



## Paper & Paperboard Testing Program

### Summary Report #3181 S - May 2022

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

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

<b><u>Analysis</u></b>	<b><u>Analysis Name</u></b>
305	Bursting Strength - Printing Papers
310	Bursting Strength - Packaging Papers
312	Tearing Strength - Printing Papers
314	Tearing Strength - Packaging Papers
325	Tensile Breaking Strength - Printing Papers
327	Tensile Energy Absorption - Printing Papers
328	Elongation to Break - Printing Papers
330	Tensile Breaking Strength - Packaging Papers
331	Tensile Energy Absorption - Packaging Papers
332	Elongation to Break - Packaging Papers
334	Folding Endurance (MIT) - Double Folds
336	Bending Resistance, Gurley Type
338	Bending Resistance, Taber Type - 0 to 10 Units
339	Bending Resistance, Taber Type - 10 to 100 Taber Units
340	Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard
343	Z-Direction Tensile
345	Z-Direction Tensile, Recycled Paperboard
348	Internal Bond Strength - Modified Scott Mechanics
349	Internal Bond Strength - Scott Bond Models

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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.

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

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

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

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

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### Common Problems Highlighted in Footnotes

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

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



**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 305**  
**Bursting Strength - Printing Papers**  
**TAPPI Official Test Method T403**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	<u>Sample SA05</u>			<u>Sample SA06</u>		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2XXPAF		39.78	-3.79	-1.24	40.34	-3.13	-1.01
3NLY29		42.30	-1.27	-0.42	42.70	-0.77	-0.25
7TPVJZ		45.34	1.77	0.58	45.27	1.80	0.58
92TXC3		44.75	1.17	0.39	43.54	0.07	0.02
BUMYWW	*	53.43	9.86	3.23	53.81	10.34	3.34
DDQJN3		41.48	-2.09	-0.69	40.70	-2.77	-0.89
F8TJLQ		44.34	0.77	0.25	43.74	0.27	0.09
FLQWGE		42.71	-0.86	-0.28	44.57	1.10	0.36
FWDUML		43.24	-0.33	-0.11	41.06	-2.41	-0.78
GGE47F		43.43	-0.14	-0.05	42.37	-1.10	-0.35
GZTLBT		50.88	7.31	2.40	50.09	6.62	2.14
K9TC9D		41.97	-1.60	-0.52	42.04	-1.43	-0.46
LLD8YW		42.68	-0.89	-0.29	42.83	-0.64	-0.21
LQP2XE		42.90	-0.67	-0.22	42.40	-1.07	-0.35
M4PHZL		43.30	-0.27	-0.09	41.70	-1.77	-0.57
MAEV7F		45.10	1.53	0.50	43.90	0.43	0.14
MUMVDV		45.66	2.09	0.68	44.90	1.44	0.46
MZP86L		38.66	-4.91	-1.61	38.94	-4.53	-1.46
N873PM		42.01	-1.57	-0.51	42.37	-1.10	-0.36
NP48AA		43.37	-0.20	-0.07	42.50	-0.97	-0.31
ULNQG8		43.29	-0.28	-0.09	43.45	-0.02	-0.01
V4G4A6		41.80	-1.77	-0.58	42.70	-0.77	-0.25
VUEM39		43.00	-0.57	-0.19	45.60	2.13	0.69
WV7Z37		44.70	1.13	0.37	46.50	3.03	0.98
YAD4V3		40.00	-3.57	-1.17	40.00	-3.47	-1.12
YNXNDB		42.70	-0.87	-0.29	42.20	-1.27	-0.41

<b>Summary Statistics</b>	<u>Sample SA05</u>	<u>Sample SA06</u>
<b>Grand Means</b>	43.57 psi	43.47 psi
<b>Stnd Dev Btwn Labs</b>	3.05 psi	3.10 psi
Statistics based on 26 of 26 reporting participants.		



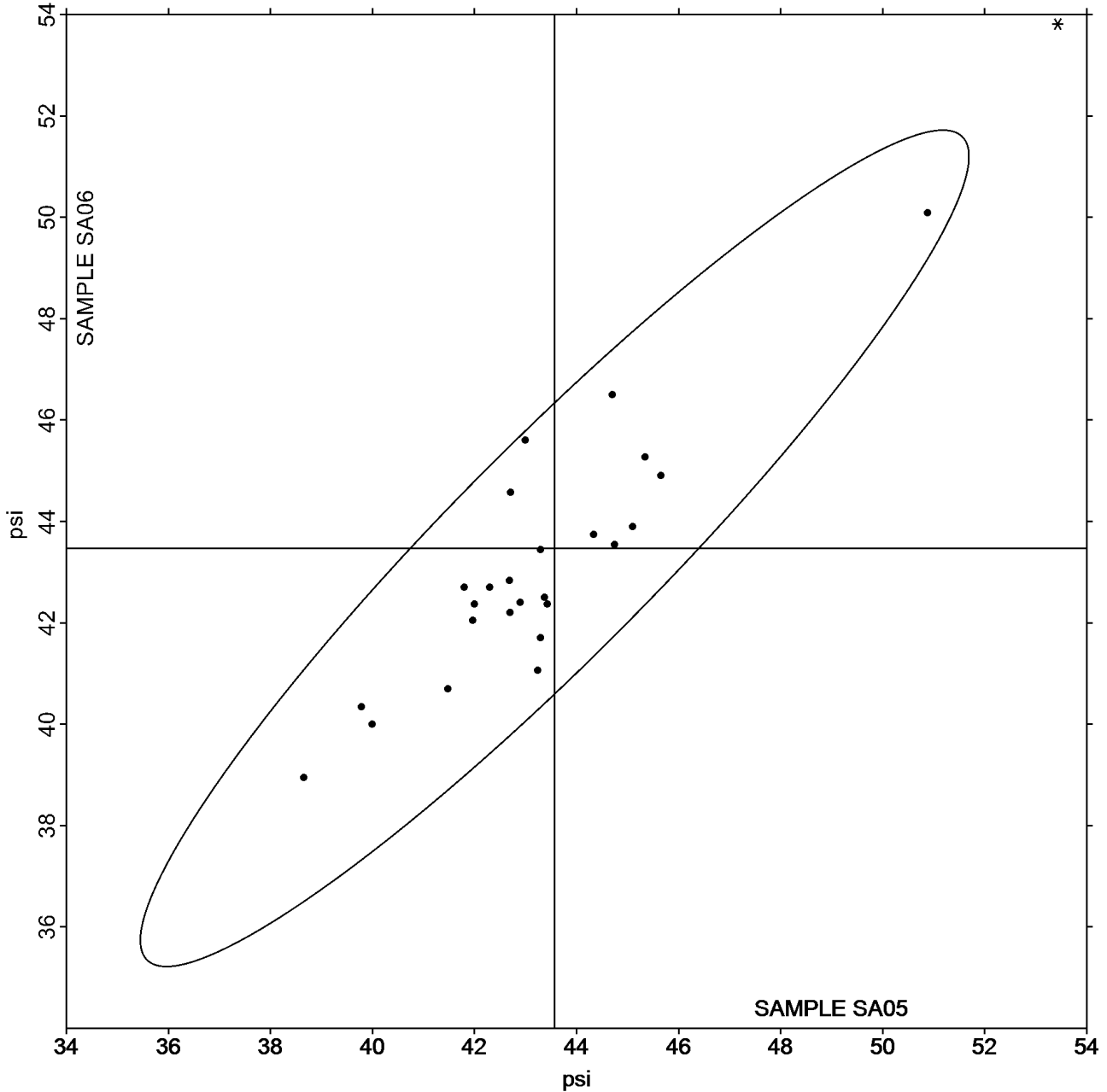
**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 305**  
**Bursting Strength - Printing Papers**  
**TAPPI Official Test Method T403**

**Report #3181S,**  
**May 2022**

**Grand Mean Sample SA05 = 43.570**  
psi

**Grand Mean Sample SA06 = 43.469**  
psi

ANALYSIS 305





**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 310**  
**Bursting Strength - Packaging Papers**  
**TAPPI Official Test Method T403**

Report #3181S,  
May 2022

WebCode	Data Flag	Sample SB05			Sample SB06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
4GXV9W		63.39	13.11	2.14	71.29	9.49	1.29
6FLGEV		50.62	0.34	0.06	61.24	-0.56	-0.08
6HNC36		46.06	-4.21	-0.69	60.55	-1.24	-0.17
9HVQ3B		48.01	-2.27	-0.37	57.17	-4.63	-0.63
ABCR4P	X	377.06	326.78	53.45	469.01	407.22	55.42
AEB3YP		56.15	5.87	0.96	70.89	9.10	1.24
AU36FT		54.90	4.62	0.76	73.40	11.61	1.58
CT66X9	*	60.00	9.72	1.59	65.01	3.21	0.44
DFGKUQ		44.91	-5.37	-0.88	56.12	-5.68	-0.77
ECRK7U		49.24	-1.04	-0.17	61.73	-0.06	-0.01
GTT4WG	*	34.30	-15.98	-2.61	38.35	-23.44	-3.19
HKC3XJ		53.38	3.10	0.51	63.71	1.92	0.26
JLMAUK		41.40	-8.88	-1.45	50.90	-10.89	-1.48
LM78UM		51.74	1.46	0.24	66.37	4.58	0.62
MUMVDV		50.97	0.69	0.11	63.34	1.55	0.21
PAAZPG		49.95	-0.33	-0.05	63.60	1.81	0.25
PPJ7KD		51.60	1.32	0.22	62.60	0.81	0.11
U3T9AQ		50.37	0.09	0.02	60.19	-1.60	-0.22
UCW82D		48.95	-1.33	-0.22	61.90	0.11	0.01
W99QK4		51.50	1.22	0.20	63.37	1.58	0.22
YAD4V3		43.80	-6.48	-1.06	57.20	-4.59	-0.62
YZ76M2		54.30	4.02	0.66	67.60	5.81	0.79
ZC2VPK		50.60	0.32	0.05	62.90	1.11	0.15

Summary Statistics	Sample SB05	Sample SB06
<b>Grand Means</b>	50.28 psi	61.79 psi
<b>Std Dev Btwn Labs</b>	6.11 psi	7.35 psi

Statistics based on 22 of 23 reporting participants.

**Comments on Assigned Data Flags for Test #310**

ABCR4P (X) - Extreme Data.



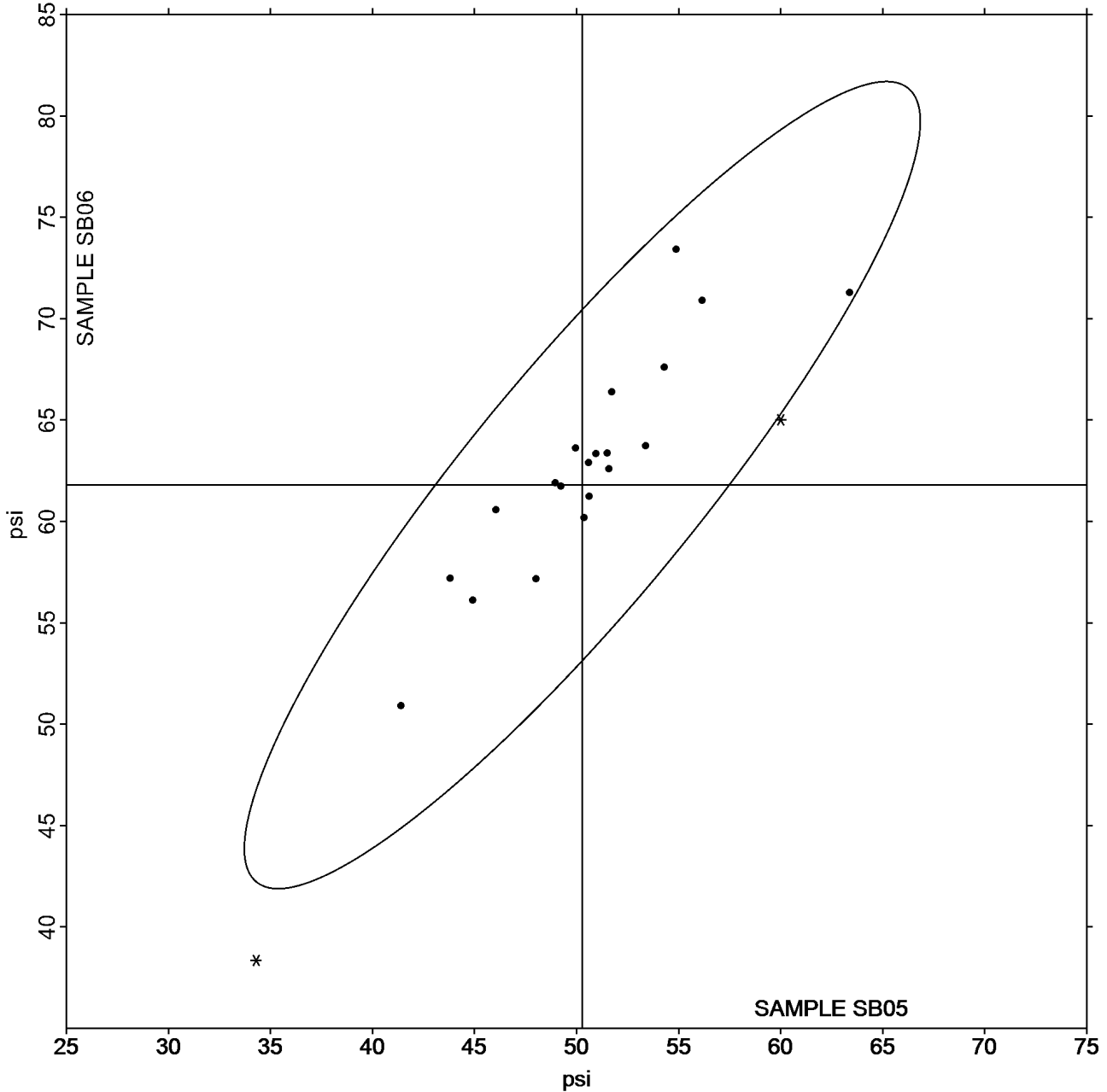
**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 310**  
**Bursting Strength - Packaging Papers**  
**TAPPI Official Test Method T403**

**Report #3181S,**  
**May 2022**

**Grand Mean Sample SB05 = 50.279**  
**psi**

**Grand Mean Sample SB06 = 61.792**  
**psi**

**ANALYSIS 310**







**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 312**  
**Tearing Strength - Printing Papers**  
**TAPPI Official Test Method T414**

Report #3181S,  
May 2022

WebCode	Data Flag	Sample SC05			Sample SC06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2MG33Z		65.00	2.04	0.56	61.80	-0.84	-0.22
2XXPAF		63.85	0.89	0.25	65.97	3.32	0.85
6FLGEV		63.61	0.65	0.18	63.79	1.15	0.30
6GVEUY		58.91	-4.05	-1.12	56.70	-5.94	-1.53
6HNC36	*	72.68	9.72	2.69	72.29	9.65	2.48
7T4JJ7		65.29	2.33	0.64	63.81	1.17	0.30
7TPVJZ		57.94	-5.02	-1.39	57.10	-5.54	-1.42
83QYMZ		61.99	-0.97	-0.27	58.79	-3.85	-0.99
98YR9J		58.40	-4.56	-1.26	57.16	-5.48	-1.41
CT66X9		62.68	-0.28	-0.08	62.73	0.08	0.02
DDQJN3		70.04	7.08	1.96	69.49	6.85	1.76
DUB8YX		71.11	8.15	2.26	71.15	8.51	2.19
EV3RZM		60.80	-2.16	-0.60	60.40	-2.24	-0.58
FLQWGE		62.70	-0.26	-0.07	62.20	-0.44	-0.11
FUMPVZ		61.15	-1.81	-0.50	60.46	-2.18	-0.56
FWDUML		66.14	3.18	0.88	65.26	2.62	0.67
G7H6CN		63.52	0.56	0.15	62.37	-0.27	-0.07
GZTLBT		57.98	-4.99	-1.38	57.68	-4.97	-1.28
H3V22W		57.38	-5.58	-1.54	57.82	-4.82	-1.24
HJFPBQ		66.47	3.51	0.97	65.12	2.48	0.64
HTQRWR		61.54	-1.42	-0.39	60.93	-1.71	-0.44
JB4T7K		62.84	-0.12	-0.03	63.80	1.16	0.30
JPZ84T		61.54	-1.42	-0.39	61.78	-0.86	-0.22
K9TC9D		59.16	-3.80	-1.05	58.48	-4.16	-1.07
LLD8YW		63.78	0.82	0.23	65.85	3.21	0.82
LM78UM		60.30	-2.66	-0.74	60.41	-2.23	-0.57
M4PHZL		67.50	4.54	1.26	67.60	4.96	1.27
MAEV7F		62.40	-0.56	-0.16	63.00	0.36	0.09
ME8ZVD		59.66	-3.30	-0.91	59.44	-3.20	-0.82
MUMVDV		62.42	-0.54	-0.15	64.17	1.53	0.39
MUMXZE		59.54	-3.42	-0.95	57.95	-4.69	-1.21
MZP86L		64.82	1.86	0.51	67.30	4.66	1.20
N873PM		61.39	-1.57	-0.43	62.64	-0.01	0.00
NP48AA		63.36	0.40	0.11	63.00	0.36	0.09
NZP9QJ		66.57	3.61	1.00	66.78	4.14	1.06
PAAZPG		61.51	-1.45	-0.40	61.37	-1.27	-0.33
T7FCKJ		64.64	1.68	0.46	63.74	1.10	0.28
U3T9AQ		63.12	0.16	0.04	62.55	-0.09	-0.02
UCW82D		57.20	-5.76	-1.59	56.30	-6.34	-1.63
ULNQG8		63.24	0.28	0.08	62.46	-0.18	-0.05



**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 312**  
**Tearing Strength - Printing Papers**  
**TAPPI Official Test Method T414**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	<u>Sample SC05</u>			<u>Sample SC06</u>		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
VKP3CG	<b>X</b>	8.10	-54.86	-15.18	8.10	-54.54	-14.01
VUEM39		65.40	2.44	0.68	65.80	3.16	0.81
W99QK4		64.66	1.70	0.47	63.41	0.76	0.20
WV7Z37		65.37	2.41	0.67	65.93	3.29	0.84
YRV32Z		56.42	-6.54	-1.81	55.92	-6.72	-1.73
ZC2VPK		67.20	4.24	1.17	66.20	3.56	0.91

<b>Summary Statistics</b>	<u>Sample SC05</u>	<u>Sample SC06</u>
<b>Grand Means</b>	62.96 Grams	62.64 Grams
<b>Std Dev Btwn Labs</b>	3.61 Grams	3.89 Grams
Statistics based on 45 of 46 reporting participants.		

**Comments on Assigned Data Flags for Test #312**

VKP3CG (X) - Extreme Data.



# Paper & Paperboard Interlaboratory Testing Program

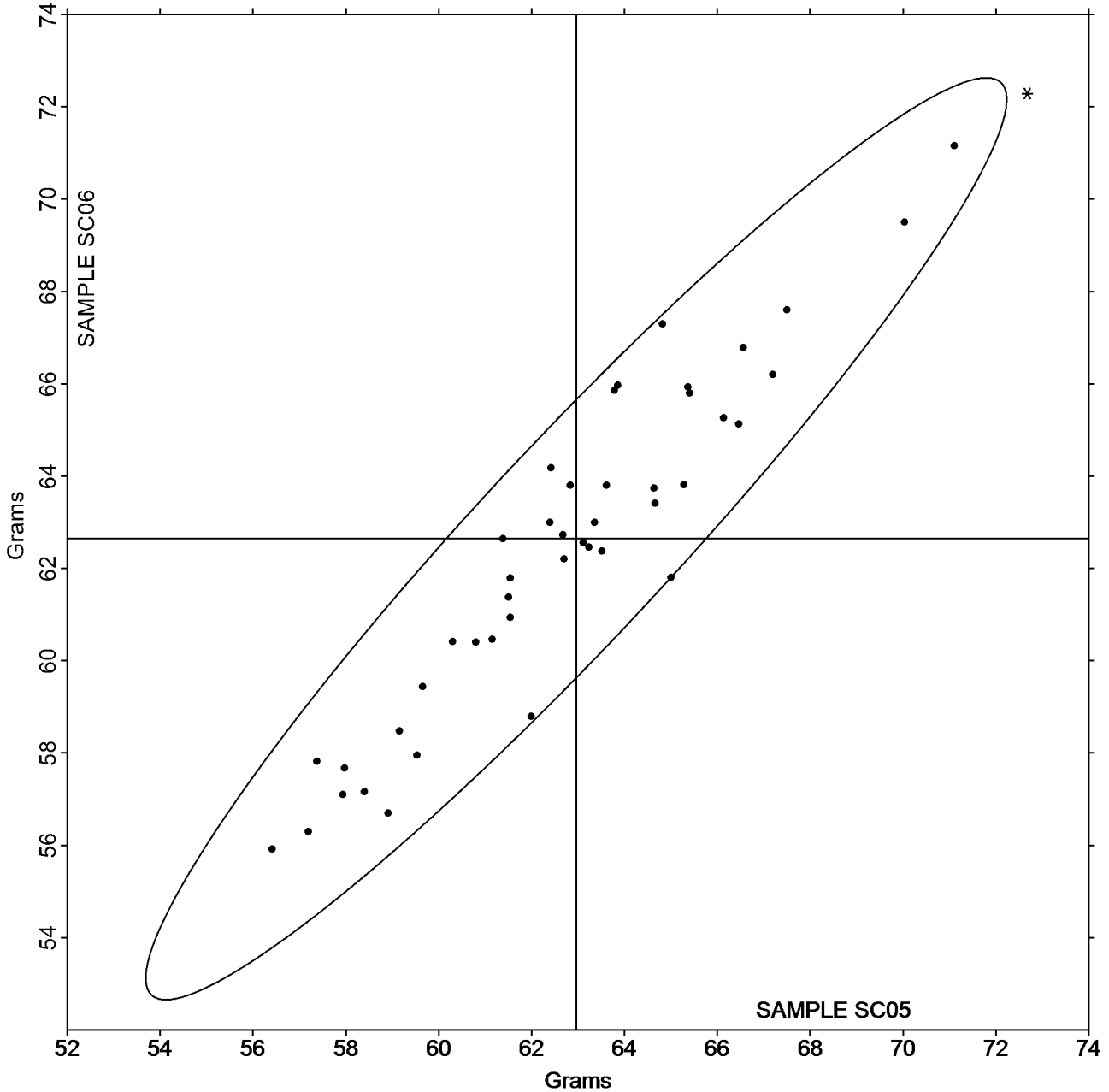
Report #3181S,  
May 2022

## Analysis 312 Tearing Strength - Printing Papers TAPPI Official Test Method T414

Grand Mean Sample SC05 = 62.960  
Grams

Grand Mean Sample SC06 = 62.642  
Grams

ANALYSIS 312





**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 314**  
**Tearing Strength - Packaging Papers**  
**TAPPI Official Test Method T414**

Report #3181S,  
May 2022

WebCode	Data Flag	Sample SD05			Sample SD06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3NLY29		185.7	8.5	0.88	190.8	13.5	1.20
4FQGZ7	X	198.0	20.9	2.15	182.2	4.9	0.43
4WCXAU		198.8	21.7	2.24	196.4	19.0	1.69
6GTQBY		189.7	12.5	1.29	184.2	6.9	0.61
7H8FEC		165.6	-11.6	-1.19	158.2	-19.1	-1.69
92TXC3		172.5	-4.7	-0.48	176.8	-0.5	-0.05
9HVQ3B		171.6	-5.6	-0.57	172.0	-5.3	-0.47
9V8WFX		181.0	3.8	0.40	187.2	9.9	0.88
AEB3YP	X	84.0	-93.1	-9.60	82.5	-94.9	-8.41
DFGKUQ		176.1	-1.0	-0.11	175.4	-1.9	-0.17
DL4AEZ		173.2	-3.9	-0.40	174.5	-2.8	-0.25
EHGD2U		186.8	9.7	1.00	188.8	11.4	1.01
F8TJLQ		177.2	0.1	0.01	177.9	0.6	0.05
F9QV3R	*	153.3	-23.8	-2.46	156.5	-20.8	-1.85
GGE47F		171.1	-6.0	-0.62	168.2	-9.1	-0.80
H3REKH		169.0	-8.2	-0.84	169.3	-8.0	-0.71
HKC3XJ		166.7	-10.4	-1.08	164.8	-12.6	-1.11
J4JUDQ		168.9	-8.2	-0.85	177.1	-0.2	-0.02
JB26MK		177.8	0.7	0.07	170.3	-7.0	-0.62
JLMAUK		193.7	16.5	1.70	196.1	18.8	1.66
K9VZPQ		173.5	-3.6	-0.37	176.7	-0.6	-0.06
LLD9MF		171.1	-6.1	-0.63	169.8	-7.5	-0.67
MAEV7F		174.7	-2.5	-0.25	168.4	-8.9	-0.79
MUMVDV		177.9	0.7	0.08	173.9	-3.4	-0.30
PPJ7KD		186.0	8.8	0.91	194.4	17.1	1.51
Q4H82K		176.4	-0.8	-0.08	167.2	-10.1	-0.90
U3T9AQ		183.1	5.9	0.61	182.3	5.0	0.44
W72H9Y		176.6	-0.5	-0.05	173.8	-3.5	-0.31
W99QK4		173.9	-3.2	-0.33	173.1	-4.2	-0.37
WVHUUH		173.7	-3.5	-0.36	172.8	-4.5	-0.40
WHUWC2		178.6	1.4	0.14	177.7	0.4	0.03
YAD4V3		164.4	-12.8	-1.32	161.2	-16.1	-1.43
YNXNDB		168.9	-8.3	-0.85	171.2	-6.1	-0.54
YZ76M2		183.5	6.3	0.65	189.1	11.8	1.04
ZC2VPK		183.2	6.0	0.62	191.2	13.9	1.23
ZFYGAV		198.8	21.6	2.23	201.6	24.3	2.15



# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 314

### Tearing Strength - Packaging Papers

#### TAPPI Official Test Method T414

Summary Statistics	Sample SD05	Sample SD06
Grand Means	177.15 Grams	177.31 Grams
Stnd Dev Btwn Labs	9.70 Grams	11.28 Grams

Statistics based on 34 of 36 reporting participants.

#### Comments on Assigned Data Flags for Test #314

AEB3YP (X) - Extreme Data.

4FQGZ7 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SD05.

#### Analysis Notes:

9V8WFX - Data appear to be reported as gf, not mN as indicated on data entry form. CTS will not correct the Units going forward.



# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

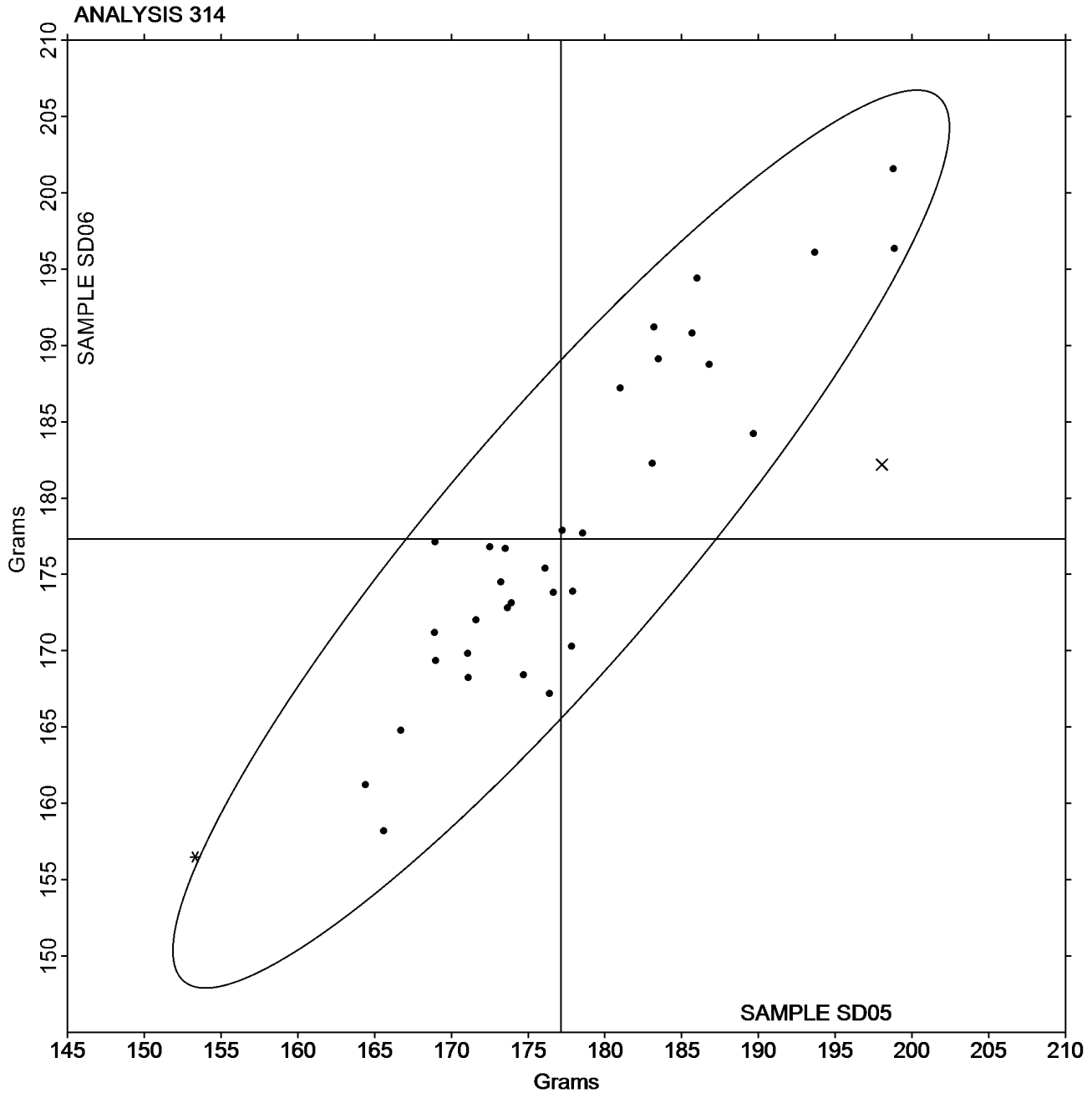
## Analysis 314

### Tearing Strength - Packaging Papers

#### TAPPI Official Test Method T414

Grand Mean Sample SD05 = 177.15  
Grams

Grand Mean Sample SD06 = 177.31  
Grams





**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 325**  
**Tensile Breaking Strength - Printing Papers**  
**TAPPI Official Test Method T494**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	Sample SF05			Sample SF06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2MG33Z		7.563	0.730	1.50	7.577	0.704	1.56	LB
2XXPAF		6.874	0.041	0.08	6.954	0.082	0.18	LI
4GXV9W		7.243	0.410	0.84	7.097	0.225	0.50	IK
6FLGEV		6.682	-0.151	-0.31	6.594	-0.278	-0.62	LI
6GVEUY		7.240	0.406	0.83	7.142	0.269	0.60	VM
7H8FEC		7.230	0.397	0.81	7.108	0.235	0.52	TO
7T4JJ7		7.690	0.857	1.76	7.658	0.786	1.75	TP
7TPVJZ		7.361	0.527	1.08	7.660	0.788	1.75	TJ
83QYMZ		6.803	-0.030	-0.06	7.266	0.394	0.88	FP
9NMZ93		7.360	0.527	1.08	7.482	0.610	1.35	TV
DDQJN3		6.817	-0.017	-0.03	7.065	0.193	0.43	LX
DUB8YX		6.858	0.025	0.05	6.991	0.119	0.26	LB
EHGD2U		6.894	0.061	0.13	6.712	-0.160	-0.36	LI
EV3RZM		6.891	0.058	0.12	6.937	0.064	0.14	TC
FLQWGE		7.301	0.468	0.96	6.960	0.087	0.19	TJ
FUMPVZ		7.236	0.403	0.83	6.916	0.044	0.10	LI
FWDUML		6.905	0.072	0.15	6.768	-0.104	-0.23	LX
G7H6CN	X	1.264	-5.569	-11.42	1.217	-5.655	-12.56	TO
GZTLBT	*	5.619	-1.214	-2.49	5.645	-1.227	-2.73	TR
H3V22W		6.096	-0.737	-1.51	6.353	-0.519	-1.15	TF
H6HD3M		6.205	-0.628	-1.29	6.438	-0.435	-0.97	ID
HJFPBQ	*	5.706	-1.127	-2.31	5.559	-1.313	-2.92	IM
HTQRWR		6.690	-0.143	-0.29	7.052	0.180	0.40	LJ
JB4T7K		6.412	-0.421	-0.86	6.593	-0.279	-0.62	LE
JPZ84T		6.290	-0.543	-1.11	6.277	-0.595	-1.32	LB
K9TC9D		6.879	0.046	0.09	6.729	-0.144	-0.32	TB
LLD8YW		6.793	-0.040	-0.08	6.788	-0.084	-0.19	LF
LM78UM		6.310	-0.523	-1.07	6.450	-0.422	-0.94	LH
M4PHZL		7.122	0.289	0.59	7.169	0.297	0.66	TO
ME8ZVD		6.443	-0.390	-0.80	6.544	-0.328	-0.73	TO
MUMVDV		6.728	-0.105	-0.22	6.966	0.093	0.21	LH
MUMXZE		7.397	0.564	1.16	7.261	0.388	0.86	LI
MZP86L		8.036	1.203	2.47	7.855	0.982	2.18	VM
N873PM		6.654	-0.180	-0.37	6.598	-0.274	-0.61	LB
NC3NGP		6.534	-0.299	-0.61	6.410	-0.462	-1.03	ID
NP48AA		6.799	-0.034	-0.07	6.904	0.031	0.07	LX
NZP9QJ		6.749	-0.084	-0.17	6.763	-0.109	-0.24	TO
PAAZPG		6.933	0.099	0.20	7.032	0.160	0.35	TF
PKP6KJ		7.805	0.972	1.99	7.459	0.587	1.30	LC
PPJ7KD		6.700	-0.133	-0.27	6.709	-0.163	-0.36	IM



**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 325**  
**Tensile Breaking Strength - Printing Papers**  
**TAPPI Official Test Method T494**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	Sample SF05			Sample SF06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
RTBW29		6.916	0.082	0.17	6.892	0.019	0.04	TV
T7FCKJ	*	6.238	-0.595	-1.22	6.870	-0.003	-0.01	XX
ULNQG8		6.569	-0.265	-0.54	6.583	-0.289	-0.64	TF
V4G4A6		6.904	0.071	0.15	6.748	-0.124	-0.28	IN
VKP3CG		7.167	0.334	0.68	7.369	0.497	1.10	LA
VP24GK		6.788	-0.045	-0.09	6.957	0.085	0.19	FP
VUEM39		6.629	-0.204	-0.42	6.761	-0.111	-0.25	TO
WV7Z37		6.565	-0.268	-0.55	6.759	-0.114	-0.25	LH
YRV32Z		6.372	-0.461	-0.95	6.496	-0.376	-0.84	TB

Summary Statistics	Sample SF05	Sample SF06
<b>Grand Means</b>	6.83 kN/m	6.87 kN/m
<b>Std Dev Btw Labs</b>	0.49 kN/m	0.45 kN/m
Statistics based on 48 of 49 reporting participants.		

**Comments on Assigned Data Flags for Test #325**

G7H6CN (X) - Extreme Data.

**Analysis Notes:**

83QYMZ - One determination removed from the Lab Mean of Sample SF05 per Grubb's Test at 1% risk (TAPPI 1205).

**Key to Instrument Codes Reported by Participants**

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IK	Instron 4400 Series	IM	Instron 5500 Series
IN	Instron 3340 series	LA	L & W Tensile - Autoline 300
LB	L & W Tensile - Autoline 400	LC	L & W Tensile - Autoline 600
LE	L & W Tensile Tester 066	LF	L & W Tensile/Fracture Toughness Tester SE 064
LH	L & W Alwetron TH1 (Horizontal) SE 060/065F	LI	L & W Tensile Tester SE 062
LJ	L & W Tensile Tester SE 063	LX	L & W (model not specified)
TB	Thwing-Albert EJA/1000	TC	Thwing-Albert Electro-Hydraulic, Model 30LT
TF	Thwing-Albert EJA Vantage-1	TJ	Thwing-Albert QC II-XS
TO	Thwing-Albert QC-1000	TP	TMI Monitor/Tensile 100 (84-21-01)
TR	Testometric 220D	TV	Thwing-Albert Vantage NX
VM	Valmet PaperLab (was Kajaani/Robotest)	XX	Instrument make/model not specified by lab





# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

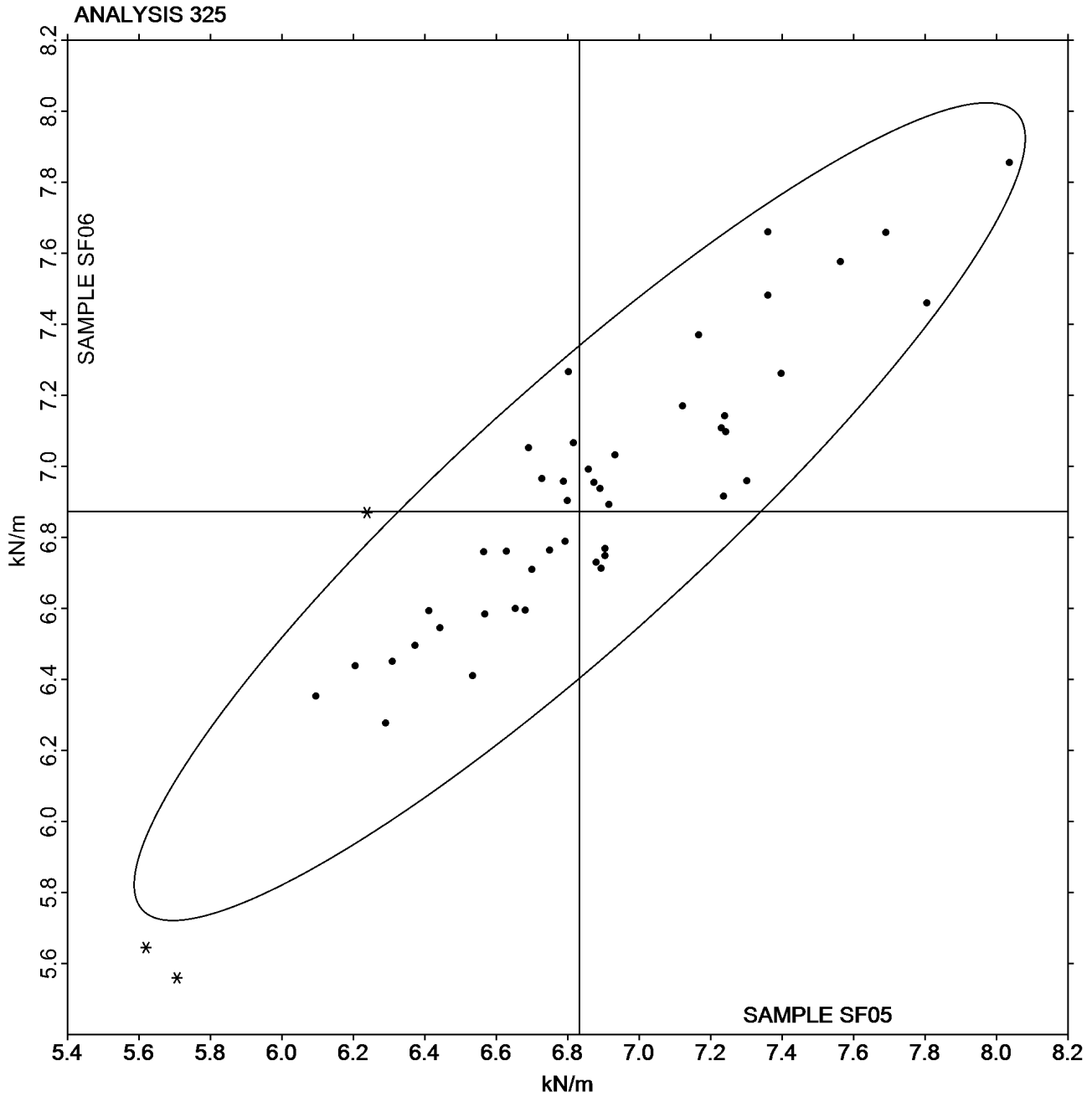
## Analysis 325

### Tensile Breaking Strength - Printing Papers

#### TAPPI Official Test Method T494

Grand Mean Sample SF05 = 6.8333  
kN/m

Grand Mean Sample SF06 = 6.8724  
kN/m





# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 327

### Tensile Energy Absorption - Printing Papers

#### TAPPI Official Test Method T494

WebCode	Data Flag	Sample SF05			Sample SF06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2MG33Z		96.23	1.96	0.15	100.69	5.71	0.48	LB
2XXPAF		98.94	4.67	0.37	99.23	4.25	0.36	LI
4GXV9W		88.86	-5.41	-0.43	87.00	-7.98	-0.67	XX
6FLGEV		90.62	-3.65	-0.29	88.12	-6.86	-0.58	LI
7H8FEC		103.22	8.96	0.71	101.84	6.86	0.58	TO
9NMZ93		98.82	4.55	0.36	103.46	8.48	0.71	TV
DDQJN3		94.80	0.53	0.04	101.54	6.57	0.55	LX
DUB8YX		71.47	-22.80	-1.80	72.65	-22.33	-1.87	LB
EHGD2U		92.79	-1.48	-0.12	87.26	-7.72	-0.65	LI
FLQWGE	*	123.03	28.76	2.27	112.08	17.11	1.44	TX
FUMPVZ		90.50	-3.77	-0.30	83.58	-11.39	-0.96	LI
FWDUML		96.84	2.57	0.20	94.81	-0.17	-0.01	LX
G7H6CN	X	569.60	475.33	37.44	548.00	453.02	38.02	TO
H6HD3M		96.02	1.76	0.14	102.94	7.96	0.67	ID
HJFPBQ		75.12	-19.15	-1.51	70.49	-24.49	-2.06	IM
HTQRWR		83.47	-10.80	-0.85	93.81	-1.17	-0.10	LJ
JPZ84T		105.21	10.95	0.86	101.68	6.70	0.56	LB
K9TC9D		100.87	6.61	0.52	98.95	3.97	0.33	TB
LLD8YW		99.57	5.30	0.42	99.45	4.47	0.38	LF
LM78UM		83.72	-10.55	-0.83	93.23	-1.75	-0.15	LH
M4PHZL		81.98	-12.28	-0.97	84.85	-10.13	-0.85	XX
ME8ZVD		91.07	-3.20	-0.25	92.53	-2.45	-0.21	TO
MUMVDV		96.11	1.84	0.14	95.40	0.42	0.04	LH
MUMXZE		76.47	-17.79	-1.40	74.60	-20.37	-1.71	LX
MZP86L		121.60	27.33	2.15	122.64	27.66	2.32	VM
N873PM		66.85	-27.41	-2.16	65.54	-29.43	-2.47	LB
NC3NGP		97.13	2.86	0.23	96.17	1.20	0.10	ID
NP48AA		94.90	0.64	0.05	93.31	-1.66	-0.14	LX
NZP9QJ		114.27	20.00	1.58	114.85	19.88	1.67	TO
PAAZPG		90.31	-3.96	-0.31	90.25	-4.73	-0.40	TF
PKP6KJ		97.39	3.12	0.25	96.22	1.24	0.10	LC
RTBW29		111.21	16.94	1.33	108.25	13.27	1.11	TV
T7FCKJ	*	71.25	-23.02	-1.81	84.99	-9.98	-0.84	XX
ULNQG8		102.31	8.04	0.63	104.17	9.19	0.77	TF
V4G4A6		104.75	10.48	0.83	96.59	1.61	0.14	IN
VKP3CG		92.96	-1.31	-0.10	98.66	3.68	0.31	LA
VP24GK		106.11	11.84	0.93	110.52	15.54	1.30	FP
VUEM39		88.34	-5.92	-0.47	92.93	-2.05	-0.17	TO
WV7Z37		87.04	-7.23	-0.57	93.84	-1.14	-0.10	LH



# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 327

### Tensile Energy Absorption - Printing Papers

#### TAPPI Official Test Method T494

Summary Statistics	Sample SF05	Sample SF06
<b>Grand Means</b>	94.27 Joules/sq m	94.98 Joules/sq m
<b>Stnd Dev Btwn Labs</b>	12.70 Joules/sq m	11.92 Joules/sq m
Statistics based on 38 of 39 reporting participants.		

#### Comments on Assigned Data Flags for Test #327

G7H6CN (X) - Extreme Data.

#### Analysis Notes:

H6HD3M - Data appear to be reported as inch-lb/sq inch, not ft-lb/sq ft as indicated on data entry form. CTS will not correct the Units going forward.

#### Key to Instrument Codes Reported by Participants

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IM	Instron 5500 Series	IN	Instron 3340 series
LA	L & W Tensile - Autoline 300	LB	L & W Tensile - Autoline 400
LC	L & W Tensile - Autoline 600	LF	L & W Tensile/Fracture Toughness Tester SE 064
LH	L & W Alwetron TH1 (Horizontal) SE 060/065F	LI	L & W Tensile Tester SE 062
LJ	L & W Tensile Tester SE 063	LX	L & W (model not specified)
TB	Thwing-Albert EJA/1000	TF	Thwing-Albert EJA Vantage-1
TO	Thwing-Albert QC-1000	TV	Thwing-Albert Vantage NX
TX	Thwing-Albert (model not specified)	VM	Valmet PaperLab (was Kajaani/Robotest)
XX	Instrument make/model not specified by lab		



# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 327

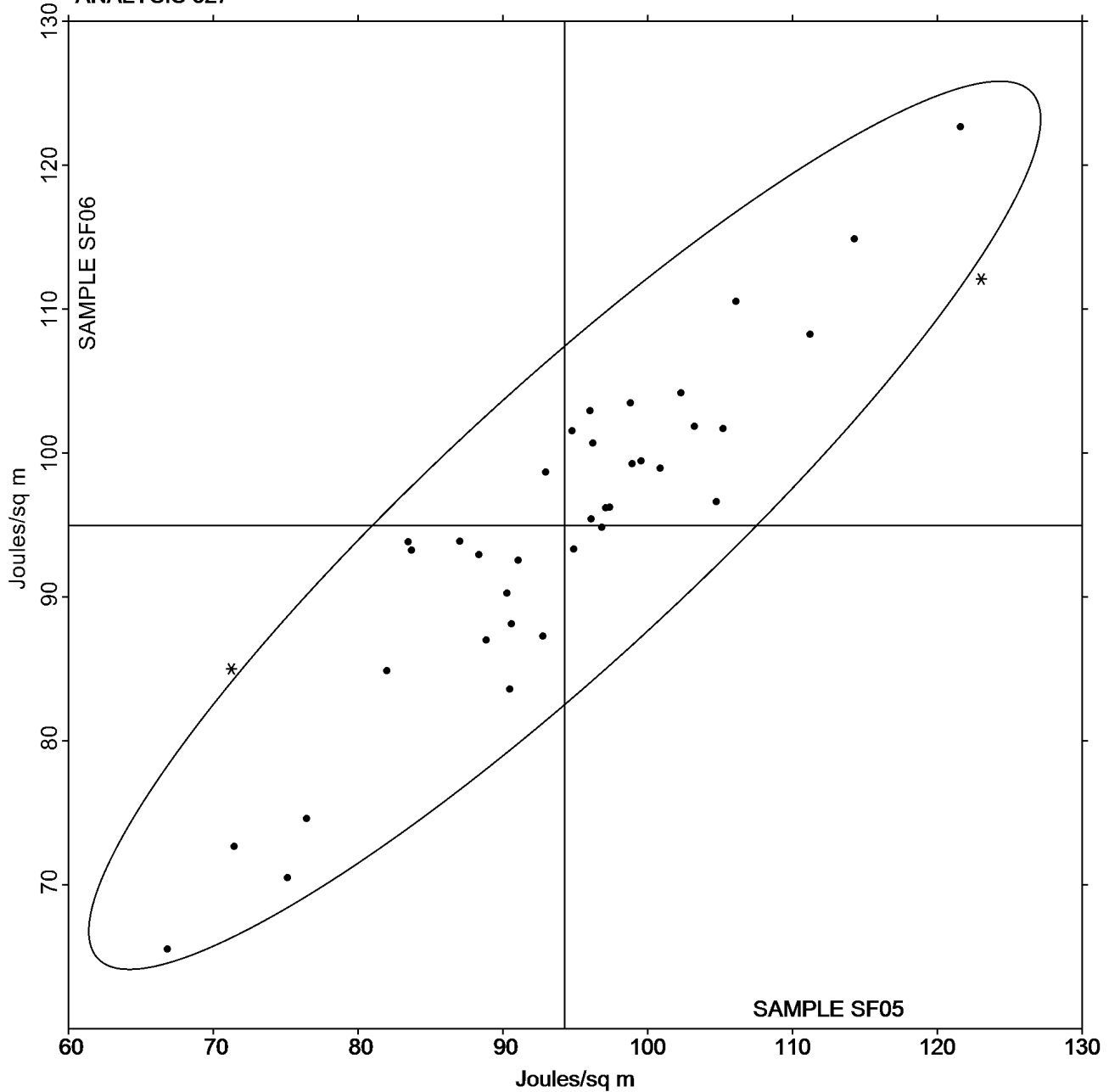
Tensile Energy Absorption - Printing Papers

TAPPI Official Test Method T494

Grand Mean Sample SF05 = 94.266  
Joules/sq m

Grand Mean Sample SF06 = 94.976  
Joules/sq m

ANALYSIS 327





**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 328**  
**Elongation to Break - Printing Papers**  
**TAPPI Official Test Method T494**

Report #3181S,  
May 2022

WebCode	Data Flag	Sample SF05			Sample SF06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2MG33Z		1.901	-0.262	-0.94	1.981	-0.191	-0.71	LB
2XXPAF		2.035	-0.128	-0.46	2.022	-0.150	-0.56	LI
4GXV9W		1.961	-0.203	-0.72	1.904	-0.267	-1.00	IK
6FLGEV		2.068	-0.095	-0.34	2.035	-0.137	-0.51	LI
6GVEUY		1.930	-0.233	-0.83	1.980	-0.192	-0.72	VM
7H8FEC		2.367	0.204	0.73	2.417	0.245	0.92	TO
9NMZ93		2.093	-0.070	-0.25	2.154	-0.018	-0.07	TV
DDQJN3		2.100	-0.063	-0.23	2.202	0.030	0.11	LX
DUB8YX		1.968	-0.195	-0.70	1.980	-0.192	-0.72	LB
EHGD2U		2.095	-0.068	-0.24	2.020	-0.152	-0.57	LI
FLQWGE	*	2.710	0.547	1.95	2.550	0.378	1.41	TJ
FUMPVZ		1.937	-0.226	-0.81	1.854	-0.318	-1.19	LI
FWDUML		2.139	-0.024	-0.09	2.120	-0.052	-0.19	LX
G7H6CN		2.387	0.224	0.80	2.399	0.227	0.85	TO
H3V22W		2.006	-0.157	-0.56	2.154	-0.018	-0.07	TF
H6HD3M		2.364	0.201	0.72	2.450	0.279	1.04	ID
HJFPBQ		2.142	-0.021	-0.08	2.064	-0.107	-0.40	IM
HTQRWR		1.911	-0.252	-0.90	2.032	-0.140	-0.52	LJ
JPZ84T		2.043	-0.120	-0.43	1.989	-0.183	-0.68	LB
K9TC9D		2.296	0.133	0.47	2.309	0.137	0.51	TB
LLD8YW		2.243	0.080	0.28	2.190	0.018	0.07	LF
LM78UM		2.070	-0.093	-0.33	2.230	0.058	0.22	LH
M4PHZL	*	2.769	0.606	2.16	2.851	0.679	2.54	TO
ME8ZVD		2.308	0.145	0.52	2.267	0.095	0.36	TO
MUMVDV		2.224	0.061	0.22	2.178	0.006	0.02	LH
MUMXZE		1.640	-0.523	-1.87	1.632	-0.540	-2.01	LI
MZP86L		1.912	-0.251	-0.90	1.986	-0.186	-0.69	VM
N873PM		1.811	-0.352	-1.26	1.787	-0.385	-1.44	LB
NC3NGP		2.264	0.101	0.36	2.282	0.110	0.41	ID
NP48AA		2.118	-0.045	-0.16	2.049	-0.123	-0.46	LX
NZP9QJ	*	2.959	0.796	2.84	2.895	0.723	2.70	TO
PAAZPG		1.992	-0.171	-0.61	1.970	-0.202	-0.75	TF
PKP6KJ		1.908	-0.255	-0.91	2.007	-0.165	-0.61	LC
PPJ7KD	X	1.020	-1.143	-4.08	1.000	-1.172	-4.37	IM
RTBW29		2.670	0.506	1.81	2.607	0.435	1.63	TV
T7FCKJ		2.073	-0.090	-0.32	2.096	-0.076	-0.28	XX
ULNQG8		2.531	0.367	1.31	2.539	0.367	1.37	TF
V4G4A6		2.540	0.377	1.34	2.411	0.239	0.89	IN
VKP3CG		1.826	-0.337	-1.20	1.889	-0.283	-1.06	LA
VP24GK		2.430	0.267	0.95	2.493	0.321	1.20	FP



**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 328**  
**Elongation to Break - Printing Papers**  
**TAPPI Official Test Method T494**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	<u>Sample SF05</u>			<u>Sample SF06</u>			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
VUEM39		2.041	-0.122	-0.44	2.122	-0.050	-0.18	TO
WV7Z37		2.026	-0.137	-0.49	2.112	-0.060	-0.22	LH
YRV32Z		2.058	-0.105	-0.38	1.995	-0.177	-0.66	TF

<b>Summary Statistics</b>	<u>Sample SF05</u>	<u>Sample SF06</u>
<b>Grand Means</b>	2.16 Percent	2.17 Percent
<b>Std Dev Btwn Labs</b>	0.28 Percent	0.27 Percent

Statistics based on 42 of 43 reporting participants.

**Comments on Assigned Data Flags for Test #328**

PPJ7KD (X) - Data for both samples are low. Possible Systematic Error.

**Key to Instrument Codes Reported by Participants**

FP	Frank PTI Universal Tester TS	ID	Instron 4200 Series
IK	Instron 4400 Series	IM	Instron 5500 Series
IN	Instron 3340 Series	LA	L & W Tensile - Autoline 300
LB	L & W Tensile - Autoline 400	LC	L & W Tensile - Autoline 600
LF	L & W Tensile/Fracture Toughness Tester SE 064	LH	L & W Alwetron TH1 (Horizontal) SE 060/065F
LI	L & W Tensile Tester SE 062	LJ	L & W Tensile Tester SE 063
LX	L & W (model not specified)	TB	Thwing-Albert EJA/1000
TF	Thwing-Albert EJA Vantage-1	TJ	Thwing-Albert QC II-XS
TO	Thwing-Albert QC-1000	TV	Thwing-Albert Vantage NX
VM	Valmet PaperLab (was Kajaani/Robotest)	XX	Instrument make/model not specified by lab



# Paper & Paperboard Interlaboratory Testing Program

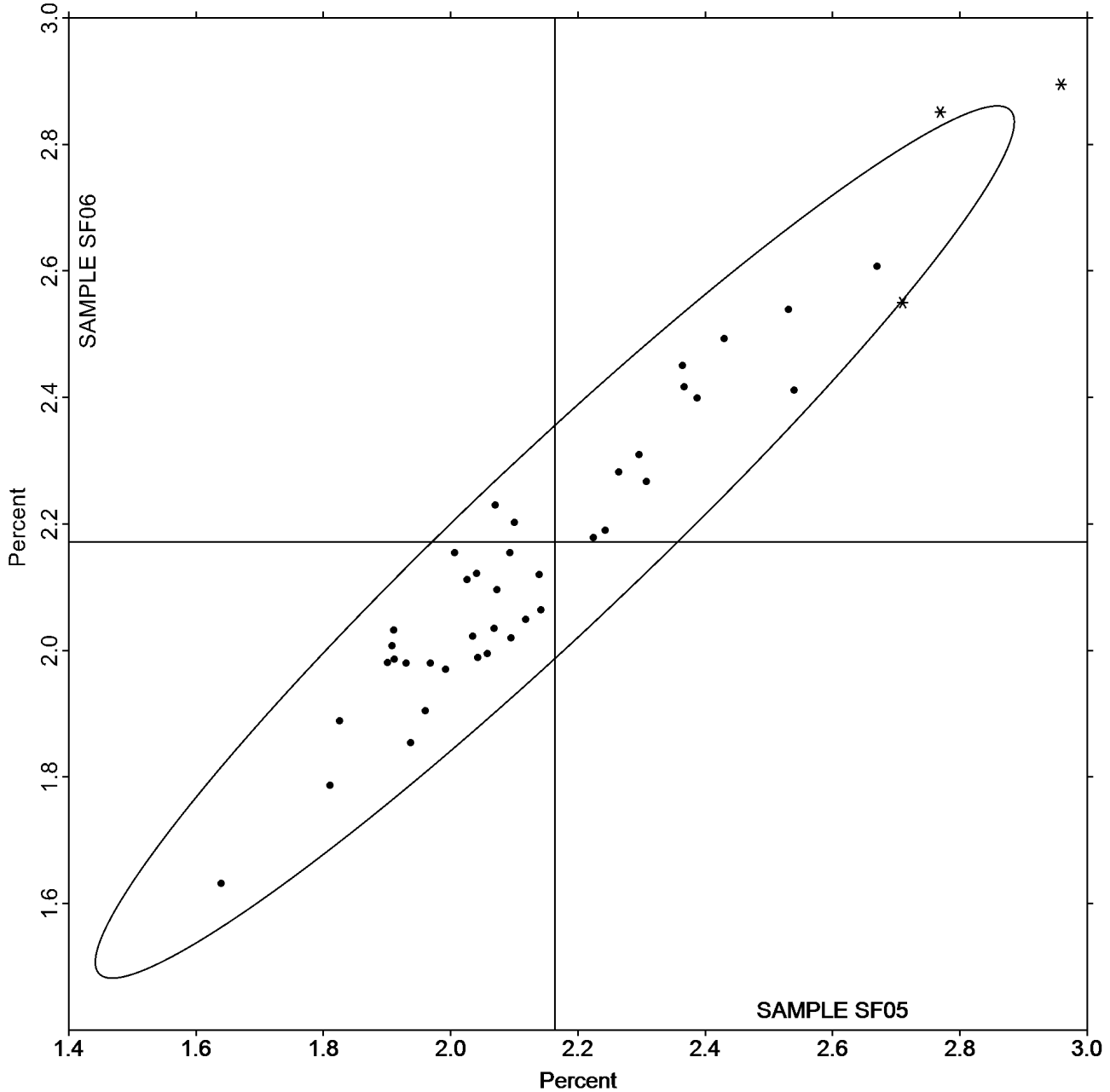
Report #3181S,  
May 2022

## Analysis 328 Elongation to Break - Printing Papers TAPPI Official Test Method T494

Grand Mean Sample SF05 = 2.1635  
Percent

Grand Mean Sample SF06 = 2.1715  
Percent

ANALYSIS 328





**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 330**  
**Tensile Breaking Strength - Packaging Papers**  
**TAPPI Official Test Method T494**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	Sample SE05			Sample SE06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3NLY29		12.15	1.21	1.66	9.649	0.497	0.96	LA
47DMMN		10.67	-0.27	-0.37	9.240	0.088	0.17	TH
4GK6H2		10.53	-0.41	-0.56	8.546	-0.606	-1.17	TB
4GXV9W	*	12.11	1.17	1.59	10.384	1.232	2.37	TR
4GZLDU		9.19	-1.75	-2.39	8.062	-1.090	-2.10	TT
4WCXAU		10.57	-0.37	-0.51	8.747	-0.405	-0.78	TR
6GTQBY		10.24	-0.70	-0.95	8.763	-0.389	-0.75	LE
6HNC36		11.00	0.06	0.08	8.667	-0.485	-0.93	LW
7RAVZB	X	10.60	-0.34	-0.47	374.604	365.452	704.00	DM
92TXC3		11.46	0.52	0.70	9.189	0.037	0.07	LA
9HVQ3B		10.36	-0.59	-0.80	8.772	-0.380	-0.73	TX
ABA3YR		10.44	-0.51	-0.69	8.777	-0.375	-0.72	TB
DFGKUQ		10.47	-0.47	-0.65	8.913	-0.239	-0.46	IM
ED4ENF	X	14.75	3.80	5.20	12.505	3.353	6.46	LA
EHGD2U		10.69	-0.25	-0.34	9.034	-0.118	-0.23	LW
F8TJLQ		10.66	-0.28	-0.38	8.838	-0.314	-0.60	IF
GGE47F		11.26	0.32	0.43	9.828	0.676	1.30	TO
HKC3XJ		12.60	1.66	2.27	10.285	1.133	2.18	LE
J4JUDQ		9.91	-1.03	-1.41	8.262	-0.890	-1.71	LH
JB26MK		10.25	-0.70	-0.95	8.774	-0.378	-0.73	TK
JLMAUK	X	8.12	-2.82	-3.85	8.967	-0.186	-0.36	LE
LCPFBJ		10.97	0.03	0.04	8.937	-0.215	-0.41	IM
LLD9MF		10.88	-0.06	-0.08	9.309	0.157	0.30	LE
MAEV7F		10.59	-0.35	-0.48	9.029	-0.123	-0.24	TB
MUK9VG		10.76	-0.19	-0.25	8.957	-0.195	-0.38	IR
MUMVDV		11.02	0.08	0.10	9.358	0.206	0.40	LH
PAAZPG		10.92	-0.02	-0.03	8.898	-0.254	-0.49	TO
PKP6KJ		11.80	0.86	1.18	9.340	0.188	0.36	LC
PPJ7KD	*	9.55	-1.39	-1.90	8.765	-0.387	-0.75	IM
Q4H82K		11.96	1.02	1.39	9.922	0.770	1.48	LX
QNR6KG		11.14	0.20	0.27	9.352	0.200	0.39	LE
RGYPZ3		11.86	0.92	1.25	10.056	0.904	1.74	LI
RVHCAZ		11.47	0.52	0.72	9.363	0.211	0.41	LA
U3T9AQ		10.75	-0.19	-0.26	9.060	-0.092	-0.18	XX
W72H9Y		10.58	-0.37	-0.50	8.592	-0.560	-1.08	IF
W99QK4		10.65	-0.29	-0.40	9.063	-0.089	-0.17	LE
WHUWC2		10.45	-0.49	-0.67	8.970	-0.182	-0.35	LW
WMC266	X	8.69	-2.26	-3.08	15.481	6.329	12.19	TH
XEB7MW	X	10.42	-0.52	-0.71	9.982	0.830	1.60	TH
YAD4V3		11.78	0.84	1.15	9.587	0.434	0.84	TH





**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 330**  
**Tensile Breaking Strength - Packaging Papers**  
**TAPPI Official Test Method T494**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	<u>Sample SE05</u>			<u>Sample SE06</u>			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
YNXNDB		11.15	0.21	0.28	9.550	0.398	0.77	LE
ZC2VPK		12.01	1.06	1.46	9.730	0.577	1.11	IF
ZFYGAV		10.95	0.00	0.01	9.213	0.061	0.12	ID

<b>Summary Statistics</b>	<b><u>Sample SE05</u></b>	<b><u>Sample SE06</u></b>
<b>Grand Means</b>	10.94 kN/m	9.15 kN/m
<b>Std Dev Btwn Labs</b>	0.73 kN/m	0.52 kN/m

Statistics based on 38 of 43 reporting participants.

**Comments on Assigned Data Flags for Test #330**

- JLMAUK (X) - Data for sample SE05 are low. Inconsistent within the determinations of sample SE06.
- 7RAVZB (X) - Extreme Data for Sample SE06.
- XEB7MW (X) - Inconsistent in testing between samples.
- ED4ENF (X) - Extreme Data.
- WMC266 (X) - Extreme Data.

**Key to Instrument Codes Reported by Participants**

<b>DM</b> IDM MTC-100 Tensile Tester	<b>ID</b> Instron 4200 Series
<b>IF</b> Instron 3340 Series	<b>IM</b> Instron 5500 Series
<b>IR</b> Instron 5900 Series	<b>LA</b> L & W Autoline
<b>LC</b> L & W Tensile - Autoline 600	<b>LE</b> L & W Tensile Tester 066
<b>LH</b> L & W Alwetron TH1 (Horizontal) SE 060	<b>LI</b> Lloyds Instruments
<b>LW</b> L & W Tensile Tester SE062	<b>LX</b> L & W (model not specified)
<b>TB</b> Thwing-Albert EJA/1000	<b>TH</b> Thwing-Albert QC-3A
<b>TK</b> Thwing-Albert Model 37-4	<b>TO</b> Thwing-Albert QC-1000
<b>TR</b> TMI Horizontal Tensile Tester	<b>TT</b> Tinius Olsen Model MHT
<b>TX</b> Thwing-Albert (model not specified)	<b>XX</b> Instrument make/model not specified by lab

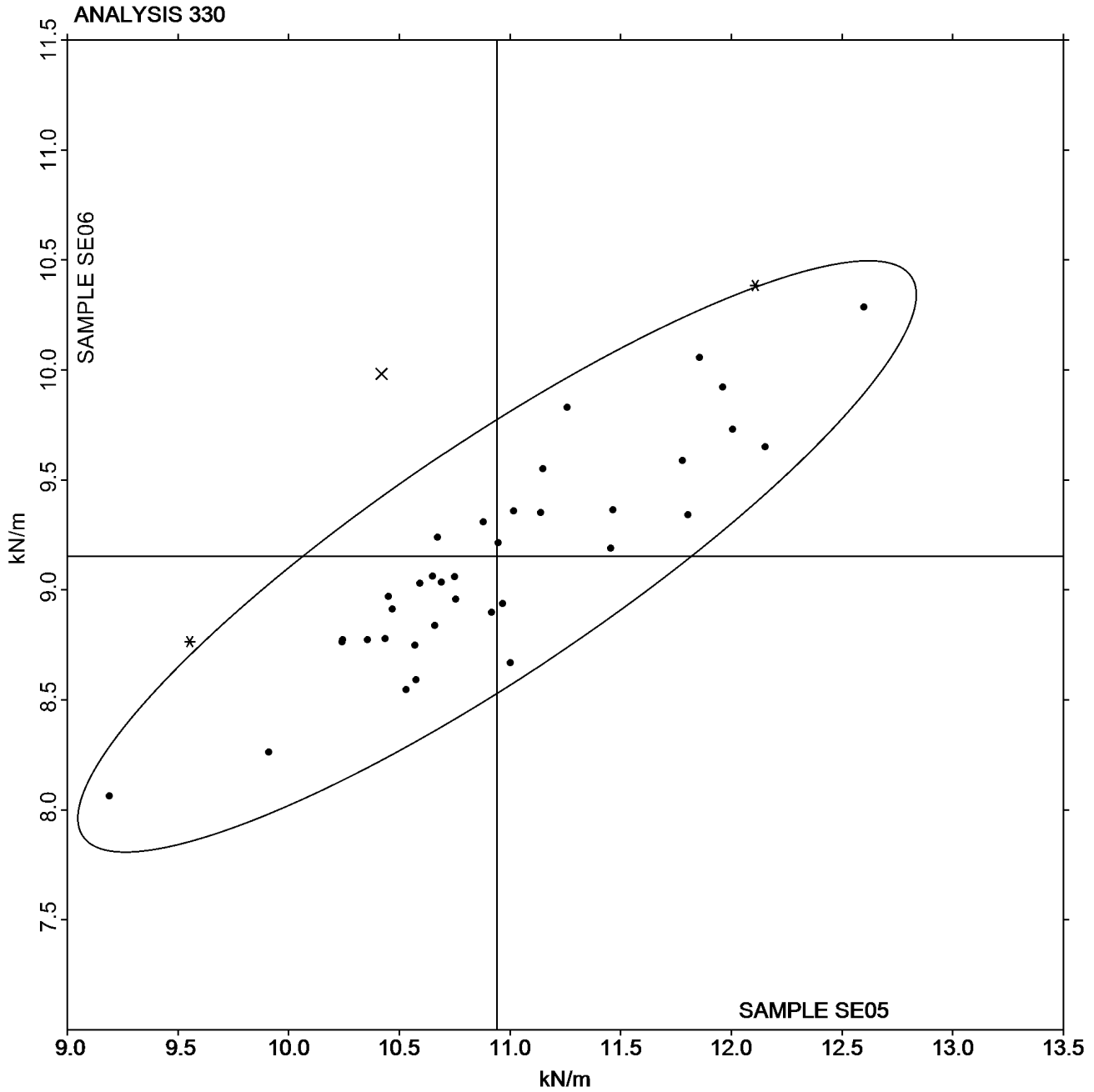


**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 330**  
**Tensile Breaking Strength - Packaging Papers**  
**TAPPI Official Test Method T494**

**Report #3181S,**  
**May 2022**

**Grand Mean Sample SE05 = 10.941**  
**kN/m**

**Grand Mean Sample SE06 = 9.1521**  
**kN/m**





# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 331

### Tensile Energy Absorption - Packaging Papers

#### TAPPI Official Test Method T494

WebCode	Data Flag	Sample SE05			Sample SE06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3NLY29		202.0	13.4	0.80	95.4	-15.8	-1.18	LA
47DMMN		204.8	16.3	0.97	122.2	11.0	0.82	TH
4GK6H2		179.9	-8.7	-0.51	91.3	-19.9	-1.49	TB
4GXV9W		200.3	11.8	0.70	130.2	19.0	1.43	TR
4GZLDU	X	250.1	61.6	3.66	170.6	59.4	4.45	TT
4WCXAU		170.4	-18.1	-1.08	94.0	-17.2	-1.29	TR
6GTQBY		168.9	-19.7	-1.17	106.6	-4.6	-0.35	LE
6HNC36		176.2	-12.3	-0.73	97.3	-14.0	-1.05	LW
7RAVZB	X	225.3	36.8	2.19	5,765.7	5,654.5	423.78	DM
92TXC3		204.3	15.8	0.94	103.8	-7.4	-0.56	LA
9HVQ3B		197.1	8.6	0.51	118.7	7.5	0.56	TX
ABA3YR		220.4	31.9	1.89	132.4	21.2	1.59	TB
DFGKUQ		203.2	14.6	0.87	122.5	11.3	0.84	IM
ED4ENF		168.9	-19.7	-1.17	86.1	-25.1	-1.88	LA
EHGD2U		174.2	-14.3	-0.85	104.9	-6.3	-0.47	LW
F8TJLQ		187.4	-1.1	-0.07	105.2	-6.0	-0.45	IF
GGE47F		199.3	10.8	0.64	125.4	14.2	1.06	TO
HKC3XJ		200.8	12.3	0.73	121.1	9.9	0.74	LE
J4JUDQ		147.0	-41.5	-2.47	84.8	-26.4	-1.98	LH
JB26MK		196.7	8.2	0.49	115.1	3.9	0.30	TK
JLMAUK	X	780.2	591.7	35.18	648.0	536.8	40.23	LE
LCPFBJ		183.8	-4.7	-0.28	111.7	0.5	0.04	IM
LLD9MF		170.4	-18.1	-1.08	110.7	-0.5	-0.04	LE
MUK9VG		181.3	-7.2	-0.43	106.6	-4.6	-0.34	IR
MUMVDV		185.7	-2.8	-0.17	115.8	4.6	0.34	LH
PAAZPG		207.1	18.6	1.10	120.8	9.6	0.72	TO
PKP6KJ		191.1	2.6	0.15	96.3	-14.9	-1.12	LC
Q4H82K		213.9	25.4	1.51	135.4	24.2	1.82	LX
QNR6KG		203.5	15.0	0.89	127.3	16.1	1.21	LE
RVHCAZ		196.2	7.7	0.46	98.5	-12.7	-0.95	LA
U3T9AQ		189.9	1.4	0.08	114.7	3.5	0.26	XX
W99QK4		180.4	-8.1	-0.48	109.2	-2.0	-0.15	LE
WHUWC2		173.6	-14.9	-0.89	109.5	-1.7	-0.13	LW
XEB7MW		183.2	-5.4	-0.32	131.8	20.6	1.54	TH
YAD4V3		210.2	21.7	1.29	112.0	0.8	0.06	TH
YNXNDB		181.8	-6.7	-0.40	114.8	3.6	0.27	LE
ZC2VPK		155.6	-32.9	-1.96	108.6	-2.6	-0.19	IN



**Paper & Paperboard Interlaboratory Testing Program**

**Report #3181S,  
May 2022**

**Analysis 331**

**Tensile Energy Absorption - Packaging Papers**

**TAPPI Official Test Method T494**

Summary Statistics	Sample SE05	Sample SE06
<b>Grand Means</b>	188.51 Joules/sq m	111.20 Joules/sq m
<b>Std Dev Btwn Labs</b>	16.82 Joules/sq m	13.34 Joules/sq m
Statistics based on 34 of 37 reporting participants.		

**Comments on Assigned Data Flags for Test #331**

JLMAUK (X) - Extreme Data.

7RAVZB (X) - Extreme Data for Sample SE06.

4GZLDU (X) - Data for both samples are high. Inconsistent within the determinations of both samples.

**Analysis Notes:**

YAD4V3 - Data appears to be transposed between Analysis 331 (T.E.A.) and Analysis 332 (% Elongation). CTS will not correct going forward.

**Key to Instrument Codes Reported by Participants**

<b>DM</b>	IDM MTC-100 Tensile Tester	<b>IF</b>	Instron 3340 Series
<b>IM</b>	Instron 5500 Series	<b>IN</b>	Instron 3360 Series
<b>IR</b>	Instron 5900 Series	<b>LA</b>	L & W Autoline
<b>LC</b>	L & W Tensile - Autoline 600	<b>LE</b>	L & W Tensile Tester 066
<b>LH</b>	L & W Alwetron TH1 (Horizontal) SE 060	<b>LW</b>	L & W Tensile Tester SE062
<b>LX</b>	L & W (model not specified)	<b>TB</b>	Thwing-Albert EJA/1000
<b>TH</b>	Thwing-Albert QC-3A	<b>TK</b>	Thwing-Albert Model 37-4
<b>TO</b>	Thwing-Albert QC-1000	<b>TR</b>	TMI Horizontal Tensile Tester
<b>TT</b>	Tinius Olsen Model MHT	<b>TX</b>	Thwing-Albert (model not specified)
<b>XX</b>	Instrument make/model not specified by lab		



# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 331

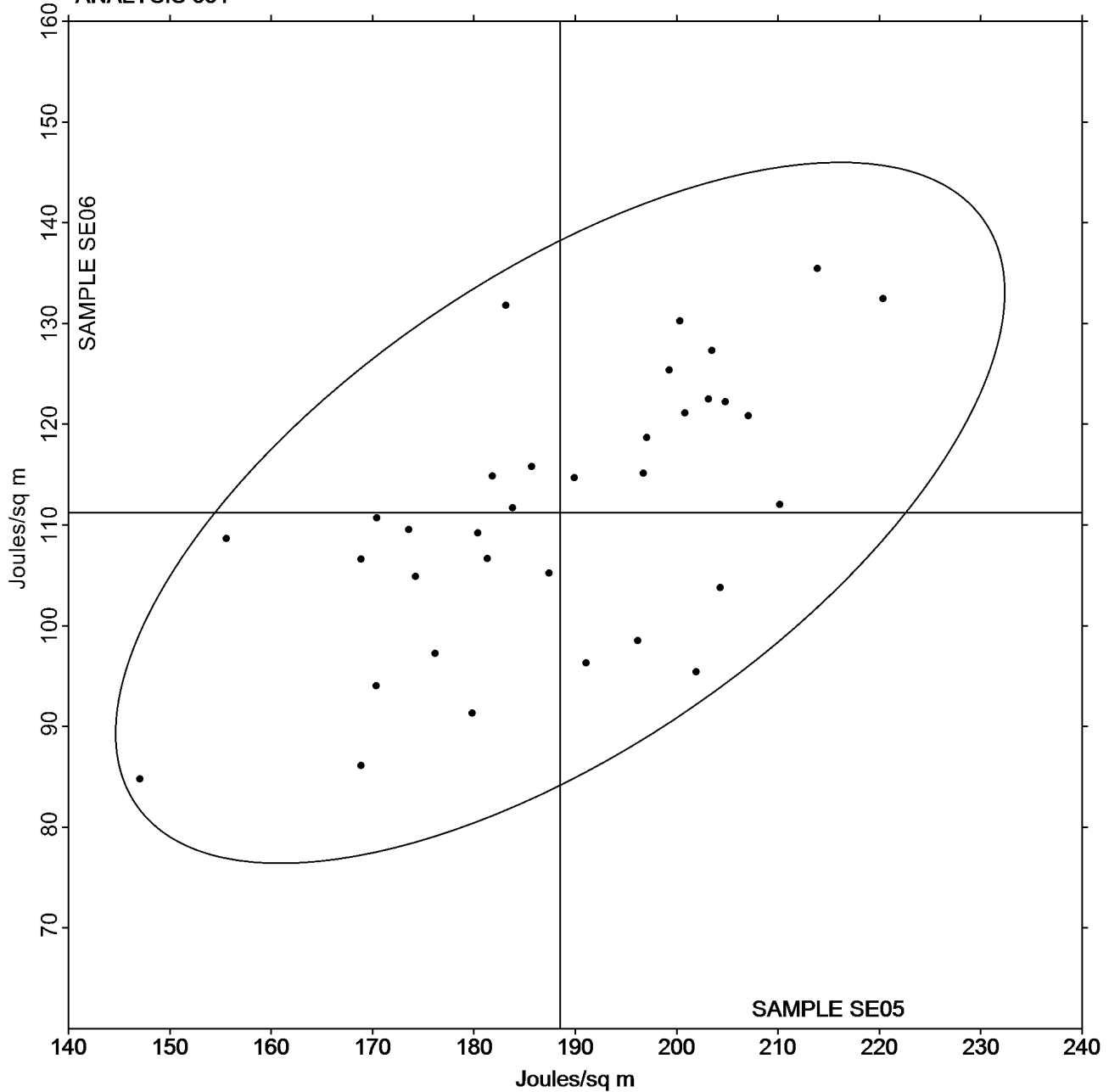
### Tensile Energy Absorption - Packaging Papers

#### TAPPI Official Test Method T494

Grand Mean Sample SE05 = 188.51  
Joules/sq m

Grand Mean Sample SE06 = 111.20  
Joules/sq m

ANALYSIS 331





**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 332**  
**Elongation to Break - Packaging Papers**  
**TAPPI Official Test Method T494**

Report #3181S,  
May 2022

WebCode	Data Flag	Sample SE05			Sample SE06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3NLY29		2.251	-0.316	-1.35	1.443	-0.361	-1.89	LA
47DMMN		2.858	0.291	1.24	1.951	0.147	0.77	TH
4GK6H2		2.533	-0.034	-0.14	1.617	-0.187	-0.98	TB
4GXV9W		2.491	-0.075	-0.32	1.905	0.101	0.53	TR
4GZLDU	X	4.244	1.677	7.16	3.266	1.462	7.65	TT
4WCXAU		2.425	-0.142	-0.60	1.735	-0.069	-0.36	TR
6GTQBY		2.412	-0.155	-0.66	1.734	-0.070	-0.37	LE
6HNC36		2.401	-0.166	-0.71	1.654	-0.150	-0.78	LW
7RAVZB		3.163	0.596	2.55	2.230	0.426	2.23	DM
92TXC3	X	2.684	0.117	0.50	1.415	-0.389	-2.04	LA
9HVQ3B		2.767	0.200	0.85	1.972	0.168	0.88	TX
ABA3YR		3.157	0.590	2.52	2.228	0.424	2.22	TB
ED4ENF		2.254	-0.313	-1.33	1.614	-0.190	-0.99	LA
EHGD2U		2.398	-0.169	-0.72	1.680	-0.124	-0.65	LW
F8TJLQ		2.599	0.032	0.14	1.773	-0.031	-0.16	IF
GGE47F		2.702	0.135	0.58	1.954	0.150	0.79	TO
HKC3XJ		2.316	-0.251	-1.07	1.719	-0.085	-0.44	LE
J4JUDQ		2.195	-0.372	-1.59	1.487	-0.317	-1.66	LH
JB26MK		2.837	0.270	1.15	1.937	0.133	0.70	TK
JLMAUK	X	11.950	9.383	40.05	6.969	5.165	27.03	LE
LCPFBJ		2.586	0.019	0.08	1.997	0.193	1.01	IM
LLD9MF		2.309	-0.258	-1.10	1.718	-0.086	-0.45	LE
MAEV7F		2.635	0.068	0.29	1.839	0.035	0.18	TB
MUK9VG		2.476	-0.091	-0.39	1.741	-0.063	-0.33	IR
MUMVDV		2.627	0.060	0.26	1.933	0.129	0.68	LH
PAAZPG		2.862	0.295	1.26	2.027	0.223	1.17	TO
PKP6KJ		2.352	-0.215	-0.92	1.467	-0.337	-1.76	LC
PPJ7KD	X	1.130	-1.437	-6.13	0.860	-0.944	-4.94	IM
Q4H82K		2.582	0.015	0.07	1.915	0.111	0.58	LX
QNR6KG		2.673	0.106	0.45	1.929	0.125	0.65	LE
RVHCAZ	*	2.469	-0.098	-0.42	1.487	-0.317	-1.66	LA
U3T9AQ		2.567	0.000	0.00	1.802	-0.002	-0.01	XX
W99QK4		2.452	-0.115	-0.49	1.716	-0.088	-0.46	LE
WHUWC2		2.460	-0.107	-0.45	1.762	-0.042	-0.22	LW
XEB7MW		2.700	0.133	0.57	2.010	0.206	1.08	TH
YAD4V3		2.882	0.315	1.35	1.853	0.049	0.26	TH
YNXNDB		2.391	-0.176	-0.75	1.736	-0.068	-0.36	LE
ZC2VPK		2.411	-0.156	-0.67	1.738	-0.066	-0.35	IN
ZFYGAV		2.638	0.071	0.30	1.835	0.031	0.16	ID



**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 332**  
**Elongation to Break - Packaging Papers**  
**TAPPI Official Test Method T494**

**Report #3181S,**  
**May 2022**

Summary Statistics	Sample SE05	Sample SE06
<b>Grand Means</b>	2.57 Percent	1.80 Percent
<b>Std Dev Btwn Labs</b>	0.23 Percent	0.19 Percent

Statistics based on 35 of 39 reporting participants.

**Comments on Assigned Data Flags for Test #332**

- PPJ7KD (X) - Extreme Data.
- JLMAUK (X) - Extreme Data.
- 4GZLDU (X) - Extreme Data.
- 92TXC3 (X) - Inconsistent in testing between samples. Inconsistent within the determinations of sample SE06.

**Analysis Notes:**

YAD4V3 - Data appears to be transposed between Analysis 331 (T.E.A.) and Analysis 332 (% Elongation). CTS will not correct going forward.

**Key to Instrument Codes Reported by Participants**

DM	IDM MTC-100 Tensile Tester	ID	Instron 4200 Series
IF	Instron 3340 Series	IM	Instron 5500 Series
IN	Instron 3360 Series	IR	Instron 5900 Series
LA	L & W Autoline 300	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)
TB	Thwing-Albert EJA/1000	TH	Thwing-Albert QC-3A
TK	Thwing-Albert Model 37-4	TO	Thwing-Albert QC-1000
TR	TMI Horizontal Tensile Tester	TT	Tinius Olsen Model MHT
TX	Thwing-Albert (model not specified)	XX	Instrument make/model not specified by lab



# Paper & Paperboard Interlaboratory Testing Program

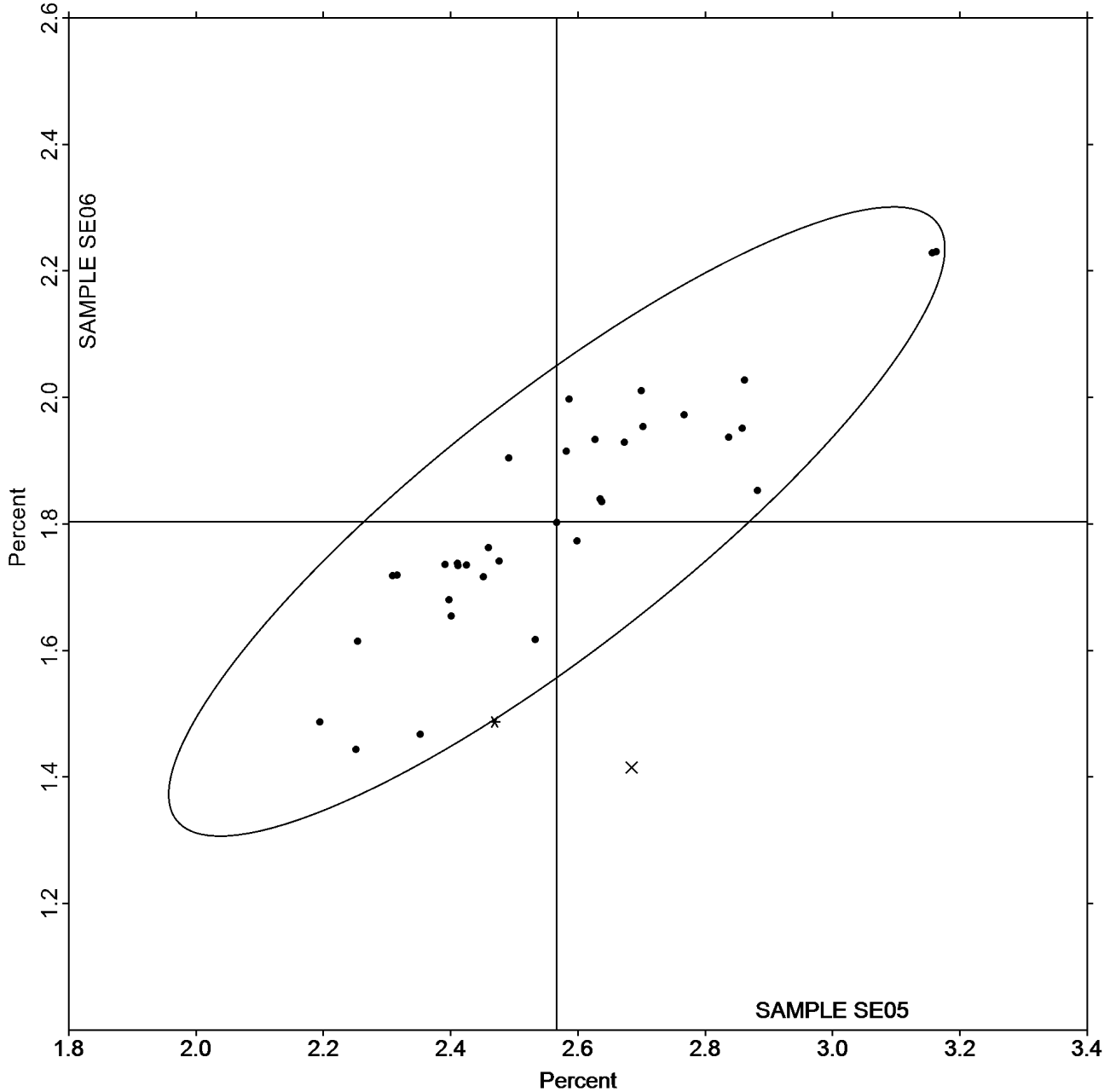
Report #3181S,  
May 2022

## Analysis 332 Elongation to Break - Packaging Papers TAPPI Official Test Method T494

Grand Mean Sample SE05 = 2.5666  
Percent

Grand Mean Sample SE06 = 1.8039  
Percent

ANALYSIS 332









# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 334

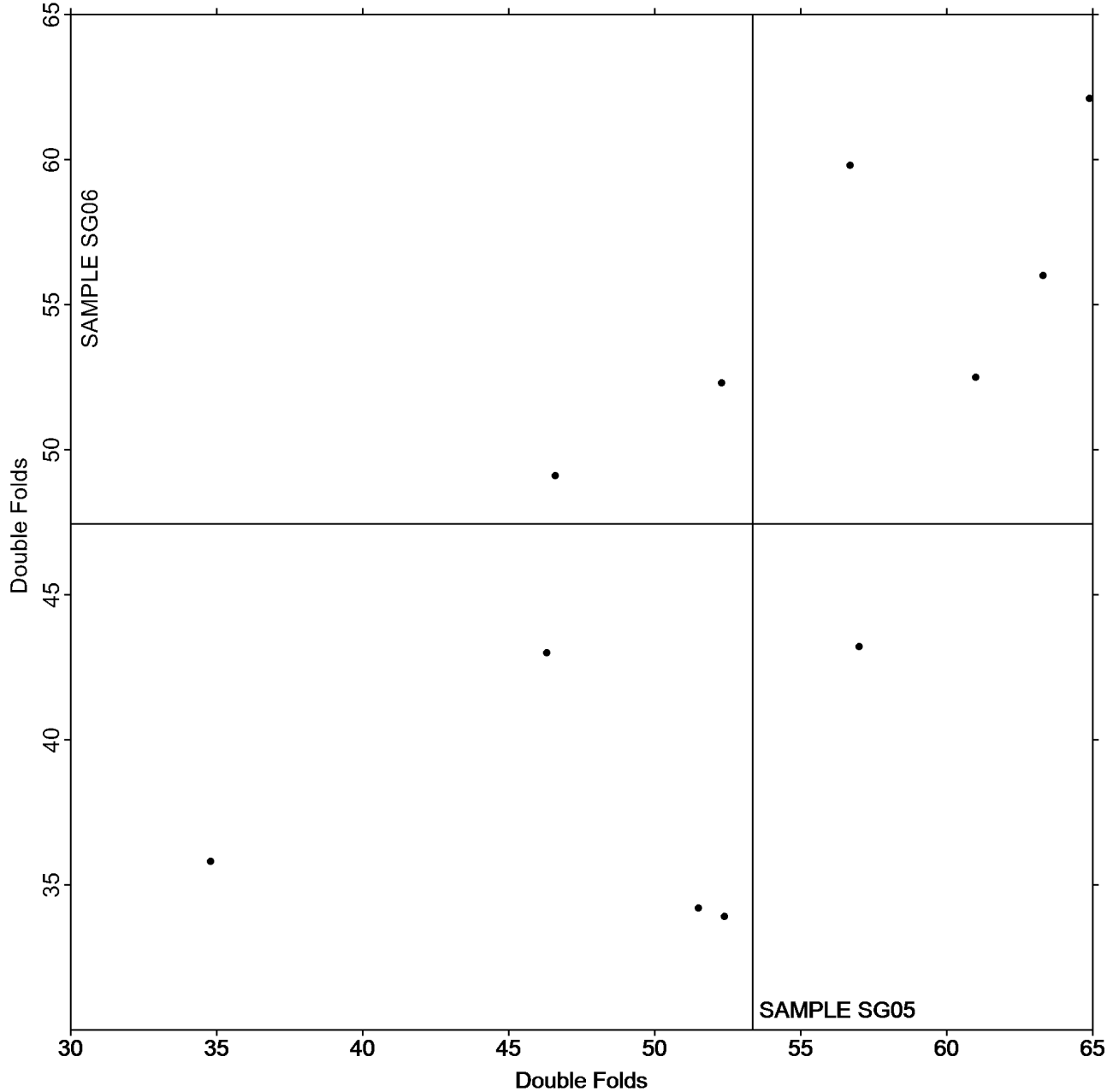
### Folding Endurance (MIT) - Double Folds

#### TAPPI Official Test Method T511

Grand Mean Sample SG05 = 53.345  
Double Folds

Grand Mean Sample SG06 = 47.445  
Double Folds

ANALYSIS 334



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 336**  
**Bending Resistance, Gurley Type**  
**TAPPI Official Test Method T543**

Report #3181S,  
May 2022

WebCode	Data Flag	Sample SH05			Sample SH06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
6GVEUY	X	215.1	71.7	6.62	239.1	93.8	8.26
7TPVJZ		154.3	10.9	1.01	157.0	11.7	1.03
DFGKUQ		151.6	8.3	0.76	151.8	6.5	0.57
EV3RZM		151.5	8.1	0.75	148.5	3.2	0.28
FWDUML		155.0	11.6	1.07	166.4	21.0	1.85
FYD4CU	X	54.5	-88.9	-8.20	53.9	-91.4	-8.05
K9TC9D		142.1	-1.3	-0.12	146.5	1.2	0.10
M4PHZL		123.3	-20.1	-1.85	122.5	-22.8	-2.01
MAEV7F		126.3	-17.1	-1.58	140.4	-4.9	-0.43
ME8ZVD		138.7	-4.6	-0.43	139.4	-5.9	-0.52
N873PM	X	57.6	-85.7	-7.92	67.7	-77.7	-6.84
NC3NGP		138.7	-4.6	-0.43	137.2	-8.1	-0.72
ULNQG8		149.9	6.5	0.60	142.5	-2.8	-0.25
V4G4A6		145.7	2.3	0.21	146.4	1.1	0.10

Summary Statistics	Sample SH05	Sample SH06
<b>Grand Means</b>	143.37 Gurley Units	145.34 Gurley Units
<b>Std Dev Btwn Labs</b>	10.83 Gurley Units	11.35 Gurley Units
Statistics based on 11 of 14 reporting participants.		

**Comments on Assigned Data Flags for Test #336**

- 6GVEUY (X) - Extreme Data.
- N873PM (X) - Extreme Data.
- FYD4CU (X) - Extreme Data.



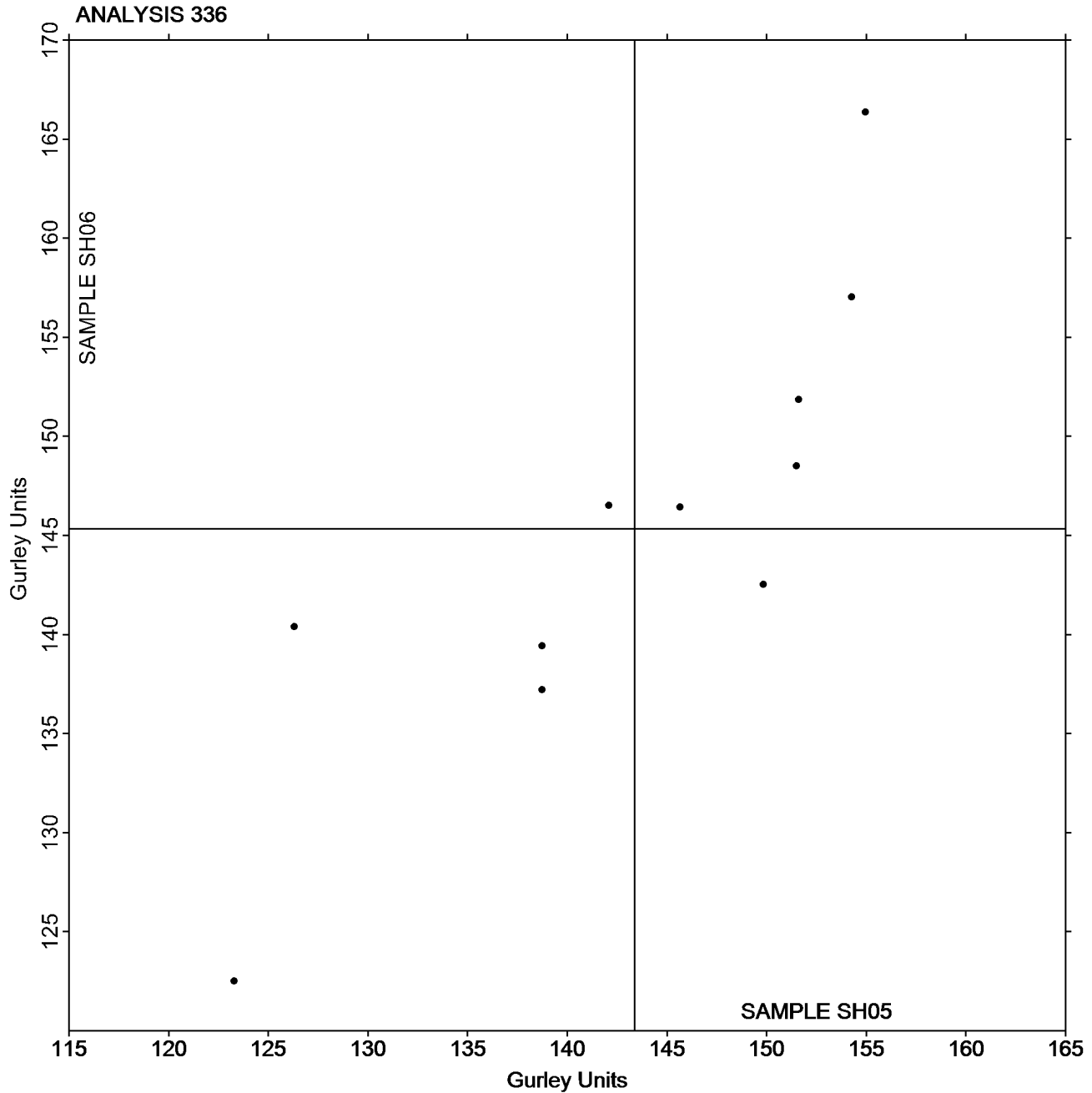
# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 336 Bending Resistance, Gurley Type TAPPI Official Test Method T543

Grand Mean Sample SH05 = 143.37  
Gurley Units

Grand Mean Sample SH06 = 145.34  
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 338**  
**Bending Resistance, Taber Type - 0 to 10 Units**  
**TAPPI Official Test Method T566**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	<u>Sample SJ05</u>			<u>Sample SJ06</u>		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2MG33Z		3.198	0.848	1.89	3.173	0.917	2.42
7TPVJZ		2.015	-0.335	-0.75	2.243	-0.013	-0.03
DFGKUQ		1.782	-0.568	-1.27	1.769	-0.487	-1.29
FWDUML		2.295	-0.055	-0.12	2.325	0.069	0.18
K9TC9D		2.086	-0.265	-0.59	2.059	-0.197	-0.52
LLD9MF		2.040	-0.310	-0.69	2.030	-0.226	-0.60
M4PHZL		2.163	-0.187	-0.42	2.189	-0.067	-0.18
MZP86L		2.408	0.058	0.13	2.198	-0.058	-0.15
NZP9QJ		3.004	0.654	1.46	2.055	-0.201	-0.53
ZC2VPK		2.510	0.160	0.36	2.520	0.264	0.70

<b>Summary Statistics</b>	<u><b>Sample SJ05</b></u>	<u><b>Sample SJ06</b></u>
<b>Grand Means</b>	2.35 Taber Units	2.26 Taber Units
<b>Std Dev Btwn Labs</b>	0.45 Taber Units	0.38 Taber Units

Statistics based on 10 of 10 reporting participants.

**Analysis Notes:**

- MZP86L - Data appear to be reported as g-cm, not mN-m as indicated on data entry form. CTS will not correct the Units going forward.
- NZP9QJ - Data appear to be reported as g-cm, not mN-m as indicated on data entry form. CTS will not correct the Units going forward.



# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

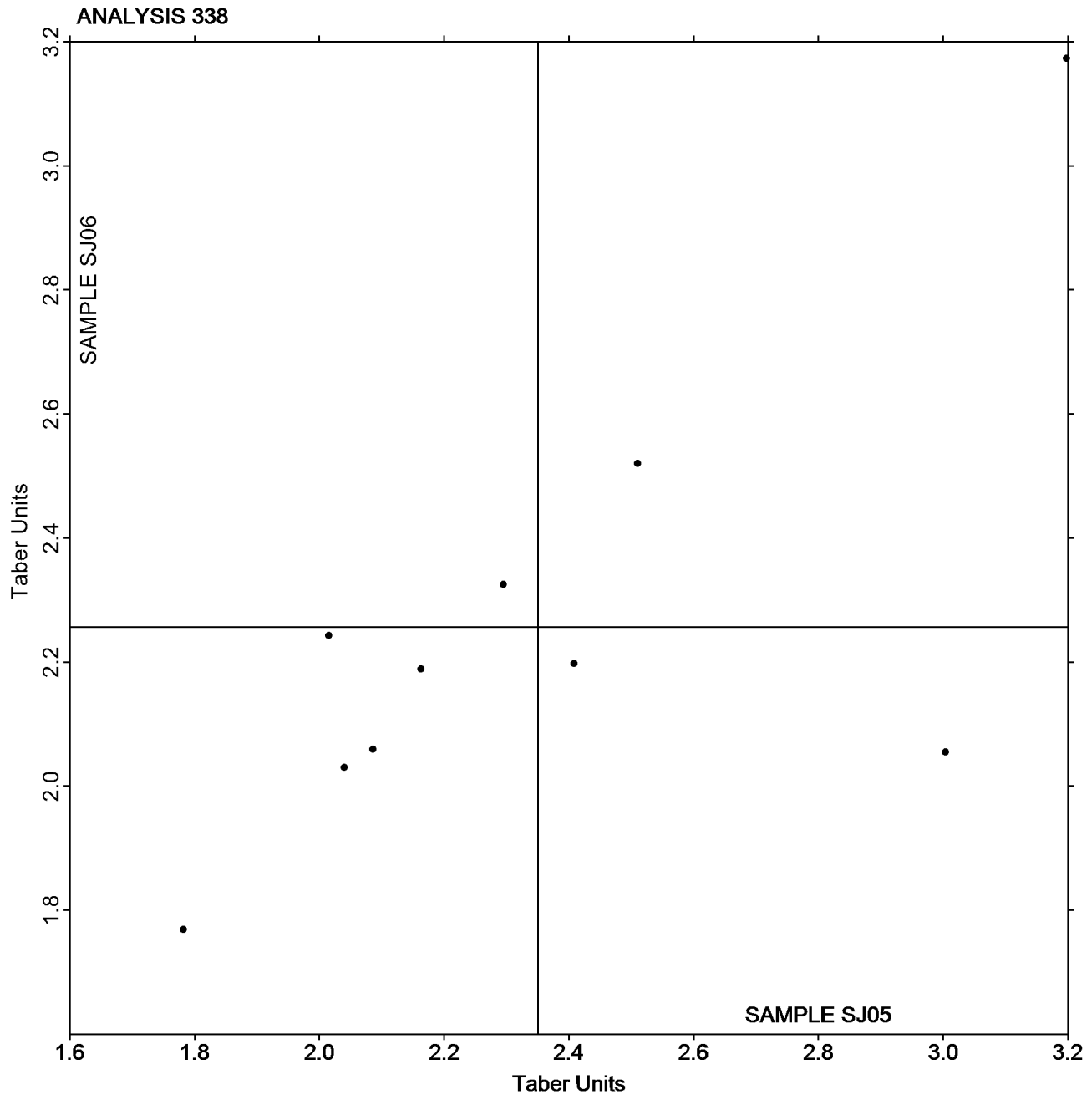
## Analysis 338

Bending Resistance, Taber Type - 0 to 10 Units

TAPPI Official Test Method T566

Grand Mean Sample SJ05 = 2.3501  
Taber Units

Grand Mean Sample SJ06 = 2.2561  
Taber 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 339**  
**Bending Resistance, Taber Type - 10 to 100 Taber Units**  
**TAPPI Official Test Method T489**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	<u>Sample SQ05</u>			<u>Sample SQ06</u>		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
4GK6H2		29.00	0.66	0.17	49.94	-0.24	-0.05
7T4JJ7		31.62	3.28	0.83	51.49	1.31	0.26
83QYMZ		27.72	-0.62	-0.16	47.03	-3.16	-0.62
EHGD2U		29.60	1.26	0.32	53.70	3.52	0.69
NC3NGP		29.32	0.98	0.25	51.34	1.16	0.23
PPJ7KD	X	16.45	-11.89	-3.00	21.55	-28.63	-5.62
QNR6KG		30.93	2.59	0.65	55.50	5.32	1.04
VUEM39		28.30	-0.04	-0.01	50.75	0.57	0.11
WVHUUH		31.64	3.30	0.83	56.12	5.94	1.17
WHUWC2		27.35	-0.99	-0.25	47.45	-2.73	-0.54
WTE9NE		17.90	-10.44	-2.63	38.49	-11.69	-2.29

<b>Summary Statistics</b>	<u>Sample SQ05</u>	<u>Sample SQ06</u>
<b>Grand Means</b>	28.34 Taber Units	50.18 Taber Units
<b>Std Dev Btwn Labs</b>	3.97 Taber Units	5.09 Taber Units
Statistics based on 10 of 11 reporting participants.		

**Comments on Assigned Data Flags for Test #339**

PPJ7KD (X) - Data for both samples are low.



# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

## Analysis 339

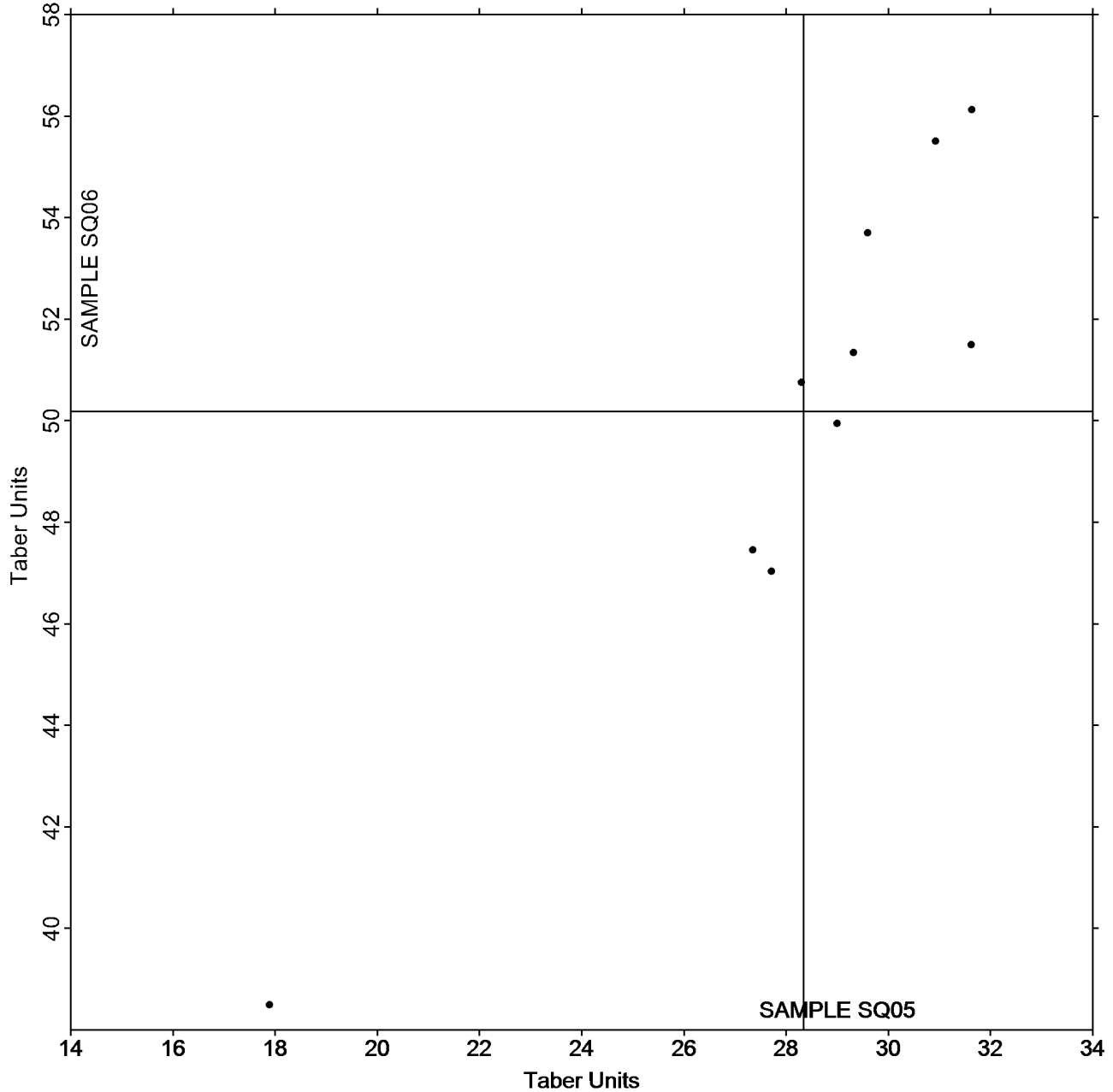
Bending Resistance, Taber Type - 10 to 100 Taber Units

TAPPI Official Test Method T489

Grand Mean Sample SQ05 = 28.338  
Taber Units

Grand Mean Sample SQ06 = 50.181  
Taber Units

ANALYSIS 339



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 #3181S,  
May 2022**

**Analysis 340**

**Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard**

**TAPPI Official Test Method T489**

WebCode	Data Flag	<u>Sample ST05</u>			<u>Sample ST06</u>		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
47DMMN		168.2	-7.3	-1.65	162.3	-13.4	-2.02
4WCXAU		169.5	-6.0	-1.36	169.3	-6.5	-0.97
9V8WFX		172.3	-3.2	-0.72	179.2	3.5	0.52
AEB3YP		175.2	-0.3	-0.07	170.3	-5.4	-0.82
BACB4X		177.7	2.1	0.48	178.4	2.7	0.40
EHGD2U		178.2	2.7	0.61	178.5	2.8	0.42
NC3NGP		177.3	1.8	0.41	176.0	0.2	0.04
V2D73H		171.7	-3.8	-0.86	172.4	-3.3	-0.50
W72H9Y		180.6	5.1	1.15	179.2	3.5	0.52
WMC266		180.7	5.2	1.17	181.2	5.5	0.82
YZ76M2		179.2	3.7	0.83	186.2	10.5	1.58

<b>Summary Statistics</b>	<u><b>Sample ST05</b></u>	<u><b>Sample ST06</b></u>
<b>Grand Means</b>	175.50 Taber Units	175.72 Taber Units
<b>Std Dev Btwn Labs</b>	4.43 Taber Units	6.64 Taber Units

Statistics based on 11 of 11 reporting participants.



# Paper & Paperboard Interlaboratory Testing Program

Report #3181S,  
May 2022

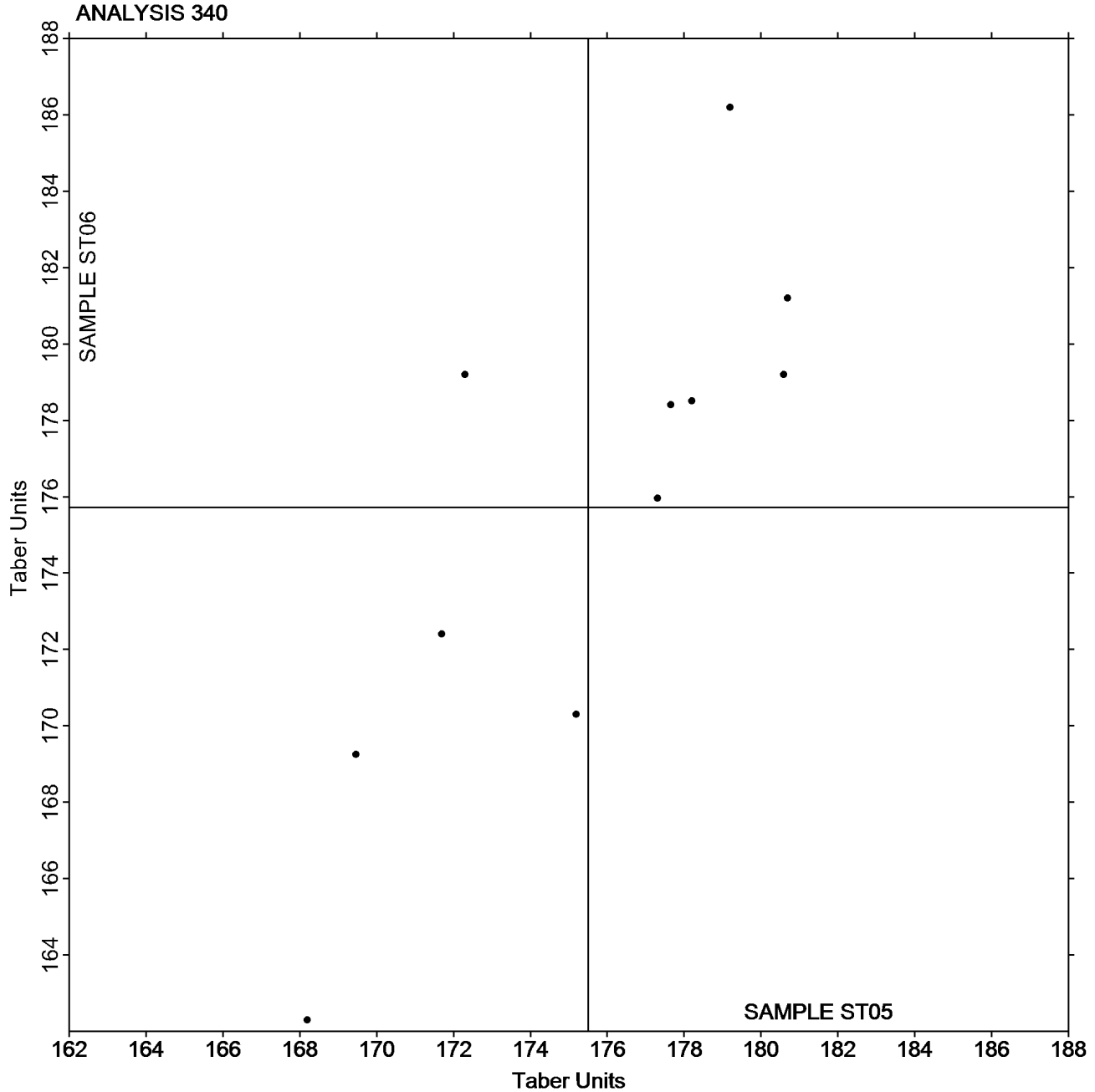
## Analysis 340

Bending Resistance, Taber Type - 50 to 500 Taber Units - Recycled Paperboard

TAPPI Official Test Method T489

Grand Mean Sample ST05 = 175.50  
Taber Units

Grand Mean Sample ST06 = 175.72  
Taber 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 343**  
**Z-Direction Tensile**  
**TAPPI Official Test Method T541**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	<u>Sample SM05</u>			<u>Sample SM06</u>			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
29VMZZ		85.20	-7.79	-0.51	88.22	-3.50	-0.24	XX
47DMMN		112.72	19.73	1.28	109.66	17.94	1.21	LW
4GK6H2		94.66	1.67	0.11	93.10	1.38	0.09	TA
83QYMZ		93.77	0.78	0.05	85.87	-5.85	-0.40	LW
AEB3YP		58.30	-34.69	-2.26	59.47	-32.24	-2.18	LW
DFGKUQ		79.84	-13.15	-0.86	80.56	-11.16	-0.75	CD
EHGD2U		101.34	8.35	0.54	102.88	11.16	0.76	LW
LLD8YW		87.86	-5.13	-0.33	86.15	-5.56	-0.38	LW
QNR6KG		107.00	14.01	0.91	103.68	11.96	0.81	CD
WVHUUH		113.68	20.69	1.35	113.92	22.20	1.50	CD
XEB7MW		86.40	-6.59	-0.43	83.20	-8.52	-0.58	TA
Y2MG67		95.14	2.15	0.14	93.88	2.16	0.15	DX

<b>Summary Statistics</b>	<u>Sample SM05</u>	<u>Sample SM06</u>
<b>Grand Means</b>	92.99 psi	91.72 psi
<b>Stnd Dev Btwn Labs</b>	15.37 psi	14.78 psi

Statistics based on 12 of 12 reporting participants.

**Key to Instrument Codes Reported by Participants**

CD	CSI CS-163D	DX	Dek-Tron XP2 Series
LW	L & W ZD Tensile Tester	TA	Thwing-Albert Tensile Tester
XX	Instrument make/model not specified by lab		



# Paper & Paperboard Interlaboratory Testing Program

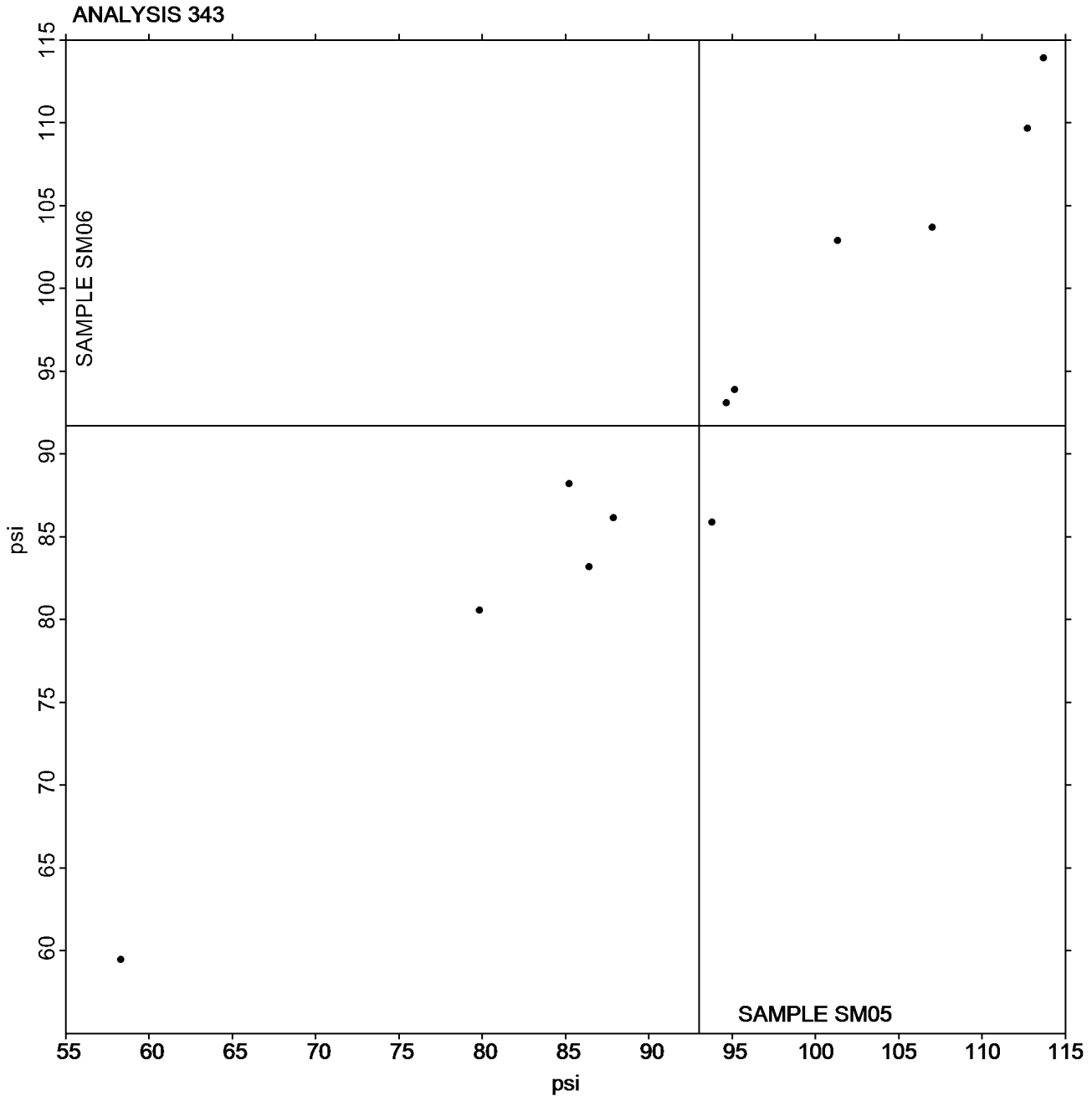
Report #3181S,  
May 2022

## Analysis 343 Z-Direction Tensile

### TAPPI Official Test Method T541

Grand Mean Sample SM05 = 92.993  
psi

Grand Mean Sample SM06 = 91.716  
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**  
**Analysis 345**  
**Z-Direction Tensile, Recycled Paperboard**  
**TAPPI Official Test Method T541**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	Sample SZ05			Sample SZ06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
9HVQ3B	*	34.50	-15.92	-2.73	45.34	-6.47	-1.38	XX
9V8WFX		53.00	2.58	0.44	54.80	2.99	0.64	CD
ABA3YR		56.38	5.96	1.02	55.02	3.21	0.69	DP
BACB4X		49.80	-0.62	-0.11	50.76	-1.05	-0.22	TA
EHGD2U		45.46	-4.96	-0.85	48.68	-3.13	-0.67	LW
H3REKH		56.10	5.68	0.97	58.50	6.69	1.43	LW
JPZ84T		52.00	1.58	0.27	50.86	-0.95	-0.20	CA
KPFNYL		52.60	2.18	0.37	51.80	-0.01	0.00	CD
LCPFBJ		49.40	-1.02	-0.17	50.60	-1.21	-0.26	CA
NC3NGP		51.96	1.54	0.26	52.40	0.59	0.13	CA
QEXYMA		60.12	9.70	1.66	61.06	9.25	1.97	LW
RGYPZ3		51.07	0.65	0.11	52.55	0.75	0.16	CH
RU8AN2		45.64	-4.78	-0.82	44.84	-6.97	-1.49	TA
RVHCAZ		52.40	1.98	0.34	51.18	-0.63	-0.13	TA
V2D73H		52.00	1.58	0.27	51.60	-0.21	-0.04	TA
W72H9Y		49.98	-0.44	-0.08	47.32	-4.49	-0.96	LW
WEVKG2		57.00	6.58	1.13	60.34	8.53	1.82	LW
YE9W97		45.94	-4.48	-0.77	44.86	-6.95	-1.48	LW
YZ76M2		42.60	-7.82	-1.34	51.80	-0.01	0.00	CA

Summary Statistics	Sample SZ05	Sample SZ06
<b>Grand Means</b>	50.42 psi	51.81 psi
<b>Std Dev Btwn Labs</b>	5.83 psi	4.69 psi
Statistics based on 19 of 19 reporting participants.		

**Key to Instrument Codes Reported by Participants**

CA	CSI CS-163	CD	CSI CS-163D
CH	Chatillon Ametek	DP	Dek-Tron XP Series
LW	L & W ZD Tensile Tester	TA	Thwing-Albert Tensile Tester
XX	Instrument make/model not specified by lab		

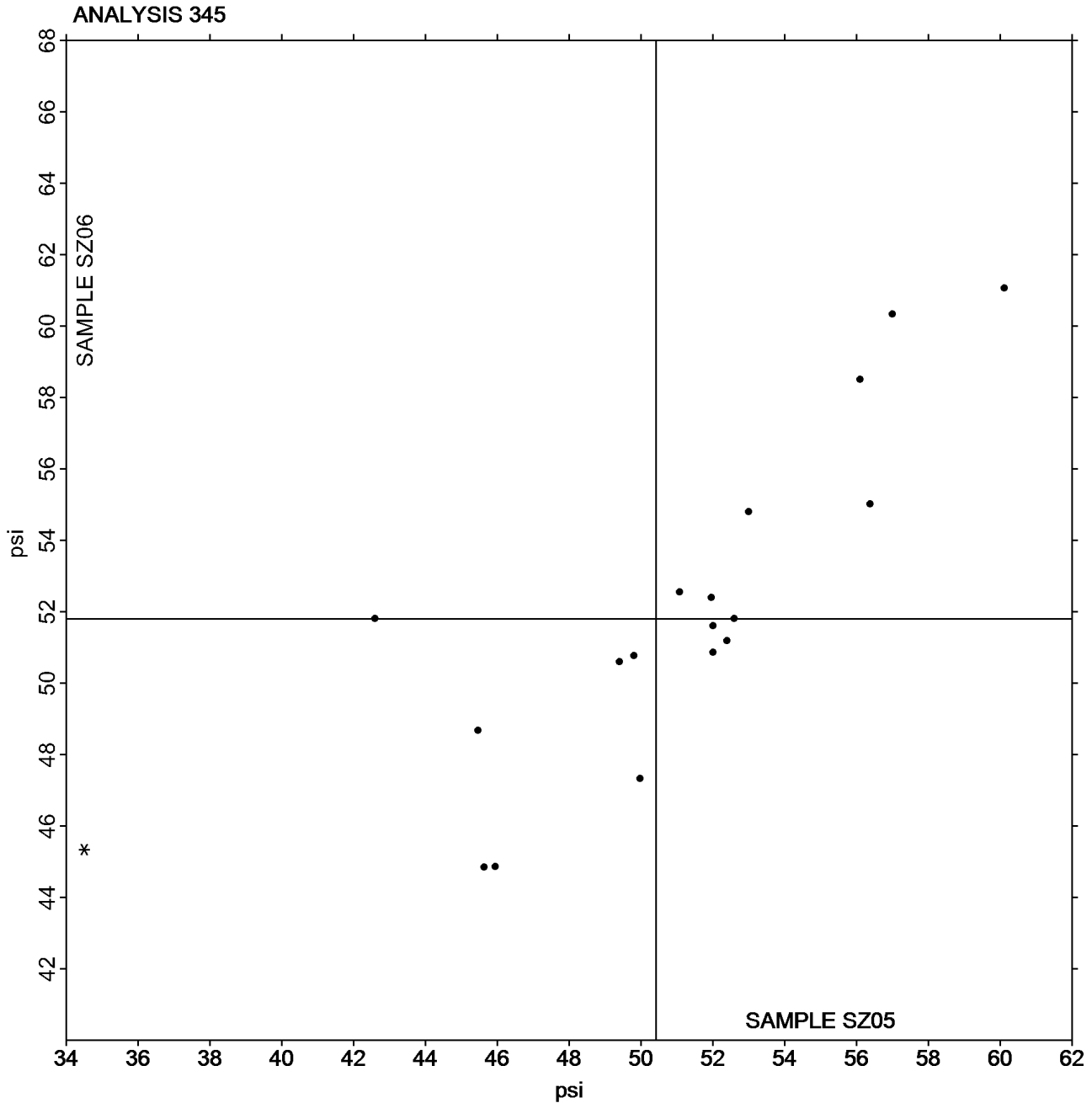


**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 345**  
**Z-Direction Tensile, Recycled Paperboard**  
**TAPPI Official Test Method T541**

**Report #3181S,**  
**May 2022**

**Grand Mean Sample SZ05 = 50.419**  
**psi**

**Grand Mean Sample SZ06 = 51.806**  
**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**  
**Analysis 348**  
**Internal Bond Strength - Modified Scott Mechanics**  
**TAPPI Provisional Test Method T569**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	<u>Sample SN05</u>			<u>Sample SN06</u>			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
47DMMN		124.6	-4.6	-0.73	108.2	-19.2	-1.79	HZ
4GK6H2		136.2	7.0	1.12	137.0	9.6	0.89	HZ
6GVEUY		126.8	-2.4	-0.38	128.8	1.4	0.13	HY
7H8FEC		127.4	-1.8	-0.28	122.0	-5.4	-0.50	HZ
EHGD2U		130.6	1.4	0.23	130.6	3.2	0.30	HY
FWDUML		122.2	-6.9	-1.11	118.2	-9.2	-0.85	KR
G7H6CN		130.0	0.8	0.13	149.0	21.6	2.01	HY
GGE47F		129.2	0.0	0.00	125.2	-2.2	-0.21	HY
NP48AA		129.2	0.0	0.00	130.0	2.6	0.24	HX
QNR6KG		130.2	1.0	0.16	126.6	-0.8	-0.08	HY
ULNQG8		123.2	-6.0	-0.95	128.8	1.4	0.13	HY
WVHUH		145.0	15.8	2.52	140.0	12.6	1.17	HY
Y2MG67		120.4	-8.8	-1.40	110.8	-16.6	-1.55	XX
YZ76M2		133.4	4.2	0.67	128.6	1.2	0.11	XX

<b>Summary Statistics</b>	<u>Sample SN05</u>	<u>Sample SN06</u>
<b>Grand Means</b>	129.17 1000th ft-lbs	127.42 1000th ft-lbs
<b>Stnd Dev Btwn Labs</b>	6.28 1000th ft-lbs	10.75 1000th ft-lbs
Statistics based on 14 of 14 reporting participants.		

**Key to Instrument Codes Reported by Participants**

HX	Huygen Internal Scott Bond Tester	HY	Huygen Digitized Internal Scott Bond Tester
HZ	Huygen Internal Bond Tester with AccuPress	KR	Kumagai Riki Kogyo Internal Bond Tester
XX	Instrument make/model not specified by lab		



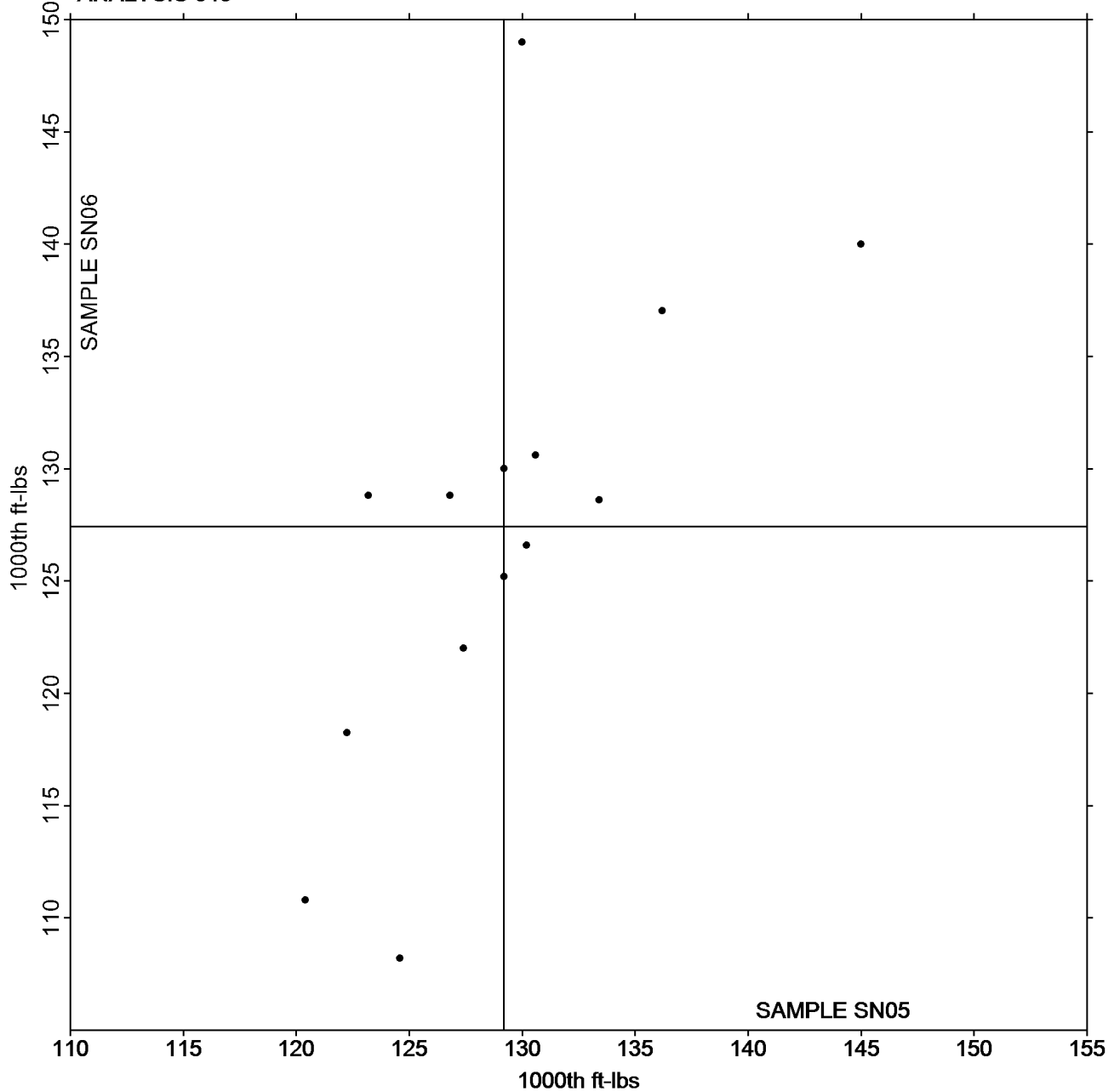
**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 348**  
**Internal Bond Strength - Modified Scott Mechanics**  
**TAPPI Provisional Test Method T569**

**Report #3181S,**  
**May 2022**

**Grand Mean Sample SN05 = 129.17**  
**1000th ft-lbs**

**Grand Mean Sample SN06 = 127.42**  
**1000th ft-lbs**

**ANALYSIS 348**



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 349**  
**Internal Bond Strength - Scott Bond Models**  
**TAPPI Provisional Test Method T569**

**Report #3181S,**  
**May 2022**

WebCode	Data Flag	Sample SP05			Sample SP06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
92TXC3		130.0	11.3	0.57	130.4	12.8	0.74	TM
ABA3YR		93.6	-25.1	-1.26	89.0	-28.6	-1.65	TM
AEB3YP		98.0	-20.7	-1.03	97.7	-19.9	-1.15	TM
EV3PD4		106.6	-12.1	-0.60	102.9	-14.7	-0.85	SC
FYD4CU		129.2	10.5	0.53	134.0	16.4	0.95	XX
K9TC9D	*	174.8	56.1	2.81	157.2	39.6	2.29	TM
M4PHZL		117.8	-0.9	-0.04	117.6	0.0	0.00	SC
ME8ZVD		125.4	6.7	0.34	126.4	8.8	0.51	TM
MUMVDV		124.7	6.0	0.30	122.7	5.1	0.29	TM
NZP9QJ		109.8	-8.9	-0.44	108.8	-8.8	-0.51	SC
RGYPZ3		109.4	-9.3	-0.46	107.8	-9.8	-0.57	TM
VKP3CG		124.6	5.9	0.30	123.0	5.4	0.31	SC
WHUWC2		116.9	-1.8	-0.09	122.8	5.2	0.30	XX
YNXNDB		100.8	-17.9	-0.90	106.2	-11.4	-0.66	TM

Summary Statistics	Sample SP05	Sample SP06
<b>Grand Means</b>	118.69 1000th ft-lbs	117.61 1000th ft-lbs
<b>Stnd Dev Btwn Labs</b>	19.99 1000th ft-lbs	17.30 1000th ft-lbs
Statistics based on 14 of 14 reporting participants.		

**Key to Instrument Codes Reported by Participants**

- SC Scott Internal Bond Tester (Manual)                      TM TMI Monitor/Internal Bond Tester  
 XX Instrument make/model not specified by lab



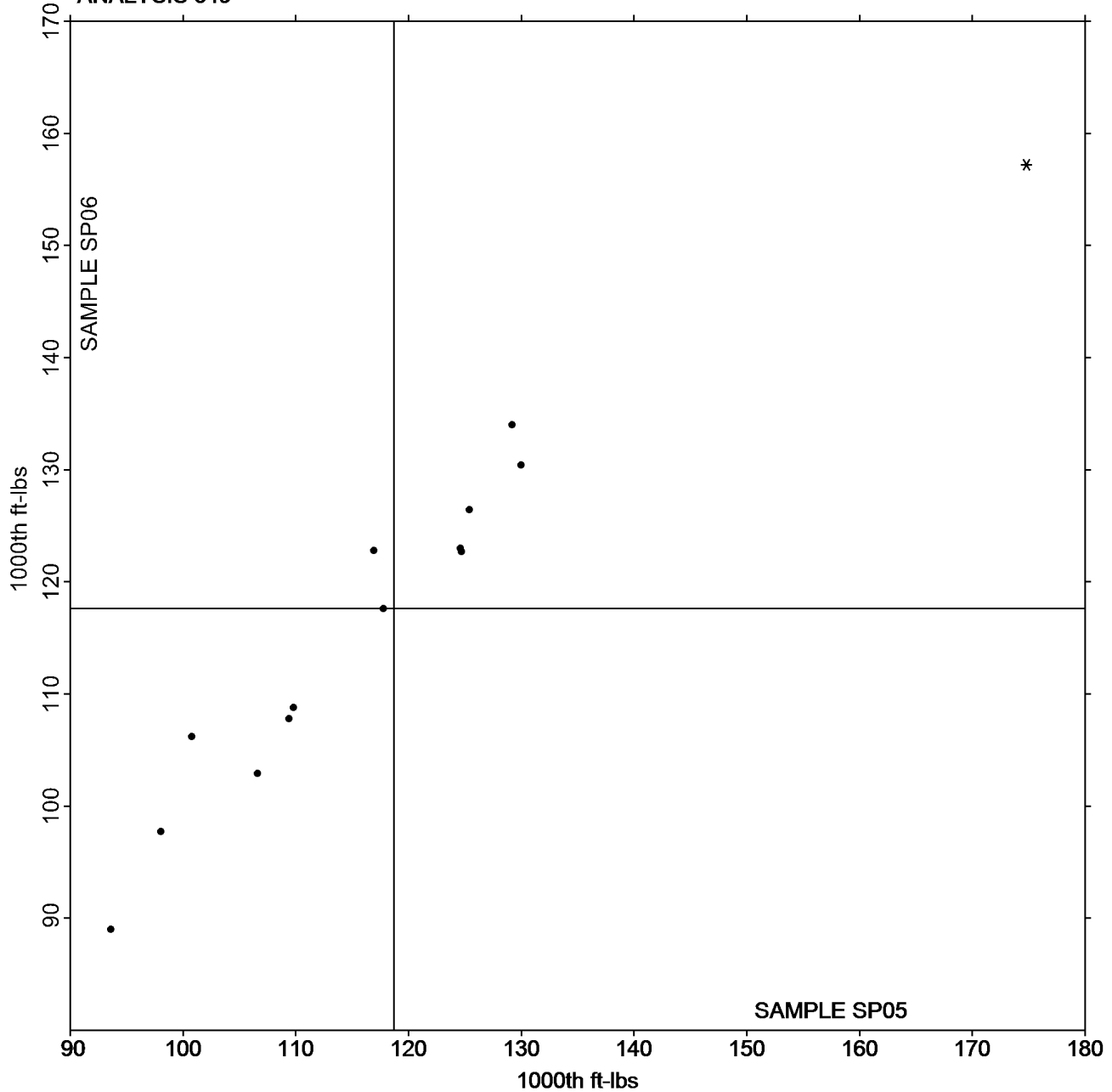
**Paper & Paperboard Interlaboratory Testing Program**  
**Analysis 349**  
**Internal Bond Strength - Scott Bond Models**  
**TAPPI Provisional Test Method T569**

**Report #3181S,**  
**May 2022**

**Grand Mean Sample SP05 = 118.69**  
**1000th ft-lbs**

**Grand Mean Sample SP06 = 117.61**  
**1000th ft-lbs**

**ANALYSIS 349**



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 349**  
**Internal Bond Strength - Scott Bond Models**  
**TAPPI Provisional Test Method T569**

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**Report #3181S,**  
**May 2022**

-End of Report-