboratory's data for one sample are high/low compared to the other participants. If this inconsistency is slight, the lab's plotted point will be an * that falls on the edge of the ellipse.

4. *Inconsistency in testing within a sample* - The laboratory's within-lab standard deviation for a specified sample is high when compared to the other participants, often causing the lab's plotted point to fall outside of the ellipse.

Labs flagged with an * are not typically included in the footnotes of a data table. These labs may locate their position in the control ellipse and use the definitions above to help identify the type of testing error. An * should serve as a caution flag, a "yellow light", to a lab. If this error is repeated in future rounds, a lab may need to stop and review its testing procedures. The initial data flag is not cause for alarm. Interlaboratory tests conducted at regular intervals permit a lab to recognize trends in testing.

Paper & Paperboard Interlaboratory Testing Program
Analysis 350
Color & Color Difference - Near White Papers - C/2deg obs
Hunter L,a,b - Illuminant C - 2 Degree Observer

Report #3162 G, February 2022

Web Code	Data Flag	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	ΔL	Δa	Δb	ΔE	
22QF9N	X	GA01	82.60	0.25	-0.14	0.00	0.03	-0.04	0.05	TS
		GA02	82.60	0.28	-0.18					
2WXD7A		GA01	93.38	-0.35	1.63	0.00	-0.01	0.01	0.02	TC
		GA02	93.38	-0.36	1.64					
7V4GJB		GA01	92.35	-0.28	1.03	-0.08	-0.04	0.02	0.09	TS
		GA02	92.27	-0.32	1.04					
7ZM7AF		GA01	94.72	-0.55	1.61	-0.02	0.04	-0.10	0.11	EH
		GA02	94.70	-0.50	1.50					
8EWJZC		GA01	94.83	-0.51	2.03	0.01	-0.01	0.01	0.01	TS
		GA02	94.84	-0.52	2.05					
BB7ETC		GA01	94.69	-0.52	1.84	-0.01	-0.02	-0.01	0.02	LS
		GA02	94.68	-0.54	1.83					
CNBW6C		GA01	93.49	-0.39	1.73	0.01	0.01	-0.01	0.01	LA
		GA02	93.50	-0.38	1.72					
CV8UUZ		GA01	95.53	-0.71	2.90	-0.07	0.01	-0.05	0.09	VM
		GA02	95.45	-0.70	2.85					
HD9PRY		GA01	93.40	-0.58	1.60	-0.03	0.03	-0.06	0.07	HE
		GA02	93.36	-0.55	1.54					
MQF3BU		GA01	93.63	-0.49	1.72	-0.01	-0.04	0.00	0.04	HE
		GA02	93.62	-0.53	1.72					
MUFD7U		GA01	93.26	-0.54	1.70	0.05	0.01	0.02	0.05	HE
		GA02	93.31	-0.53	1.72					
PYNDGQ		GA01	94.77	-0.54	2.02	-0.01	0.00	0.08	0.08	NG
		GA02	94.75	-0.54	2.10					
TKC9JL		GA01	92.47	-1.02	0.82	1.63	0.02	0.14	1.63 X	HZ
		GA02	94.10	-1.00	0.96					
WV3YWP		GA01	94.75	-0.51	1.58	0.00	-0.02	0.05	0.05	TC
		GA02	94.75	-0.53	1.63					
YUWT4J		GA01	92.86	-0.01	1.20	0.00	-0.02	0.01	0.02	TS
		GA02	92.85	-0.03	1.21					
ZB2GUP		GA01	93.58	-0.62	1.88	0.00	0.02	-0.02	0.02	XS
		GA02	93.58	-0.60	1.87					

Paper & Paperboard Interlaboratory Testing Program
Analysis 350
Color & Color Difference - Near White Papers - C/2deg obs
Hunter L,a,b - Illuminant C - 2 Degree Observer

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Web Code	Data Flag	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	ΔL	Δa	Δb	ΔE	
ZW7T6K		**GA01**	82.38	-0.37	-0.60	0.34	0.01	0.03	0.34	TC
		GA02	82.72	-0.36	-0.57					
ZWKLFE		**GA01**	94.81	-0.62	1.43	-0.01	0.03	-0.06	0.07	LS
		GA02	94.80	-0.59	1.38					

Summary Statistics								
<u>Grand Means</u>								
GA01	92.648	-0.506	1.537	0.106	0.001	0.005	0.161	
GA02	92.657	-0.505	1.541					
<u>Stnd Dev Btwn Labs</u>								
GA01	3.919	0.208	0.713	0.403	0.023	0.056	0.387	
GA02	3.860	0.196	0.697					

Statistics based on 17 of 18 reporting participants

Comments on Assigned Data Flags for Test #350

22QF9N (X) - Very high data for both "a" values & very low data for both "b" values.

Analysis Notes:

22QF9N - Due to CTS graphs using Absolute Values, data Flag is located within consensus data. However, "a" data is higher than the negative Grand Mean as shown above graphs.

Key to Instrument Codes Reported by Participants

EH	Datacolor Elrepho SF450	HE	Hunter LabScan
HZ	Hunter ColorFlex EZ	LA	L & W Elrepho AL300
LS	L & W Elrepho SE 070	NG	Minolta CM-3700d Spectrophotometer
TC	Technidyne Color Touch Series	TS	Technidyne Brightimeter Micro S-5
VM	Valmet PaperLab (was Kajaani/Robotest)	XS	X-Rite 938 Spectrodensitometer

Paper & Paperboard Interlaboratory Testing Program
Analysis 350
Color & Color Difference - Near White Papers - C/2deg obs
Hunter L,a,b - Illuminant C - 2 Degree Observer

Report #3162 G,
February 2022

Plot of L values GA02 vs L values GA01

ANALYSIS 350 – L2 vs L1

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 350
Color & Color Difference - Near White Papers - C/2deg obs
Hunter L,a,b - Illuminant C - 2 Degree Observer

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February 2022

Plot of a values GA02 vs a values GA01

ANALYSIS 350 – a2 vs a1

SAMPLE GA02

SAMPLE GA01

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 350
Color & Color Difference - Near White Papers - C/2deg obs
Hunter L,a,b - Illuminant C - 2 Degree Observer

Report #3162 G,
February 2022

Plot of b values GA02 vs b values GA01
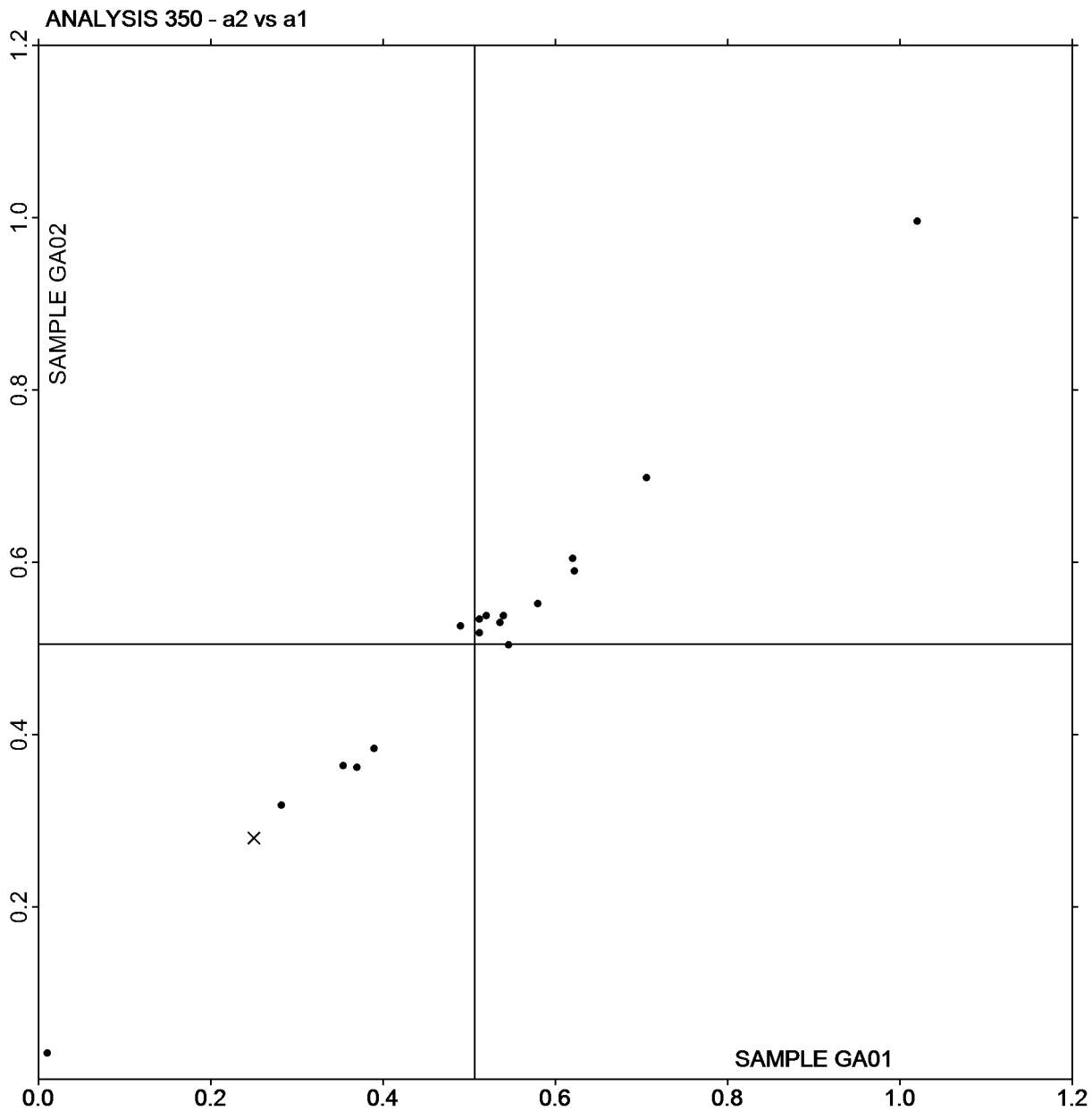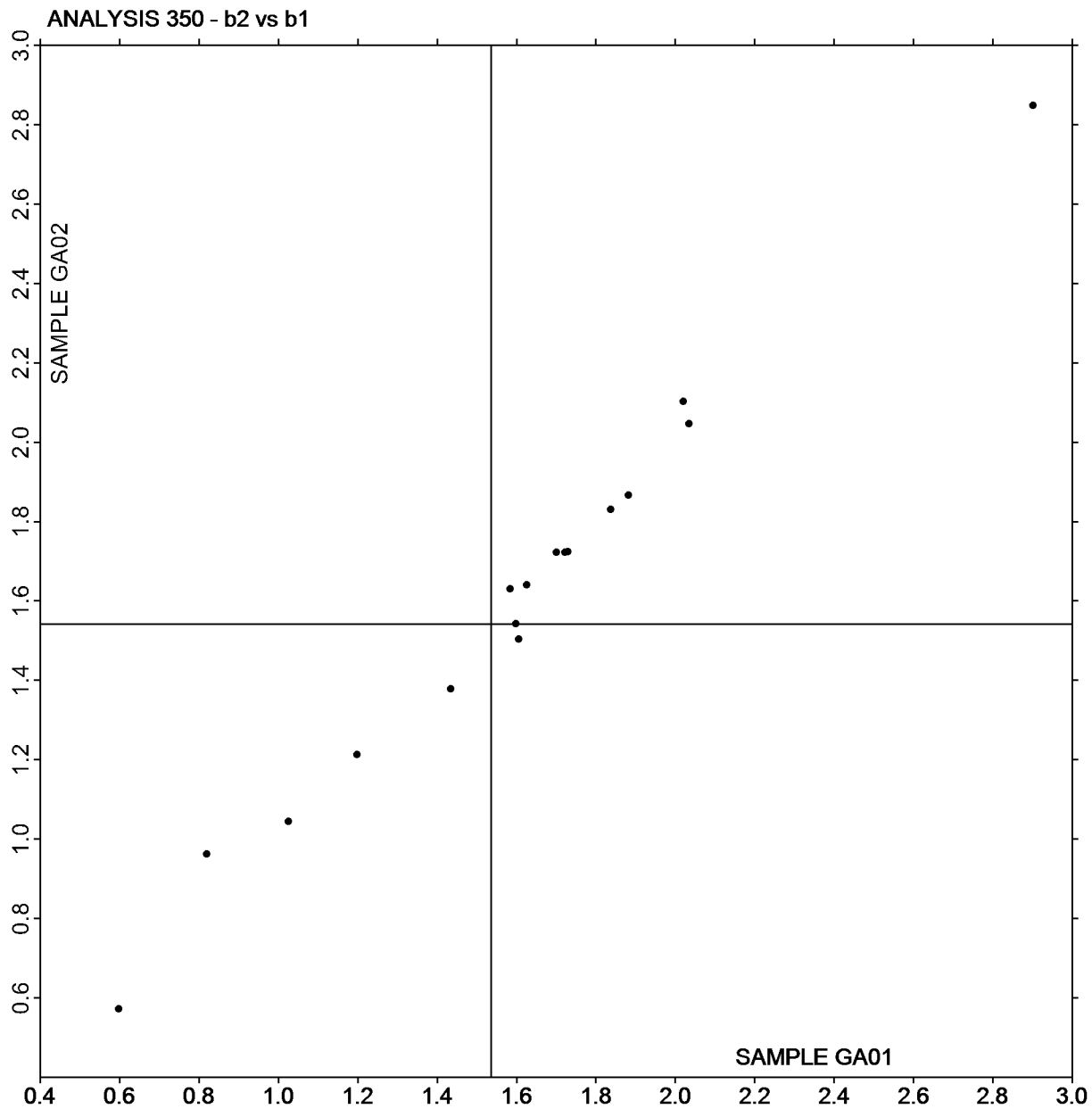

ANALYSIS 350 - b2 vs b1

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

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

Web Code	Data Flag	Samples	CIE L* a* b* Color Values			Color Difference Values				InstrCode
			L*	a*	b*	ΔL*	Δa*	Δb*	ΔE*	
2N8PDT		GA01	94.82	-0.47	1.98	-0.01	-0.01	0.00	0.01	NG
		GA02	94.81	-0.48	1.98					
7ZM7AF		GA01	94.69	-0.57	1.73	0.01	0.04	-0.13	0.13	EH
		GA02	94.70	-0.53	1.60					
8BYX9A		GA01	94.94	-0.39	1.65	-0.03	-0.03	0.12	0.13	EH
		GA02	94.91	-0.42	1.77					
9Q94YY		GA01	93.31	-0.35	1.54	0.00	0.00	0.04	0.04	XB
		GA02	93.31	-0.35	1.58					
BWMQLZ		GA01	94.74	-0.52	1.95	0.00	-0.01	-0.02	0.02	EF
		GA02	94.74	-0.53	1.93					
CXBKYU		GA01	93.21	-0.34	1.69	0.05	-0.01	0.01	0.05	TC
		GA02	93.25	-0.35	1.70					
GV8HX8		GA01	94.83	-0.49	1.81	-0.02	-0.01	0.09	0.09	HT
		GA02	94.81	-0.50	1.89					
JMTD3R		GA01	95.12	-0.56	1.63	-0.03	0.00	0.00	0.03	XC
		GA02	95.10	-0.57	1.63					
KY3BJ2		GA01	95.04	-0.40	1.68	-0.05	0.00	0.06	0.08	NG
		GA02	94.98	-0.40	1.74					
LDE97D		GA01	94.65	-0.38	2.15	-0.01	0.00	0.00	0.02	NH
		GA02	94.63	-0.38	2.16					
R3DRXW		GA01	94.76	-0.41	1.78	0.00	0.03	0.02	0.04	LS
		GA02	94.76	-0.39	1.80					
TL9M9Y		GA01	95.37	-0.42	1.27	0.07	-0.15	-0.03	0.17	XP
		GA02	95.45	-0.57	1.24					
TPLM6Q		GA01	93.91	-0.35	1.64	-0.08	-0.02	-0.01	0.09	HE
		GA02	93.83	-0.37	1.63					
TW9EE6		GA01	94.73	-0.44	1.62	0.09	0.17	-0.41	0.45 X	TC
		GA02	94.82	-0.28	1.21					
TX24XZ		GA01	94.89	-0.62	2.28	0.02	0.03	-0.06	0.07	NG
		GA02	94.91	-0.59	2.22					
YXH9XL		GA01	94.91	-0.50	1.99	0.00	0.01	-0.02	0.02	HT
		GA02	94.91	-0.50	1.97					

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

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ZW7T6K	GA01	93.27	-0.72	0.61	-0.02	0.01	-0.03	0.04	HE
	GA02	93.25	-0.71	0.58					

Summary Statistics

Grand Means							
GA01	94.541	-0.468	1.706	-0.001	0.002	-0.021	0.086
GA02	94.540	-0.466	1.685				
Stnd Dev Btwn Labs							
GA01	0.676	0.106	0.371	0.042	0.059	0.114	0.104
GA02	0.680	0.112	0.393				

Statistics based on 17 of 17 reporting participants

Key to Instrument Codes Reported by Participants

EF	Datacolor Elrepho 3000	EH	Datacolor Elrepho SF450
HE	Hunter LabScan	HT	Hunter UltraScan Vis
LS	L & W Elrepho SE 070	NG	Minolta CM-3700d Spectrophotometer
NH	Minolta CM-3700A Spectrophotometer	TC	Technidyne Color Touch Series
XB	X-Rite Ci7	XC	X-Rite eXact Series
XP	X-Rite Spectrophotometer DTP		

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

Report #3162 G,
February 2022

Plot of L values GA02 vs L values GA01

ANALYSIS 351 - L2 vs L1

SAMPLE GA02

SAMPLE GA01

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

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

Report #3162 G,
February 2022

Plot of a values GA02 vs a values GA01

ANALYSIS 351 - a2 vs a1

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

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

Report #3162 G,
February 2022

Plot of b values GA02 vs b values GA01

ANALYSIS 351 - b2 vs b1
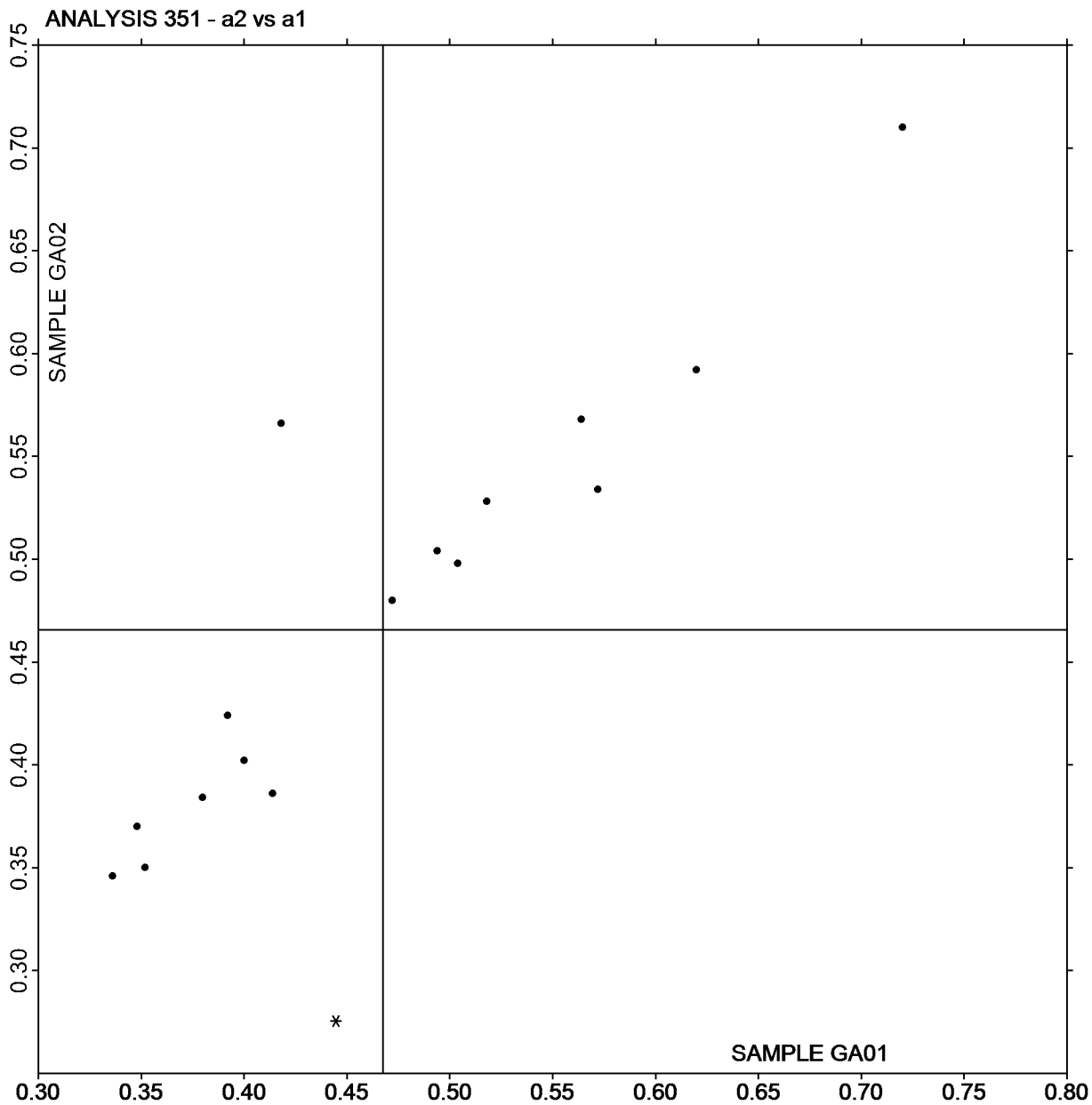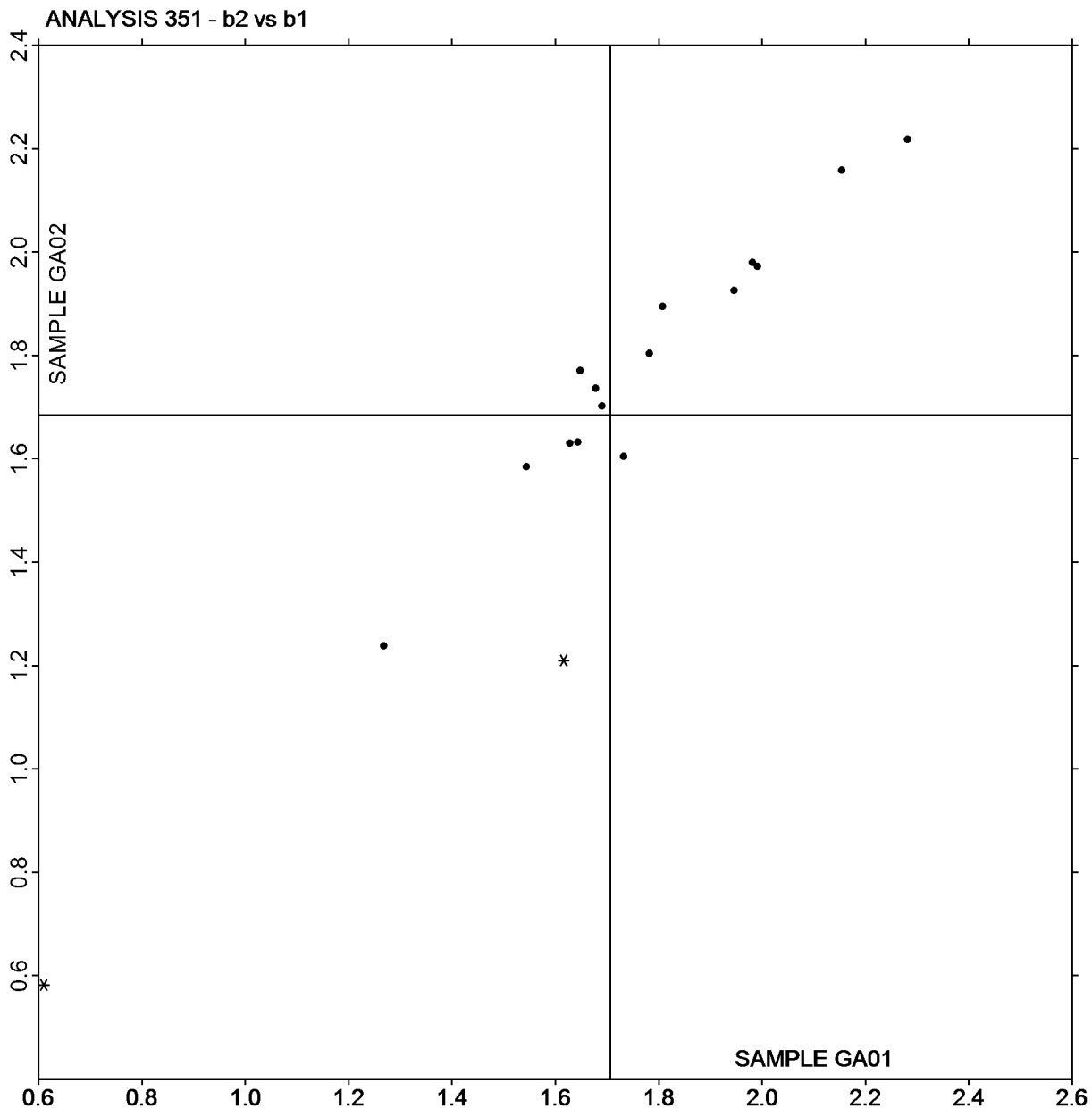
SAMPLE GA02

SAMPLE GA01

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

Paper & Paperboard Interlaboratory Testing Program
Analysis 360
Thickness (Caliper), Printing papers
TAPPI Official Test Method T411

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WebCode	Data Flag	Sample GV01 Lab Mean	Sample GV01 Diff from Grand Mean	Sample GV01 CPV	Sample GV02 Lab Mean	Sample GV02 Diff from Grand Mean	Sample GV02 CPV	Instr Code
273F9M		3.783	-0.096	-1.30	3.802	-0.066	-0.85	LW
2N8PDT		3.862	-0.017	-0.24	3.854	-0.014	-0.17	EM
4KG6J9		3.874	-0.005	-0.07	3.889	0.021	0.28	PP
6KD6VD		3.789	-0.090	-1.23	3.765	-0.103	-1.32	TA
6UFM8G		3.917	0.037	0.51	3.912	0.044	0.57	LW
76UWCL		3.865	-0.014	-0.20	3.837	-0.031	-0.39	TA
7NQ6T6		3.927	0.048	0.64	3.953	0.085	1.10	TA
7V4GJB		3.737	-0.142	-1.93	3.729	-0.139	-1.78	TM
7ZM7AF		3.894	0.015	0.20	3.841	-0.027	-0.34	EM
82B8LG		3.928	0.048	0.66	3.916	0.048	0.62	LW
8BW94C		3.873	-0.006	-0.09	3.852	-0.016	-0.20	TA
8BYX9A		3.828	-0.051	-0.70	3.803	-0.065	-0.83	EM
8QRRJE		4.009	0.130	1.76	3.956	0.089	1.14	LW
8WVUME		3.790	-0.089	-1.21	3.760	-0.108	-1.38	TM
9Q94YY		3.882	0.003	0.03	3.915	0.047	0.61	TM
9ZXRWM		3.827	-0.053	-0.71	3.803	-0.064	-0.83	MS
BB7ETC		3.933	0.054	0.73	3.921	0.053	0.68	LW
BQGV6K		3.798	-0.081	-1.10	3.785	-0.083	-1.06	LW
BUG7ZK		3.872	-0.007	-0.10	3.893	0.025	0.33	PP
BWMQLZ		3.766	-0.113	-1.54	3.802	-0.066	-0.84	TM
CAPFFE		3.948	0.069	0.93	3.888	0.020	0.26	EM
CCTDM2		3.930	0.051	0.69	3.905	0.037	0.48	EM
CNBW6C		3.917	0.037	0.51	3.933	0.065	0.84	EM
CWHWFY		3.934	0.055	0.74	3.912	0.044	0.56	LW
CXBKYU		3.735	-0.144	-1.96	3.695	-0.173	-2.22	TA
DBF389		3.956	0.077	1.04	3.985	0.117	1.51	PP
DGKYVF	X	3.662	-0.217	-2.95	3.726	-0.142	-1.82	TA
E8CRQY		3.826	-0.054	-0.73	3.834	-0.033	-0.43	PP
FBTE3J		3.916	0.037	0.50	3.889	0.021	0.28	EM
FJMJX7	*	4.001	0.122	1.65	3.933	0.065	0.84	LW
GBNF38		3.903	0.023	0.32	3.895	0.027	0.35	TM
GV8HX8		4.028	0.149	2.01	4.038	0.170	2.19	EM
HVRL78		3.889	0.009	0.12	3.890	0.023	0.29	LW
JMTD3R		3.937	0.058	0.78	3.941	0.073	0.94	LW
LDE97D		3.944	0.065	0.87	3.908	0.040	0.52	PP
NPJ9QV		3.812	-0.067	-0.91	3.814	-0.054	-0.69	LA
P6U9ZQ		3.955	0.076	1.02	3.969	0.101	1.30	LB
PYNDGQ		3.924	0.044	0.60	3.925	0.058	0.74	LW
T4QLDX		3.941	0.061	0.83	3.925	0.058	0.74	TM
TL9M9Y	M	3.830	-0.049	-0.67	No data reported for this sample			TM
TPLM6Q		3.950	0.071	0.96	3.964	0.096	1.24	PP

Paper & Paperboard Interlaboratory Testing Program
Analysis 360
Thickness (Caliper), Printing papers
TAPPI Official Test Method T411

WebCode	Data Flag	Sample GV01			Sample GV02			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
TW9EE6		4.031	0.152	2.06	4.000	0.132	1.70	PP
TX24XZ		3.820	-0.059	-0.81	3.829	-0.039	-0.50	PP
UBGQHH	*	3.800	-0.079	-1.08	3.720	-0.148	-1.90	TA
V2ABAP		3.857	-0.022	-0.30	3.852	-0.016	-0.20	OK
V37NWH		3.870	-0.009	-0.13	3.850	-0.018	-0.23	TA
WV3YWP		3.796	-0.083	-1.13	3.752	-0.115	-1.48	LA
YUWT4J		3.909	0.030	0.40	3.904	0.036	0.47	EM
YXH9XL		3.879	0.000	-0.01	3.862	-0.006	-0.07	EM
ZB2GUP		3.770	-0.109	-1.48	3.740	-0.128	-1.64	TM
ZTHLFG		3.834	-0.045	-0.62	3.860	-0.008	-0.10	PP
ZW2B7L		3.807	-0.072	-0.98	3.780	-0.088	-1.13	PP

Summary Statistics	Sample GV01	Sample GV02
Grand Means	3.88 mils	3.87 mils
Stnd Dev Btwn Labs	0.07 mils	0.08 mils

Statistics based on 50 of 52 reporting participants.

Comments on Assigned Data Flags for Test #360

DGKYVF (X) - Data for sample GV01 are low. Inconsistent within the determinations of sample GV01.

TL9M9Y (M) - Participant did not submit data for sample GV02.

Analysis Notes:

76UWCL - Data appear to be reported as mils, not mm as indicated on data entry form. CTS will not correct the Units going forward.

Key to Instrument Codes Reported by Participants

EM	Emveco	LA	L & W Autoline
LB	L & W Autoline 600	LW	L & W
MS	Messmer	OK	Oakland
PP	Technidyne Profile/Plus	TA	Thwing-Albert
TM	TMI		

Paper & Paperboard Interlaboratory Testing Program
Analysis 360
Thickness (Caliper), Printing papers
TAPPI Official Test Method T411

Report #3162G,
February 2022

CTS

Grand Mean Sample GV01 = 3.8795 mils

Grand Mean Sample GV02 = 3.8676 mils
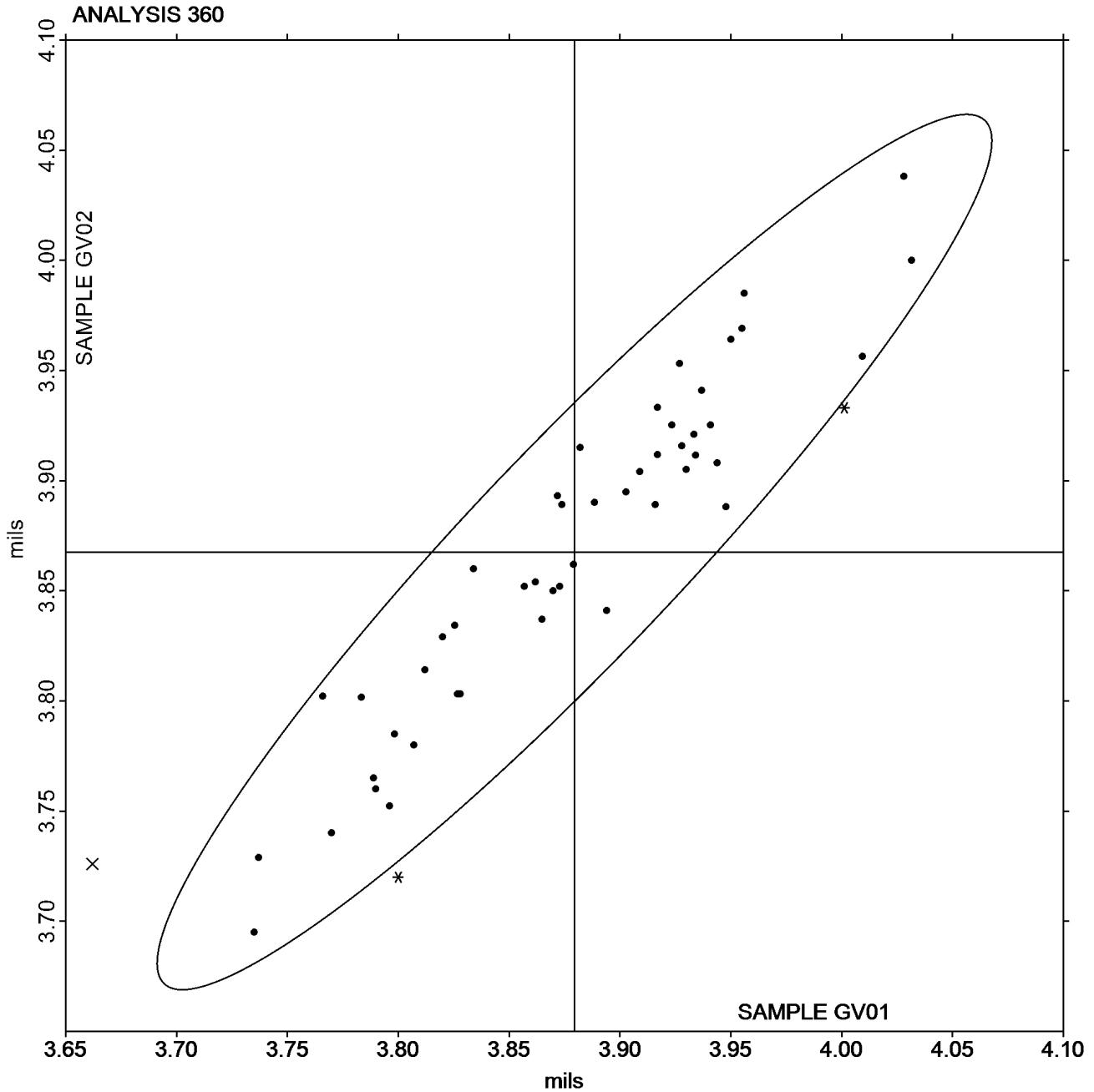
ANALYSIS 360

SAMPLE GV02

mils

SAMPLE GV01

mils

Paper & Paperboard Interlaboratory Testing Program
Analysis 361
Thickness (Caliper), Packaging papers
TAPPI Official Test Method T411

WebCode	Data Flag	Sample GY01			Sample GY02			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
22QF9N	X	7.312	-0.283	-2.66	7.729	0.140	1.51	OK
3A3R6M		7.504	-0.091	-0.86	7.463	-0.126	-1.35	LA
4VTVYP	X	10.197	2.602	24.41	11.330	3.741	40.14	LW
6UFM8G		7.617	0.022	0.20	7.618	0.030	0.32	LW
7JX22L		7.741	0.146	1.37	7.722	0.133	1.43	LA
7MXCXL		7.635	0.040	0.37	7.628	0.039	0.42	LW
8BW94C		7.621	0.026	0.24	7.594	0.005	0.06	TA
8BYX9A		7.539	-0.056	-0.53	7.590	0.001	0.02	EM
A2NBDE		7.635	0.040	0.37	7.613	0.024	0.26	TM
AEQ4JG		7.524	-0.072	-0.67	7.559	-0.030	-0.32	LW
AJ3WVF		7.814	0.219	2.05	7.735	0.146	1.57	LW
CHLEQZ		7.622	0.026	0.25	7.612	0.024	0.25	LW
CNBW6C		7.500	-0.095	-0.89	7.472	-0.116	-1.25	EM
CV8UUZ		7.596	0.001	0.01	7.592	0.003	0.04	VP
DGKYVF		7.432	-0.163	-1.53	7.514	-0.075	-0.80	TA
E8CRQY		7.728	0.133	1.25	7.642	0.053	0.57	LW
EF4A68		7.524	-0.072	-0.67	7.657	0.069	0.74	LW
EPTVB7		7.710	0.115	1.08	7.648	0.059	0.63	LW
F96ZEA		7.410	-0.185	-1.74	7.380	-0.209	-2.24	TA
GKQWTC	*	7.418	-0.178	-1.67	7.335	-0.254	-2.73	LA
HD9PRY		7.483	-0.112	-1.05	7.547	-0.042	-0.45	EM
HXVBA2		7.653	0.058	0.55	7.618	0.029	0.32	LW
JY6JDU		7.573	-0.022	-0.21	7.548	-0.041	-0.44	EM
LDE97D		7.727	0.132	1.24	7.633	0.044	0.48	PP
MQF3BU		7.550	-0.045	-0.42	7.632	0.043	0.47	EM
MTLPNY		7.451	-0.144	-1.35	7.457	-0.132	-1.41	TM
MUFD7U		7.581	-0.014	-0.13	7.628	0.039	0.42	EM
P6U9ZQ		7.704	0.109	1.02	7.639	0.050	0.54	LB
PAZ3W8		7.602	0.007	0.06	7.712	0.124	1.33	LW
R3DRXW		7.511	-0.084	-0.79	7.538	-0.051	-0.54	LW
RDYZHK		7.691	0.095	0.90	7.673	0.085	0.91	LW
UTYRCK		7.543	-0.052	-0.49	7.488	-0.100	-1.08	LA
WA28BH		7.675	0.080	0.75	7.602	0.013	0.14	LA
XKWE82	X	7.236	-0.359	-3.37	7.177	-0.411	-4.41	GE
XQ3AQ2		7.790	0.195	1.83	7.708	0.119	1.28	PP
ZW7T6K		7.538	-0.057	-0.54	7.625	0.036	0.39	EM

Paper & Paperboard Interlaboratory Testing Program
Analysis 361
Thickness (Caliper), Packaging papers
TAPPI Official Test Method T411

Report #3162G,
February 2022

Summary Statistics	Sample GY01	Sample GY02
Grand Means	7.60 mils	7.59 mils
Stnd Dev Btwn Labs	0.11 mils	0.09 mils

Statistics based on 33 of 36 reporting participants.

Comments on Assigned Data Flags for Test #361

22QF9N (X) - Inconsistent in testing between samples.

4VTVYP (X) - Extreme Data.

XKWE82 (X) - Data for both samples are low. Possible Systematic Error.

Key to Instrument Codes Reported by Participants

EM	Emveco	GE	Gester Electronic Thickness Tester
LA	L & W Autoline	LB	L & W Autoline 600
LW	L & W	OK	Oakland
PP	Technidyne Profile/Plus	TA	Thwing-Albert
TM	TMI	VP	Valmet Paper Lab Automated Tester

Paper & Paperboard Interlaboratory Testing Program
Analysis 361
Thickness (Caliper), Packaging papers
TAPPI Official Test Method T411

Report #3162G,
February 2022

Grand Mean Sample GY01 = 7.5952 mils

Grand Mean Sample GY02 = 7.5886 mils
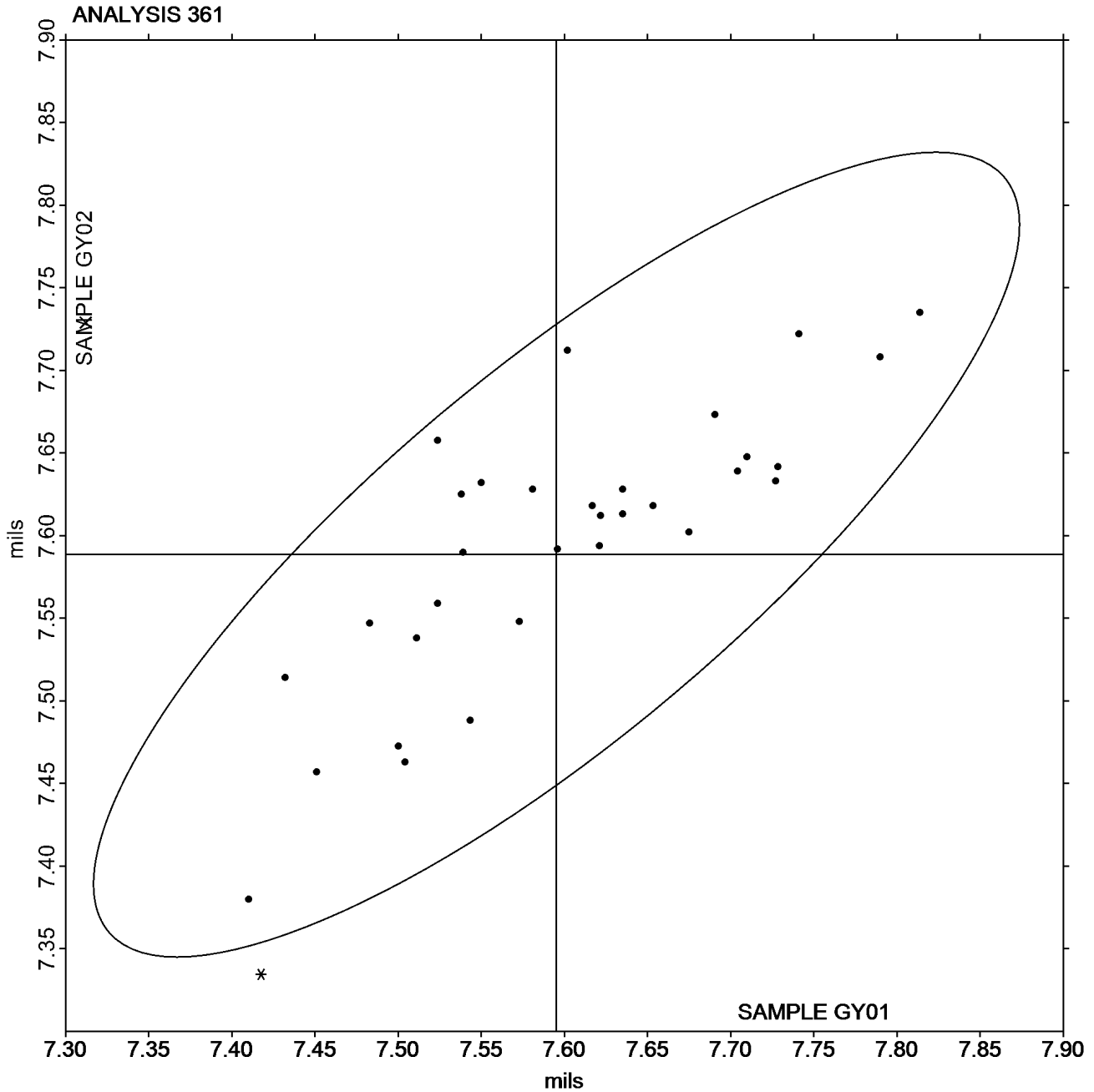
Paper & Paperboard Interlaboratory Testing Program
Analysis 364
Coefficient of Static Friction - Horizontal Plane Method - Printing Papers
TAPPI Official Test Method T549

WebCode	Data Flag	Sample GD01			Sample GD02			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
BUG7ZK		0.4020	-0.1662	-2.73	0.4940	-0.1030	-1.89	TA
CCTDM2		0.6040	0.0358	0.59	0.6340	0.0370	0.68	TA
GKQWTC		0.5550	-0.0132	-0.22	0.5746	-0.0224	-0.41	TA
HW3MR7		0.6010	0.0328	0.54	0.6074	0.0104	0.19	TA
JNM2KM		0.5976	0.0294	0.48	0.6050	0.0080	0.15	IT
LDE97D		0.5600	-0.0082	-0.14	0.5680	-0.0290	-0.53	TP
PYNDGQ		0.5952	0.0270	0.44	0.6904	0.0934	1.71	TM
RDYZHK		0.5400	-0.0282	-0.46	0.6304	0.0334	0.61	TA
TPLM6Q		0.5740	0.0058	0.10	0.6120	0.0150	0.28	TA
YUWT4J		0.6384	0.0702	1.15	0.6470	0.0500	0.92	TA
ZB2GUP		0.5368	-0.0314	-0.52	0.5166	-0.0804	-1.48	XX
ZWKLFE		0.6146	0.0464	0.76	0.5846	-0.0124	-0.23	TA

Summary Statistics	Sample GD01	Sample GD02
Grand Means	0.57 COF	0.60 COF
Stnd Dev Btwn Labs	0.06 COF	0.05 COF

Statistics based on 12 of 12 reporting participants.

Key to Instrument Codes Reported by Participants

IT	IMASS SP-2100	TA	Thwing-Albert Friction Tester
TM	TMI 32-06 Monitor/Slip and Friction	TP	TMI 32-25 COF Tester (Inclined Plane)
XX	Instrument make/model not specified by lab		

Paper & Paperboard Interlaboratory Testing Program
Analysis 364
Coefficient of Static Friction - Horizontal Plane Method - Printing Papers
TAPPI Official Test Method T549

**Report #3162G,
February 2022**

**Grand Mean Sample GD01 = 0.56822
COF**

**Grand Mean Sample GD02 =
0.59700 COF**

If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.
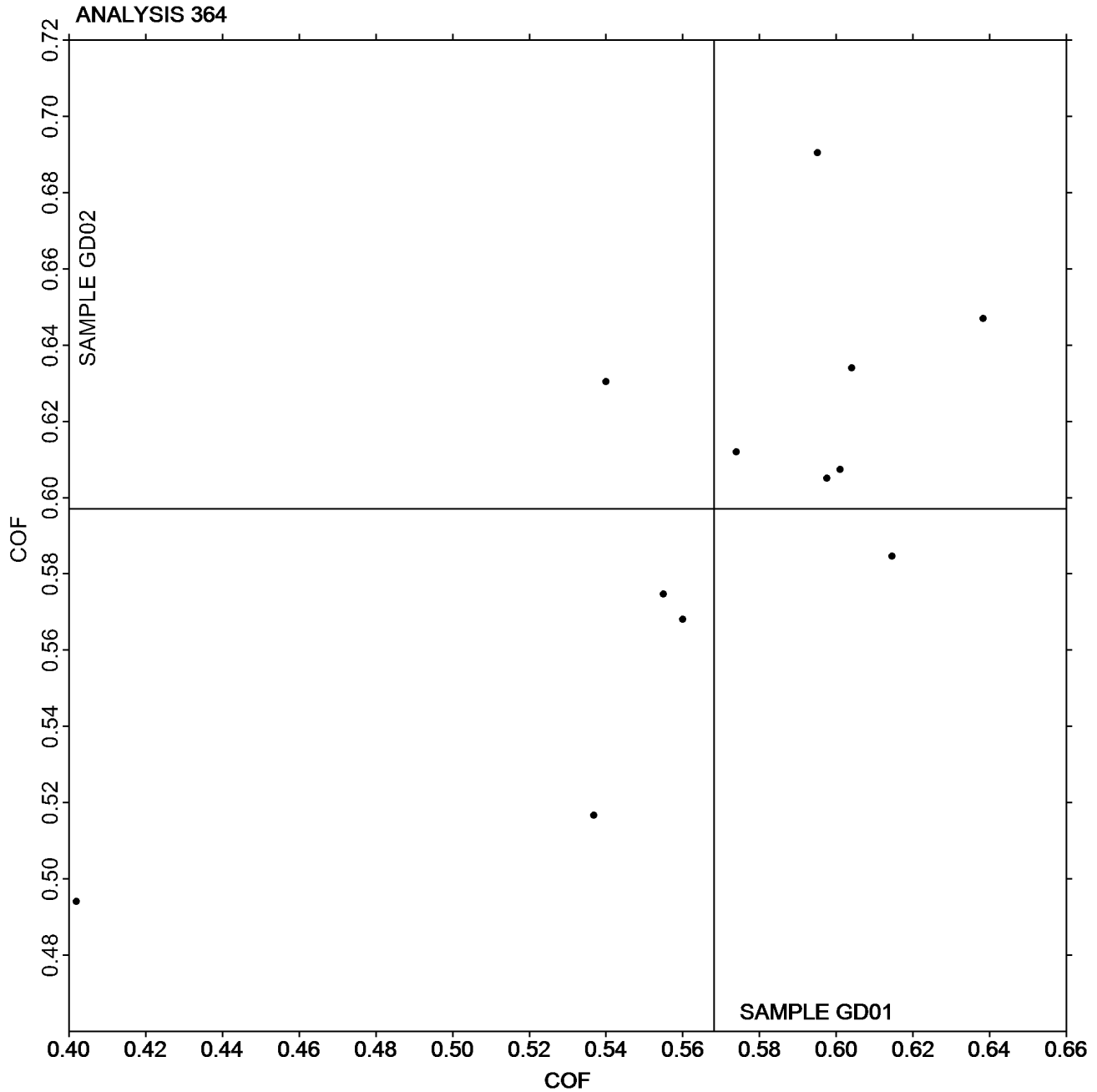
Paper & Paperboard Interlaboratory Testing Program
Analysis 365
Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers
TAPPI Official Test Method T549

Report #3162G,
February 2022

WebCode	Data Flag	Sample GD01 Lab Mean	Diff from Grand Mean	CPV	Sample GD02 Lab Mean	Diff from Grand Mean	CPV	Instr Code
BUG7ZK		0.3640	-0.1197	-2.19	0.4600	-0.0565	-1.06	TA
CCTDM2		0.5280	0.0443	0.81	0.5480	0.0315	0.59	XX
GKQWTC		0.5118	0.0281	0.51	0.5596	0.0431	0.81	TA
HW3MR7		0.4566	-0.0271	-0.49	0.5060	-0.0105	-0.20	TA
JNM2KM		0.4628	-0.0209	-0.38	0.4516	-0.0649	-1.22	IR
PYNDGQ		0.4838	0.0001	0.00	0.5324	0.0159	0.30	TM
RDYZHK		0.5332	0.0495	0.90	0.6058	0.0893	1.68	TN
TPLM6Q		0.4160	-0.0677	-1.24	0.4380	-0.0785	-1.47	TA
YUWT4J		0.5090	0.0253	0.46	0.5660	0.0495	0.93	TA
ZB2GUP		0.5368	0.0531	0.97	0.5290	0.0125	0.24	XX
ZWKLFE		0.5186	0.0349	0.64	0.4848	-0.0317	-0.59	TA

Summary Statistics	Sample GD01	Sample GD02
Grand Means	0.48 COF	0.52 COF
Stnd Dev Btwn Labs	0.05 COF	0.05 COF

Statistics based on 11 of 11 reporting participants.

Key to Instrument Codes Reported by Participants

IR	IMASS SP-2000	TA	Thwing-Albert Friction Tester
TM	TMI 32-06 Monitor/Slip and Friction	TN	TMI 32-07 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
TAPPI Official Test Method T549

Report #3162G,
February 2022

Grand Mean Sample GD01 = 0.48369 COF

Grand Mean Sample GD02 = 0.51647 COF
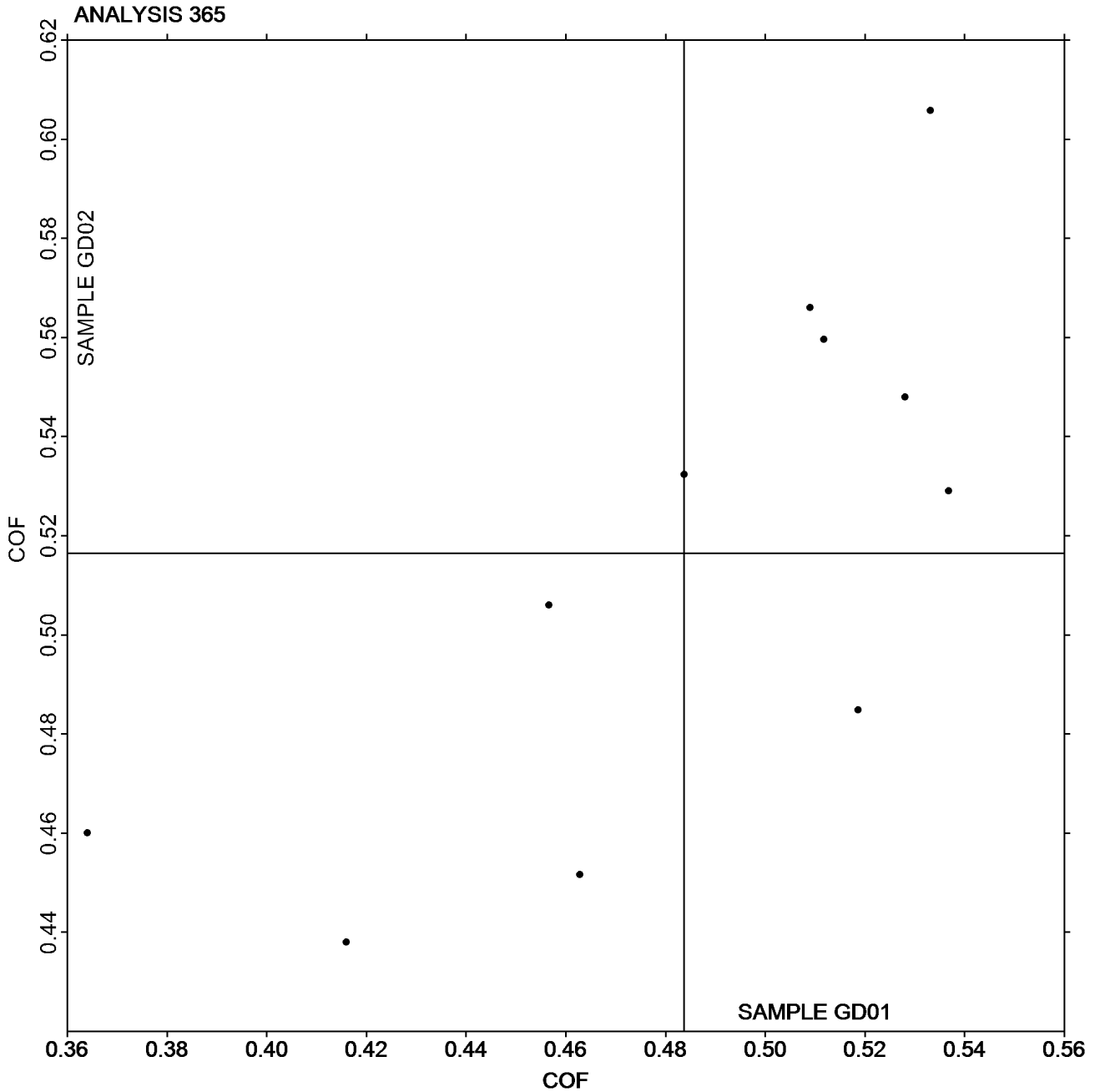
ANALYSIS 365

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

Paper & Paperboard Interlaboratory Testing Program
Analysis 370
Air Resistance - Gurley Oil Type
TAPPI Official Test Method T460

Report #3162G,
February 2022

| WebCode | Data Flag | Sample GE01 | | | Sample GE02 | | | Instr Code |
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4KG6J9		18.48	1.57	1.66	18.61	1.54	1.69	PP
4VTVYP	X	12.52	-4.39	-4.64	14.07	-3.00	-3.30	TL
6KD6VD		18.11	1.20	1.27	16.80	-0.27	-0.30	GA
7JX22L		15.62	-1.29	-1.36	16.22	-0.85	-0.93	LA
7MXCXL		17.64	0.73	0.77	17.78	0.71	0.78	LP
7V4GJB		16.71	-0.20	-0.21	18.27	1.20	1.32	LP
7ZM7AF		17.46	0.56	0.59	16.41	-0.66	-0.72	PP
84YJM8		14.97	-1.94	-2.05	15.00	-2.07	-2.28	GA
8BW94C		16.48	-0.43	-0.45	16.24	-0.83	-0.91	GA
8QRRJE		17.40	0.49	0.52	17.48	0.41	0.45	LP
8WVUME		16.79	-0.12	-0.12	16.62	-0.45	-0.49	HG
9BT7UX		17.48	0.57	0.60	16.94	-0.13	-0.14	GL
9Q94YY		15.96	-0.95	-1.01	16.75	-0.32	-0.35	PP
AEQ4JG		16.18	-0.73	-0.77	16.11	-0.96	-1.06	LP
BB7ETC		16.72	-0.19	-0.20	17.09	0.02	0.02	LP
BUG7ZK		17.29	0.38	0.40	17.83	0.76	0.83	VM
BWMQLZ		17.56	0.65	0.69	17.55	0.48	0.53	LP
CAPFFE		16.92	0.01	0.01	16.78	-0.29	-0.32	PP
CCTDM2		17.33	0.43	0.45	17.97	0.90	0.99	PP
CHLEQZ		16.97	0.06	0.07	16.70	-0.37	-0.41	LW
CV8UUZ		15.44	-1.47	-1.55	15.26	-1.81	-1.99	VM
CXBKYU		15.74	-1.17	-1.24	16.10	-0.97	-1.07	PP
D4HB2Z		16.96	0.05	0.06	16.41	-0.66	-0.73	LP
DBF389		17.70	0.79	0.83	17.44	0.37	0.41	PP
E8CRQY		16.52	-0.39	-0.41	16.79	-0.28	-0.31	PP
FJMJX7		16.64	-0.27	-0.28	17.31	0.24	0.26	LP
GKQWTC		16.68	-0.23	-0.24	16.62	-0.45	-0.49	LA
GV8HX8		16.88	-0.03	-0.03	17.42	0.35	0.38	PP
HW3MR7		18.36	1.45	1.54	18.78	1.71	1.88	WG
HXVBA2		15.93	-0.98	-1.03	17.21	0.14	0.15	GA
JMTD3R		16.70	-0.21	-0.22	17.10	0.03	0.03	LW
JY6JDU		16.17	-0.74	-0.78	16.52	-0.55	-0.60	LP
LDE97D		16.41	-0.50	-0.53	16.52	-0.55	-0.60	PP
NPJ9QV		19.14	2.23	2.36	18.95	1.88	2.06	LA
PM8TWU		15.18	-1.73	-1.83	15.89	-1.18	-1.30	LP
T7TLDU		17.99	1.08	1.14	17.28	0.21	0.23	XX
TPLM6Q		17.29	0.38	0.40	17.04	-0.03	-0.04	PP
TW9EE6		18.75	1.84	1.95	19.38	2.31	2.54	PP
UTYRCK		17.48	0.57	0.60	17.46	0.39	0.43	LA
YXH9XL		16.82	-0.09	-0.09	17.07	0.00	0.00	HG
ZB2GUP		16.60	-0.31	-0.33	16.30	-0.77	-0.85	GS

Paper & Paperboard Interlaboratory Testing Program
Analysis 370
Air Resistance - Gurley Oil Type
TAPPI Official Test Method T460

Report #3162G,
February 2022

		Sample GE01			Sample GE02			
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
ZW2B7L	*	15.50	-1.41	-1.49	17.40	0.33	0.36	HG
ZW7T6K		17.21	0.30	0.31	17.55	0.48	0.53	PP

Summary Statistics	Sample GE01	Sample GE02
Grand Means	16.91 sec/100 cc	17.07 sec/100 cc
Stnd Dev Btwn Labs	0.95 sec/100 cc	0.91 sec/100 cc

Statistics based on 42 of 43 reporting participants.

Comments on Assigned Data Flags for Test #370

4VTVYP (X) - Data for both samples are low. Possible Systematic Error.

Key to Instrument Codes Reported by Participants

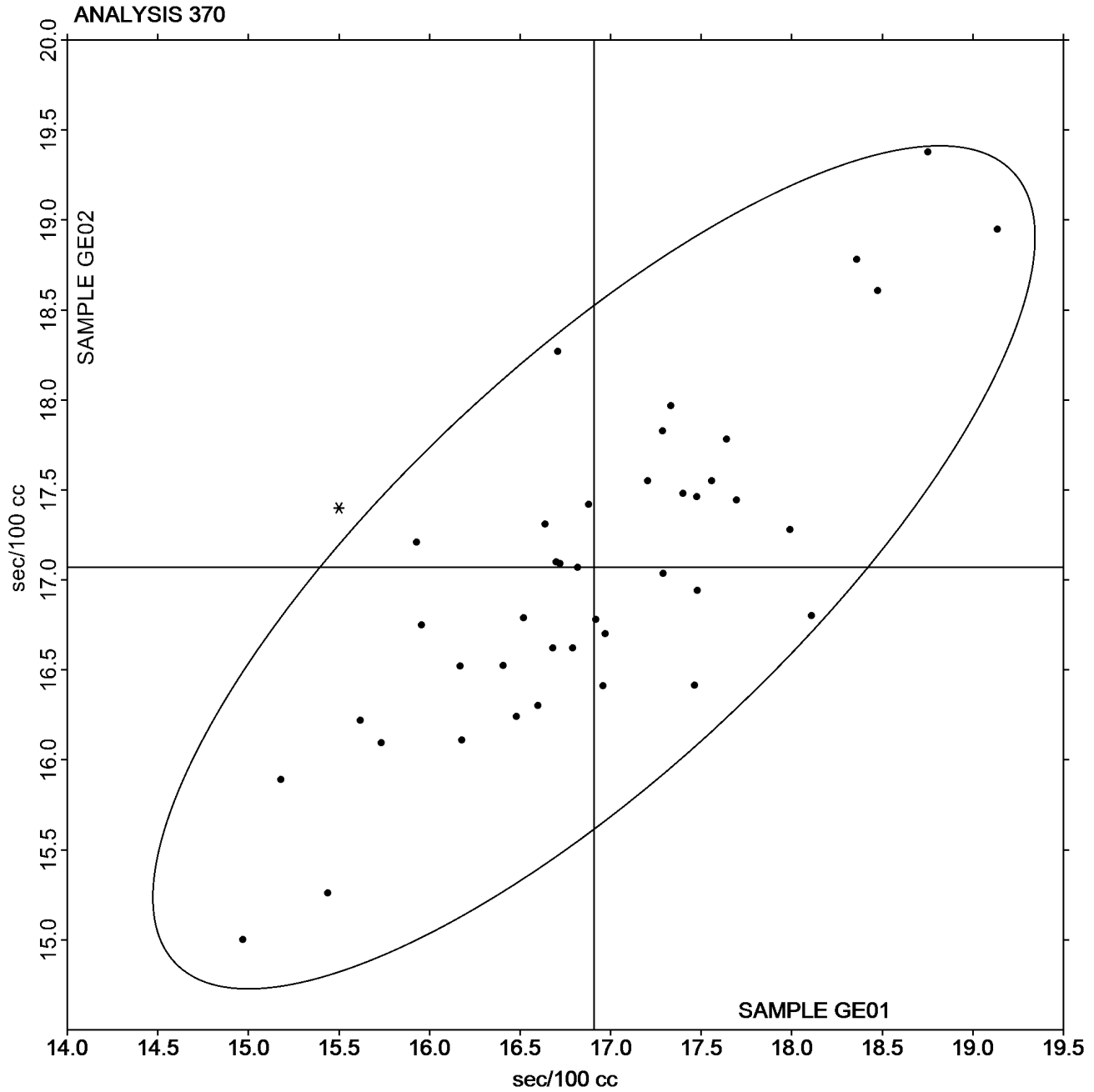| GA	Gurley Precision #4340 Automatic Densometer	GL	Gurley #4110
GS	Gurley-Hill S-P-S Tester #4190	HG	Technidyne - Hagerty Model #1
LA	L & W Autoline	LP	L & W Densometer, Air Permeance
LW	L & W Type Gurley Densometer, Oil Flotation	PP	Technidyne Profile/Plus
TL	Gurley Densometer #4110, Oil Flotation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

Paper & Paperboard Interlaboratory Testing Program
Analysis 370
Air Resistance - Gurley Oil Type
TAPPI Official Test Method T460

Report #3162G,
February 2022

Grand Mean Sample GE01 = 16.908
sec/100 cc

Grand Mean Sample GE02 = 17.070
sec/100 cc

ANALYSIS 370

SAMPLE GE02

SAMPLE GE01

sec/100 cc

sec/100 cc

Paper & Paperboard Interlaboratory Testing Program
Analysis 372
Porosity - Sheffield Type - Sheffield Units for 3/4 inch Diameter Orifice
TAPPI Official Test Method T547

Report #3162G, February 2022

WebCode	Data Flag	Sample GE01 Lab Mean	Sample GE01 Diff from Grand Mean	Sample GE01 CPV	Sample GE02 Lab Mean	Sample GE02 Diff from Grand Mean	Sample GE02 CPV	Instr Code
7NQ6T6		162.6	4.9	0.60	154.7	-6.1	-0.66	HM
8BW94C		159.3	1.6	0.20	167.0	6.2	0.66	GA
CV8UUZ		152.3	-5.4	-0.65	167.4	6.5	0.70	PP
CXBKYU		157.3	-0.4	-0.04	153.1	-7.8	-0.84	PP
TL9M9Y		145.2	-12.5	-1.51	151.4	-9.4	-1.02	TT
V2ABAP		171.6	13.9	1.68	176.0	15.2	1.63	LA
ZB2GUP		155.3	-2.4	-0.28	156.4	-4.4	-0.48	SH

Summary Statistics	Sample GE01	Sample GE02
Grand Means	157.65 Sheffield Units	160.85 Sheffield Units
Stnd Dev Btwn Labs	8.29 Sheffield Units	9.29 Sheffield Units

Statistics based on 7 of 7 reporting participants.

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	HM	Technidyne - Hagerty Model #538
LA	L & W Roughness Sheffield - Autoline	PP	Technidyne Profile/Plus
SH	Sheffield	TT	TMI Monitor/Smoothness II, Model 58-24

Paper & Paperboard Interlaboratory Testing Program
Analysis 372
Porosity - Sheffield Type - Sheffield Units for 3/4 inch Diameter Orifice
TAPPI Official Test Method T547

Report #3162G,
February 2022

Grand Mean Sample GE01 = 157.65
Sheffield Units

Grand Mean Sample GE02 = 160.85
Sheffield Units

ANALYSIS 372

SAMPLE GE02

Sheffield Units

SAMPLE GE01

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
TAPPI Official Test Method T555

WebCode	Data Flag	Sample GJ01 Lab Mean	Sample GJ01 Diff from Grand Mean	Sample GJ01 CPV	Sample GJ02 Lab Mean	Sample GJ02 Diff from Grand Mean	Sample GJ02 CPV	Instr Code
22QF9N		0.8690	0.0207	0.29	1.0170	0.0750	0.93	ZZ
2WXD7A		0.8250	-0.0233	-0.32	0.9470	0.0050	0.06	ZZ
3A3R6M		0.7520	-0.0963	-1.34	0.7730	-0.1690	-2.09	ZZ
6UFM8G		0.8680	0.0197	0.27	0.9480	0.0060	0.07	ZZ
6XYDXK	X	4.7440	3.8957	54.02	5.5440	4.6020	56.86	ZZ
7V4GJB		0.8900	0.0417	0.58	0.9360	-0.0060	-0.07	ZZ
7ZM7AF		0.8330	-0.0153	-0.21	0.8230	-0.1190	-1.47	ZZ
8BYX9A		0.6970	-0.1513	-2.10	0.7750	-0.1670	-2.06	ZZ
BJZG2F		0.8560	0.0077	0.11	0.9750	0.0330	0.41	ZZ
CAPFFE		1.0080	0.1597	2.21	1.1110	0.1690	2.09	ZZ
CV8UUZ		0.7880	-0.0603	-0.84	0.9370	-0.0050	-0.06	ZZ
CWHWFY		0.7580	-0.0903	-1.25	0.9650	0.0230	0.28	ZZ
HD9PRY		0.9610	0.1127	1.56	0.9740	0.0320	0.40	ZZ
HVRL78		0.8990	0.0507	0.70	0.9660	0.0240	0.30	ZZ
HW3MR7		0.7840	-0.0643	-0.89	0.8840	-0.0580	-0.72	ZZ
MQF3BU		0.8830	0.0347	0.48	1.0740	0.1320	1.63	ZZ
MUFD7U		0.8770	0.0287	0.40	0.9170	-0.0250	-0.31	ZZ
P6U9ZQ		0.7660	-0.0823	-1.14	0.8740	-0.0680	-0.84	ZZ
R3DRXW		0.9140	0.0657	0.91	1.0010	0.0590	0.73	ZZ
TPLM6Q		0.9050	0.0567	0.79	0.9850	0.0430	0.53	ZZ
WJQTJ2		0.8310	-0.0173	-0.24	0.8410	-0.1010	-1.25	ZZ
WV3YWP		0.8530	0.0047	0.06	0.9970	0.0550	0.68	ZZ
WYGYRV		0.8710	0.0227	0.31	0.9880	0.0460	0.57	ZZ
ZTHLFG	*	0.7280	-0.1203	-1.67	1.0140	0.0720	0.89	ZZ
ZW2B7L		0.9240	0.0757	1.05	0.9580	0.0160	0.20	ZZ
ZW7T6K		0.8490	0.0007	0.01	0.9260	-0.0160	-0.20	ZZ
ZWKLFE		0.8680	0.0197	0.27	0.8850	-0.0570	-0.70	ZZ

Summary Statistics	Sample GJ01	Sample GJ02
Grand Means	0.85 Microns	0.94 Microns
Stnd Dev Btwn Labs	0.07 Microns	0.08 Microns

Statistics based on 26 of 27 reporting participants.

Comments on Assigned Data Flags for Test #376

6XYDXK (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

ZZ   Instruments No Longer Tracked

Paper & Paperboard Interlaboratory Testing Program
Analysis 376
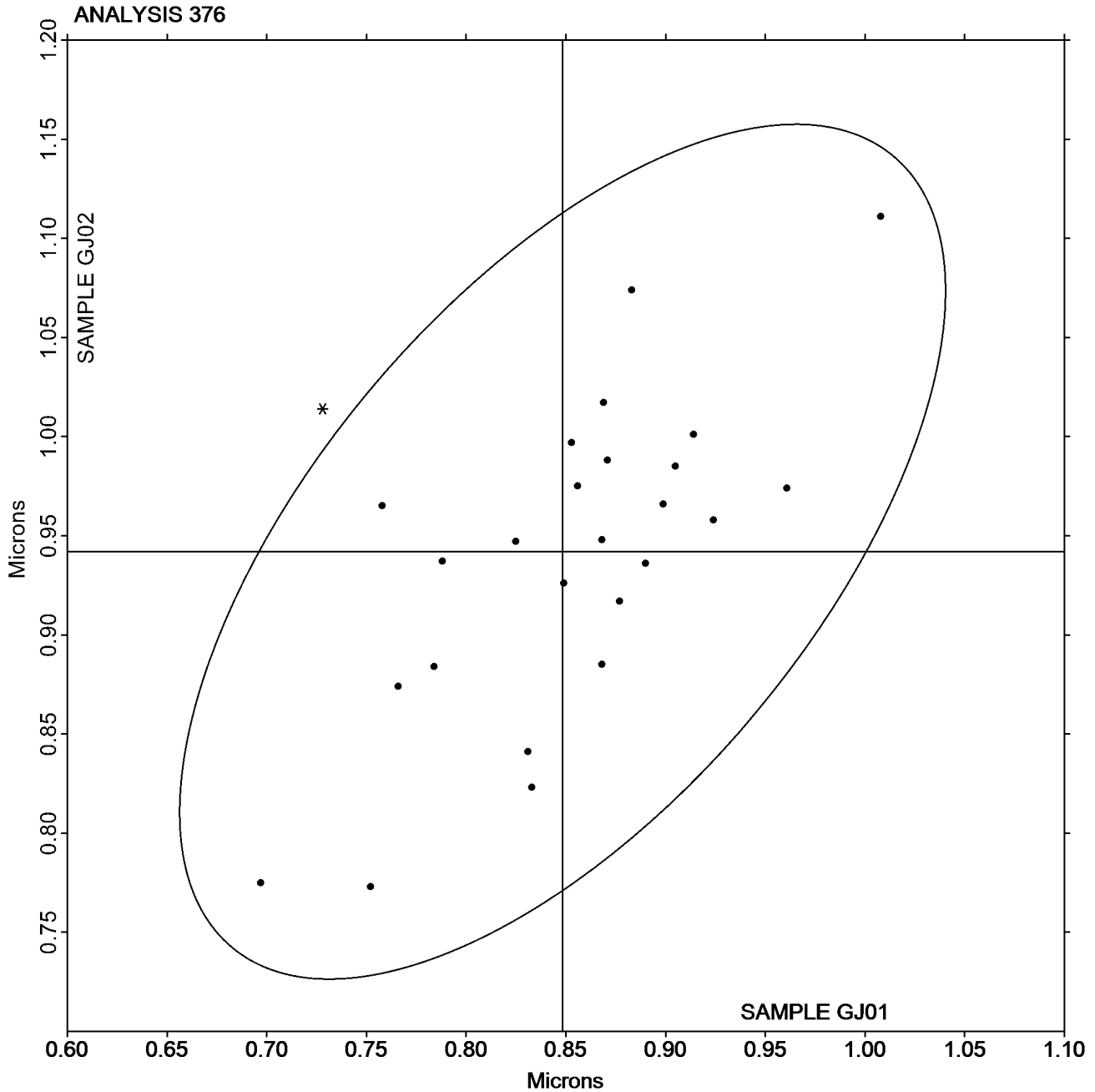**Roughness - Print Surf Method - 0.5 to 4.0 Microns**
TAPPI Official Test Method T555

**Report #3162G,
February 2022**

**Grand Mean Sample GJ01 = 0.84835
Microns**

**Grand Mean Sample GJ02 =
0.94196 Microns**

Paper & Paperboard Interlaboratory Testing Program
Analysis 377
Roughness - Print Surf Method - 2.5 to 6.0 Microns
TAPPI Official Test Method T555

Report #3162G,
February 2022

| | | Sample GK01 | | | Sample GK02 | | | |
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
8BYX9A		5.562	-0.370	-1.53	5.781	-0.154	-0.97	ZZ
CCTDM2		5.991	0.059	0.24	5.949	0.014	0.09	ZZ
E8CRQY		5.887	-0.045	-0.19	5.850	-0.085	-0.53	ZZ
HW3MR7		5.651	-0.281	-1.16	5.782	-0.153	-0.96	ZZ
LDE97D		5.857	-0.075	-0.31	5.848	-0.087	-0.55	ZZ
P6U9ZQ		5.935	0.003	0.01	5.860	-0.075	-0.47	ZZ
RDYZHK		6.022	0.090	0.37	6.031	0.096	0.60	ZZ
YUWT4J		6.101	0.169	0.70	6.041	0.106	0.66	ZZ
ZW7T6K		6.385	0.453	1.87	6.276	0.341	2.13	ZZ

Summary Statistics	**Sample GK01**	**Sample GK02**
Grand Means	5.93 Microns	5.94 Microns
Stnd Dev Btwn Labs	0.24 Microns	0.16 Microns

Statistics based on 9 of 9 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ   Instruments No Longer Tracked

Paper & Paperboard Interlaboratory Testing Program
Analysis 377
Roughness - Print Surf Method - 2.5 to 6.0 Microns
TAPPI Official Test Method T555

**Report #3162G,
February 2022**

**Grand Mean Sample GK01 = 5.9323
Microns**

**Grand Mean Sample GK02 = 5.9353
Microns**
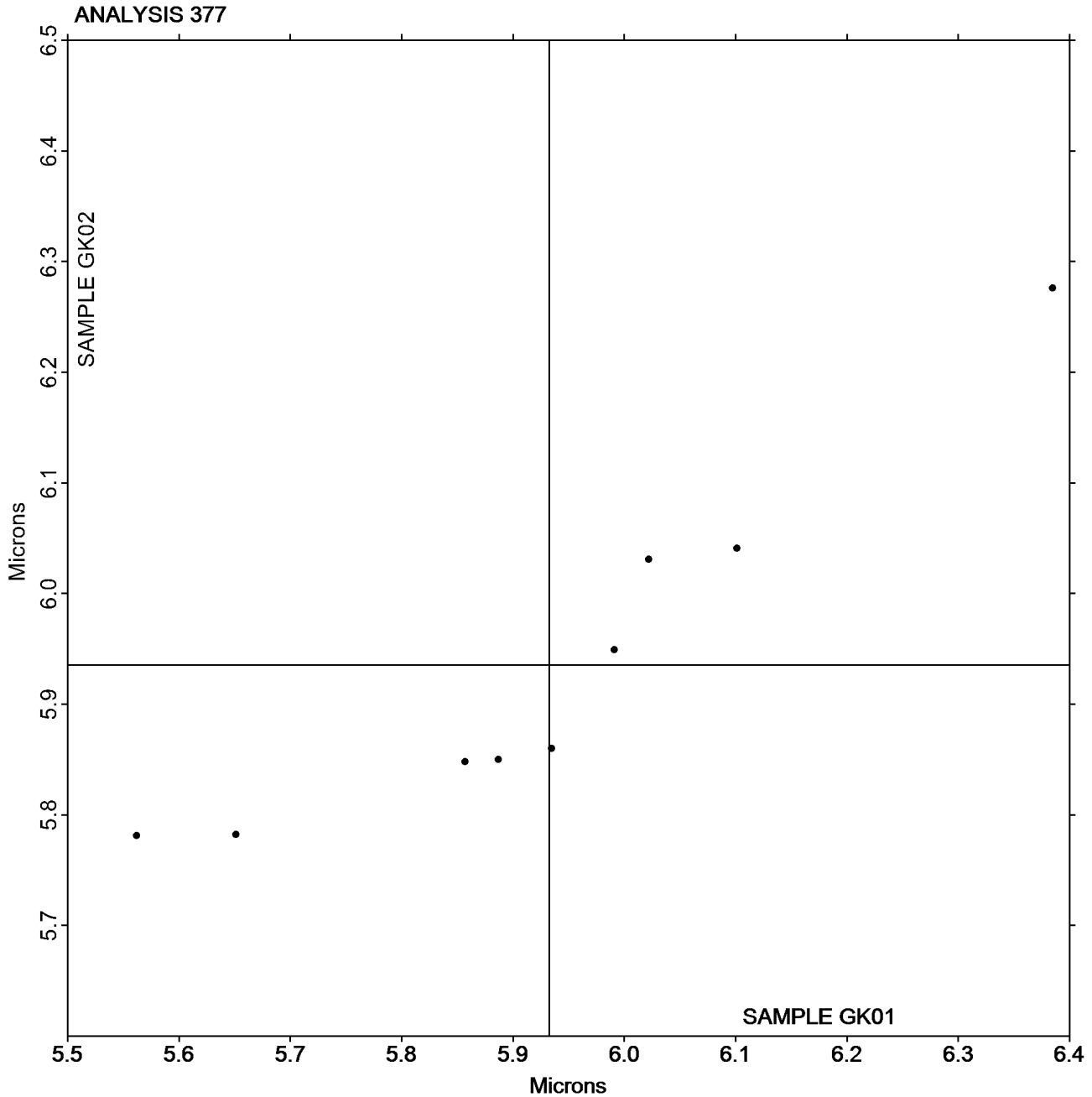
ANALYSIS 377

SAMPLE GK02

Microns

SAMPLE GK01

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
TAPPI Official Test Method T538

**Report #3162G,
February 2022**

| WebCode | Data Flag | Sample GL01 | | | Sample GL02 | | | Instr Code |
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
22QF9N	X	165.0	43.3	5.54	166.0	47.6	6.99	GL
2N8PDT		119.3	-2.3	-0.30	117.9	-0.5	-0.07	PP
3A3R6M		128.9	7.2	0.92	120.2	1.8	0.26	LA
4KG6J9		128.7	7.0	0.89	126.2	7.8	1.15	PP
6KD6VD		123.9	2.3	0.29	124.4	6.0	0.88	GA
7JX22L		114.0	-7.7	-0.98	118.1	-0.3	-0.04	LA
7MXCXL		119.0	-2.7	-0.34	122.9	4.5	0.66	LW
7V4GJB		118.2	-3.5	-0.44	113.4	-5.0	-0.73	TS
7ZM7AF	X	455.9	334.2	42.69	455.7	337.3	49.53	PP
8BW94C		120.1	-1.6	-0.20	118.0	-0.4	-0.06	PP
8BYX9A		125.7	4.0	0.52	112.7	-5.7	-0.84	LW
8WVUME		128.5	6.8	0.87	122.5	4.1	0.60	TS
9Q94YY		117.5	-4.2	-0.53	109.1	-9.3	-1.36	PP
BB7ETC		137.6	15.9	2.04	124.1	5.7	0.84	LW
BJZG2F		113.9	-7.7	-0.99	110.6	-7.8	-1.14	PP
BUG7ZK		117.4	-4.3	-0.54	114.7	-3.7	-0.54	PP
BWMQLZ		114.0	-7.7	-0.98	111.2	-7.2	-1.06	LW
CAPFFE		114.6	-7.1	-0.90	106.7	-11.7	-1.72	PP
CCTDM2		116.1	-5.6	-0.72	115.6	-2.8	-0.41	PP
CV8UUZ		120.2	-1.5	-0.19	120.9	2.5	0.37	VM
CXBKYU		121.2	-0.5	-0.06	119.7	1.3	0.19	TT
DBF389		111.2	-10.5	-1.34	108.9	-9.5	-1.40	PP
E8CRQY		125.5	3.8	0.49	130.3	11.8	1.74	PP
GV8HX8		117.8	-3.9	-0.49	114.8	-3.6	-0.53	SH
HD9PRY		125.2	3.5	0.45	121.8	3.4	0.50	PP
HW3MR7		133.9	12.2	1.56	127.7	9.3	1.36	XX
JMTD3R		122.7	1.0	0.13	117.2	-1.2	-0.18	TS
JRPZX2	*	146.3	24.6	3.15	137.5	19.1	2.80	TT
LDE97D		135.2	13.6	1.73	122.1	3.7	0.54	PP
MQF3BU		121.2	-0.5	-0.06	123.3	4.9	0.72	PP
MUFD7U		122.0	0.3	0.04	118.9	0.5	0.07	PP
NPJ9QV	*	106.3	-15.4	-1.96	99.4	-19.1	-2.80	LA
P6U9ZQ		111.0	-10.7	-1.36	109.9	-8.5	-1.25	LB
R3DRXW		125.5	3.8	0.48	121.5	3.1	0.46	PP
RDYZHK		124.2	2.5	0.32	120.7	2.3	0.34	LW
TPLM6Q		125.2	3.6	0.46	119.9	1.5	0.23	PP
TW9EE6		112.8	-8.9	-1.13	116.2	-2.2	-0.33	PP
TX24XZ		120.0	-1.7	-0.22	116.7	-1.7	-0.25	PP
UL2WEL		118.8	-2.9	-0.37	116.7	-1.7	-0.25	LA
V2ABAP	*	104.3	-17.4	-2.22	111.8	-6.6	-0.97	LA
WJQTJ2		124.9	3.2	0.41	121.2	2.8	0.41	LW

Paper & Paperboard Interlaboratory Testing Program

Analysis 378
Roughness - Sheffield Type
TAPPI Official Test Method T538

WebCode	Data Flag	Sample GL01 Lab Mean	Sample GL01 Diff from Grand Mean	Sample GL01 CPV	Sample GL02 Lab Mean	Sample GL02 Diff from Grand Mean	Sample GL02 CPV	Instr Code
YHPKNM		125.7	4.0	0.52	126.7	8.3	1.22	GA
YUWT4J		121.8	0.2	0.02	112.6	-5.8	-0.85	PP
YXH9XL		127.0	5.3	0.68	119.0	0.6	0.09	HM
ZB2GUP		119.2	-2.5	-0.31	119.8	1.4	0.20	XX
ZW2B7L		116.4	-5.3	-0.67	113.4	-5.0	-0.73	HM
ZW7T6K		127.0	5.3	0.68	121.4	3.0	0.44	LW
ZWKLFE		126.7	5.0	0.64	128.2	9.8	1.44	HM

Summary Statistics	Sample GL01	Sample GL02
Grand Means	121.67 Sheffield	118.40 Sheffield
Stnd Dev Btwn Labs	7.83 Sheffield	6.81 Sheffield

Statistics based on 46 of 48 reporting participants.

Comments on Assigned Data Flags for Test #378

22QF9N (X) - Extreme Data.

7ZM7AF (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	GL	Giddings and Lewis Sheffield
HM	Technidyne - Hagerty Model #538	LA	L & W Roughness Sheffield - Autoline
LB	L & W - Autoline 600	LW	L & W Roughness Tester
PP	Technidyne Profile/Plus	SH	Sheffield (Bendix Precisionaire)
TS	TMI Monitor/Smoothness, Model 58-02	TT	TMI Monitor/Smoothness II, Model 58-24
VM	Valmet PaperLab (was Kajaani\Robotest)	XX	Instrument make/model not specified by lab

Paper & Paperboard Interlaboratory Testing Program
Analysis 378
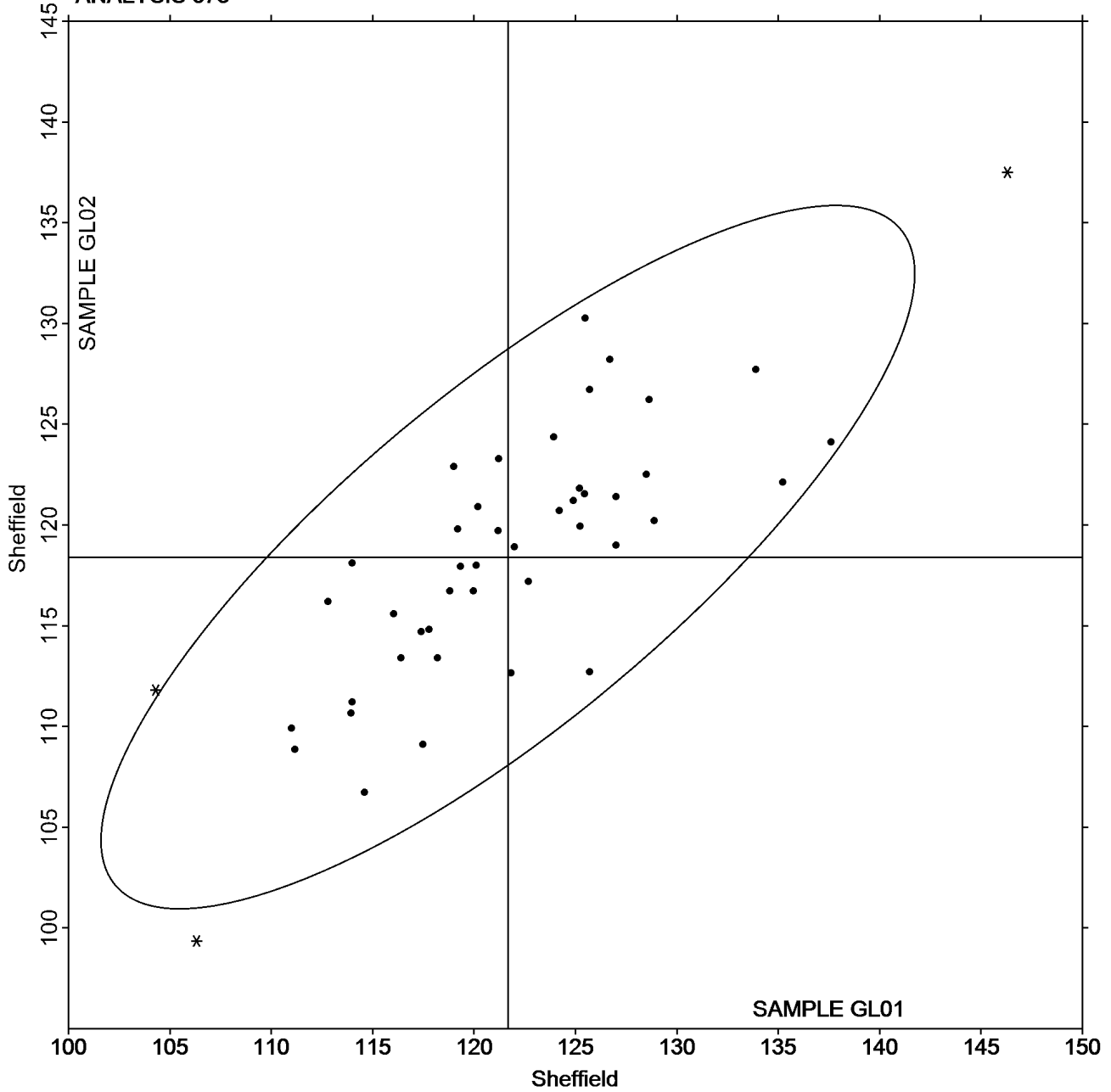**Roughness - Sheffield Type**
TAPPI Official Test Method T538

Report #3162G,
February 2022

Grand Mean Sample GL01 = 121.67
Sheffield

Grand Mean Sample GL02 = 118.40
Sheffield

Paper & Paperboard Interlaboratory Testing Program
Analysis 382
Moisture in Paper
TAPPI Official Test Method T412

Report #3162G,
February 2022

WebCode	Data Flag	Sample GM01 Lab Mean	Sample GM01 Diff from Grand Mean	Sample GM01 CPV	Sample GM02 Lab Mean	Sample GM02 Diff from Grand Mean	Sample GM02 CPV	Instr Code
27PNHQ		4.310	0.040	0.10	4.240	-0.022	-0.08	ZZ
3AGF4T		4.837	0.567	1.39	4.806	0.544	1.94	ZZ
6JGMXJ		4.150	-0.120	-0.29	4.165	-0.097	-0.35	ZZ
7NQ6T6		5.124	0.854	2.09	4.535	0.273	0.98	ZZ
A2NBDE		4.177	-0.093	-0.23	4.158	-0.104	-0.37	ZZ
BB7ETC		3.547	-0.723	-1.77	3.781	-0.481	-1.72	ZZ
BQGV6K		4.593	0.323	0.79	4.529	0.267	0.95	ZZ
CCTDM2		4.059	-0.211	-0.51	4.285	0.024	0.08	ZZ
GVWJ4X		4.570	0.300	0.73	4.510	0.248	0.89	ZZ
H7CMR9		4.017	-0.253	-0.62	3.994	-0.268	-0.96	ZZ
HVRL78		4.167	-0.103	-0.25	4.113	-0.149	-0.53	ZZ
KY3BJ2		3.800	-0.470	-1.15	4.020	-0.242	-0.86	ZZ
XKWE82		4.074	-0.196	-0.48	4.030	-0.232	-0.83	ZZ
ZJGW3M		4.355	0.085	0.21	4.499	0.237	0.85	ZZ

Summary Statistics	Sample GM01	Sample GM02
Grand Means	4.27 Percent	4.26 Percent
Stnd Dev Btwn Labs	0.41 Percent	0.28 Percent

Statistics based on 14 of 14 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ   Instruments No Longer Tracked
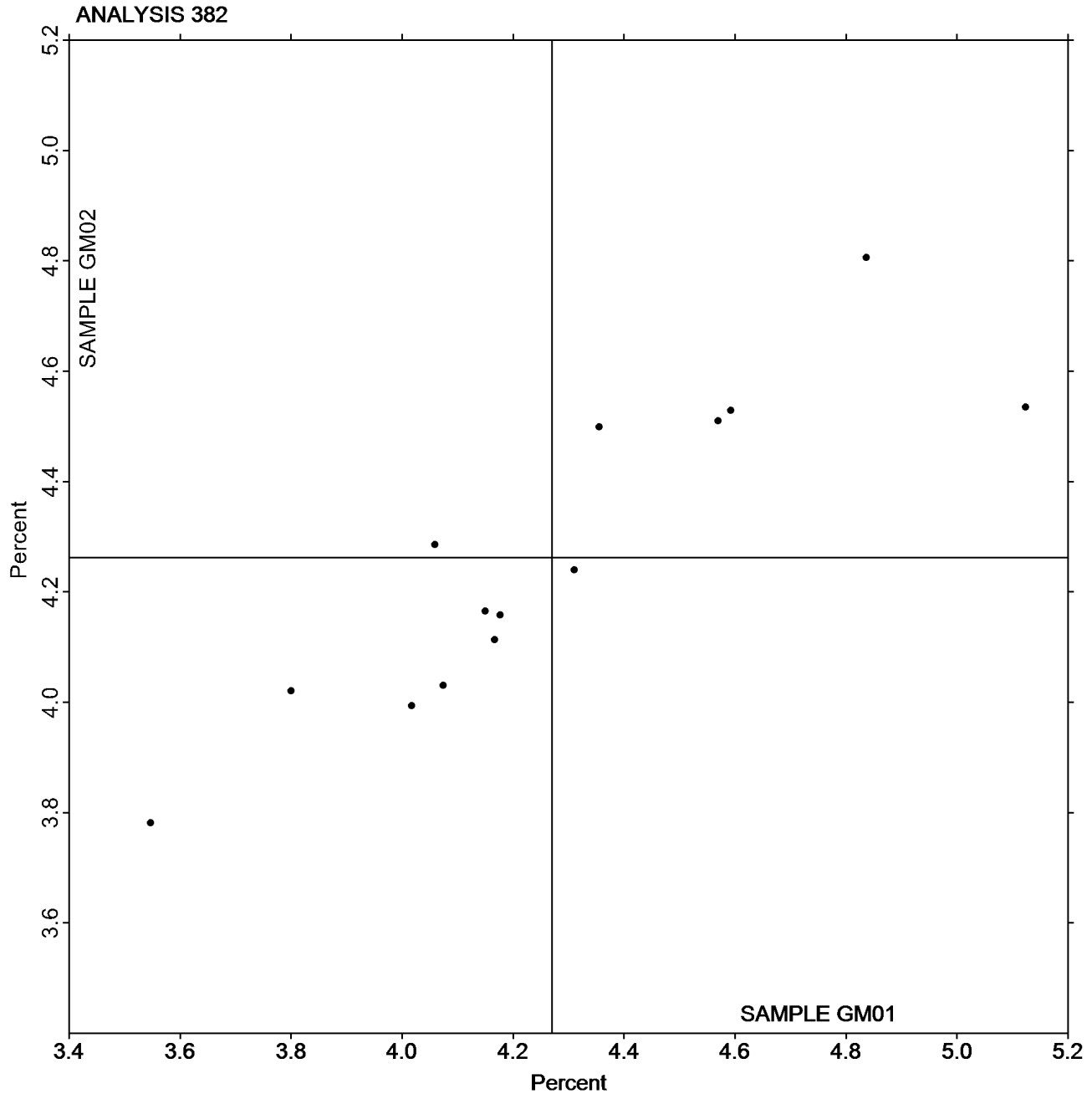
Paper & Paperboard Interlaboratory Testing Program
Analysis 382
Moisture in Paper
TAPPI Official Test Method T412

**Report #3162G,
February 2022**

**Grand Mean Sample GM01 = 4.2700
Percent**

**Grand Mean Sample GM02 = 4.2618
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
TAPPI Official Test Method T425

Report #3162G, February 2022

		Sample GN01			Sample GN02			
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
2N8PDT	*	90.63	1.33	2.73	90.36	1.10	1.92	ZZ
2WXD7A		89.06	-0.24	-0.50	89.07	-0.19	-0.34	ZZ
4KG6J9		89.01	-0.29	-0.59	88.77	-0.49	-0.86	ZZ
7ZM7AF		89.26	-0.04	-0.08	89.05	-0.21	-0.37	ZZ
8BW94C		89.05	-0.25	-0.51	88.65	-0.61	-1.08	ZZ
9Q94YY		89.40	0.10	0.21	89.51	0.25	0.43	ZZ
BUG7ZK		88.25	-1.05	-2.15	88.16	-1.11	-1.94	ZZ
CCTDM2		89.63	0.33	0.67	89.60	0.34	0.60	ZZ
CXBKYU		88.93	-0.37	-0.76	88.71	-0.55	-0.97	ZZ
E8CRQY		89.96	0.66	1.36	90.45	1.19	2.09	ZZ
GV8HX8		88.59	-0.71	-1.46	88.66	-0.60	-1.06	ZZ
JMTD3R		89.40	0.10	0.21	89.46	0.20	0.34	ZZ
LDE97D		89.04	-0.26	-0.54	88.90	-0.36	-0.64	ZZ
NPJ9QV		89.42	0.12	0.25	89.27	0.01	0.01	ZZ
PLD6DY		90.18	0.88	1.81	90.29	1.02	1.79	ZZ
TL9M9Y		89.26	-0.04	-0.08	89.33	0.07	0.12	ZZ
TPLM6Q		88.98	-0.32	-0.65	89.20	-0.07	-0.12	ZZ
TW9EE6	X	89.80	0.50	1.02	88.53	-0.73	-1.28	ZZ
TX24XZ		89.40	0.10	0.21	89.22	-0.04	-0.08	ZZ
V2ABAP		89.07	-0.23	-0.47	88.90	-0.36	-0.64	ZZ
WV3YWP		89.60	0.30	0.61	90.14	0.87	1.53	ZZ
YUWT4J		89.07	-0.23	-0.48	89.26	0.00	0.00	ZZ
YXH9XL		89.03	-0.27	-0.55	89.03	-0.23	-0.41	ZZ
ZB2GUP		89.14	-0.16	-0.33	88.90	-0.36	-0.64	ZZ
ZW2B7L		89.51	0.21	0.43	89.12	-0.14	-0.25	ZZ
ZWKLFE		89.62	0.32	0.66	89.58	0.32	0.55	ZZ

Summary Statistics	Sample GN01	Sample GN02
Grand Means	89.30 Percent	89.26 Percent
Stnd Dev Btwn Labs	0.49 Percent	0.57 Percent

Statistics based on 25 of 26 reporting participants.

Comments on Assigned Data Flags for Test #384

TW9EE6 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample GN01.

Key to Instrument Codes Reported by Participants
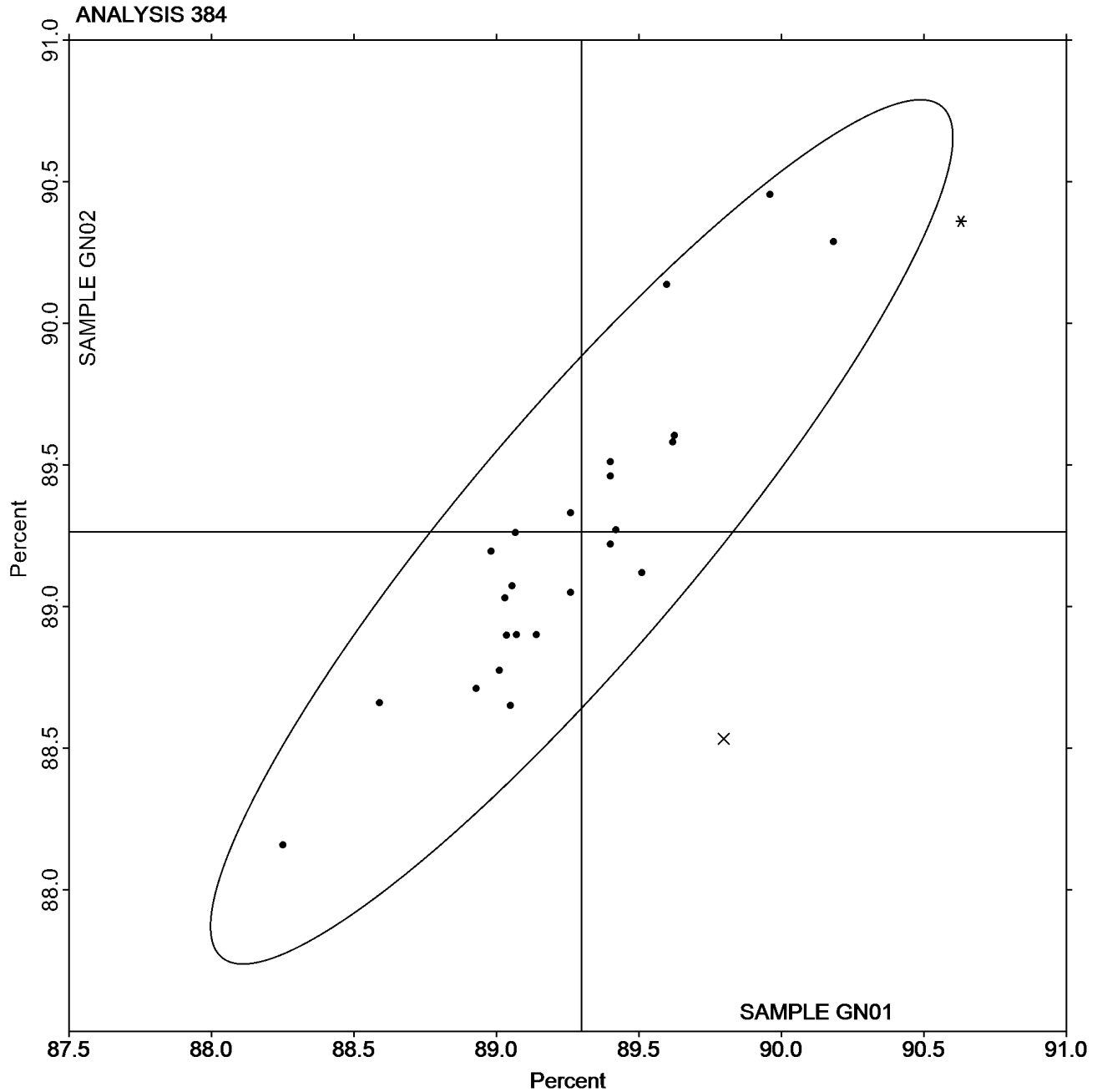
ZZ   Instruments No Longer Tracked

Paper & Paperboard Interlaboratory Testing Program
Analysis 384
Opacity (89% Reflectance Backing) - Fine Papers
TAPPI Official Test Method T425

Report #3162G, February 2022

Grand Mean Sample GN01 = 89.299 Percent

Grand Mean Sample GN02 = 89.264 Percent

ANALYSIS 384

SAMPLE GN02

Percent

SAMPLE GN01

Percent

Paper & Paperboard Interlaboratory Testing Program
Analysis 386
Opacity (Paper Backing) - Fine Papers and Newsprint
TAPPI Official Test Method T519

WebCode	Data Flag	Sample GP01 Lab Mean	Sample GP01 Diff from Grand Mean	Sample GP01 CPV	Sample GP02 Lab Mean	Sample GP02 Diff from Grand Mean	Sample GP02 CPV	Instr Code
6UFM8G		90.16	-0.26	-0.28	90.29	-0.27	-0.31	ZZ
82B8LG	X	90.05	-0.37	-0.39	94.95	4.39	5.02	ZZ
AEQ4JG		92.54	2.12	2.26	92.54	1.98	2.26	ZZ
BB7ETC		89.94	-0.48	-0.51	90.17	-0.39	-0.45	ZZ
CHLEQZ		90.17	-0.25	-0.27	90.29	-0.27	-0.31	ZZ
CNBW6C		89.97	-0.44	-0.47	90.19	-0.37	-0.42	ZZ
D4HB2Z		90.17	-0.25	-0.27	90.17	-0.39	-0.44	ZZ
FJMJX7		89.98	-0.43	-0.46	90.27	-0.29	-0.33	ZZ

Summary Statistics	Sample GP01	Sample GP02
Grand Means	90.42 Percent	90.56 Percent
Stnd Dev Btwn Labs	0.94 Percent	0.87 Percent

Statistics based on 7 of 8 reporting participants.

Comments on Assigned Data Flags for Test #386

82B8LG (X) - Data for sample GP02 are high.

Key to Instrument Codes Reported by Participants

ZZ   Instruments No Longer Tracked
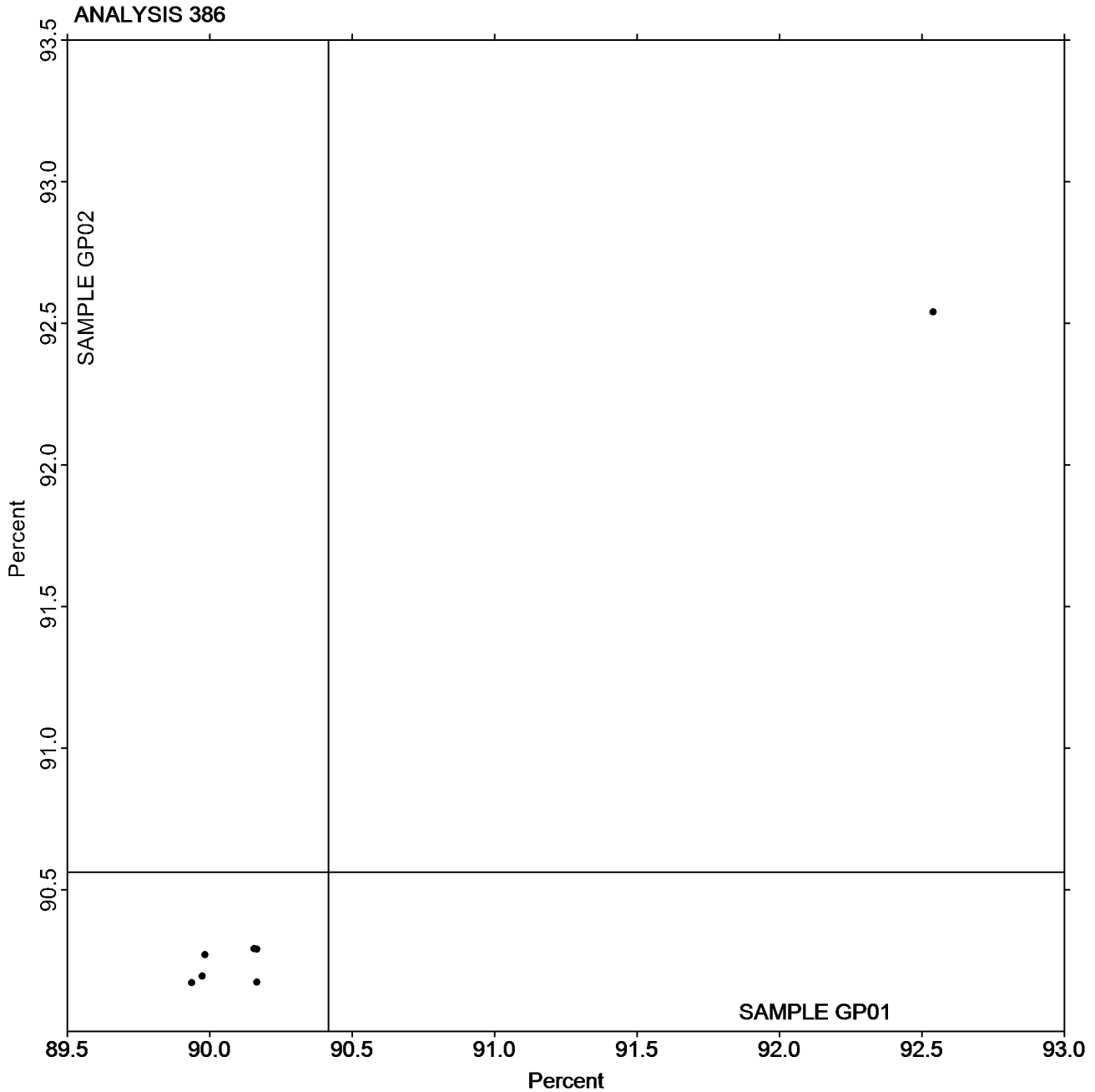
Paper & Paperboard Interlaboratory Testing Program
Analysis 386
Opacity (Paper Backing) - Fine Papers and Newsprint
TAPPI Official Test Method T519

**Report #3162G,
February 2022**

**Grand Mean Sample GP01 = 90.417
Percent**

**Grand Mean Sample GP02 = 90.561
Percent**

ANALYSIS 386

SAMPLE GP02

Percent

SAMPLE GP01

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
TAPPI Official Test Method T452

WebCode	Data Flag	Sample GR01 Lab Mean	Sample GR01 Diff from Grand Mean	Sample GR01 CPV	Sample GR02 Lab Mean	Sample GR02 Diff from Grand Mean	Sample GR02 CPV	Instr Code
22QF9N	X	67.88	-18.38	-19.12	69.50	-16.22	-16.28	TS
2N8PDT		87.26	1.01	1.05	86.78	1.07	1.07	TS
4KG6J9		85.43	-0.82	-0.85	84.90	-0.82	-0.82	TP
6XYDXK		87.03	0.78	0.81	86.74	1.02	1.03	TD
7ZM7AF		85.63	-0.62	-0.65	85.08	-0.63	-0.64	TT
8BW94C		85.75	-0.50	-0.52	85.35	-0.37	-0.37	XC
8BYX9A		87.71	1.46	1.52	87.20	1.48	1.49	TT
8WVUME		85.40	-0.85	-0.89	84.36	-1.35	-1.36	TS
9Q94YY		85.50	-0.75	-0.78	85.18	-0.54	-0.54	TT
BJZG2F		87.17	0.92	0.96	86.73	1.01	1.01	TS
HD9PRY		85.39	-0.86	-0.89	84.95	-0.77	-0.77	HG
MQF3BU		85.44	-0.81	-0.85	85.10	-0.62	-0.62	HG
MUFD7U		87.40	1.15	1.19	86.53	0.81	0.81	TP
NJEAGQ		87.64	1.39	1.44	86.92	1.20	1.21	HG
R3DRXW		85.20	-1.05	-1.09	84.68	-1.04	-1.05	TP
TPLM6Q		87.45	1.20	1.25	86.46	0.74	0.74	PP
TX24XZ		85.55	-0.70	-0.73	84.83	-0.89	-0.89	XX
WJQTJ2		85.46	-0.80	-0.83	84.75	-0.97	-0.97	HZ
ZB2GUP		86.97	0.72	0.75	87.12	1.41	1.41	PE
ZW7T6K		86.58	0.33	0.34	86.19	0.47	0.47	HG
ZWKLFE		85.06	-1.19	-1.24	84.50	-1.22	-1.22	TT

Summary Statistics	Sample GR01	Sample GR02
Grand Means	86.25 Percent	85.72 Percent
Stnd Dev Btwn Labs	0.96 Percent	1.00 Percent

Statistics based on 20 of 21 reporting participants.

Comments on Assigned Data Flags for Test #390

22QF9N (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

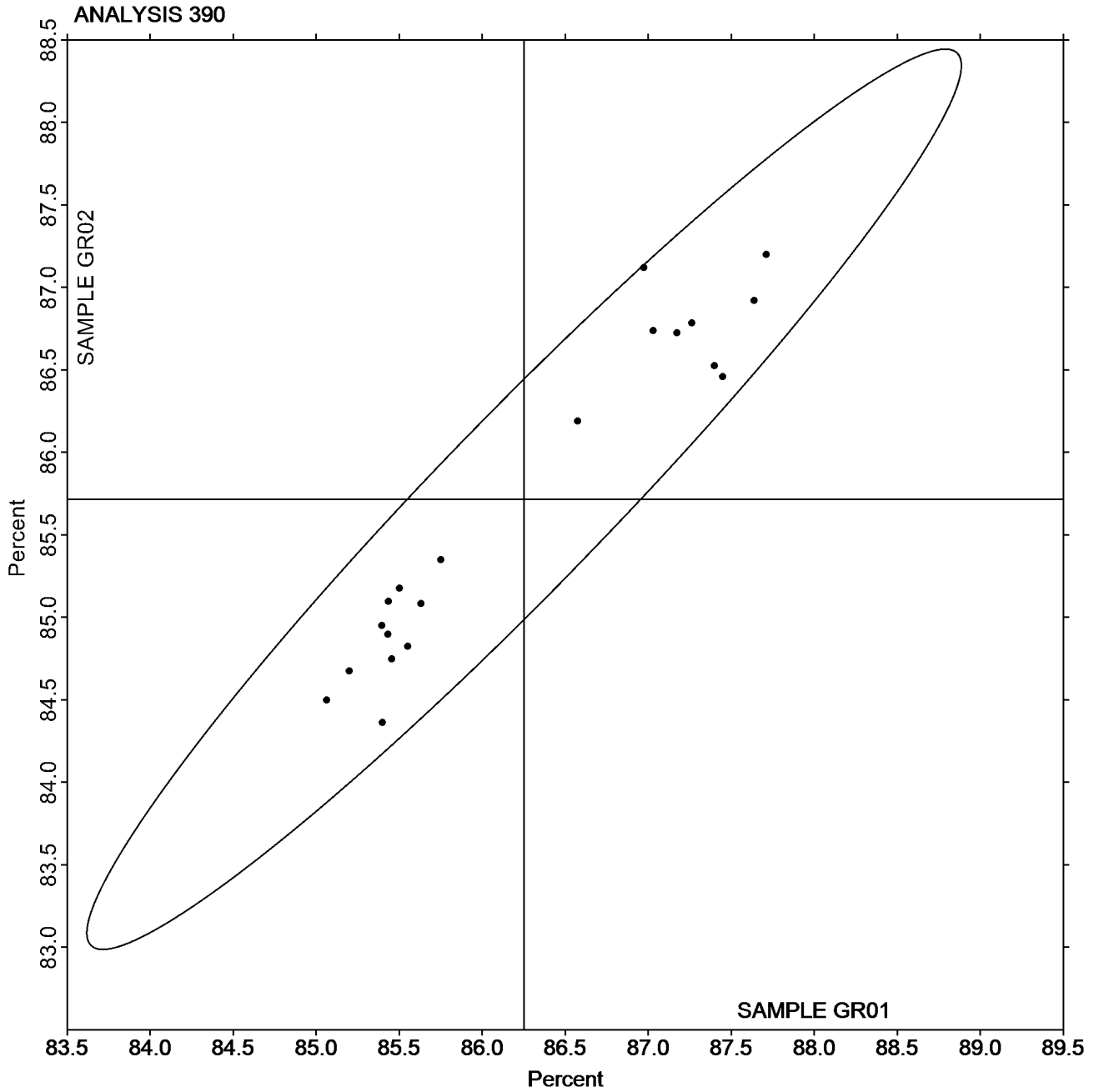|			
HG	Hunter Labscan / XE	HZ	Hunter Lab ColorFlex EZ Series
PE	Photovolt 577	PP	Technidyne Profile/Plus
TD	Technidyne Color Touch 45X	TP	Technidyne Test/Plus
TS	Technidyne Brightimeter Micro S-5	TT	Technidyne Brightimeter Micro S4-M
XC	X-Rite Color i5	XX	Instrument make/model not specified by lab

Paper & Paperboard Interlaboratory Testing Program
Analysis 390
Directional Brightness
TAPPI Official Test Method T452

Report #3162G,
February 2022

Grand Mean Sample GR01 = 86.251
Percent

Grand Mean Sample GR02 = 85.716
Percent

ANALYSIS 390

SAMPLE GR02

Percent

SAMPLE GR01

Percent

Paper & Paperboard Interlaboratory Testing Program
Analysis 391
Directional Brightness of Fluorescent Samples
TAPPI Official Test Method T452

Report #3162G,
February 2022

		Sample GZ01			Sample GZ02			
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
2WXD7A		99.38	0.75	0.39	96.87	0.31	0.17	PP
4KG6J9		99.09	0.45	0.23	98.24	1.68	0.91	PP
7ZM7AF		101.58	2.94	1.52	99.69	3.13	1.70	EF
8WVUME		99.44	0.81	0.42	97.14	0.58	0.32	TS
BUG7ZK		99.20	0.57	0.29	97.88	1.32	0.72	PP
CCTDM2		99.56	0.93	0.48	97.22	0.66	0.36	TS
E8CRQY		99.34	0.71	0.37	96.95	0.39	0.21	TS
JMTD3R		99.24	0.61	0.31	96.86	0.30	0.16	TS
LDE97D		99.30	0.67	0.34	97.42	0.86	0.47	TT
NPJ9QV		95.32	-3.31	-1.70	93.44	-3.12	-1.69	TT
PAZ3W8		97.34	-1.30	-0.67	95.02	-1.54	-0.84	LE
PYNDGQ		98.63	0.00	0.00	96.15	-0.41	-0.23	TS
TL9M9Y		99.18	0.55	0.28	96.60	0.04	0.02	TT
TW9EE6		99.22	0.59	0.30	96.94	0.38	0.21	PP
WV3YWP		99.18	0.54	0.28	96.68	0.12	0.07	TS
ZW2B7L	*	93.12	-5.51	-2.84	91.86	-4.70	-2.56	TT

Summary Statistics	**Sample GZ01**	**Sample GZ02**
Grand Means	98.63 Percent	96.56 Percent
Stnd Dev Btwn Labs	1.94 Percent	1.84 Percent

Statistics based on 16 of 16 reporting participants.

Key to Instrument Codes Reported by Participants

|			
EF	Datacolor Elrepho	LE	L & W Elrepho
PP	Technidyne Profile/Plus	TS	Technidyne Brightimeter Micro S-5
TT	Technidyne Brightimeter Micro S4-M		

Paper & Paperboard Interlaboratory Testing Program
Analysis 391
Directional Brightness of Fluorescent Samples
TAPPI Official Test Method T452

Report #3162G,
February 2022

Grand Mean Sample GZ01 = 98.632 Percent

Grand Mean Sample GZ02 = 96.560 Percent
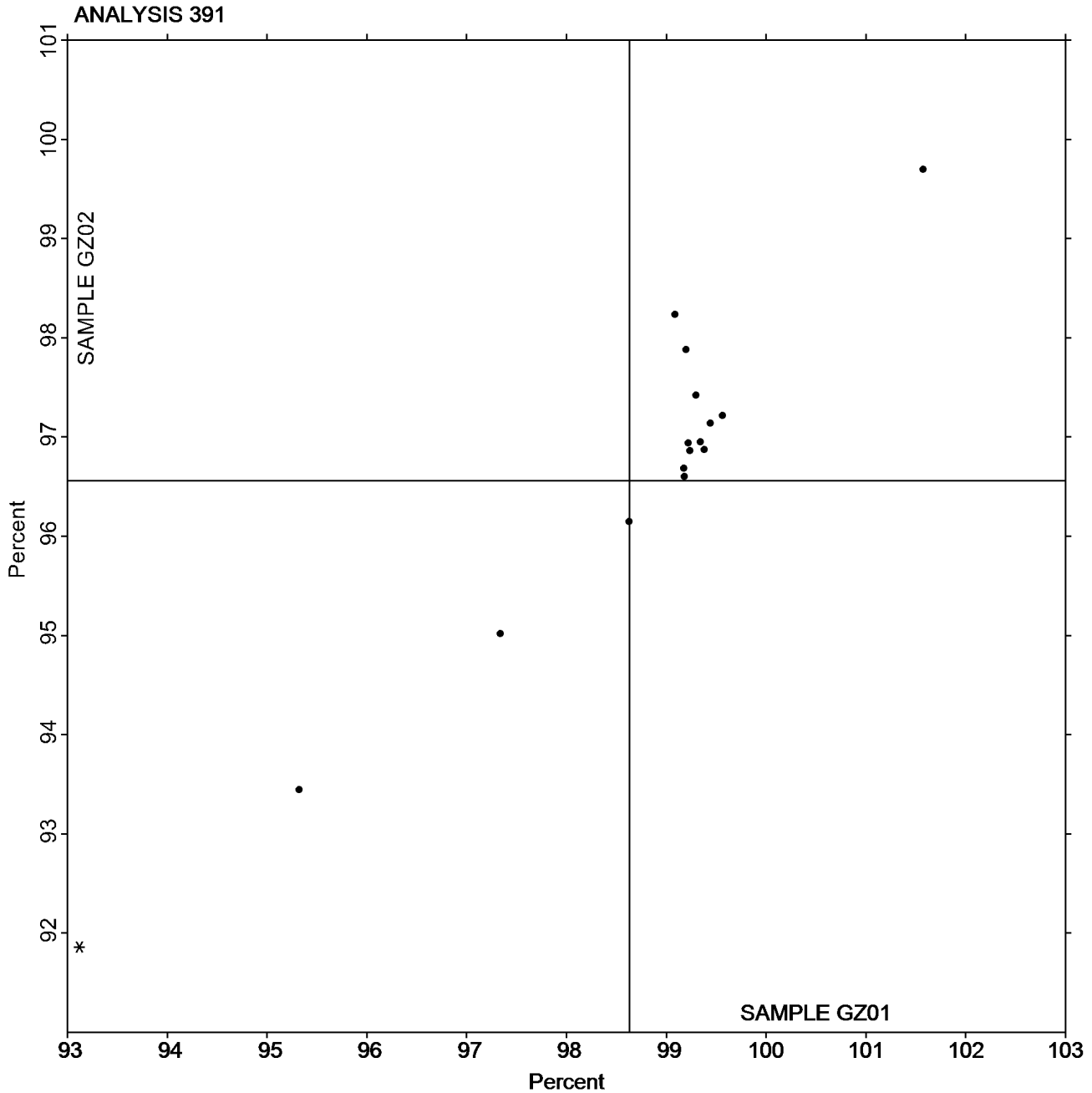
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.

Paper & Paperboard Interlaboratory Testing Program
Analysis 392
Diffuse Brightness
TAPPI Official Test Method T525

| WebCode | Data Flag | Sample GR01 | | | Sample GR02 | | | Instr Code |
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
273F9M		85.73	0.88	0.33	85.11	0.74	0.32	LE
2BF46C		79.23	-5.62	-2.08	79.48	-4.90	-2.13	TL
6UFM8G		85.56	0.71	0.26	84.82	0.45	0.20	AC
82B8LG	X	85.03	0.19	0.07	85.51	1.13	0.49	LE
8BYX9A		86.18	1.33	0.49	85.47	1.10	0.48	EG
8EWJZC		85.65	0.80	0.30	85.02	0.64	0.28	LA
BB7ETC		85.34	0.49	0.18	84.72	0.35	0.15	LE
BJZG2F	*	76.59	-8.26	-3.06	77.46	-6.91	-3.01	TC
BWMQLZ		85.43	0.58	0.22	84.80	0.43	0.19	EF
CNBW6C		85.75	0.90	0.33	85.11	0.74	0.32	LA
CNQDY6	X	68.66	-16.19	-6.00	69.12	-15.26	-6.65	TC
CWHWFY		85.64	0.80	0.30	85.23	0.86	0.37	TC
CXBKYU	X	68.34	-16.51	-6.12	69.13	-15.25	-6.65	TC
D4HB2Z		85.57	0.72	0.27	85.04	0.67	0.29	TC
MUFD7U		87.53	2.68	0.99	86.69	2.32	1.01	TC
R3DRXW		85.29	0.44	0.16	84.78	0.41	0.18	LT
UBGQHH		85.80	0.96	0.35	85.21	0.84	0.37	TC
V37NWH		85.54	0.70	0.26	84.88	0.51	0.22	TC
ZTHLFG	X	68.64	-16.21	-6.01	69.08	-15.29	-6.67	TC
ZW7T6K		85.77	0.92	0.34	85.30	0.92	0.40	TC
ZWKLFE		85.81	0.97	0.36	85.19	0.82	0.36	LT

Summary Statistics	Sample GR01	Sample GR02
Grand Means	84.85 Percent	84.37 Percent
Stnd Dev Btwn Labs	2.70 Percent	2.29 Percent

Statistics based on 17 of 21 reporting participants.

Comments on Assigned Data Flags for Test #392

CXBKYU (X) - Extreme Data.

ZTHLFG (X) - Extreme Data.

CNQDY6 (X) - Extreme Data.

82B8LG (X) - Inconsistent in testing between samples.

Key to Instrument Codes Reported by Participants

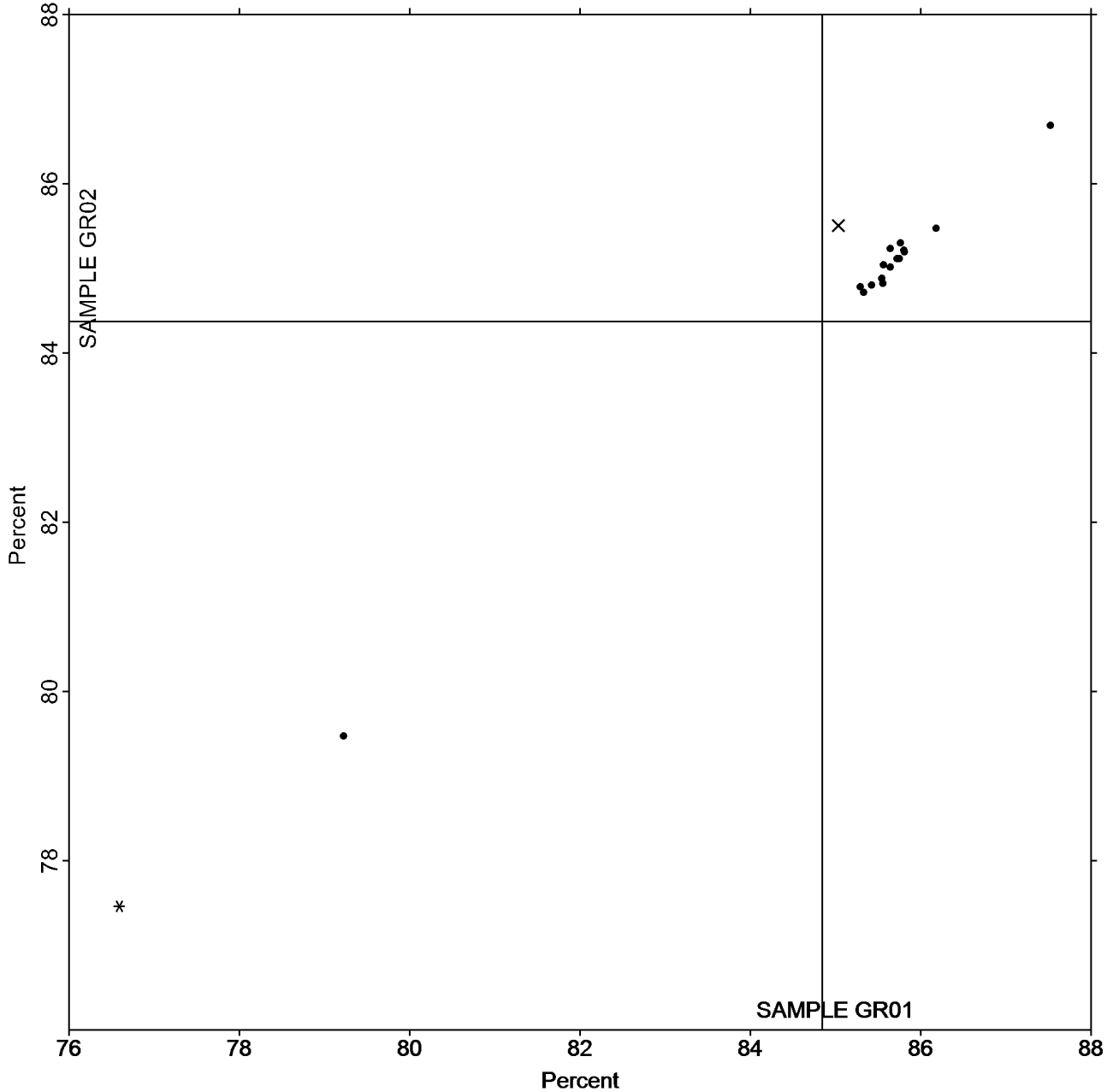|			
AC	ACS Spectro-Sensor II	EF	Datacolor Elrepho 3000
EG	Datacolor Elrepho 450X	LA	L & W Elrepho - Autoline
LE	L & W Elrepho	LT	L & W Elrepho SE 071
TC	Technidyne Color Touch Series	TL	Technidyne Technibrite TB-1

Paper & Paperboard Interlaboratory Testing Program
Analysis 392
Diffuse Brightness
TAPPI Official Test Method T525

Report #3162G,
February 2022

Grand Mean Sample GR01 = 84.846 Percent

Grand Mean Sample GR02 = 84.372 Percent

ANALYSIS 392

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 394
Fluorescent Component of Directional Brightness
TAPPI Official Test Method T452

Report #3162G,
February 2022

		Sample GZ01			Sample GZ02			
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
2WXD7A		7.858	-0.040	-0.05	7.608	0.091	0.11	PP
4KG6J9		7.756	-0.142	-0.18	7.546	0.029	0.04	XX
7ZM7AF	*	10.446	2.548	3.18	10.040	2.523	3.09	EF
8WVUME		8.020	0.122	0.15	7.720	0.203	0.25	TS
BUG7ZK		7.760	-0.138	-0.17	7.080	-0.437	-0.53	PP
CCTDM2		8.156	0.258	0.32	7.784	0.267	0.33	TS
E8CRQY		7.682	-0.216	-0.27	7.304	-0.213	-0.26	TS
LDE97D		7.260	-0.638	-0.80	7.040	-0.477	-0.58	TT
NPJ9QV		7.640	-0.258	-0.32	6.942	-0.575	-0.70	TT
PAZ3W8		8.232	0.334	0.42	8.000	0.483	0.59	LE
PYNDGQ		7.491	-0.407	-0.51	7.086	-0.431	-0.53	TS
TW9EE6		7.820	-0.078	-0.10	7.400	-0.117	-0.14	PP
WV3YWP		7.348	-0.550	-0.69	7.008	-0.509	-0.62	TS
ZW2B7L		7.100	-0.798	-0.99	6.680	-0.837	-1.02	TT

Summary Statistics	Sample GZ01	Sample GZ02
Grand Means	7.90 Percent	7.52 Percent
Stnd Dev Btwn Labs	0.80 Percent	0.82 Percent

Statistics based on 14 of 14 reporting participants.

Key to Instrument Codes Reported by Participants

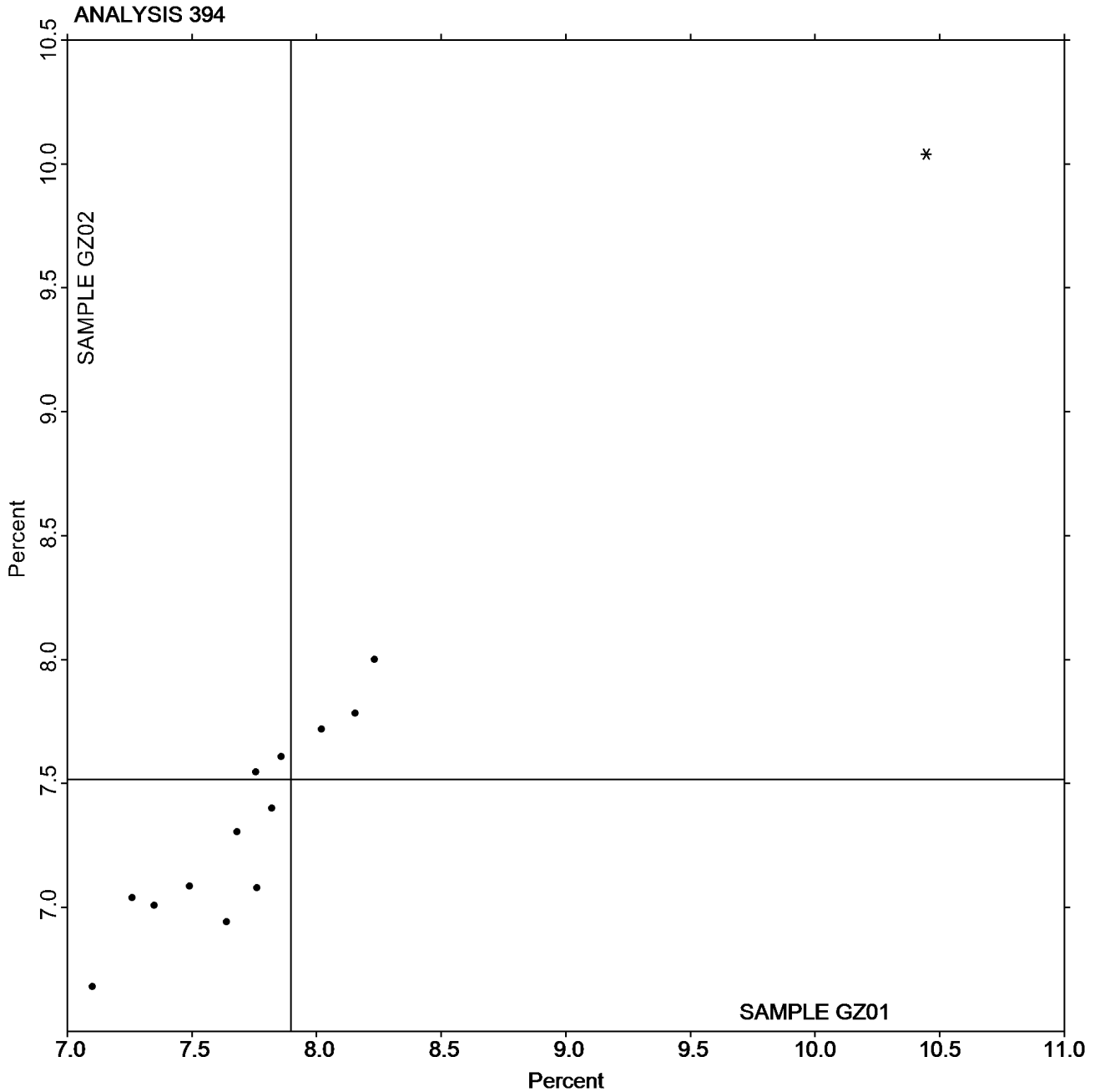|			
EF	Datacolor Elrepho	LE	L & W Elrepho
PP	Technidyne Profile/Plus	TS	Technidyne Brightimeter Micro S-5
TT	Technidyne Brightimeter Micro S4-M	XX	Instrument make/model not specified by lab

Paper & Paperboard Interlaboratory Testing Program
Analysis 394
Fluorescent Component of Directional Brightness
TAPPI Official Test Method T452

Report #3162G,
February 2022

Grand Mean Sample GZ01 = 7.8978
Percent

Grand Mean Sample GZ02 = 7.5170
Percent

ANALYSIS 394

SAMPLE GZ02

SAMPLE GZ01

Percent

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
TAPPI Official Test Method T480

Report #3162G,
February 2022

| | | Sample GT01 | | | Sample GT02 | | | |
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
2WXD7A		72.91	0.14	0.09	71.45	-0.54	-0.37	PP
3A3R6M		76.41	3.64	2.42	74.17	2.18	1.51	LF
6UFM8G		73.45	0.68	0.45	74.12	2.13	1.47	LB
7V4GJB		72.91	0.14	0.09	70.36	-1.63	-1.12	XX
7ZM7AF		73.91	1.14	0.76	72.75	0.76	0.52	TH
8BYX9A		73.92	1.15	0.76	72.77	0.78	0.54	TH
CV8UUZ		73.52	0.75	0.50	72.31	0.32	0.22	VM
HD9PRY		72.50	-0.27	-0.18	72.73	0.74	0.51	PP
MQF3BU		73.04	0.27	0.18	73.85	1.86	1.29	PP
MUFD7U		70.40	-2.37	-1.57	69.70	-2.29	-1.58	GM
P6U9ZQ		72.14	-0.63	-0.42	71.23	-0.76	-0.52	LG
R3DRXW		72.69	-0.08	-0.05	72.45	0.46	0.32	GA
T4QLDX		71.39	-1.38	-0.91	70.18	-1.81	-1.24	GM
WV3YWP		72.06	-0.71	-0.47	70.71	-1.28	-0.88	LF
ZW2B7L		70.27	-2.50	-1.66	71.01	-0.98	-0.67	PP

Summary Statistics	**Sample GT01**	**Sample GT02**
Grand Means	72.77 Gloss Units	71.99 Gloss Units
Stnd Dev Btwn Labs	1.51 Gloss Units	1.45 Gloss Units

Statistics based on 15 of 15 reporting participants.

Key to Instrument Codes Reported by Participants

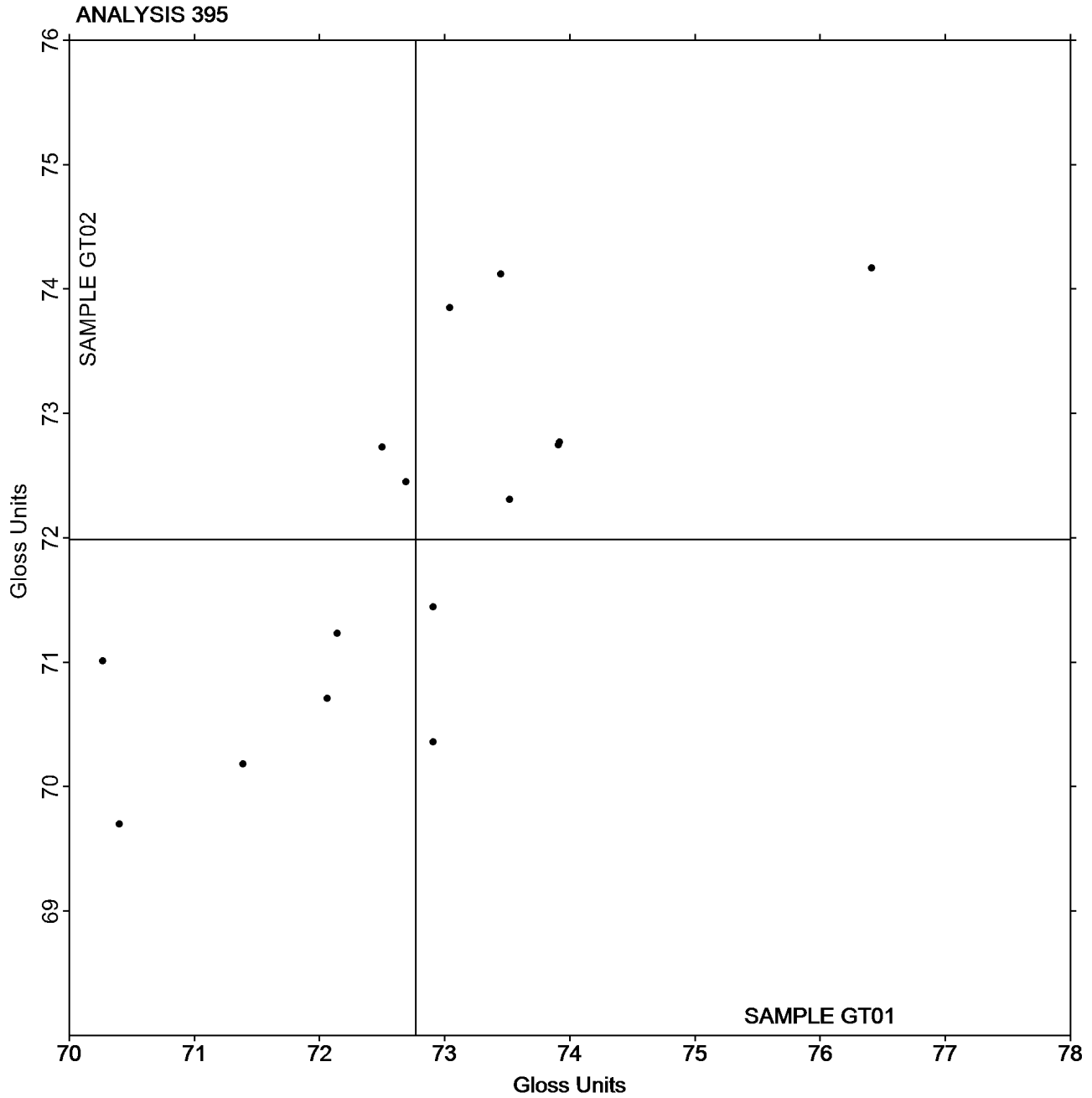|			
GA	BYK-Gardner (model not specified)	GM	BYK-Gardner micro-gloss
LB	L & W Gloss Tester Code 224	LF	L & W Autoline 400
LG	L & W Autoline 600	PP	Technidyne Profile/Plus
TH	Technidyne T480A	VM	Valmet PaperLab (was Kajaani/Robotest)
XX	Instrument make/model not specified by lab			

Paper & Paperboard Interlaboratory Testing Program
Analysis 395
Specular Gloss at 75 Degrees - High Range
TAPPI Official Test Method T480

Report #3162G,
February 2022

Grand Mean Sample GT01 = 72.768
Gloss Units

Grand Mean Sample GT02 = 71.985
Gloss Units

ANALYSIS 395

SAMPLE GT02

Gloss Units

SAMPLE GT01

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
TAPPI Official Test Method T480

WebCode	Data Flag	Sample GU01 Lab Mean	Sample GU01 Diff from Grand Mean	Sample GU01 CPV	Sample GU02 Lab Mean	Sample GU02 Diff from Grand Mean	Sample GU02 CPV	Instr Code
6UFM8G		28.89	-0.46	-0.28	29.76	0.01	0.00	LA
7MXCXL		30.24	0.89	0.54	30.43	0.68	0.51	GM
8BW94C		31.80	2.45	1.48	31.60	1.85	1.41	TH
9Q94YY		28.48	-0.87	-0.52	28.39	-1.36	-1.04	TH
CXBKYU		31.53	2.18	1.32	31.77	2.02	1.54	TH
HVRL78		26.95	-2.40	-1.45	28.20	-1.55	-1.18	WJ
WJQTJ2		27.50	-1.85	-1.12	28.91	-0.84	-0.64	GS
YUWT4J		29.03	-0.32	-0.19	28.84	-0.91	-0.70	PP
ZW7T6K		29.72	0.37	0.22	29.89	0.14	0.10	PP

Summary Statistics	Sample GU01	Sample GU02
Grand Means	29.35 Gloss Units	29.75 Gloss Units
Stnd Dev Btwn Labs	1.66 Gloss Units	1.31 Gloss Units

Statistics based on 9 of 9 reporting participants.

Key to Instrument Codes Reported by Participants

GM	BYK-Gardner micro-gloss	GS	BYK-Gardner Glossgard ll
LA	L & W Gloss - Autoline 300	PP	Technidyne Profile/Plus
TH	Technidyne T480A	WJ	Zehntner ZLR 1020

Paper & Paperboard Interlaboratory Testing Program
Analysis 396
Specular Gloss at 75 Degrees - Low Range
TAPPI Official Test Method T480

Report #3162G,
February 2022

CTS

Grand Mean Sample GU01 = 29.349
Gloss Units

Grand Mean Sample GU02 = 29.754
Gloss Units
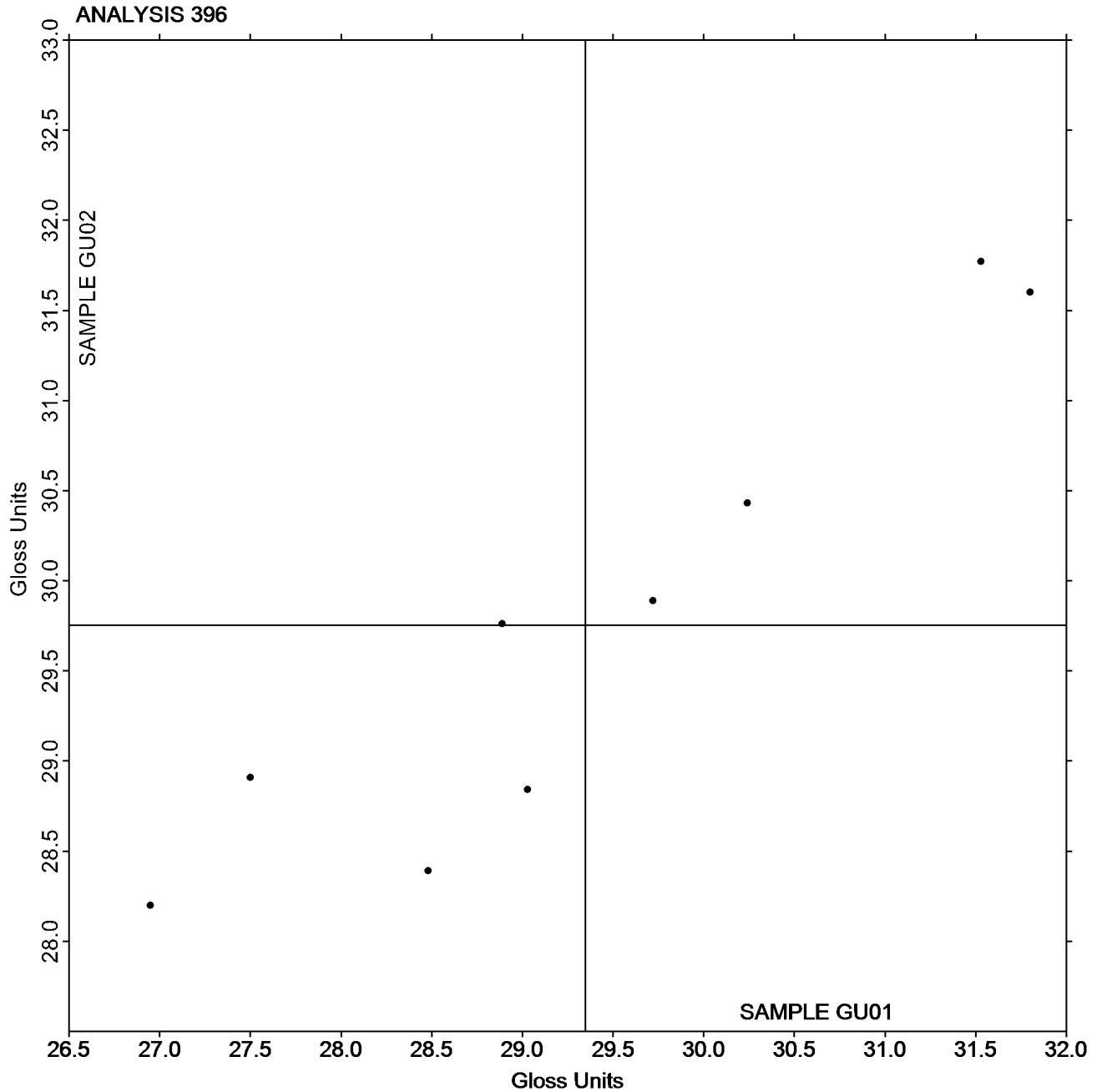
ANALYSIS 396

SAMPLE GU02

SAMPLE GU01

Gloss Units

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)
TAPPI Official Test Method T410

WebCode	Data Flag	Sample GW01			Sample GW02			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2N8PDT		75.21	-0.06	-0.13	89.49	-0.60	-1.12	ZZ
3AGF4T		75.88	0.62	1.47	90.10	0.02	0.03	ZZ
493B6U		75.47	0.20	0.48	90.35	0.26	0.50	ZZ
6JGMXJ		75.33	0.06	0.15	89.96	-0.12	-0.23	ZZ
6KD6VD		74.91	-0.35	-0.84	89.74	-0.34	-0.64	ZZ
6UFM8G		75.29	0.03	0.07	90.21	0.12	0.23	ZZ
7NQ6T6		75.39	0.12	0.29	90.47	0.38	0.72	ZZ
8BW94C		75.31	0.05	0.11	90.73	0.64	1.21	ZZ
9Q94YY		75.24	-0.03	-0.06	90.31	0.22	0.41	ZZ
A2NBDE		74.84	-0.43	-1.02	89.05	-1.04	-1.95	ZZ
AEQ4JG		75.43	0.16	0.39	90.27	0.18	0.35	ZZ
BB7ETC		75.55	0.28	0.67	90.64	0.55	1.04	ZZ
BQGV6K		75.96	0.70	1.66	90.68	0.59	1.12	ZZ
CHLEQZ		75.13	-0.14	-0.32	90.12	0.03	0.06	ZZ
CXBKYU		74.30	-0.97	-2.31	88.92	-1.17	-2.20	ZZ
D4HB2Z	X	3.79	-71.47	-169.97	4.50	-85.58	-161.16	ZZ
EF4A68		75.64	0.38	0.89	90.31	0.22	0.41	ZZ
FW8YYJ		75.56	0.29	0.69	90.72	0.64	1.20	ZZ
GKQWTC		75.80	0.53	1.27	90.40	0.31	0.59	ZZ
GV8HX8		74.94	-0.33	-0.78	90.46	0.37	0.70	ZZ
HCC8U4		75.02	-0.24	-0.58	89.84	-0.25	-0.47	ZZ
HVRL78		75.37	0.10	0.25	90.26	0.17	0.33	ZZ
JMTD3R		74.96	-0.31	-0.73	90.28	0.19	0.37	ZZ
NJEAGQ		75.10	-0.17	-0.40	89.35	-0.74	-1.40	ZZ
T4QLDX		74.88	-0.39	-0.93	89.47	-0.61	-1.16	ZZ
TX24XZ		74.59	-0.68	-1.61	89.72	-0.37	-0.69	ZZ
V2ABAP		75.01	-0.26	-0.61	89.53	-0.56	-1.05	ZZ
WA28BH		75.72	0.45	1.08	89.84	-0.25	-0.46	ZZ
XKWE82		74.83	-0.44	-1.04	89.89	-0.20	-0.38	ZZ
YHR96Z		74.89	-0.37	-0.89	90.09	0.00	0.00	ZZ
YXH9XL		75.48	0.21	0.51	90.04	-0.05	-0.09	ZZ
ZJGW3M	*	76.23	0.96	2.29	91.45	1.36	2.56	ZZ

Summary Statistics	Sample GW01	Sample GW02
Grand Means	75.27 g/sq m	90.09 g/sq m
Stnd Dev Btwn Labs	0.42 g/sq m	0.53 g/sq m

Statistics based on 31 of 32 reporting participants.

Comments on Assigned Data Flags for Test #398

D4HB2Z (X) - Extreme Data.

Paper & Paperboard Interlaboratory Testing Program
Analysis 398
Grammage (Mass per Unit Area)
TAPPI Official Test Method T410

Report #3162G,
February 2022

Key to Instrument Codes Reported by Participants
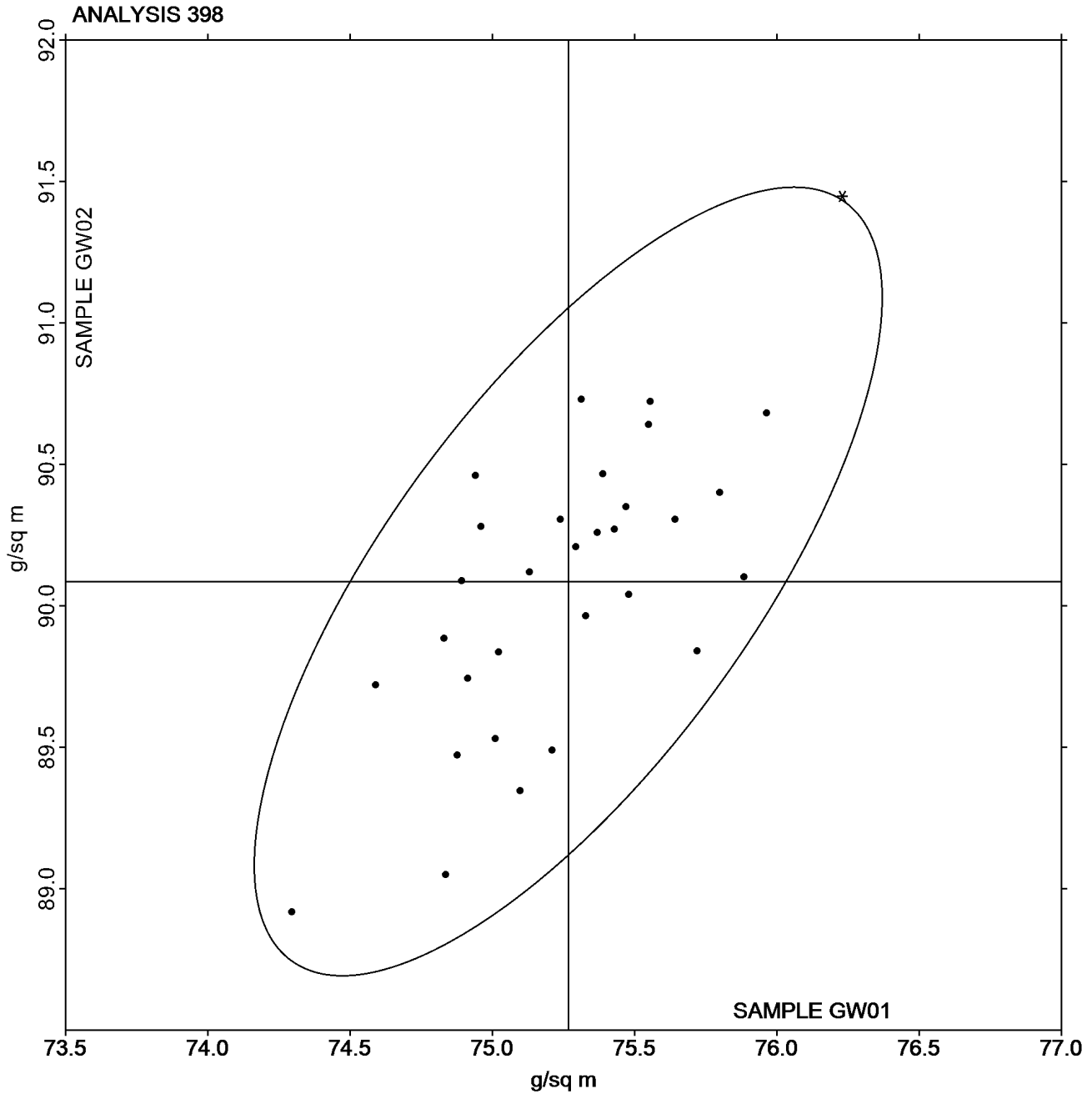
ZZ Instruments No Longer Tracked

Paper & Paperboard Interlaboratory Testing Program
Analysis 398
Grammage (Mass per Unit Area)
TAPPI Official Test Method T410

Report #3162G,
February 2022

Grand Mean Sample GW01 = 75.267 g/sq m

Grand Mean Sample GW02 = 90.086 g/sq m

ANALYSIS 398

SAMPLE GW02

g/sq m

SAMPLE GW01

g/sq m

Paper & Paperboard Interlaboratory Testing Program
Analysis 399
Sizing Test (Hercules Type)
TAPPI Official Test Method T530

| | | Sample GX01 | | | Sample GX02 | | | |
WebCode	Data Flag	Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	Instr Code
2N8PDT		11.86	0.57	0.19	4.540	-0.272	-0.20	HE
4KG6J9		15.85	4.56	1.49	6.600	1.788	1.30	HE
7JX22L		9.70	-1.59	-0.52	3.900	-0.912	-0.66	HE
7MXCXL		13.24	1.95	0.64	4.380	-0.432	-0.31	HE
7V4GJB		9.51	-1.78	-0.58	2.260	-2.552	-1.85	HE
84YJM8		6.63	-4.66	-1.52	2.950	-1.862	-1.35	HE
8WVUME		11.89	0.60	0.20	5.030	0.218	0.16	HE
BUG7ZK	*	16.00	4.71	1.54	4.467	-0.345	-0.25	HE
CCTDM2		10.28	-1.01	-0.33	4.560	-0.252	-0.18	HE
CV8UUZ		8.84	-2.45	-0.80	4.030	-0.782	-0.57	HE
CWHWFY		10.46	-0.83	-0.27	4.490	-0.322	-0.23	HE
CXBKYU		15.46	4.17	1.36	7.910	3.098	2.25	HE
DGKYVF		11.09	-0.20	-0.06	4.670	-0.142	-0.10	HE
JMTD3R		11.20	-0.09	-0.03	5.000	0.188	0.14	HE
JY6JDU		9.31	-1.98	-0.65	4.890	0.078	0.06	HE
LDE97D		10.80	-0.49	-0.16	4.300	-0.512	-0.37	HE
PYNDGQ	*	20.10	8.81	2.88	8.970	4.158	3.02	HE
RDYZHK		8.47	-2.82	-0.92	3.770	-1.042	-0.76	HE
TL9M9Y		11.89	0.60	0.20	5.220	0.408	0.30	HE
TPLM6Q		15.84	4.55	1.49	6.480	1.668	1.21	HE
TW9EE6		8.39	-2.90	-0.95	4.343	-0.469	-0.34	HE
TX24XZ		11.89	0.60	0.20	5.520	0.708	0.51	XX
UTYRCK		8.22	-3.07	-1.00	3.820	-0.992	-0.72	HE
V2ABAP		9.10	-2.19	-0.71	4.400	-0.412	-0.30	HE
WV3YWP		10.34	-0.95	-0.31	4.110	-0.702	-0.51	HE
YUWT4J		9.66	-1.63	-0.53	5.080	0.268	0.19	HE
ZB2GUP	X	20.66	9.37	3.06	11.250	6.438	4.68	HE
ZWKLFE		8.75	-2.54	-0.83	4.230	-0.582	-0.42	HE

Summary Statistics	Sample GX01	Sample GX02
Grand Means	11.29 Seconds	4.81 Seconds
Stnd Dev Btwn Labs	3.06 Seconds	1.38 Seconds

Statistics based on 27 of 28 reporting participants.

Comments on Assigned Data Flags for Test #399

ZB2GUP (X) - Data for both samples are high. Inconsistent within the determinations of sample GX02.

Paper & Paperboard Interlaboratory Testing Program
Analysis 399
Sizing Test (Hercules Type)
TAPPI Official Test Method T530

Report #3162G,
February 2022

Key to Instrument Codes Reported by Participants

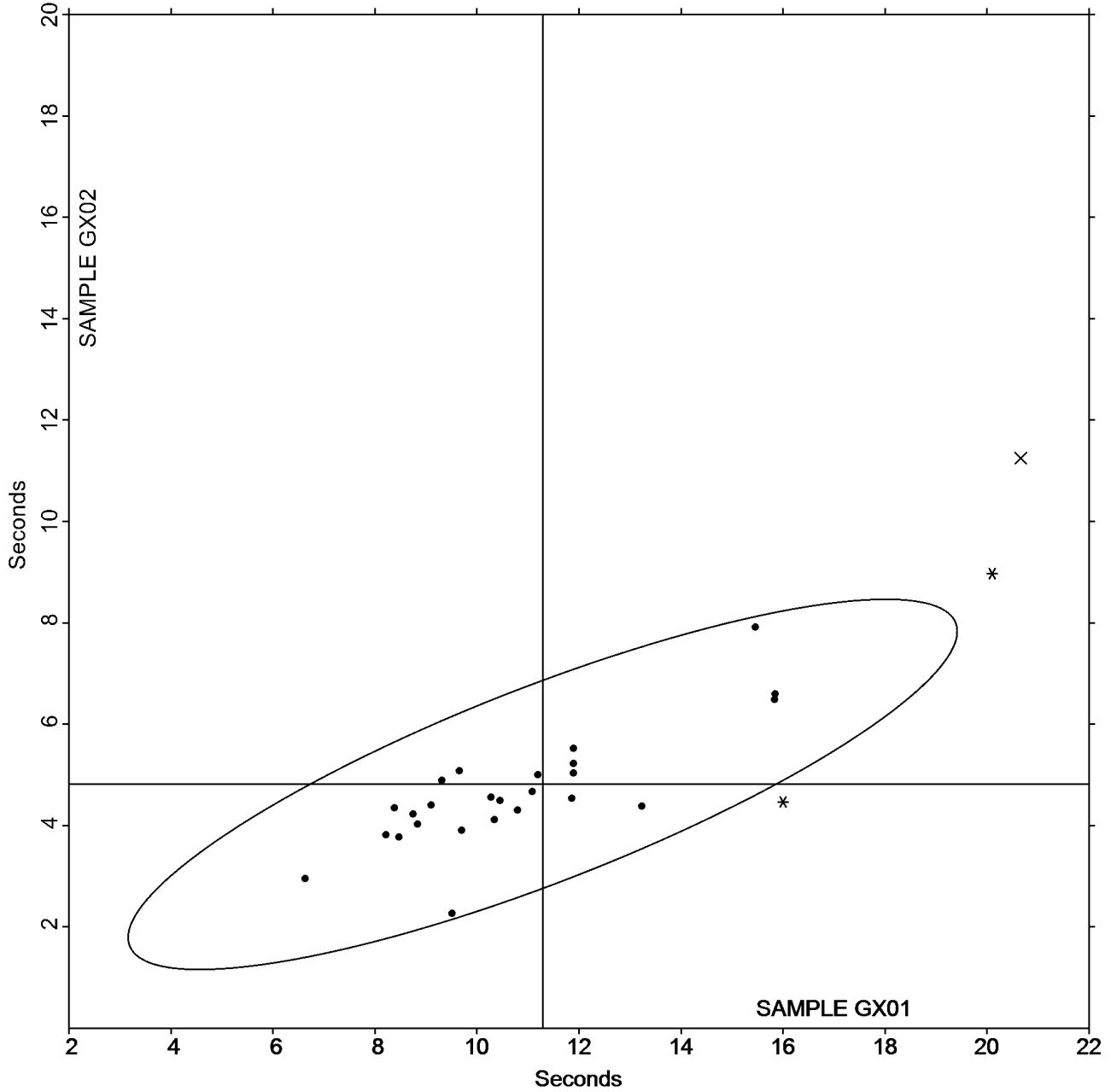|			
HE	Hercules Sizing Tester	XX	Instrument make/model not specified by lab

Paper & Paperboard Interlaboratory Testing Program
Analysis 399
Sizing Test (Hercules Type)
TAPPI Official Test Method T530

Report #3162G,
February 2022

Grand Mean Sample GX01 = 11.288 Seconds

Grand Mean Sample GX02 = 4.8118 Seconds

ANALYSIS 399

SAMPLE GX02

Seconds

SAMPLE GX01

Seconds

-End of Report-