

Paper & Paperboard Testing Program

Summary Report #4422 - June 2026

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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 industries including color, rubber, plastics, fasteners and metals, containerboard, paper, agriculture, hemp, 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 100 countries, currently participate in the CTS programs.

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

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

Office Hours: 8:00 a.m. - 4:30 p.m. ET

Key for Web Summary Reports (Page 1 of 2)

WebCode	Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Paper Report published on the CTS Website. 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.
Difference from Grand Mean	The difference of the LAB MEAN from the GRAND MEAN.
Between-Lab Standard Deviation	An indication of the precision of measurement between the laboratories. The greater the spread of the LAB MEANS about the GRAND MEAN, the larger the BETWEEN-LAB STANDARD DEVIATION (and vice versa).
Comparative Performance Value	An indication of how well a laboratory's results agree with the other participants. The CPV is a ratio indicating the number of standard deviations from the GRAND MEAN. The closer a laboratory's COMPARATIVE PERFORMANCE VALUE is to zero, the more consistent its results are with the other participants' data (and vice versa). The critical value for each CPV will vary depending on the number of labs participating in a test.
Inst Code	A code indicating the manufacturer of the instrument used to perform the test (see separate INSTRUMENT CODE LIST for each test section), if instruments are tracked.
Data Flag	DATA FLAGS are assigned based on the simultaneous analysis of both samples tested. Refer to the following chart for an explanation of each symbol:

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

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

Common Problems Highlighted in Footnotes

1. **Extreme data** - The laboratory's results for one or both samples are so inconsistent with those of the other participants that the lab mean(s) fall outside the plot. The participant is advised to immediately review his data and/or testing procedure.
2. **Systematic bias** - The laboratory's results are either consistently high or low for both samples when compared to the other participants (the plotted point falls near the top or bottom of the ellipse). This indicates that the participant is performing the test with a constant bias. Causes of systematic errors include improper calibration, the particular make/model of equipment or a modification to the testing procedure.
3. **Inconsistency in testing between samples/sample sets** - The laboratory's results indicate that there are differences in the way the two samples tested (the plotted point falls to the side of the ellipse). This type of error may be attributed to the analyst deviating from the procedure when testing one of the samples or a material interaction occurrence with the instrument or room conditions. The inconsistency is reflected in the CPVs for the two samples, such as a +1.5 CPV for sample A and a -2.2 CPV for sample B. CTS also will specify if the laboratory's data for one sample are high/low compared to the other participants. If this inconsistency is slight, the lab's plotted point will be an * that falls on the edge of the ellipse.
4. **Inconsistency in testing within a sample** - The laboratory's within-lab standard deviation for a specified sample is high when compared to the other participants, often causing the lab's plotted point to fall outside of the ellipse.

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



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3501 Thickness (Caliper), Packaging papers TAPPI Official Test Method T411

WebCode	Data Flag	Sample CK53			Sample CK54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
36Z7Q8		9.594	0.036	0.41	10.68	-0.01	-0.13	LC
487XA8		9.515	-0.043	-0.49	10.62	-0.07	-0.75	PP
4UGZ9A		9.572	0.014	0.16	10.64	-0.05	-0.52	TA
68YVTL		9.588	0.030	0.34	10.69	-0.01	-0.06	EM
8M62C2		9.606	0.048	0.55	10.69	-0.01	-0.07	EM
9E3J43		9.420	-0.138	-1.58	10.49	-0.20	-2.02	TA
9FHT3V		9.460	-0.098	-1.12	10.56	-0.13	-1.36	XX
A3XDYV		9.531	-0.027	-0.31	10.77	0.07	0.74	EM
AK9EM3		9.627	0.069	0.79	10.71	0.01	0.11	LA
AKU4T4	*	9.370	-0.188	-2.15	10.69	-0.01	-0.06	MS
B8MDQW		9.543	-0.015	-0.17	10.74	0.05	0.47	TA
BT2XMW		9.641	0.083	0.95	10.82	0.13	1.30	LW
DLTTVH		9.665	0.107	1.23	10.81	0.12	1.17	PP
E9NGUU		9.571	0.013	0.15	10.72	0.02	0.21	LW
EDTDDU		9.588	0.030	0.34	10.76	0.07	0.67	XX
GAND8U		9.546	-0.012	-0.14	10.59	-0.11	-1.07	LW
GNLAFX		9.508	-0.050	-0.57	10.70	0.00	0.03	OK
GW4Y4U		9.622	0.064	0.73	10.72	0.03	0.27	PP
H8ZCNR		9.488	-0.070	-0.80	10.58	-0.11	-1.13	LC
HHHW8N	X	8.380	-1.178	-13.49	9.70	-0.99	-9.98	LW
HM8HRV		9.565	0.007	0.08	10.63	-0.07	-0.70	XX
J4GKCP		9.663	0.105	1.21	10.70	0.01	0.07	LB
N4DTYP		9.710	0.152	1.74	10.86	0.17	1.66	LC
NRJ4Y3		9.519	-0.039	-0.44	10.71	0.01	0.11	LC
UWECYJ		9.382	-0.176	-2.02	10.53	-0.17	-1.68	LW
WDZC69	*	9.679	0.121	1.39	10.95	0.26	2.56	EM
XKNWDD		9.538	-0.020	-0.22	10.68	-0.01	-0.15	LW
XT9QZB		9.429	-0.129	-1.47	10.62	-0.07	-0.71	LW
Y38ZJ7		9.608	0.050	0.57	10.80	0.11	1.10	TM
ZBWXZD		9.630	0.072	0.83	10.69	0.00	-0.05	LW

Summary Statistics	Sample CK53	Sample CK54
Grand Means	9.56 mils	10.69 mils
Std Dev Btwn Labs	0.09 mils	0.10 mils
Statistics based on 29 of 30 reporting participants.		

Comments on Assigned Data Flags for Test #3501

HHHW8N (X) - Extreme Data.



Paper & Paperboard Interlaboratory Testing Program

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Analysis 3501 Thickness (Caliper), Packaging papers TAPPI Official Test Method T411

Key to Instrument Codes Reported by Participants

EM	Emveco	LA	L & W Autoline
LB	L & W Autoline 600	LC	L & W Autoline 400
LW	L & W	MS	Messmer
OK	Oakland	PP	Technidyne Profile/Plus
TA	Thwing-Albert	TM	TMI
XX	Instrument make/model not specified by lab		



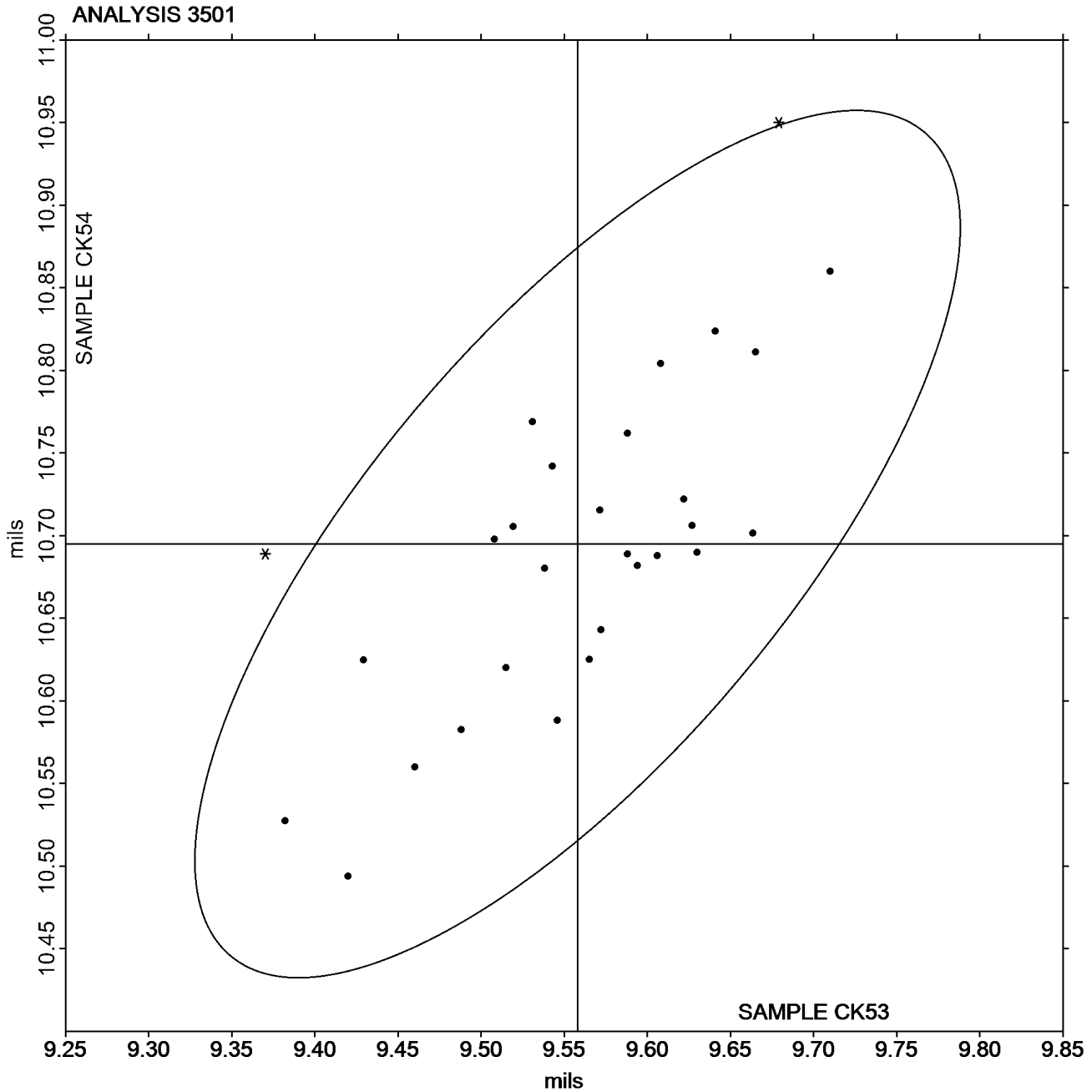
Paper & Paperboard Interlaboratory Testing Program

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Analysis 3501
Thickness (Caliper), Packaging papers
TAPPI Official Test Method T411

Grand Mean Sample CK53 = 9.5579
mils

Grand Mean Sample CK54 = 10.695
mils





Paper & Paperboard Interlaboratory Testing Program
Analysis 3511
Bursting Strength - Packaging Papers
TAPPI Official Test Method T403

Report #4422,
June 2026

WebCode	Data Flag	Sample BK53			Sample BK54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
23CGK9		52.30	4.17	0.87	69.80	8.04	1.29	ZZ
68YVTL		49.99	1.87	0.39	62.54	0.78	0.12	ZZ
6FAHWZ		56.00	7.87	1.63	69.20	7.44	1.19	ZZ
9E3J43		46.55	-1.58	-0.33	58.85	-2.91	-0.47	ZZ
BT2XMW		43.61	-4.52	-0.94	55.43	-6.33	-1.01	ZZ
E9NGUU		45.94	-2.18	-0.45	59.01	-2.75	-0.44	ZZ
GW4Y4U		57.60	9.47	1.97	74.50	12.74	2.04	ZZ
HHHW8N		43.81	-4.32	-0.90	56.55	-5.21	-0.84	ZZ
LBRKLH		45.01	-3.12	-0.65	57.36	-4.41	-0.71	ZZ
LVQ9QJ		45.31	-2.82	-0.58	57.57	-4.20	-0.67	ZZ
UXA8T2		47.59	-0.54	-0.11	63.35	1.59	0.25	ZZ
YJCANC		43.80	-4.33	-0.90	57.00	-4.76	-0.76	ZZ

Summary Statistics

Sample BK53

Sample BK54

Grand Means

48.13 psi

61.76 psi

Std Dev Btwn Labs

4.82 psi

6.24 psi

Statistics based on 12 of 12 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



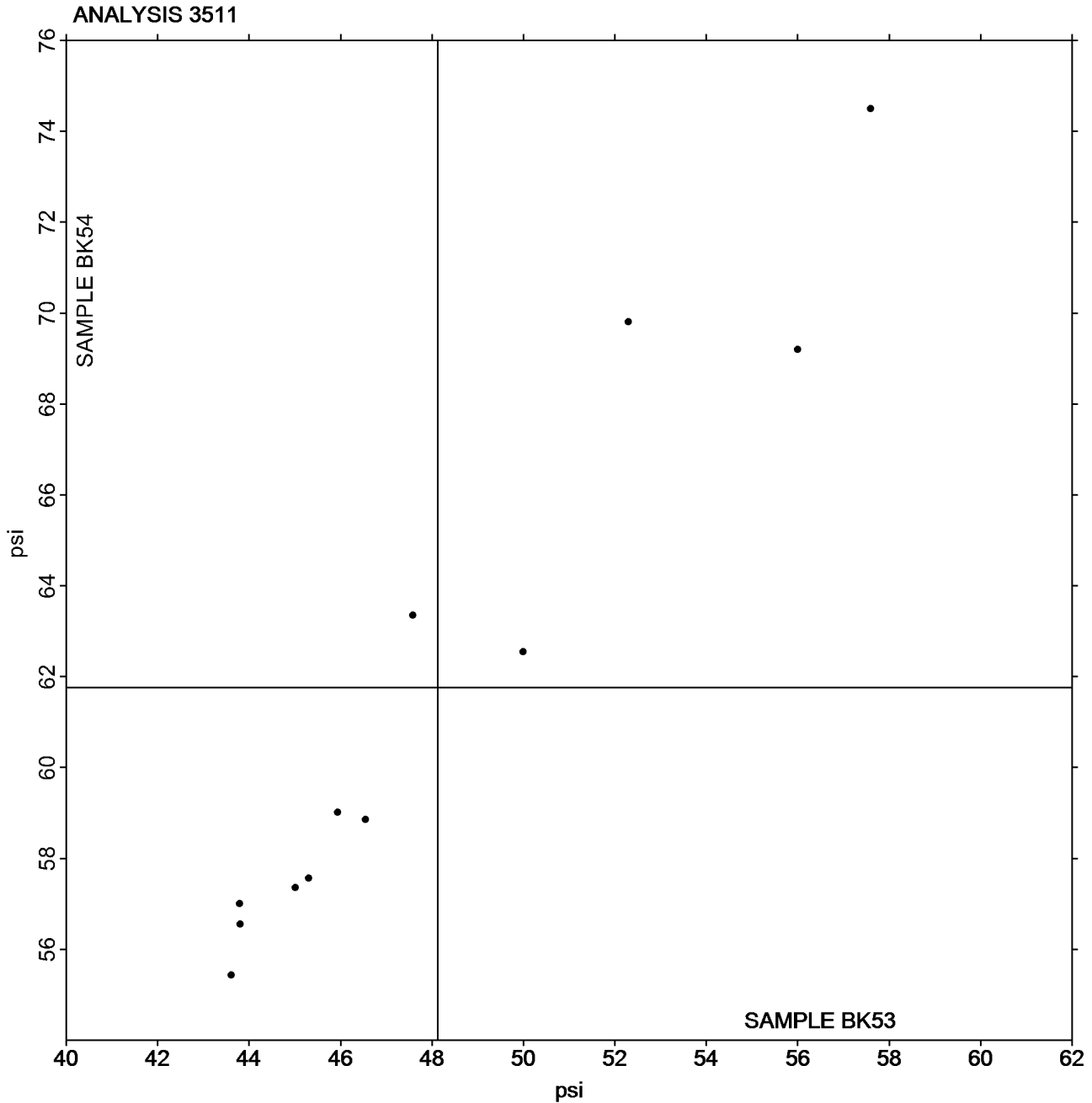
Paper & Paperboard Interlaboratory Testing Program

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Analysis 3511 Bursting Strength - Packaging Papers TAPPI Official Test Method T403

Grand Mean Sample BK53 = 48.126
psi

Grand Mean Sample BK54 = 61.764
psi



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



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
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Analysis 3513

Tearing Strength - Packaging Papers

TAPPI Official Test Method T414

WebCode	Data Flag	Sample RK53			Sample RK54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3JKLU7		112.7	1.2	0.14	113.0	1.2	0.12	ZZ
9FHT3V		118.0	6.5	0.76	120.8	8.9	0.96	ZZ
A3XDYV		106.7	-4.9	-0.57	106.3	-5.6	-0.60	ZZ
AK9EM3		106.0	-5.5	-0.65	103.0	-8.9	-0.95	ZZ
AQE9GX		92.9	-18.7	-2.19	91.3	-20.5	-2.20	ZZ
B8MDQW		109.1	-2.5	-0.29	117.8	6.0	0.64	ZZ
BT2XMW		113.8	2.2	0.26	113.7	1.8	0.20	ZZ
E6YEFU		116.4	4.9	0.58	126.4	14.5	1.56	ZZ
E9NGUU		114.6	3.0	0.36	112.1	0.3	0.03	ZZ
FYR2HV		102.4	-9.2	-1.08	106.4	-5.4	-0.58	ZZ
GAND8U	*	134.4	22.9	2.68	128.0	16.1	1.73	ZZ
GW4Y4U		116.7	5.1	0.60	118.3	6.4	0.69	ZZ
H8ZCNR		106.3	-5.3	-0.62	103.9	-8.0	-0.86	ZZ
HHHW8N		112.4	0.9	0.10	110.4	-1.5	-0.16	ZZ
L3U3YU		109.8	-1.7	-0.20	114.4	2.5	0.27	ZZ
LBRKLH		101.8	-9.7	-1.14	104.4	-7.5	-0.80	ZZ
MYU4AM		113.0	1.5	0.17	110.3	-1.5	-0.16	ZZ
XKNWDD		106.5	-5.0	-0.59	103.5	-8.4	-0.90	ZZ
XT9QZB		125.2	13.7	1.60	118.0	6.1	0.66	ZZ
Y38ZJ7		113.5	2.0	0.23	108.3	-3.6	-0.38	ZZ
YJCANC		105.6	-5.9	-0.70	101.9	-9.9	-1.07	ZZ
YPXAVC		116.2	4.6	0.54	128.7	16.9	1.81	ZZ

Summary Statistics

Sample RK53

Sample RK54

Grand Means

111.54 Grams

111.86 Grams

Std Dev Btwn Labs

8.52 Grams

9.33 Grams

Statistics based on 22 of 22 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



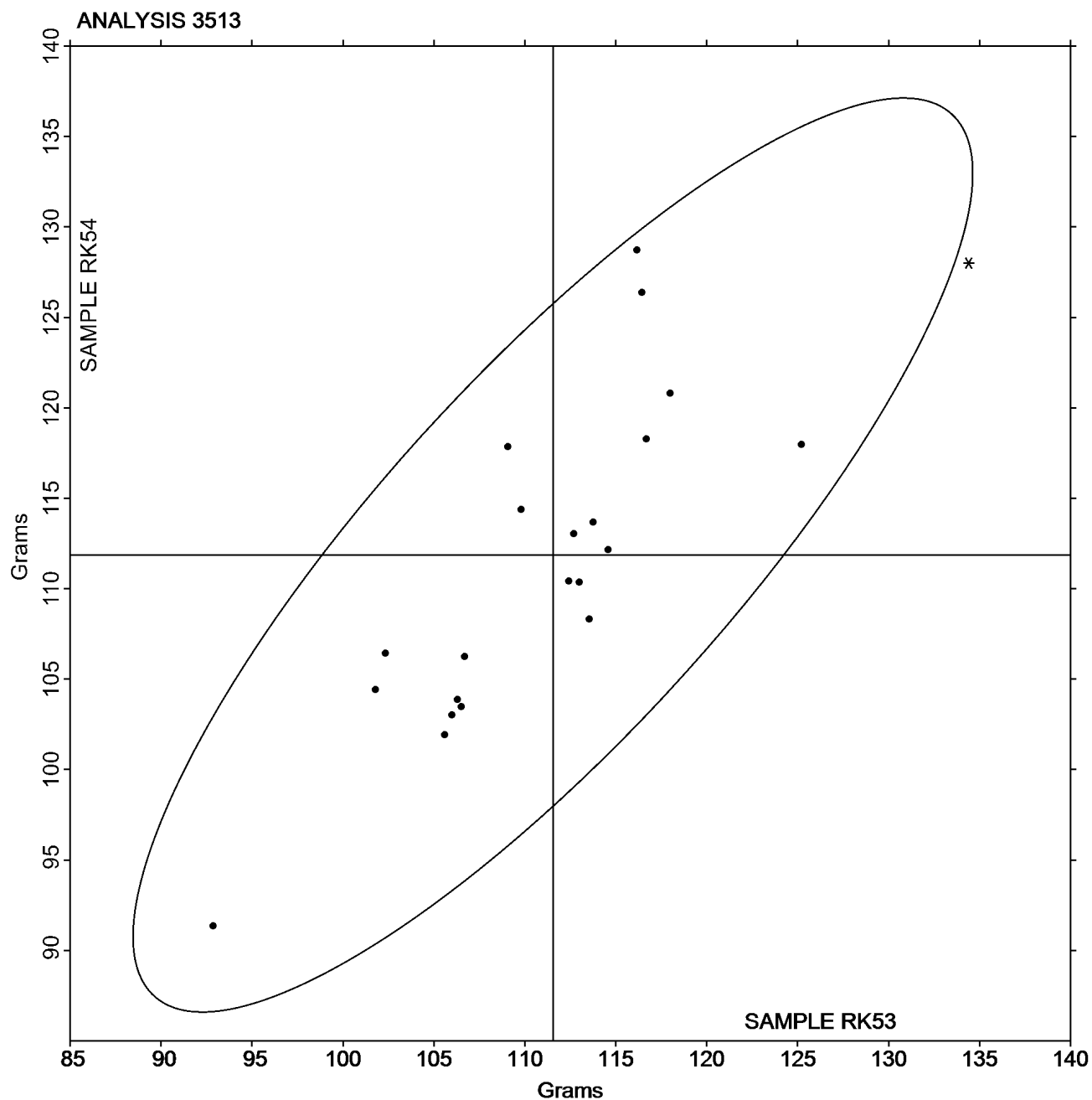
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Analysis 3513 Tearing Strength - Packaging Papers TAPPI Official Test Method T414

Grand Mean Sample RK53 = 111.54
Grams

Grand Mean Sample RK54 = 111.86
Grams





Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3515

Tensile Breaking Strength - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK53			Sample NK54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2X7MQD	*	7.712	-1.551	-2.70	7.794	-1.473	-2.48	TT
3JKLU7		8.948	-0.315	-0.55	8.880	-0.387	-0.65	TV
482FCA		10.352	1.089	1.90	10.455	1.188	2.00	XX
487XA8		9.658	0.395	0.69	9.592	0.325	0.55	TB
4UGZ9A		9.529	0.265	0.46	9.266	-0.001	0.00	TX
9E3J43	*	8.552	-0.712	-1.24	8.918	-0.349	-0.59	TV
9FHT3V		9.867	0.604	1.05	9.938	0.671	1.13	XX
9L7FXZ		9.075	-0.188	-0.33	8.996	-0.272	-0.46	IR
AK9EM3		9.435	0.172	0.30	9.408	0.141	0.24	LA
B8MDQW		10.028	0.764	1.33	10.025	0.758	1.28	TB
BT2XMW		8.619	-0.644	-1.12	8.639	-0.628	-1.06	IM
E9NGUU		8.914	-0.349	-0.61	8.904	-0.363	-0.61	LE
FYR2HV		9.121	-0.143	-0.25	9.077	-0.190	-0.32	LE
GAND8U		9.120	-0.143	-0.25	9.072	-0.196	-0.33	TX
GW4Y4U		9.620	0.357	0.62	9.672	0.405	0.68	TA
H8ZCNR		8.955	-0.309	-0.54	8.945	-0.322	-0.54	IF
HHHW8N		8.501	-0.762	-1.33	8.572	-0.695	-1.17	LH
J4GKCP		10.375	1.112	1.94	10.440	1.173	1.98	LC
KYUGHP		8.898	-0.366	-0.64	8.891	-0.376	-0.63	TS
L3U3YU		9.444	0.181	0.32	9.270	0.003	0.00	IA
L7TDUU		9.375	0.112	0.20	9.408	0.140	0.24	LA
L9VEVQ	X	15.502	6.239	10.86	15.513	6.246	10.53	LX
LBRKLH		8.763	-0.500	-0.87	8.681	-0.586	-0.99	TX
MYU4AM		8.693	-0.570	-0.99	8.730	-0.537	-0.91	LE
TCWJXD		9.732	0.469	0.82	9.496	0.228	0.39	DM
UXA8T2		9.953	0.690	1.20	10.154	0.887	1.49	LE
WDZC69		9.491	0.228	0.40	9.754	0.487	0.82	LE
XKNWDD		9.147	-0.116	-0.20	9.224	-0.043	-0.07	LE
XT9QZB		8.909	-0.354	-0.62	8.769	-0.499	-0.84	LW
Y38ZJ7		9.251	-0.013	-0.02	9.407	0.139	0.24	ID
YJCANC		9.208	-0.055	-0.10	9.145	-0.122	-0.21	LE
ZBWXZD		9.192	-0.071	-0.12	8.870	-0.397	-0.67	TH
ZG3UJD		9.986	0.723	1.26	10.158	0.891	1.50	LI

Summary Statistics

Sample NK53

Sample NK54

Grand Means

9.26 kN/m

9.27 kN/m

Std Dev Btwn Labs

0.57 kN/m

0.59 kN/m

Statistics based on 32 of 33 reporting participants.



Paper & Paperboard Interlaboratory Testing Program
Analysis 3515
Tensile Breaking Strength - Packaging Papers
TAPPI Official Test Method T494

Report #4422,
June 2026

Comments on Assigned Data Flags for Test #3515

L9VEVQ (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	IA	Instron 1000 Series
ID	Instron 4200 Series	IF	Instron 3340 Series
IM	Instron 5500 Series	IR	Instron 5900 Series
LA	L & W Autoline	LC	L & W Tensile - Autoline 600
LE	L & W Tensile Tester 066	LH	L & W Alwetron TH1 (Horizontal) SE 060
LI	Lloyds Instruments	LW	L & W Tensile Tester SE062
LX	L & W (model not specified)	TA	Thwing-Albert Tensile Tester
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
TS	TMI Horizontal Tensile Tester 84-58	TT	Tinius Olsen Model MHT
TV	Thwing-Albert Vantage NX	TX	Thwing-Albert (model not specified)
XX	Instrument make/model not specified by lab		



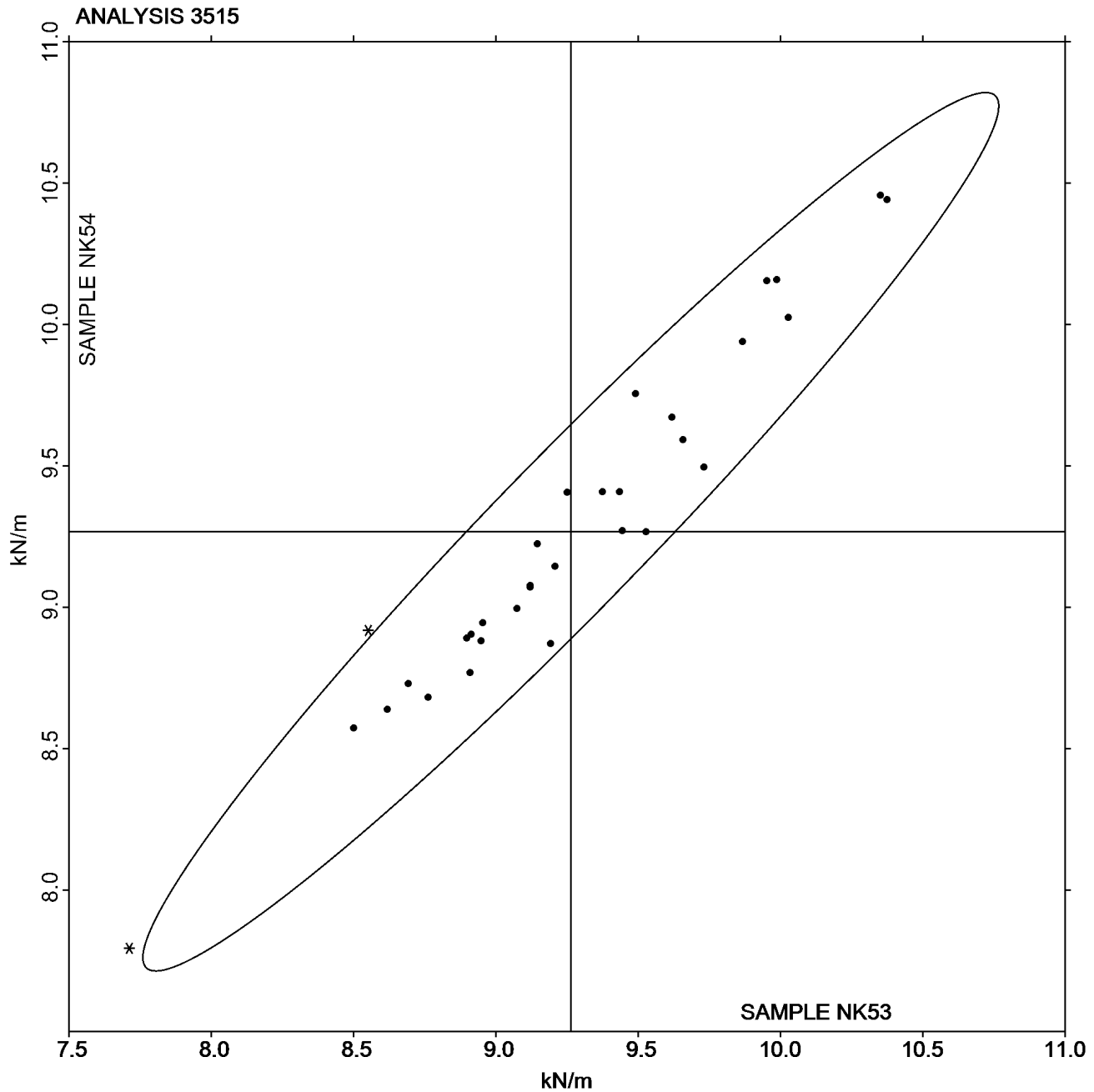
Paper & Paperboard Interlaboratory Testing Program

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Analysis 3515 Tensile Breaking Strength - Packaging Papers TAPPI Official Test Method T494

Grand Mean Sample NK53 = 9.2632
kN/m

Grand Mean Sample NK54 = 9.2672
kN/m





Paper & Paperboard Interlaboratory Testing Program

Report #4422,
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Analysis 3516

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK53			Sample NK54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2X7MQD		100.1	-26.3	-1.93	102.7	-24.8	-1.54	TT
3JKLU7		125.6	-0.8	-0.06	120.9	-6.6	-0.41	TV
482FCA		142.1	15.7	1.16	142.7	15.3	0.95	XX
487XA8		130.6	4.2	0.31	131.1	3.7	0.23	TB
4UGZ9A		112.2	-14.2	-1.04	117.3	-10.1	-0.63	TX
9E3J43	*	149.9	23.5	1.73	163.4	36.0	2.24	TV
9FHT3V	*	161.6	35.2	2.59	170.8	43.4	2.70	XX
9L7FXZ		114.3	-12.1	-0.89	109.6	-17.8	-1.11	IR
AK9EM3		145.5	19.1	1.41	149.3	21.9	1.36	LA
BT2XMW		122.5	-3.9	-0.28	122.6	-4.9	-0.30	IM
E9NGUU		120.5	-5.9	-0.43	117.7	-9.7	-0.61	LE
FYR2HV		117.6	-8.8	-0.65	115.6	-11.9	-0.74	LE
GAND8U		131.5	5.1	0.38	127.4	0.0	0.00	TH
GW4Y4U		138.1	11.7	0.86	141.0	13.5	0.84	TA
H8ZCNR		115.9	-10.5	-0.77	116.1	-11.4	-0.71	IF
HHHW8N		110.6	-15.8	-1.16	114.4	-13.0	-0.81	LH
J4GKCP		124.5	-1.9	-0.14	129.7	2.2	0.14	LC
KYUGHP		127.2	0.8	0.06	124.1	-3.3	-0.21	TS
L3U3YU		138.7	12.3	0.91	132.6	5.2	0.32	IA
L7TDUU		128.3	1.9	0.14	133.5	6.0	0.38	LA
L9VEVQ	X	2,357.2	2,230.8	164.27	2,478.0	2,350.6	146.31	LX
LBRKLH		132.7	6.3	0.46	131.6	4.1	0.26	TX
MYU4AM		114.5	-11.9	-0.88	113.0	-14.4	-0.90	LE
TCWJXD	X	177.0	50.6	3.73	162.4	35.0	2.18	DM
UXA8T2		134.8	8.4	0.62	139.1	11.7	0.73	LE
WDZC69		128.6	2.2	0.16	139.4	12.0	0.74	LE
XKNWDD		112.7	-13.7	-1.01	114.4	-13.0	-0.81	LE
XT9QZB		114.1	-12.3	-0.90	111.1	-16.3	-1.02	LW
YJCANC		115.8	-10.6	-0.78	112.7	-14.8	-0.92	LE
ZBWXZD		128.5	2.1	0.16	124.6	-2.8	-0.17	TH

Summary Statistics

Sample NK53

Sample NK54

Grand Means

126.39 Joules/sq m

127.44 Joules/sq m

Std Dev Btwn Labs

13.58 Joules/sq m

16.07 Joules/sq m

Statistics based on 28 of 30 reporting participants.

Comments on Assigned Data Flags for Test #3516

TCWJXD (X) - Data for sample NK53 are high.

L9VEVQ (X) - Extreme Data.



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3516

Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	IA	Instron 1000 Series
IF	Instron 3340 Series	IM	Instron 5500 Series
IR	Instron 5900 Series	LA	L & W Autoline
LC	L & W Tensile - Autoline 600	LE	L & W Tensile Tester 066
LH	L & W Alwetron TH1 (Horizontal) SE 060	LW	L & W Tensile Tester SE062
LX	L & W (model not specified)	TA	Thwing-Albert Tensile Tester
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
TS	TMI Horizontal Tensile Tester 84-58	TT	Tinius Olsen Model MHT
TV	Thwing-Albert Vantage NX	TX	Thwing-Albert (model not specified)
XX	Instrument make/model not specified by lab		



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3516

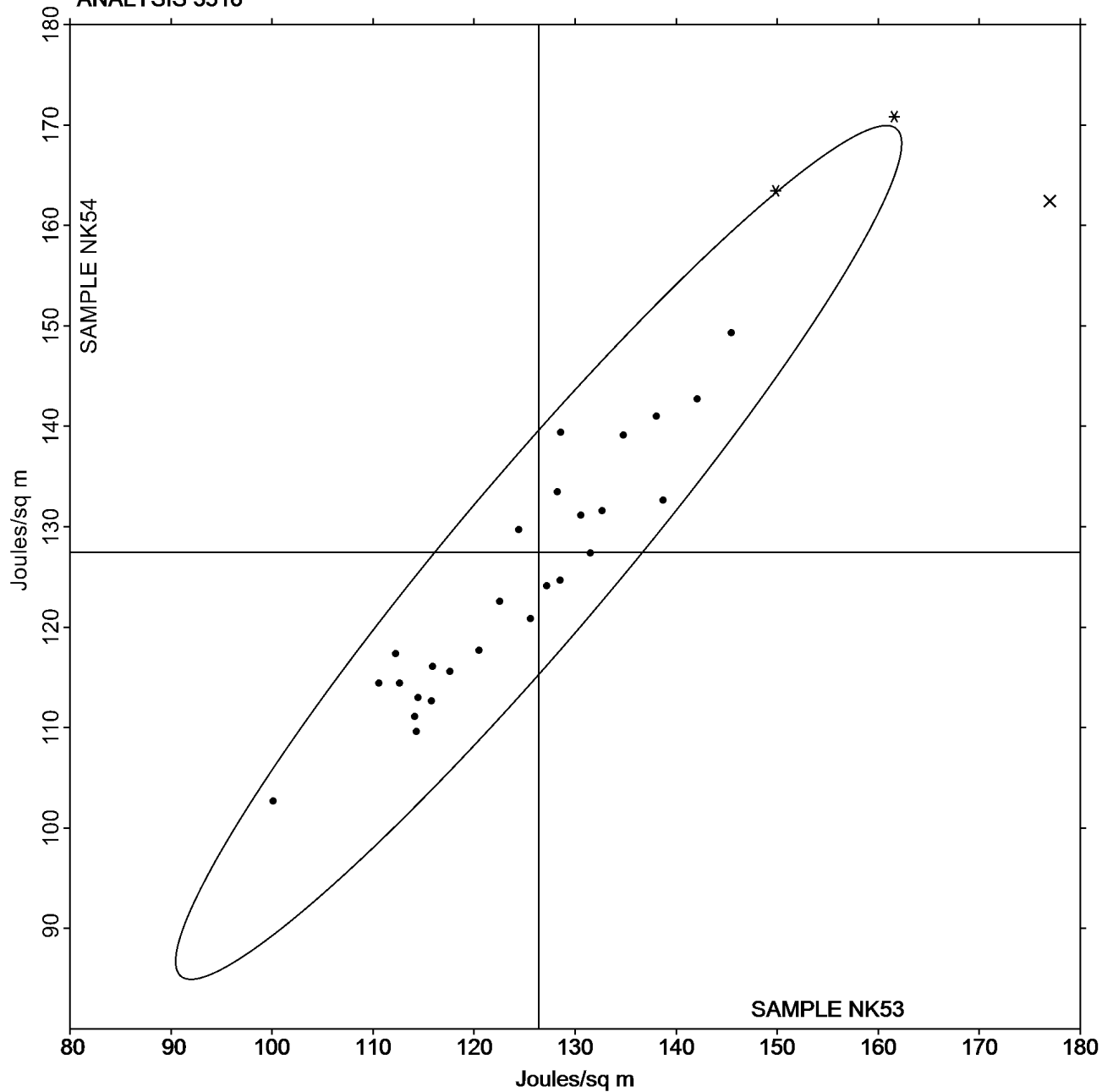
Tensile Energy Absorption - Packaging Papers

TAPPI Official Test Method T494

Grand Mean Sample NK53 = 126.39
Joules/sq m

Grand Mean Sample NK54 = 127.44
Joules/sq m

ANALYSIS 3516





Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3517

Elongation to Break - Packaging Papers

TAPPI Official Test Method T494

WebCode	Data Flag	Sample NK53			Sample NK54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2X7MQD		2.115	-0.001	0.00	2.160	0.041	0.17	TT
3JKLU7		2.144	0.028	0.12	2.104	-0.015	-0.06	TV
482FCA		1.881	-0.235	-0.97	1.876	-0.243	-1.01	XX
487XA8		2.063	-0.053	-0.22	2.073	-0.046	-0.19	XX
4UGZ9A		1.926	-0.190	-0.78	2.049	-0.070	-0.29	TX
9E3J43	*	2.670	0.554	2.29	2.770	0.651	2.70	TV
9FHT3V		1.844	-0.272	-1.12	1.894	-0.226	-0.94	XX
9L7FXZ		1.924	-0.192	-0.79	1.865	-0.254	-1.06	XX
AK9EM3		2.284	0.168	0.70	2.344	0.225	0.93	LX
B8MDQW		2.338	0.222	0.92	2.372	0.253	1.05	TB
BT2XMW		2.164	0.048	0.20	2.173	0.054	0.22	IM
E9NGUU		2.018	-0.098	-0.40	1.979	-0.140	-0.58	LE
FYR2HV		1.942	-0.174	-0.72	1.923	-0.196	-0.82	LE
GAND8U		2.247	0.131	0.54	2.141	0.022	0.09	LX
GW4Y4U		2.586	0.470	1.94	2.609	0.490	2.04	TA
H8ZCNR		1.990	-0.126	-0.52	1.981	-0.138	-0.57	IF
HHHW8N		2.015	-0.101	-0.41	1.990	-0.129	-0.54	LX
J4GKCP		1.742	-0.374	-1.54	1.797	-0.322	-1.34	LC
KYUGHP		2.229	0.113	0.47	2.195	0.076	0.31	TS
L3U3YU		2.286	0.170	0.70	2.235	0.115	0.48	IA
L7TDUU		2.027	-0.089	-0.37	2.078	-0.041	-0.17	XX
L9VEVQ	X	0.076	-2.039	-8.42	0.079	-2.040	-8.48	LX
LBRKLH		2.288	0.172	0.71	2.286	0.167	0.69	TX
MYU4AM		1.951	-0.165	-0.68	1.912	-0.207	-0.86	LE
TCWJXD	*	2.760	0.644	2.66	2.637	0.518	2.15	DM
UXA8T2		2.068	-0.048	-0.20	2.084	-0.035	-0.15	LE
WDZC69		2.045	-0.071	-0.29	2.147	0.028	0.12	LE
XKNWDD		1.888	-0.228	-0.94	1.891	-0.228	-0.95	LE
XT9QZB		1.948	-0.168	-0.69	1.927	-0.192	-0.80	LW
Y38ZJ7		1.967	-0.149	-0.61	2.000	-0.119	-0.50	ID
YJCANC		1.900	-0.216	-0.89	1.870	-0.249	-1.04	LE
ZBWXZD		2.332	0.216	0.89	2.337	0.218	0.90	TH

Summary Statistics

Sample NK53

Sample NK54

Grand Means

2.12 Percent

2.12 Percent

Std Dev Btwn Labs

0.24 Percent

0.24 Percent

Statistics based on 31 of 32 reporting participants.



Paper & Paperboard Interlaboratory Testing Program
Analysis 3517
Elongation to Break - Packaging Papers
TAPPI Official Test Method T494

Report #4422,
June 2026

Comments on Assigned Data Flags for Test #3517

L9VEVQ (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

DM	IDM MTC-100 Tensile Tester	IA	Instron 1000 Series
ID	Instron 4200 Series	IF	Instron 3340 Series
IM	Instron 5500 Series	LC	L & W Tensile - Autoline 600
LE	L & W Tensile Tester 066	LW	L & W Tensile Tester SE062
LX	L & W (model not specified)	TA	Thwing-Albert Tensile Tester
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
TS	TMI Horizontal Tensile Tester 84-58	TT	Tinius Olsen Model MHT
TV	Thwing-Albert Vantage NX	TX	Thwing-Albert (model not specified)
XX	Instrument make/model not specified by lab		



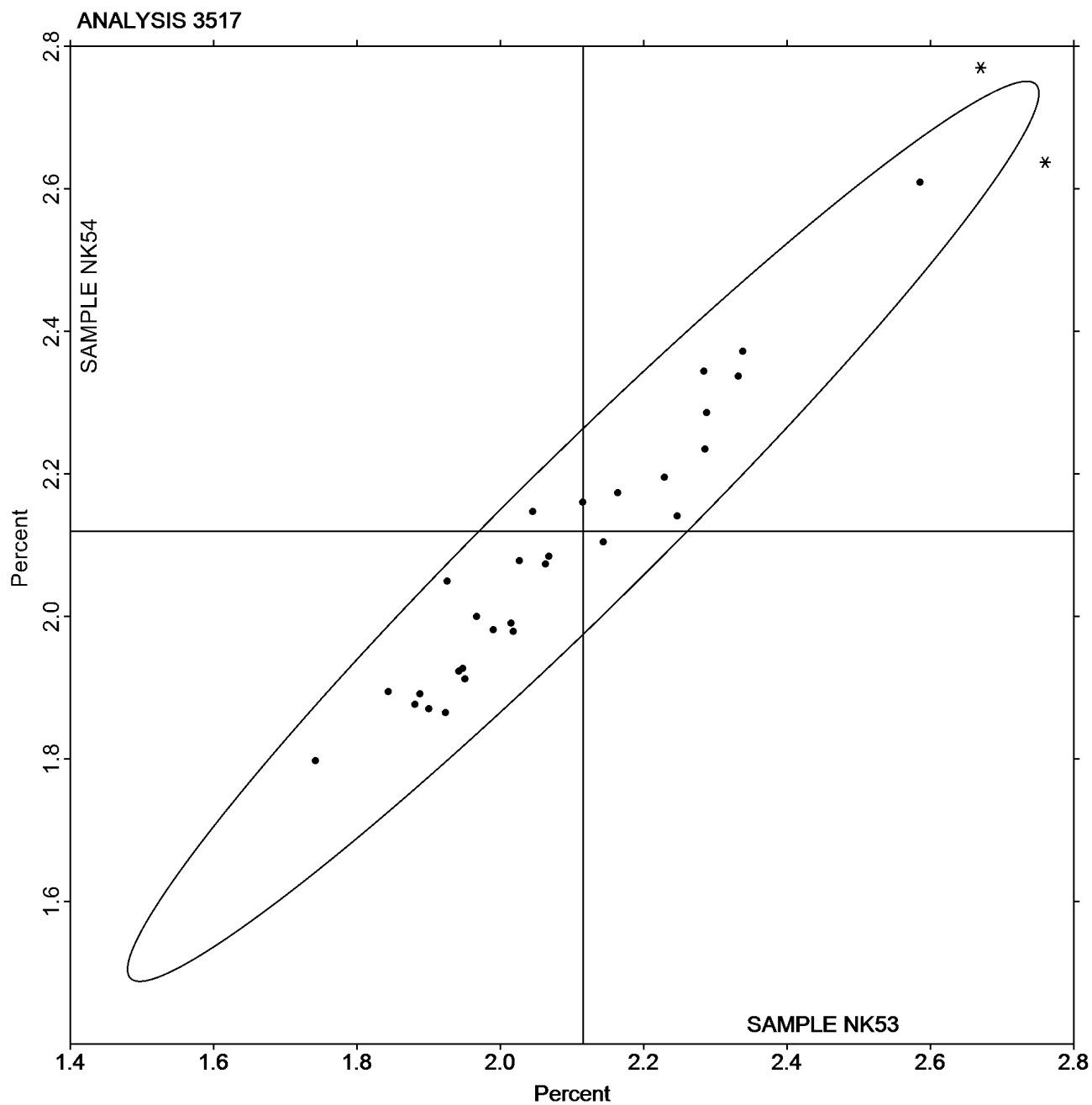
Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3517 Elongation to Break - Packaging Papers TAPPI Official Test Method T494

Grand Mean Sample NK53 = 2.1155
Percent

Grand Mean Sample NK54 = 2.1193
Percent





Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3531

Roughness - Print Surf Method - 0.5 to 4.0 Microns

TAPPI Official Test Method T555

WebCode	Data Flag	Sample PS53			Sample PS54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3F2DL8		0.8050	0.0602	0.72	0.8260	0.0837	1.01	ZZ
487XA8		0.7350	-0.0098	-0.12	0.7350	-0.0073	-0.09	ZZ
8M62C2		0.7530	0.0082	0.10	0.7380	-0.0043	-0.05	ZZ
A3XDYV		0.8000	0.0552	0.66	0.7750	0.0327	0.39	ZZ
BKAKNW		0.6870	-0.0578	-0.70	0.7080	-0.0343	-0.41	ZZ
GNLPFX		0.7460	0.0012	0.01	0.7540	0.0117	0.14	ZZ
H8VVPT		0.6040	-0.1408	-1.69	0.5960	-0.1463	-1.76	ZZ
J4GKCP		0.7110	-0.0338	-0.41	0.7120	-0.0303	-0.36	ZZ
KYUGHP		0.7880	0.0432	0.52	0.7830	0.0407	0.49	ZZ
LFYBPN		0.9680	0.2232	2.68	0.9570	0.2147	2.58	ZZ
MZYXJR		0.8750	0.1302	1.56	0.8670	0.1247	1.50	ZZ
N4DTYP		0.6790	-0.0658	-0.79	0.6440	-0.0983	-1.18	ZZ
RMHM6C		0.7010	-0.0438	-0.53	0.6820	-0.0603	-0.72	ZZ
WDZC69		0.7340	-0.0108	-0.13	0.7520	0.0097	0.12	ZZ
XT9QZB		0.6600	-0.0848	-1.02	0.6570	-0.0853	-1.02	ZZ
YQUTXD		0.6860	-0.0588	-0.71	0.6980	-0.0443	-0.53	ZZ
ZBWXXD		0.7180	-0.0268	-0.32	0.7410	-0.0013	-0.02	ZZ
ZCRF2E		0.7570	0.0122	0.15	0.7360	-0.0063	-0.08	ZZ

Summary Statistics

Sample PS53

Sample PS54

Grand Means

0.74 Microns

0.74 Microns

Std Dev Btwn Labs

0.08 Microns

0.08 Microns

Statistics based on 18 of 18 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

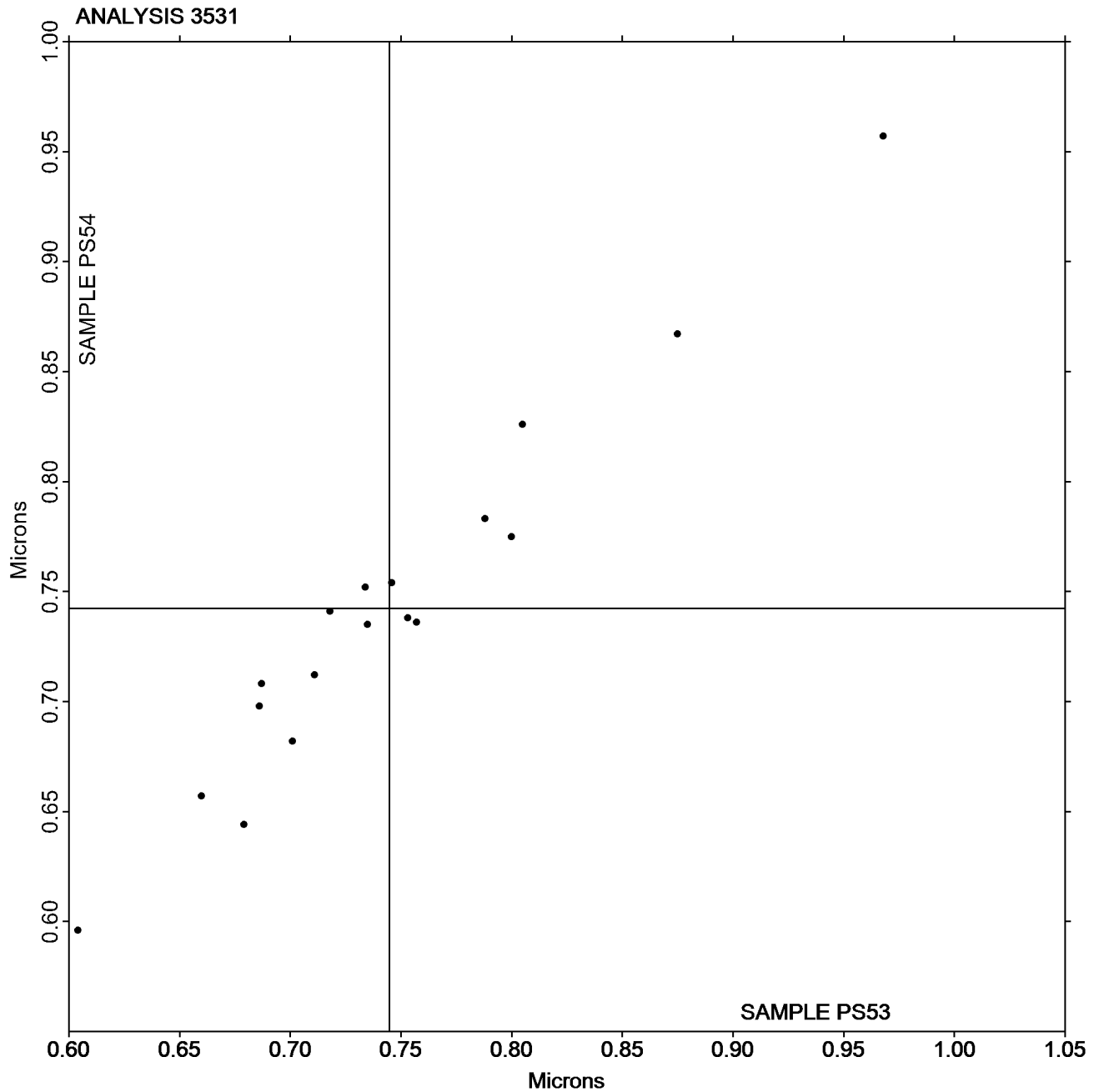
Analysis 3531

Roughness - Print Surf Method - 0.5 to 4.0 Microns

TAPPI Official Test Method T555

Grand Mean Sample PS53 = 0.74483
Microns

Grand Mean Sample PS54 =
0.74228 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

Report #4422,
June 2026

Analysis 3545

Directional Brightness

TAPPI Official Test Method T452

WebCode	Data Flag	Sample BR53			Sample BR54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
36Z7Q8	*	71.40	-5.33	-2.83	71.27	-5.46	-2.83	LA
3F2DL8		76.61	-0.12	-0.06	76.71	-0.02	-0.01	HZ
6XAGX9		75.66	-1.06	-0.57	75.80	-0.93	-0.48	TS
8M62C2		78.28	1.55	0.82	77.85	1.12	0.58	TP
9FHT3V		77.78	1.06	0.56	78.03	1.30	0.67	XX
A3XDYV		79.29	2.56	1.36	79.42	2.69	1.40	HG
B8MDQW		76.55	-0.17	-0.09	76.49	-0.24	-0.12	XD
DKJBQX		75.39	-1.34	-0.71	75.65	-1.08	-0.56	XX
DMPTPT		75.99	-0.74	-0.39	75.90	-0.83	-0.43	TD
GNLAFX		77.62	0.89	0.47	77.65	0.92	0.48	HG
H8VVPT		76.37	-0.36	-0.19	76.43	-0.30	-0.16	PP
KYUGHP		76.12	-0.61	-0.32	76.23	-0.50	-0.26	TS
M83VDP		77.84	1.12	0.59	78.33	1.60	0.83	TP
QVCKN2		75.38	-1.34	-0.72	74.70	-2.03	-1.05	TP
WDZC69		80.16	3.43	1.82	80.09	3.36	1.74	HG
XT9QZB		75.97	-0.76	-0.40	75.98	-0.75	-0.39	TP
Y38ZJ7		78.87	2.14	1.14	78.74	2.01	1.04	TD
ZBWXZD		76.39	-0.34	-0.18	76.51	-0.22	-0.11	TP
ZCRF2E		76.17	-0.56	-0.30	76.08	-0.65	-0.34	TP

Summary Statistics

Sample BR53

Sample BR54

Grand Means

76.73 Percent

76.73 Percent

Std Dev Btwn Labs

1.88 Percent

1.93 Percent

Statistics based on 19 of 19 reporting participants.

Key to Instrument Codes Reported by Participants

HG	Hunter Labscan / XE	HZ	Hunter Lab ColorFlex EZ Series
LA	L & W Elrepho - Autoline	PP	Technidyne Profile/Plus
TD	Technidyne Color Touch 45X	TP	Technidyne Test/Plus
TS	Technidyne Brightimeter Micro S-5	XD	X-Rite Color Ci7600
XX	Instrument make/model not specified by lab		



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3545

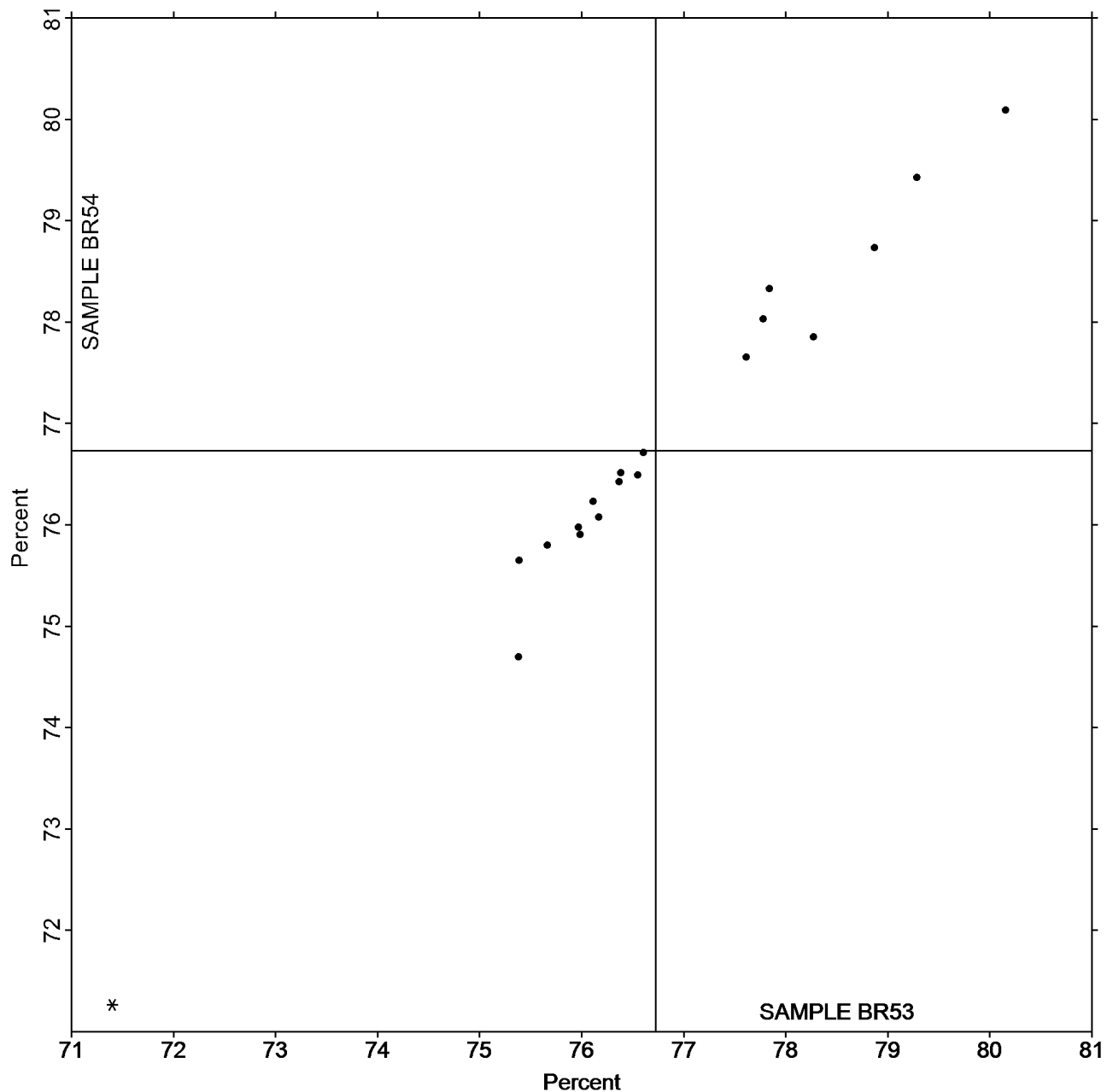
Directional Brightness

TAPPI Official Test Method T452

Grand Mean Sample BR53 = 76.727
Percent

Grand Mean Sample BR54 = 76.729
Percent

ANALYSIS 3545



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



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3547 Diffuse Brightness

TAPPI Official Test Method T525

WebCode	Data Flag	Sample BR53			Sample BR54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
8M62C2		76.31	-0.18	-0.90	76.40	-0.04	-0.15	TC
GA98UP		76.66	0.17	0.83	76.66	0.21	0.73	XX
GNLPHX		76.42	-0.07	-0.34	76.00	-0.44	-1.52	TC
HHHW8N		76.39	-0.10	-0.50	76.38	-0.07	-0.24	LT
KYUGHP		76.95	0.46	2.26	77.07	0.63	2.16	LT
LFYBPN		76.38	-0.12	-0.56	76.28	-0.17	-0.58	LE
PXBYQE		76.54	0.05	0.25	76.38	-0.07	-0.24	LA
XT9QZB		76.33	-0.16	-0.78	76.42	-0.03	-0.10	EA
ZBWZXD		76.44	-0.05	-0.26	76.43	-0.02	-0.07	LT

Summary Statistics

Sample BR53

Sample BR54

Grand Means

76.49 Percent

76.45 Percent

Std Dev Btwn Labs

0.20 Percent

0.29 Percent

Statistics based on 9 of 9 reporting participants.

Key to Instrument Codes Reported by Participants

EA	Datacolor Elrepho	LA	L & W Elrepho - Autoline
LE	L & W Elrepho	LT	L & W Elrepho SE 071
TC	Technidyne Color Touch Series	XX	Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

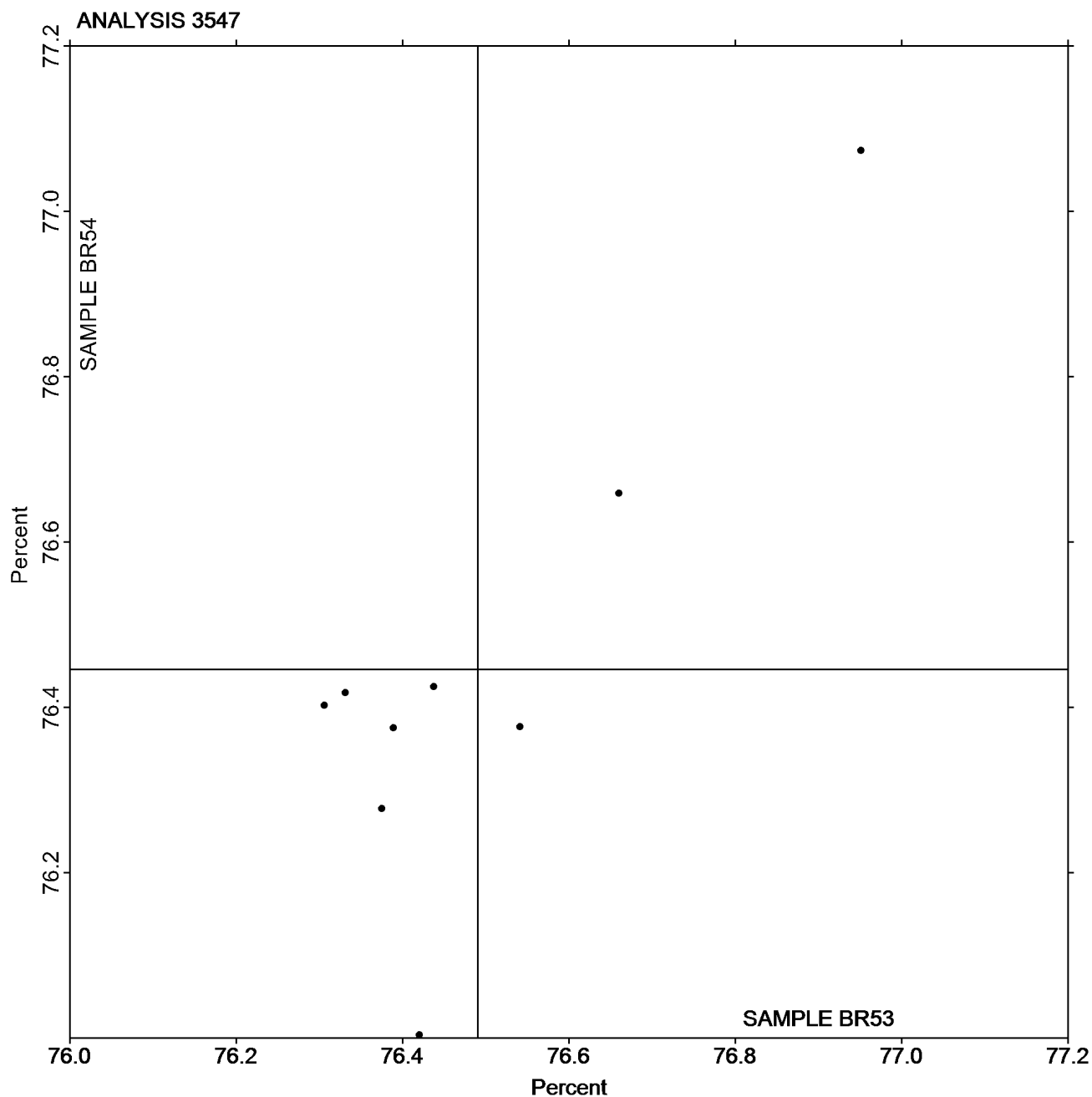
Report #4422,
June 2026

Analysis 3547
Diffuse Brightness

TAPPI Official Test Method T525

Grand Mean Sample BR53 = 76.490
Percent

Grand Mean Sample BR54 = 76.446
Percent





Paper & Paperboard Interlaboratory Testing Program

Analysis 3549

Report #4422,
June 2026

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

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

Web Code	Data Flag	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	ΔL	Δa	Δb	ΔE	
36Z7Q8		CA53	86.64	-0.04	0.05	0.08	-0.11	0.06	0.15	XX
		CA54	86.72	-0.15	0.11					
68YVTL		CA53	89.46	0.46	-0.51	0.07	-0.04	0.12	0.15	TC
		CA54	89.53	0.42	-0.39					
8M62C2		CA53	86.72	0.29	-0.35	-0.08	0.03	-0.10	0.13	TC
		CA54	86.64	0.33	-0.45					
9FHT3V		CA53	90.09	0.36	-0.62	0.09	0.00	-0.07	0.12	XX
		CA54	90.18	0.36	-0.70					
A3XDYV		CA53	86.88	-0.28	-0.27	0.04	0.04	-0.04	0.07	HK
		CA54	86.92	-0.24	-0.31					
GA98UP		CA53	89.62	-0.55	-0.20	0.05	0.01	0.04	0.06	TC
		CA54	89.66	-0.54	-0.16					
GFWRZQ		CA53	85.53	0.79	-1.26	0.05	0.03	-0.08	0.10	TD
		CA54	85.58	0.82	-1.34					
GNLPFX		CA53	87.22	0.85	-0.75	0.02	-0.03	0.09	0.09	HK
		CA54	87.25	0.82	-0.66					
H8VVPT		CA53	86.65	0.26	-0.38	-0.12	0.11	-0.22	0.28	TC
		CA54	86.53	0.37	-0.60					
HZZX3Q		CA53	89.62	-0.37	-0.33	0.10	0.04	0.09	0.15	NH
		CA54	89.72	-0.33	-0.23					
KYUGHP		CA53	85.52	2.26 *	-1.62	0.24	-0.03	0.06	0.25	TS
		CA54	85.77	2.23	-1.56					
MZYXJR		CA53	89.40	0.33	-0.56	0.10	-0.04	0.18	0.22	TC
		CA54	89.50	0.29	-0.37					
WDZC69		CA53	87.36	-0.33	-0.29	0.03	0.04	-0.02	0.06	HK
		CA54	87.39	-0.29	-0.31					
YQUTXD		CA53	85.58	0.96 *	-1.42	-0.34 X	-0.89 X	0.14	0.97 X	TC
		CA54	85.24	0.07	-1.28					



Paper & Paperboard Interlaboratory Testing Program

Analysis 3549

Report #4422,
June 2026

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

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

Grand Means			Summary Statistics					
CA53	87.592	0.357	-0.607					
CA54	87.617	0.297	-0.589	0.025	-0.060	0.018	0.198	
Std Dev Btwn Labs								
CA53	1.687	0.724	0.492					
CA54	1.737	0.695	0.484	0.135	0.246	0.111	0.231	
Statistics based on 14 of 14 reporting participants								

Key to Instrument Codes Reported by Participants

HK	Hunter LabScan XE	NH	Minolta CM-3700A Spectrophotometer
TC	Technidyne Color Touch Series	TD	Technidyne Color Touch X45
TS	Technidyne Brightimeter Micro S-5	XX	Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

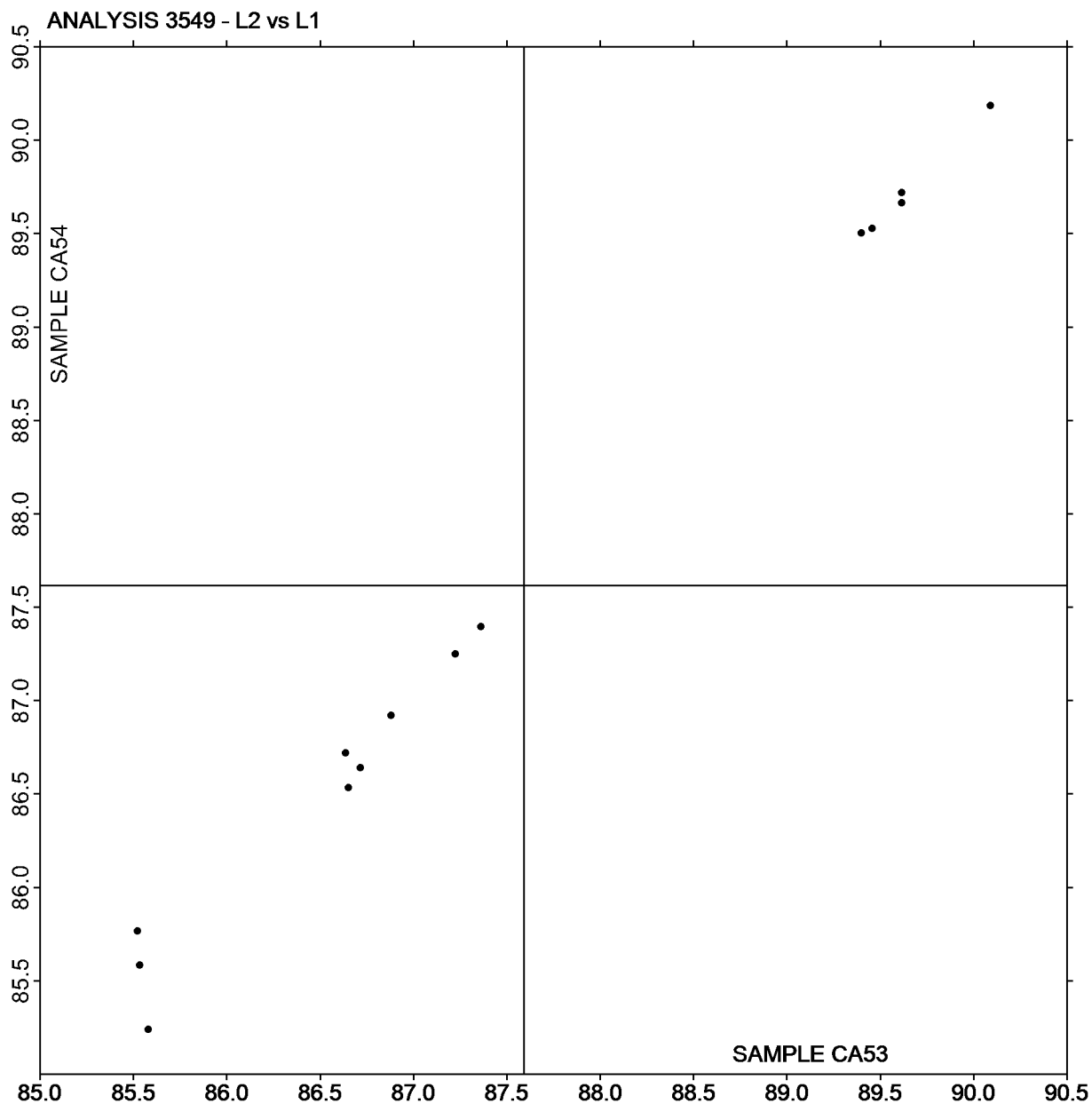
Analysis 3549

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

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

Report #4422,
June 2026

Plot of L values CA54 vs L values CA53



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

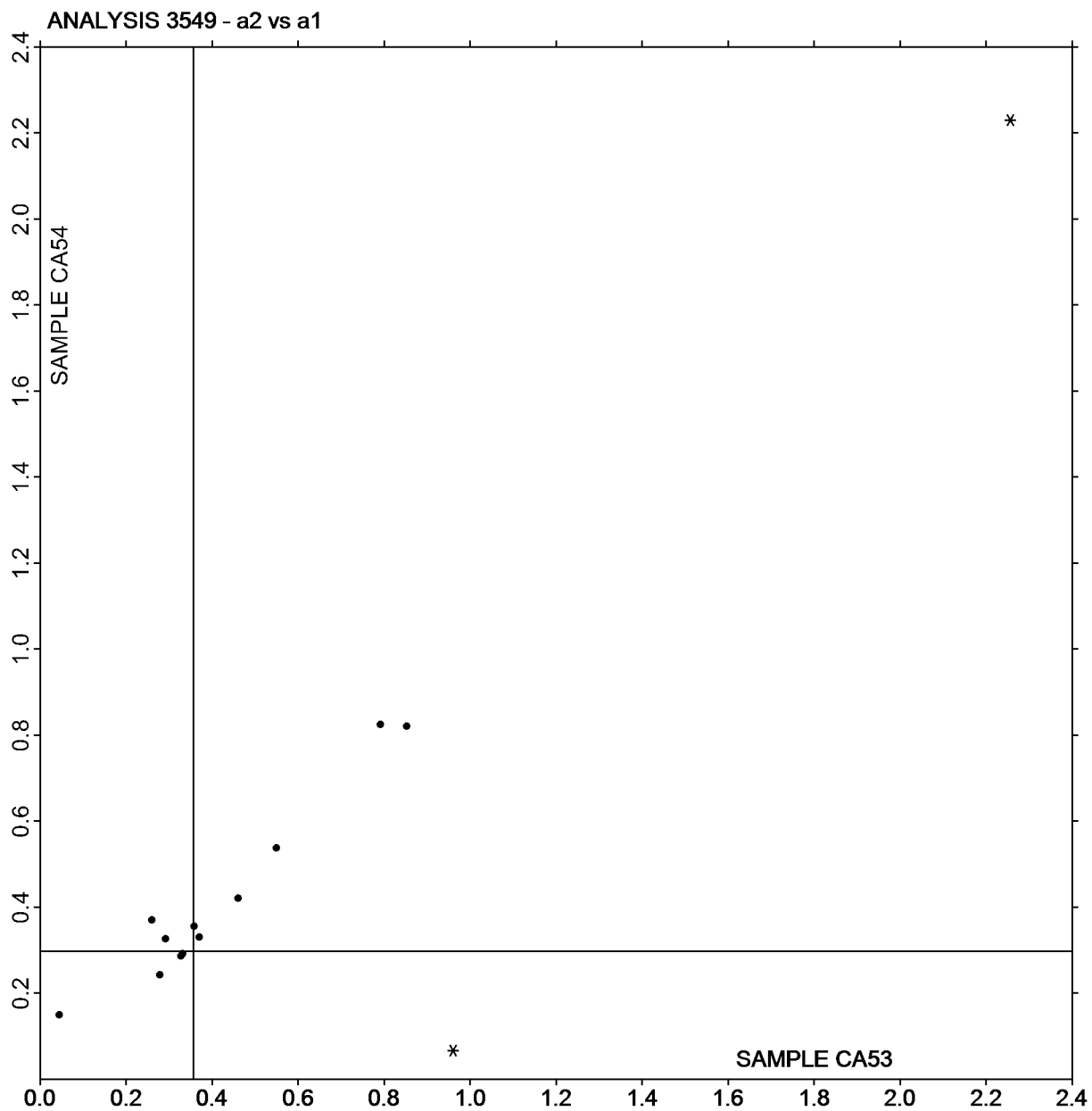
Analysis 3549

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

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

Report #4422,
June 2026

Plot of a values CA54 vs a values CA53



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

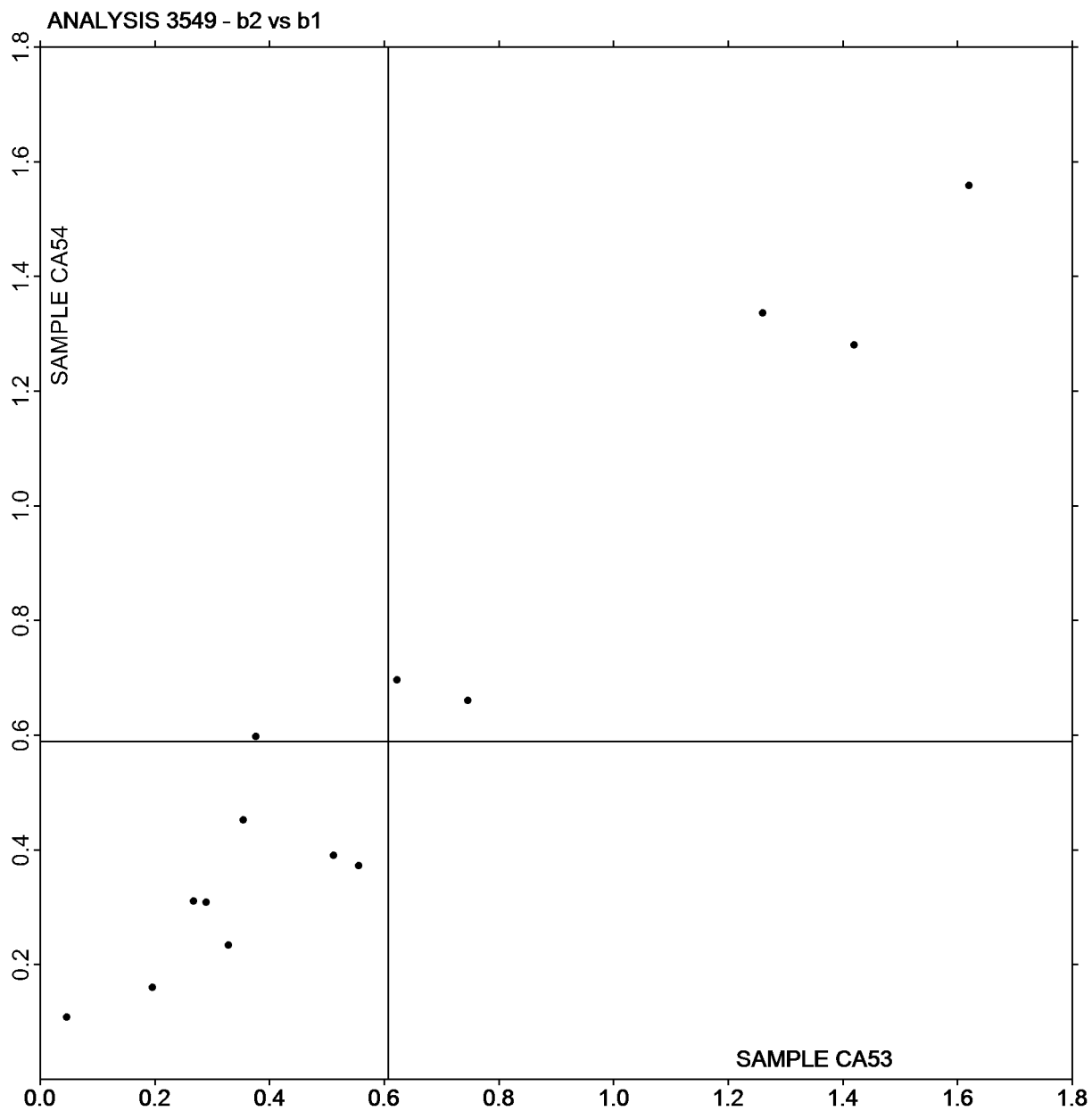
Analysis 3549

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

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

Report #4422,
June 2026

Plot of b values CA54 vs b values CA53



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 3551
Color & Color Difference - Near White Papers - D65/10deg obs
Hunter L,a,b - Illuminant D65 - 10 Degree Observer

Report #4422,
June 2026

Web Code	Data Flag	Samples	Hunter L, a, b Color Values			Color Difference Values				Instr Code
			L	a	b	ΔL	Δa	Δb	ΔE	
6FAHWZ		CA53	92.29	-0.51	-0.37	0.14	-0.03	0.03	0.14	NF
		CA54	92.43	-0.55	-0.34					
893KF8		CA53	89.75	-0.56	0.06	-0.07	0.01	-0.09	0.12	XX
		CA54	89.67	-0.55	-0.03					
AZPB3Y		CA53	89.81	-0.51	-0.10	-0.08	0.18 X	-0.47	0.51 X	TC
		CA54	89.73	-0.33	-0.57					
GNLPFX		CA53	86.74	-0.66	-0.25	0.05	0.01	0.13	0.14	TC
		CA54	86.79	-0.65	-0.13					
XT9QZB		CA53	89.45	-0.55	-0.15	0.00	0.03	0.00	0.03	EG
		CA54	89.46	-0.52	-0.15					
Z6T4R4		CA53	89.63	-0.57	0.06	-0.06	0.02	-0.17	0.18	XX
		CA54	89.57	-0.54	-0.10					
ZBW XZD		CA53	89.59	-0.75	0.00	0.07	0.01	0.04	0.08	LT
		CA54	89.66	-0.74	0.05					
ZCRF2E		CA53	87.75	-0.53	-0.22	0.04	0.07	-0.11	0.14	HL
		CA54	87.79	-0.45	-0.34					

Grand Means

Summary Statistics

CA53	89.376	-0.578	-0.123	0.011	0.038	-0.079	0.168
CA54	89.387	-0.541	-0.202				

Std Dev Btwn Labs

CA53	1.628	0.083	0.158	0.079	0.064	0.184	0.144
CA54	1.640	0.121	0.201				

Statistics based on 8 of 8 reporting participants

Key to Instrument Codes Reported by Participants

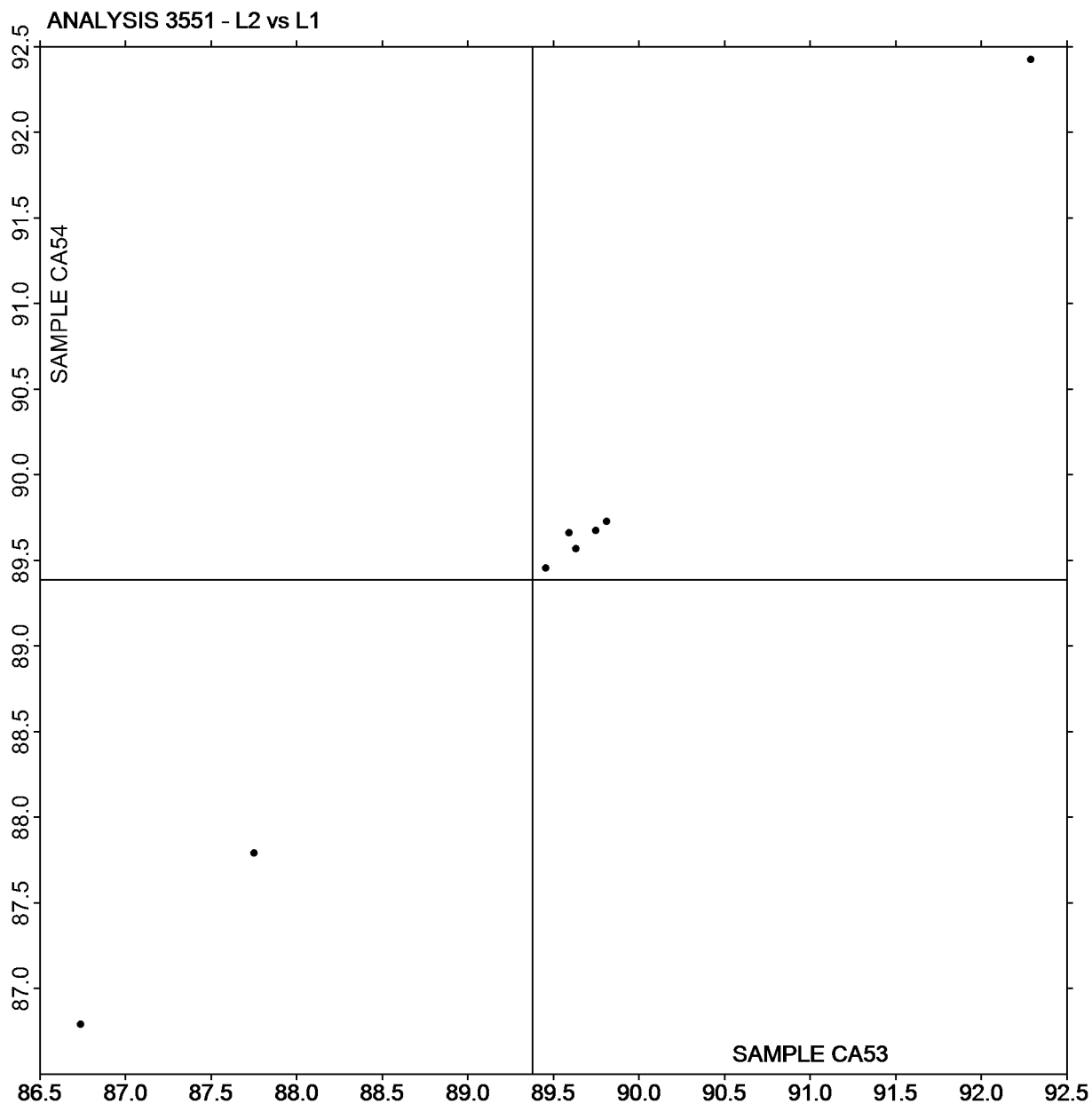
EG	Datacolor Elrepho	HL	Hunter Agera
LT	L & W Elrepho SE 071	NF	Minolta CM-3600d Spectrophotometer
TC	Technidyne Color Touch Series	XX	Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program
Analysis 3551
Color & Color Difference - Near White Papers - D65/10deg obs
Hunter L,a,b - Illuminant D65 - 10 Degree Observer

Report #4422,
June 2026

Plot of L values CA54 vs L values CA53



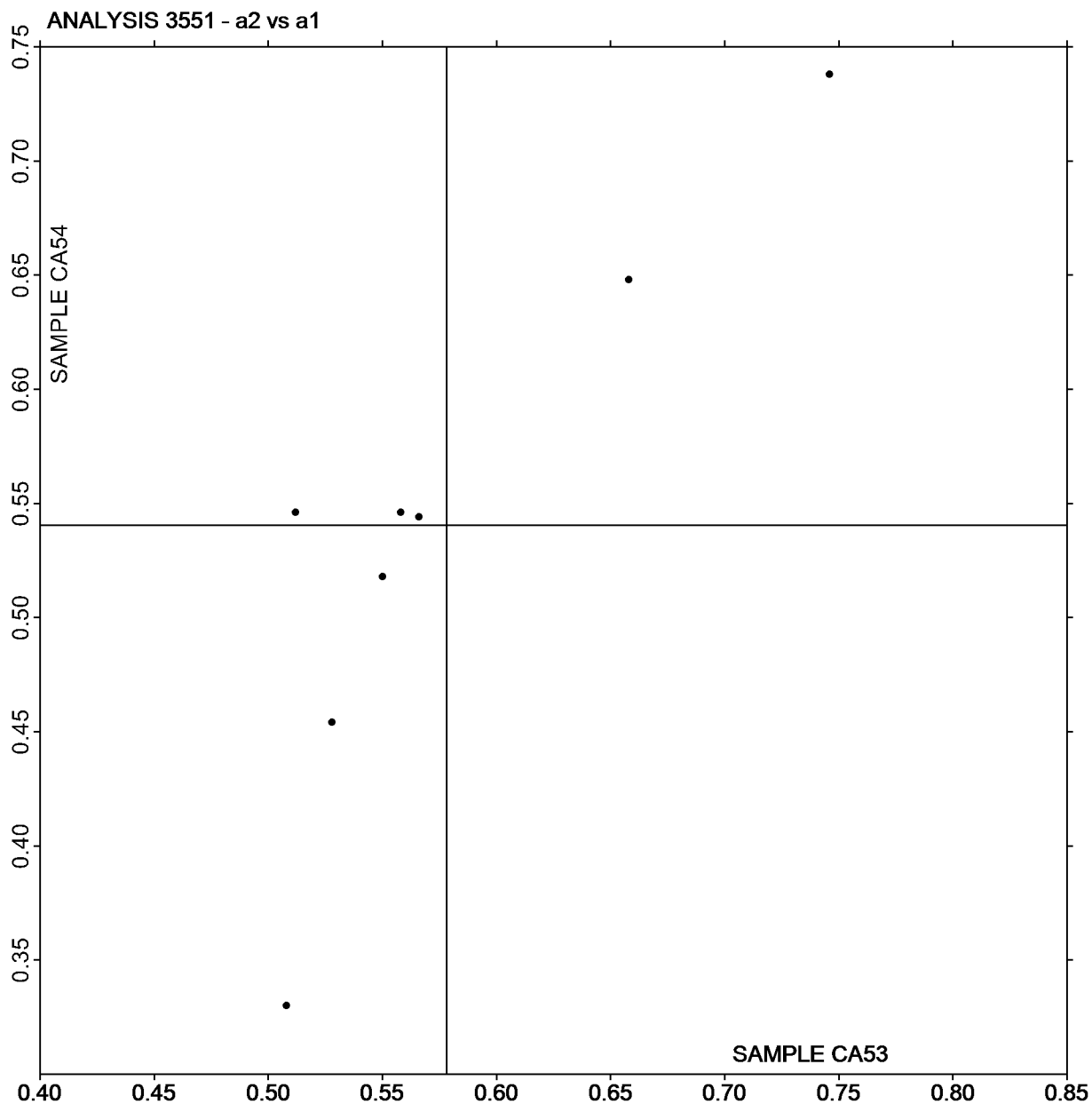
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Paper & Paperboard Interlaboratory Testing Program
Analysis 3551
Color & Color Difference - Near White Papers - D65/10deg obs
Hunter L,a,b - Illuminant D65 - 10 Degree Observer

Report #4422,
June 2026

Plot of a values CA54 vs a values CA53



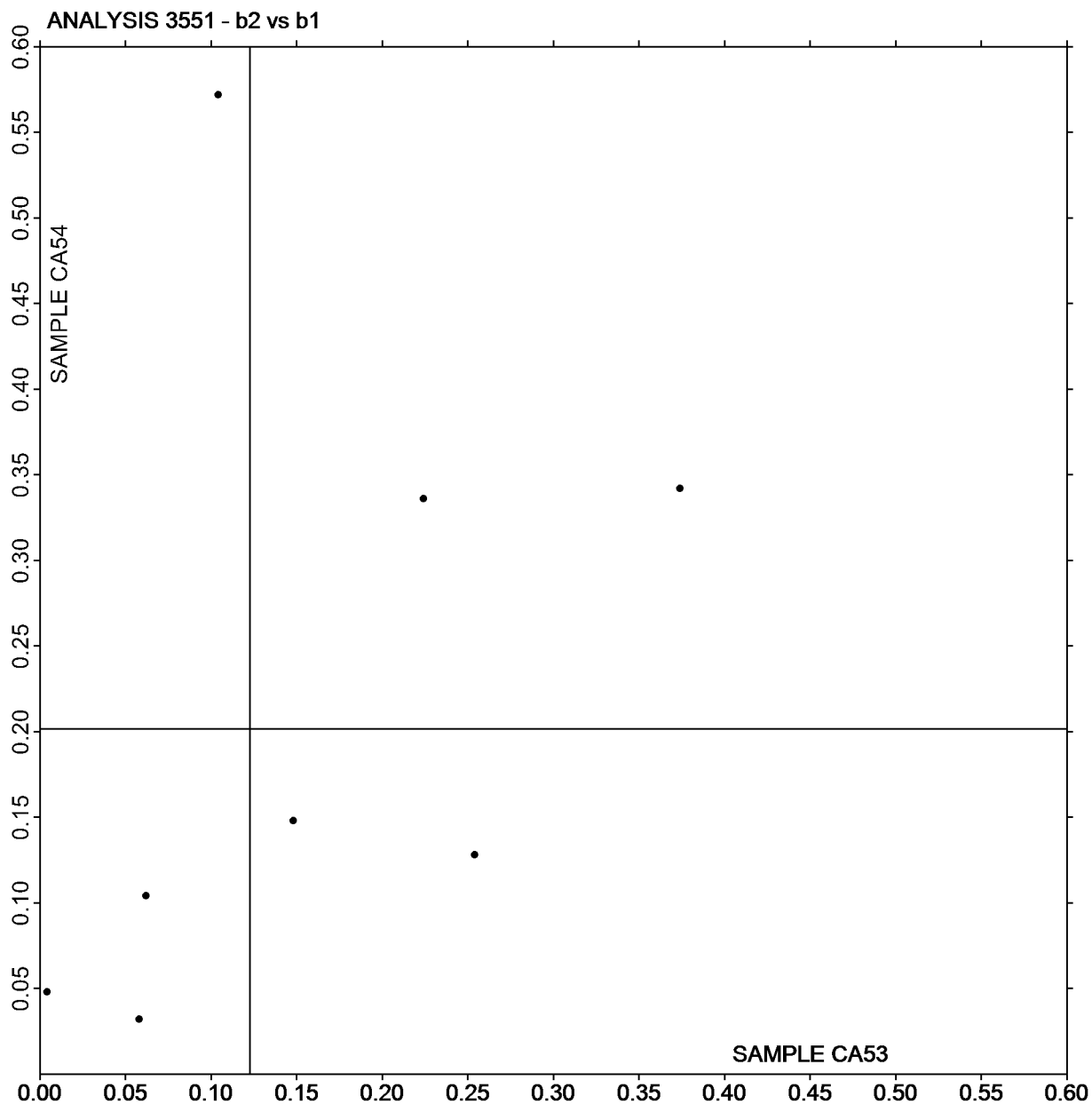
If fewer than 20 laboratories are included in an analysis, a control ellipse will not be drawn on the two-sample plot.



Paper & Paperboard Interlaboratory Testing Program
Analysis 3551
Color & Color Difference - Near White Papers - D65/10deg obs
Hunter L,a,b - Illuminant D65 - 10 Degree Observer

Report #4422,
June 2026

Plot of b values CA54 vs b values CA53



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



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3553

Specular Gloss at 75 Degrees - High Range

TAPPI Official Test Method T480

WebCode	Data Flag	Sample GH53			Sample GH54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
8M62C2		68.50	1.99	0.93	68.93	2.27	1.02	GM
A3XDYV		65.17	-1.34	-0.62	65.33	-1.33	-0.60	TP
BKAKNW		69.56	3.05	1.42	70.72	4.06	1.82	VM
H8VVPT		68.95	2.44	1.13	67.88	1.22	0.55	PP
J4GKCP		64.02	-2.49	-1.16	64.59	-2.07	-0.93	LG
MZYXJR		64.74	-1.77	-0.82	65.67	-0.99	-0.45	LF
N4DTYP		65.79	-0.72	-0.33	66.02	-0.64	-0.29	LF
WDZC69		64.25	-2.26	-1.05	63.97	-2.69	-1.21	PP
XT9QZB		68.65	2.14	1.00	68.59	1.93	0.87	TH
ZBWXZD		65.45	-1.06	-0.49	64.95	-1.72	-0.77	GA

Summary Statistics

Sample GH53

Sample GH54

Grand Means

66.51 Gloss Units

66.67 Gloss Units

Std Dev Btwn Labs

2.15 Gloss Units

2.22 Gloss Units

Statistics based on 10 of 10 reporting participants.

Key to Instrument Codes Reported by Participants

GA BYK-Gardner (model not specified)

GM BYK-Gardner micro-gloss

LF L & W Autoline 400

LG L & W Autoline 600

PP Technidyne Profile/Plus

TH Technidyne T480A

TP Technidyne Profile Plus

VM Valmet PaperLab (was Kajaani/Robotest)



Paper & Paperboard Interlaboratory Testing Program

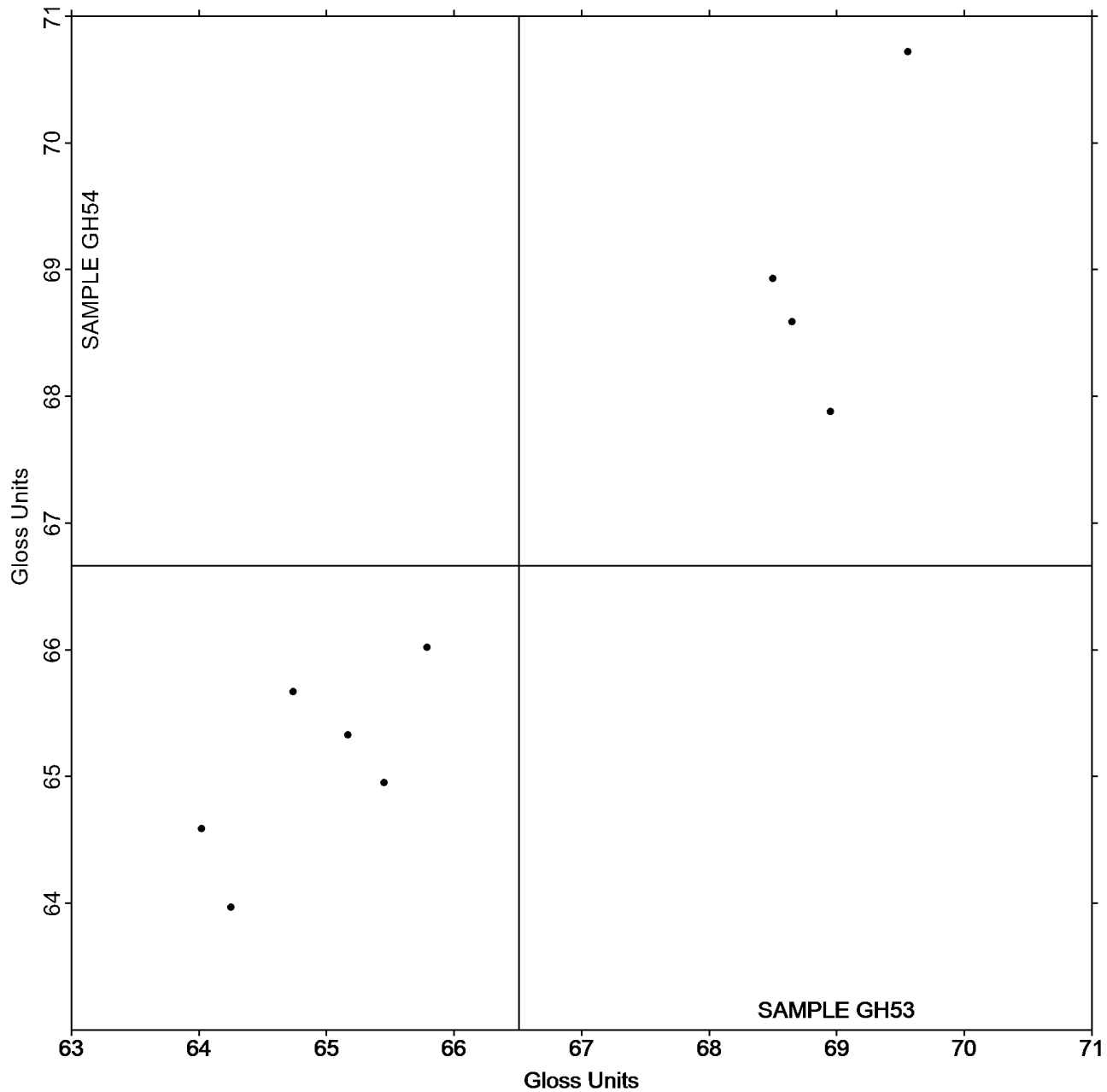
Report #4422,
June 2026

Analysis 3553 Specular Gloss at 75 Degrees - High Range TAPPI Official Test Method T480

Grand Mean Sample GH53 = 66.508
Gloss Units

Grand Mean Sample GH54 = 66.665
Gloss Units

ANALYSIS 3553



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



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3555

Specular Gloss at 75 Degrees - Low Range

TAPPI Official Test Method T480

WebCode	Data Flag	Sample GL53			Sample GL54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3F2DL8		34.96	-0.82	-0.31	34.79	-1.34	-0.41	GS
9MH6C7		41.26	5.48	2.05	43.46	7.33	2.22	XX
B8MDQW		32.01	-3.77	-1.41	32.07	-4.06	-1.23	TH
EW6CCW		36.15	0.37	0.14	36.13	0.00	0.00	TA
GFWRZQ		34.85	-0.93	-0.35	35.16	-0.97	-0.30	TP
GNLAFX		37.08	1.30	0.49	36.98	0.85	0.26	PP
LVQ9QJ		35.78	0.00	0.00	35.84	-0.29	-0.09	WJ
XKNWDD		34.15	-1.63	-0.61	34.64	-1.49	-0.45	GM

Summary Statistics

Sample GL53

Sample GL54

Grand Means

35.78 Gloss Units

36.13 Gloss Units

Std Dev Btwn Labs

2.68 Gloss Units

3.29 Gloss Units

Statistics based on 8 of 8 reporting participants.

Key to Instrument Codes Reported by Participants

GM	BYK-Gardner micro-gloss	GS	BYK-Gardner Glossgard II
PP	Technidyne Profile/Plus	TA	Technidyne Test Plus Gloss 75 degree
TH	Technidyne T480A	TP	Technidyne Profile Plus
WJ	Zehntner ZLR 1020	XX	Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3555

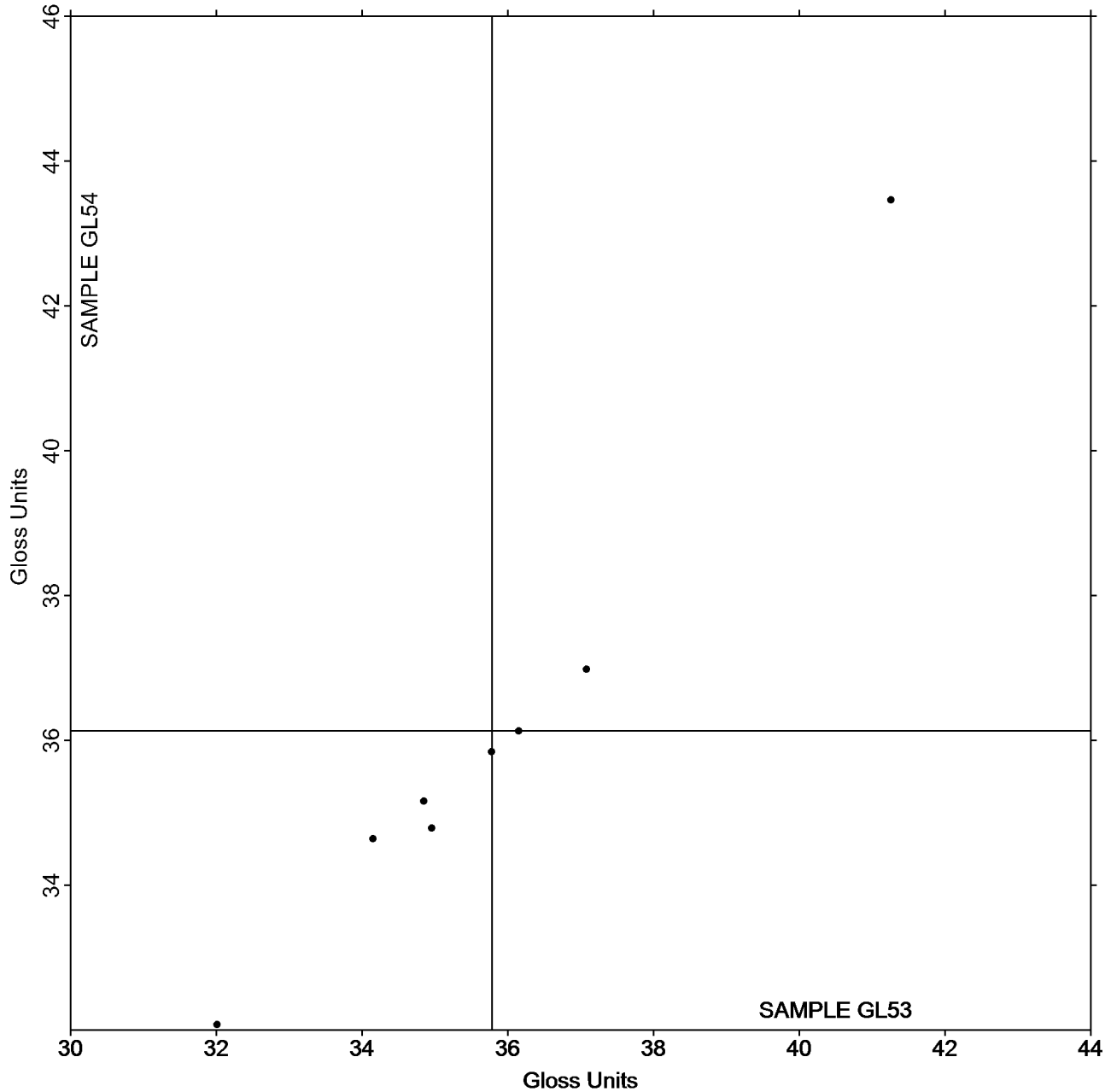
Specular Gloss at 75 Degrees - Low Range

TAPPI Official Test Method T480

Grand Mean Sample GL53 = 35.780
Gloss Units

Grand Mean Sample GL54 = 36.134
Gloss Units

ANALYSIS 3555



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



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3601 Folding Endurance (MIT) - Double Folds TAPPI Official Test Method T511

WebCode	Data Flag	Sample MT53			Sample MT54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
ATKLAX		25.60	-12.69	-1.79	25.70	-10.33	-1.29	MT
B8MDQW		40.40	2.11	0.30	50.00	13.98	1.74	MT
BKAKNW		33.00	-5.29	-0.75	29.00	-7.03	-0.88	MT
BT2XMW		35.60	-2.69	-0.38	33.70	-2.32	-0.29	MT
DMPTPT		42.70	4.41	0.62	37.00	0.98	0.12	MT
RVTPQD		48.50	10.21	1.44	44.70	8.68	1.08	MT
XT9QZB		43.30	5.01	0.71	36.20	0.18	0.02	MT
Z6T4R4		37.20	-1.09	-0.15	31.90	-4.13	-0.51	XX

Summary Statistics

Sample MT53

Sample MT54

Grand Means

38.29 Double Folds

36.03 Double Folds

Std Dev Btwn Labs

7.08 Double Folds

8.02 Double Folds

Statistics based on 8 of 8 reporting participants.

Key to Instrument Codes Reported by Participants

MT MIT - Tinius Olsen

XX Instrument make/model not specified by lab



Paper & Paperboard Interlaboratory Testing Program

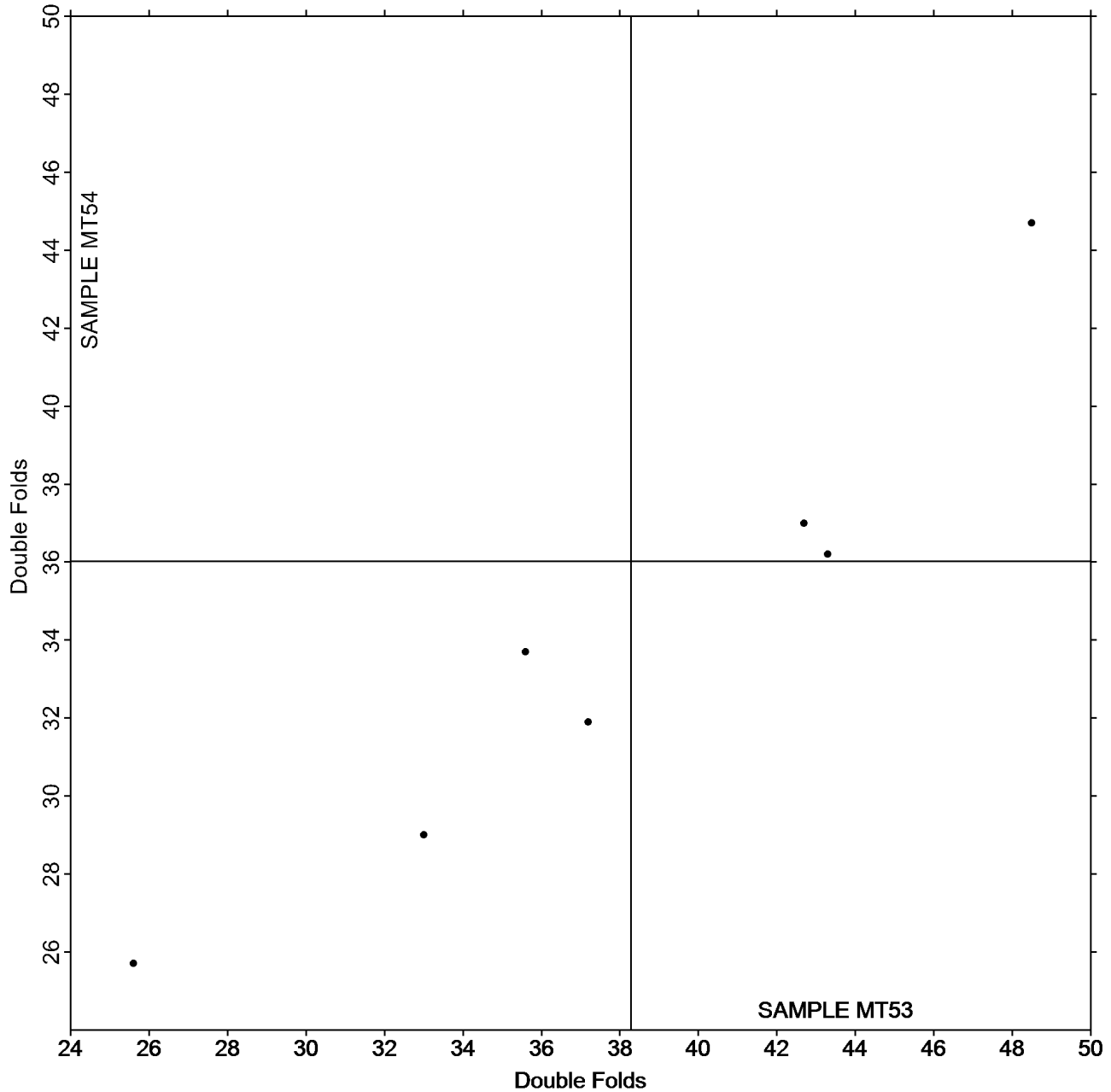
Report #4422,
June 2026

Analysis 3601 Folding Endurance (MIT) - Double Folds TAPPI Official Test Method T511

Grand Mean Sample MT53 = 38.288
Double Folds

Grand Mean Sample MT54 = 36.025
Double Folds

ANALYSIS 3601



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



Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3603 Bending Resistance, Gurley Type TAPPI Official Test Method T543

WebCode	Data Flag	Sample BG53			Sample BG54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
B8MDQW		144.9	21.0	1.84	149.0	23.4	1.85	ZZ
BKAKNW	X	67.5	-56.4	-4.94	68.3	-57.3	-4.53	ZZ
DKJBQX		128.2	4.3	0.38	128.7	3.1	0.25	ZZ
DLTTVH		108.0	-15.9	-1.39	111.1	-14.5	-1.14	ZZ
DMPTPT		113.4	-10.4	-0.91	115.2	-10.4	-0.82	ZZ
ECMVEY		136.3	12.4	1.09	140.3	14.7	1.16	ZZ
HZZX3Q	X	4.6	-119.3	-10.45	4.5	-121.1	-9.56	ZZ
LFYBPN		122.1	-1.8	-0.16	127.0	1.4	0.11	ZZ
RMHM6C		118.4	-5.4	-0.48	117.5	-8.1	-0.64	ZZ
V4A7GW		118.2	-5.7	-0.50	114.5	-11.1	-0.87	ZZ
ZCRF2E		125.4	1.5	0.14	127.0	1.4	0.11	ZZ

Summary Statistics

Sample BG53

Sample BG54

Grand Means

123.88 Gurley Units

125.61 Gurley Units

Std Dev Btwn Labs

11.42 Gurley Units

12.67 Gurley Units

Statistics based on 9 of 11 reporting participants.

Comments on Assigned Data Flags for Test #3603

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

HZZX3Q (X) - Extreme Data.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



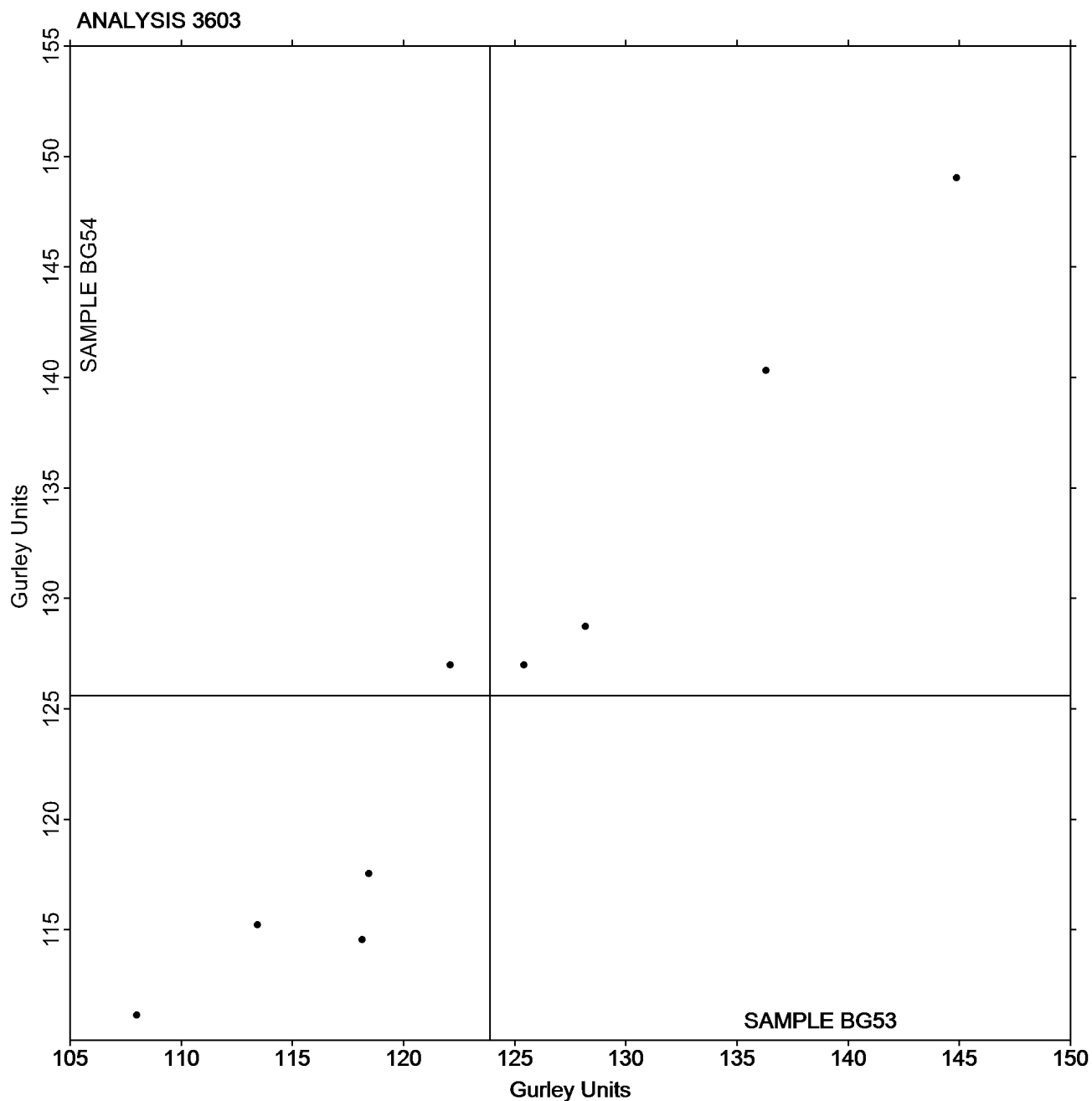
Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3603 Bending Resistance, Gurley Type TAPPI Official Test Method T543

Grand Mean Sample BG53 = 123.88
Gurley Units

Grand Mean Sample BG54 = 125.61
Gurley 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 3611
Coefficient of Static Friction - Horizontal Plane Method - Printing Papers
TAPPI Official Test Method T549

Report #4422,
June 2026

WebCode	Data Flag	<u>Sample CF53</u>			<u>Sample CF54</u>			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
9FHT3V		0.5058	0.0081	0.06	0.5174	-0.0099	-0.12	XX
BT2XMW		0.5926	0.0949	0.71	0.5830	0.0557	0.69	TM
ECMVEY		0.5180	0.0202	0.15	0.5000	-0.0273	-0.34	TA
GFWRZQ		0.5800	0.0822	0.62	0.5962	0.0689	0.85	TA
HZZX3Q		0.1864	-0.3114	-2.34	0.3492	-0.1781	-2.20	TX
KYUGHP		0.5996	0.1019	0.77	0.5964	0.0691	0.85	TA
L9VEVQ		0.5072	0.0094	0.07	0.5208	-0.0065	-0.08	TA
RMHM6C		0.4924	-0.0053	-0.04	0.5554	0.0281	0.35	TA

Summary Statistics

Sample CF53

Sample CF54

Grand Means

0.50 COF

0.53 COF

Std Dev Btwn Labs

0.13 COF

0.08 COF

Statistics based on 8 of 8 reporting participants.

Key to Instrument Codes Reported by Participants

TA Thwing-Albert Friction Tester

TM TMI 32-06 Monitor/Slip and Friction

TX TMI (model not specified)

XX Instrument make/model not specified by lab

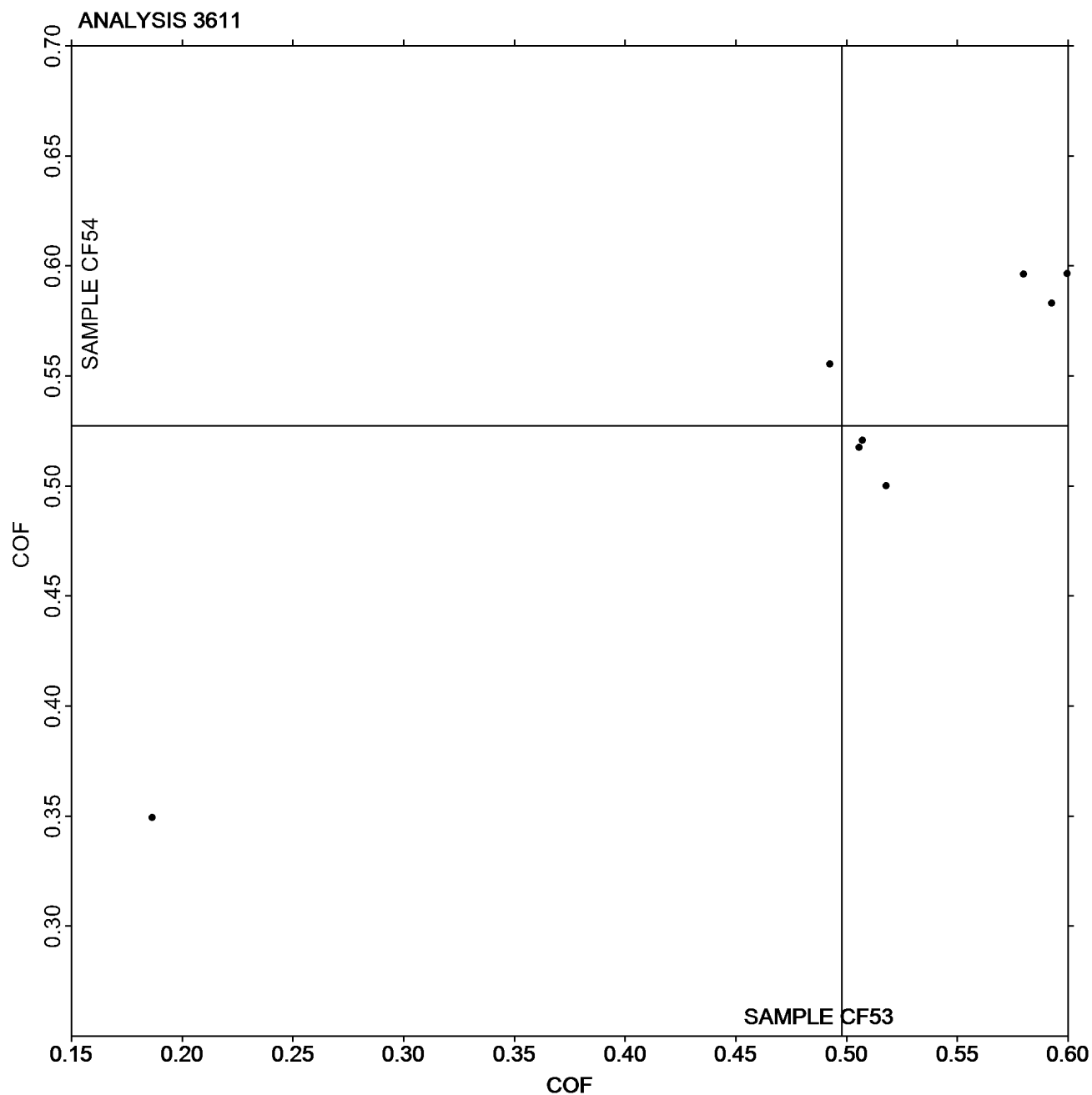


Paper & Paperboard Interlaboratory Testing Program
Analysis 3611
Coefficient of Static Friction - Horizontal Plane Method - Printing Papers
TAPPI Official Test Method T549

Report #4422,
June 2026

Grand Mean Sample CF53 = 0.49775
COF

Grand Mean Sample CF54 =
0.52730 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 3612
Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers
TAPPI Official Test Method T549

Report #4422,
June 2026

WebCode	Data Flag	<u>Sample CF53</u>			<u>Sample CF54</u>			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
9FHT3V		0.4886	0.0430	0.33	0.4952	0.0167	0.22	XX
BT2XMW		0.5552	0.1096	0.85	0.5580	0.0795	1.06	TM
ECMVEY		0.4880	0.0424	0.33	0.4800	0.0015	0.02	TA
GFWRZQ		0.4956	0.0500	0.39	0.5178	0.0393	0.52	TA
HZZX3Q		0.1408	-0.3048	-2.35	0.3048	-0.1737	-2.31	TX
KYUGHP		0.5116	0.0660	0.51	0.5110	0.0325	0.43	TA
L9VEVQ		0.4734	0.0278	0.21	0.4856	0.0071	0.09	TA
RMHM6C		0.4114	-0.0342	-0.26	0.4754	-0.0031	-0.04	TA

Summary Statistics	<u>Sample CF53</u>	<u>Sample CF54</u>
Grand Means	0.45 COF	0.48 COF
Stnd Dev Btwn Labs	0.13 COF	0.08 COF

Statistics based on 8 of 8 reporting participants.

Key to Instrument Codes Reported by Participants

TA	Thwing-Albert Friction Tester	TM	TMI 32-06 Monitor/Slip and Friction
TX	TMI (model not specified)	XX	Instrument make/model not specified by lab

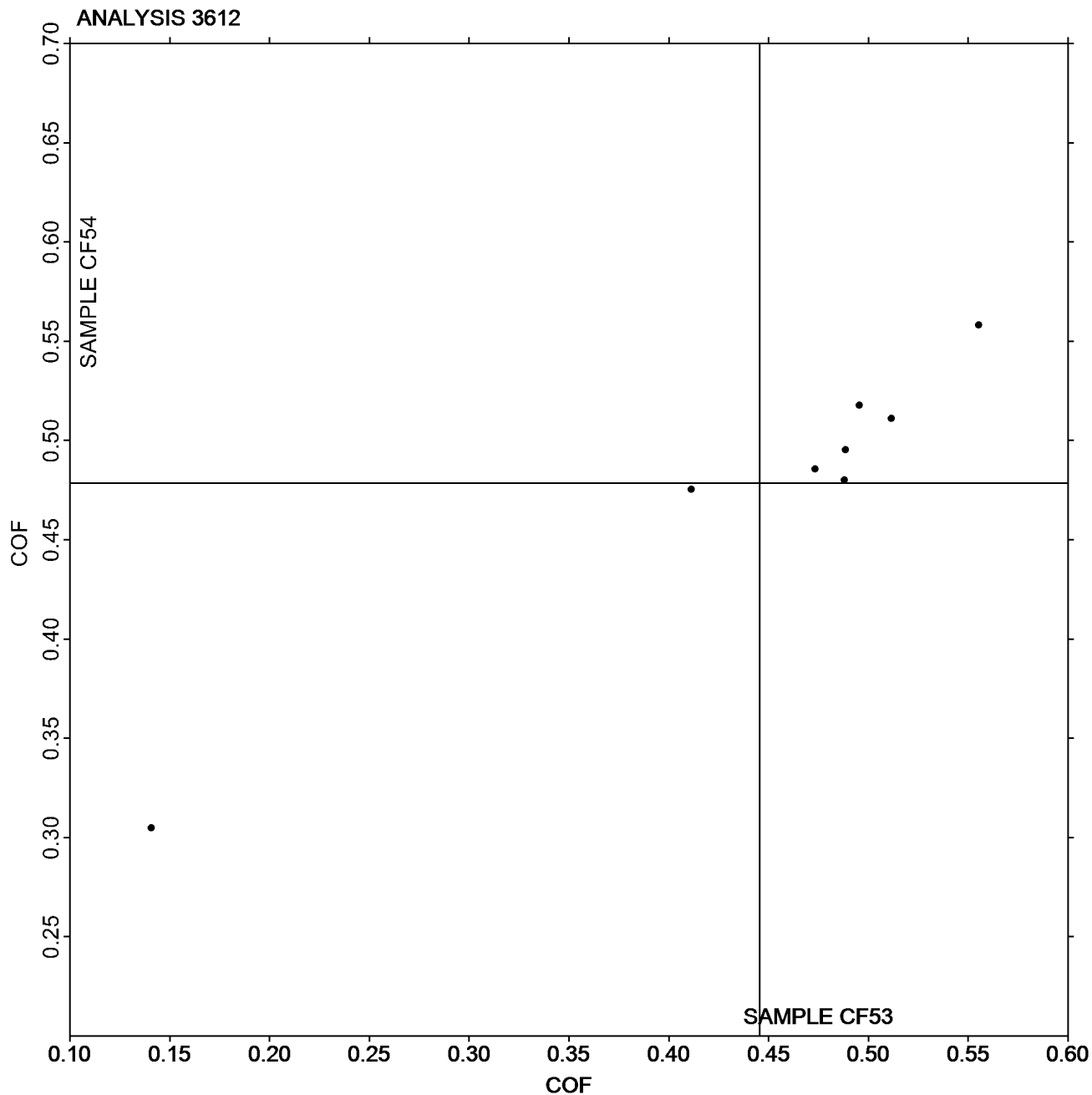


Paper & Paperboard Interlaboratory Testing Program
Analysis 3612
Coefficient of Kinetic Friction - Horizontal Plane Method - Printing Papers
TAPPI Official Test Method T549

Report #4422,
June 2026

Grand Mean Sample CF53 = 0.44558
COF

Grand Mean Sample CF54 =
0.47848 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

Report #4422,
June 2026

Analysis 3613 Moisture in Paper

TAPPI Official Test Method T412

WebCode	Data Flag	Sample MC53			Sample MC54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2X7MQD		4.117	-0.551	-0.93	4.293	-0.437	-0.80	ZZ
6FAHWZ		4.860	0.192	0.33	5.450	0.720	1.33	ZZ
8NYYF2		4.292	-0.377	-0.64	4.372	-0.358	-0.66	ZZ
DMPTPT		4.605	-0.063	-0.11	4.648	-0.083	-0.15	ZZ
ECMVEY		4.811	0.143	0.24	4.992	0.261	0.48	ZZ
FYR2HV		4.880	0.212	0.36	5.290	0.560	1.03	ZZ
GBJWAV		5.420	0.752	1.27	5.020	0.290	0.53	ZZ
LVQ9QJ		5.893	1.224	2.08	5.483	0.752	1.39	ZZ
V4A7GW		4.266	-0.402	-0.68	4.265	-0.465	-0.86	ZZ
W3XQMV		3.925	-0.743	-1.26	3.904	-0.826	-1.52	ZZ
Y38ZJ7		4.282	-0.386	-0.65	4.317	-0.413	-0.76	ZZ

Summary Statistics

Sample MC53

Sample MC54

Grand Means

4.67 Percent

4.73 Percent

Std Dev Btwn Labs

0.59 Percent

0.54 Percent

Statistics based on 11 of 11 reporting participants.

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Paper & Paperboard Interlaboratory Testing Program

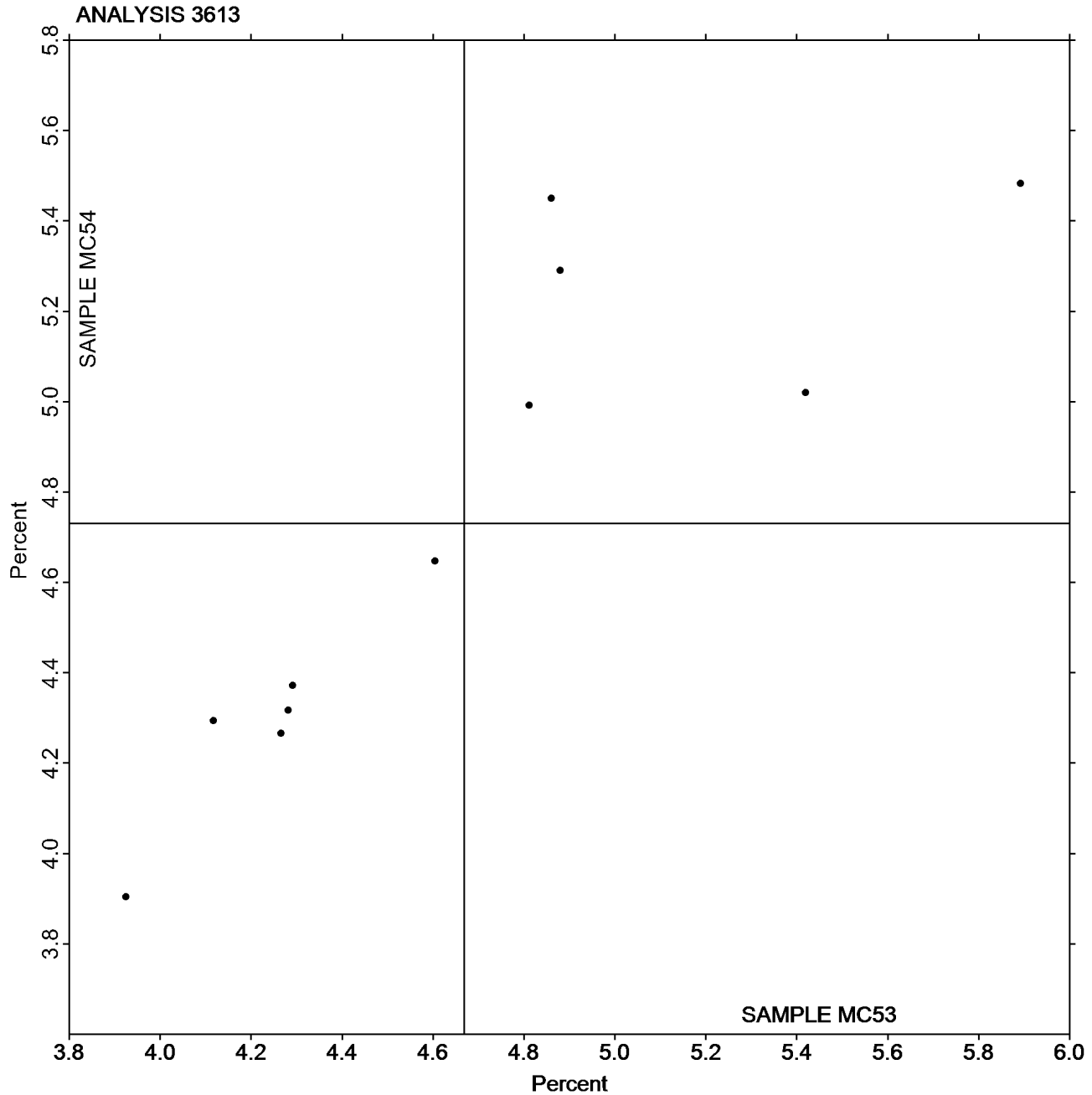
Report #4422,
June 2026

Analysis 3613 Moisture in Paper

TAPPI Official Test Method T412

Grand Mean Sample MC53 = 4.6682
Percent

Grand Mean Sample MC54 = 4.7303
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 3615
Sizing Test (Hercules Type)
TAPPI Official Test Method T530

Report #4422,
June 2026

WebCode	Data Flag	Sample HS53			Sample HS54			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
68YVTL		10.34	-13.07	-1.57	10.63	-12.32	-1.69	HE
6XAGX9		26.48	3.07	0.37	24.89	1.94	0.27	HE
9FHT3V	*	46.53	23.12	2.78	41.37	18.42	2.53	XX
AK9EM3		19.30	-4.11	-0.49	18.40	-4.55	-0.62	HE
AZPB3Y		21.16	-2.25	-0.27	18.22	-4.73	-0.65	HE
BKAKNW		17.09	-6.32	-0.76	17.48	-5.47	-0.75	HE
DKJBQX	X	217.65	194.24	23.39	148.30	125.35	17.20	XX
DLTTVH		20.80	-2.61	-0.31	22.80	-0.15	-0.02	HE
ECMVEY		21.08	-2.33	-0.28	20.37	-2.58	-0.35	HE
GFWRZQ	X	53.79	30.38	3.66	38.80	15.85	2.17	HE
H8ZCNR		19.11	-4.30	-0.52	18.88	-4.07	-0.56	HE
HZZX3Q		27.00	3.59	0.43	28.00	5.05	0.69	HE
KYUGHP		17.50	-5.91	-0.71	17.34	-5.61	-0.77	HE
LFYBPN		27.56	4.15	0.50	25.21	2.26	0.31	HE
MZYXJR		17.44	-5.97	-0.72	19.02	-3.93	-0.54	HE
NQU4BK		21.70	-1.71	-0.21	21.80	-1.15	-0.16	HE
PCLA23		21.00	-2.41	-0.29	22.20	-0.75	-0.10	HE
XKNWDD		20.58	-2.83	-0.34	20.07	-2.88	-0.39	HE
YJCANC		28.36	4.95	0.60	30.49	7.54	1.03	HE
ZBWXZD		38.35	14.94	1.80	35.89	12.94	1.78	HE
ZCRF2E	X	55.81	32.40	3.90	70.36	47.41	6.50	HE

Summary Statistics	Sample HS53	Sample HS54
Grand Means	23.41 Seconds	22.95 Seconds
Std Dev Btwn Labs	8.31 Seconds	7.29 Seconds
Statistics based on 18 of 21 reporting participants.		

Comments on Assigned Data Flags for Test #3615

DKJBQX (X) - Extreme Data.

GFWRZQ (X) - Data for sample HS53 are high. Inconsistent within the determinations of both samples.

ZCRF2E (X) - Data for both samples are high. Inconsistent within the determinations of both samples.

Key to Instrument Codes Reported by Participants

HE Hercules Sizing Tester

XX Instrument make/model not specified by lab



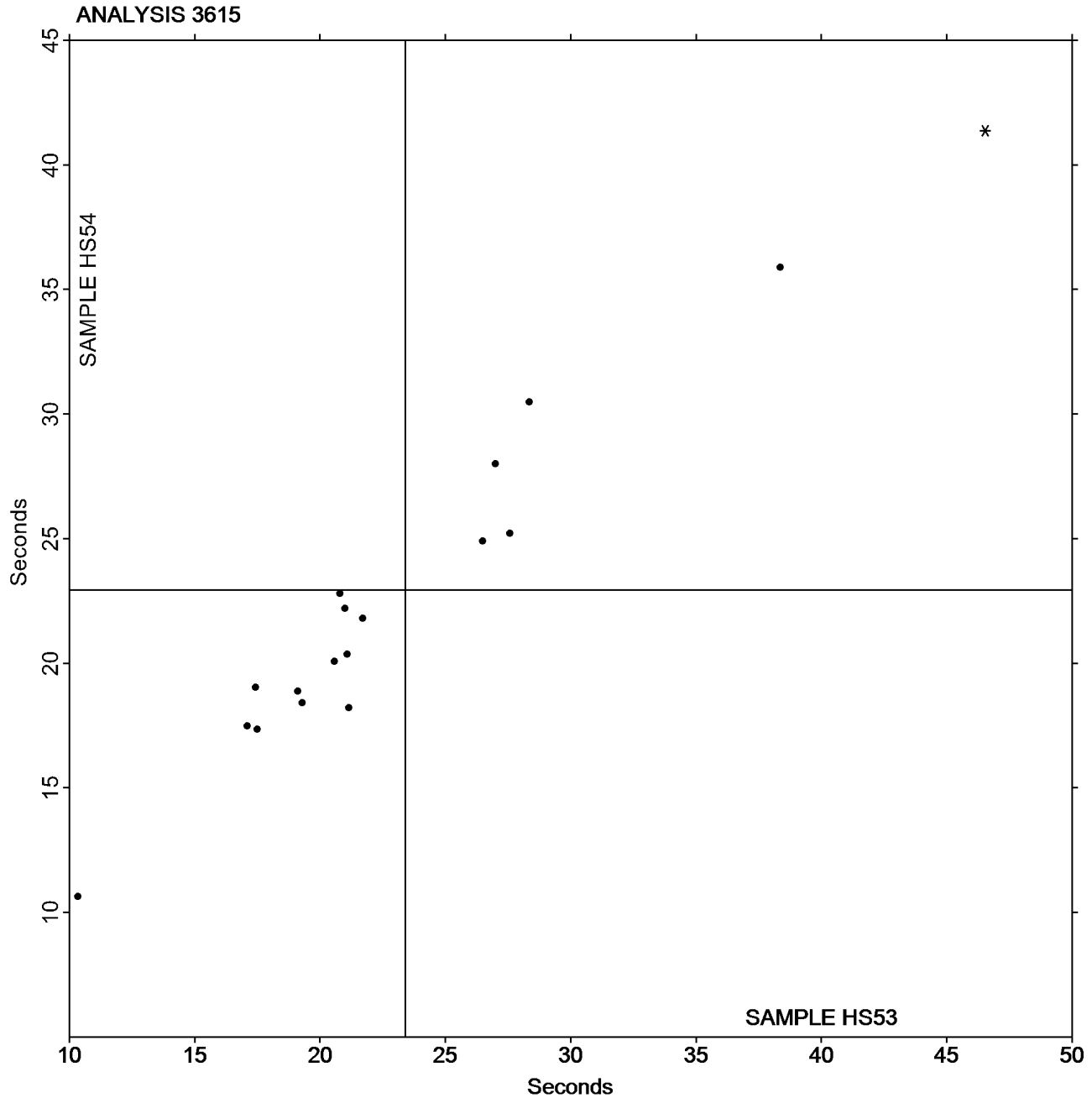
Paper & Paperboard Interlaboratory Testing Program

Report #4422,
June 2026

Analysis 3615 Sizing Test (Hercules Type) TAPPI Official Test Method T530

Grand Mean Sample HS53 = 23.410
Seconds

Grand Mean Sample HS54 = 22.948
Seconds



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

-End of Report-