



## Paper & Paperboard Interlaboratory Testing Program

Summary Report #269S - March 2014

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## **The CTS Paper & Paperboard Interlaboratory Fiberboard Program**

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

### **About CTS**

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

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

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

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

<b>WebCode</b>	Assigned laboratory identification number (temporary) used to ensure lab confidentiality while permitting a lab to locate its data in the Paper Report published on the CTS web site. The WebCode for each analysis can be found in the Performance Analysis Report mailed to each participant. In addition, the WebCodes can be found on the data sheets.
<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:

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

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

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### Common Problems Highlighted in Footnotes

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

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

## Instrument Manufacturer Contacts

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

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

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

### **Technidyne Corporation**

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

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

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

### **Testing Machines Inc.**

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

### **Huygen Corporation**

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

### **Gurley Precision Instruments**

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

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

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

### **Valmet Inc.**

Eeva Nettamo, Product Mgr Paper Testing  
3100 Medlock Bridge Road - Suite 260  
Norcross, GA 30071  
Phone: (404) 448-0849  
FAX #: (404) 242-8386

### **Custom Scientific Instruments**

DEK-TRON Scientific  
Segundo Vargas, Chief Design Engineer  
244 East Third Street

### **Emmerson Apparatus**

170 Anderson Street  
Portland, ME 04101  
Phone: (207) 774-5254

Plainfield, NJ 07060  
Phone: (908) 668-1777  
FAX #: (908) 668-4794

FAX#: (207) 774-5304

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 305**  
**Bursting Strength - Printing Papers**

WebCode	Data Flag	Sample SA05			Sample SA06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2CVKGH	X	53.40	11.64	3.45	27.00	4.84	1.93
4A9BRH		39.30	-2.46	-0.73	19.25	-2.91	-1.16
4NP9UX		38.36	-3.40	-1.01	20.86	-1.30	-0.52
4WNEP6		41.09	-0.68	-0.20	21.92	-0.24	-0.09
642MQ7		42.26	0.50	0.15	24.24	2.08	0.83
8A2LE2		44.93	3.17	0.94	23.25	1.09	0.44
8YV2RY		41.67	-0.10	-0.03	22.50	0.35	0.14
9FXLN9		34.52	-7.24	-2.14	17.24	-4.92	-1.96
AR44V3		46.01	4.25	1.26	26.63	4.47	1.78
BUPZ4T		42.96	1.20	0.36	22.59	0.43	0.17
D94LGN		43.45	1.69	0.50	23.80	1.64	0.66
DU8A7Y		39.42	-2.34	-0.69	20.64	-1.52	-0.61
DWEK89		40.05	-1.71	-0.51	20.95	-1.21	-0.48
F36HGA	*	43.00	1.24	0.37	19.90	-2.26	-0.90
JRX9RT		40.83	-0.94	-0.28	20.22	-1.94	-0.77
LZ2TKU		39.37	-2.40	-0.71	20.91	-1.25	-0.50
PLPXXF		45.60	3.84	1.14	25.40	3.24	1.29
PTLGX6		43.72	1.96	0.58	24.20	2.04	0.81
RHZU29		41.67	-0.09	-0.03	22.93	0.77	0.31
RL6RWF		40.49	-1.27	-0.38	21.96	-0.20	-0.08
T8YNM2		40.93	-0.83	-0.25	22.45	0.30	0.12
TG72MM		39.86	-1.91	-0.56	19.87	-2.29	-0.91
U8VYYZ	*	51.31	9.54	2.83	28.33	6.17	2.46
UXQVA6		42.66	0.90	0.27	21.37	-0.78	-0.31
VBBRPT		45.23	3.47	1.03	24.01	1.85	0.74
VC2L3J		43.75	1.99	0.59	25.20	3.04	1.21
XZ97K7		41.64	-0.12	-0.04	21.14	-1.01	-0.40
ZUTCH7		40.95	-0.81	-0.24	20.65	-1.51	-0.60
ZVZHBF		34.35	-7.42	-2.20	17.99	-4.17	-1.66

Summary Statistics		
	Sample SA05	Sample SA06
Grand Means	41.764 psi	22.156 psi
SD Btwn Labs	3.376 psi	2.508 psi
Statistics based on 28 of 29 reporting participants		

**Comments on assigned Data Flags for Test #305**

2CVKGH (X) - Data for Sample SA05 are high.

# TAPPI-CTS Interlaboratory Testing Program

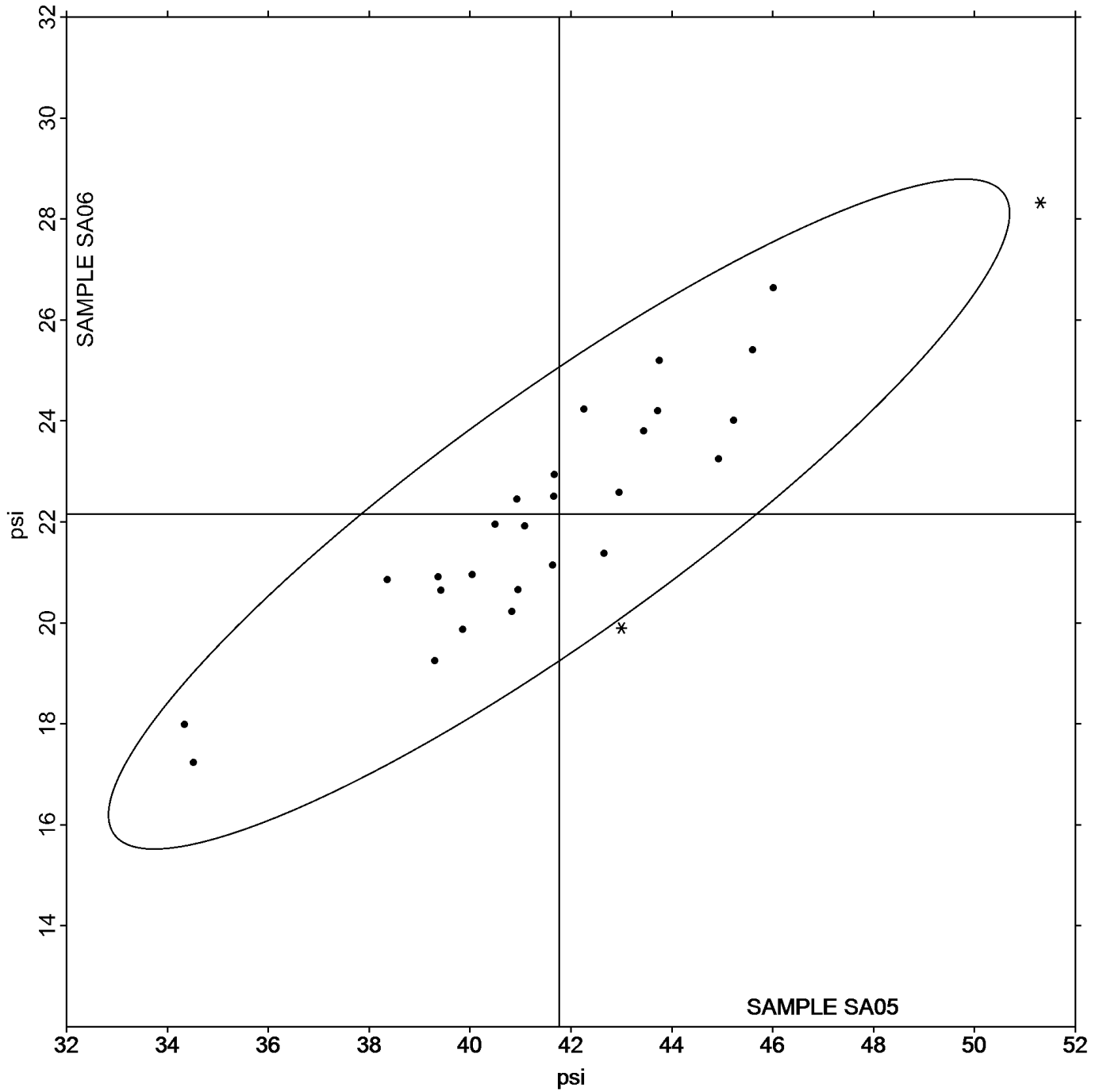
## Analysis 305

### Bursting Strength - Printing Papers

Grand Mean Sample **SA05** = 41.764 psi

Grand Mean Sample **SA06** = 22.156 psi

#### ANALYSIS 305



**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 310**  
**Bursting Strength - Packaging Papers**

WebCode	Data Flag	Sample SB05			Sample SB06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3AGGT8		66.49	0.91	0.44	44.86	2.00	0.85
3MBLJB	X	58.00	-7.58	-3.70	47.70	4.84	2.04
3Q23DX		66.93	1.35	0.66	40.57	-2.29	-0.97
3X7WF7		64.57	-1.01	-0.49	44.96	2.10	0.89
49FX9G	X	58.98	-6.60	-3.22	59.40	16.54	6.98
4HJJ9J		63.65	-1.93	-0.94	42.80	-0.06	-0.02
4LLHQ4	*	71.10	5.52	2.70	43.30	0.44	0.19
634VGZ		65.56	-0.01	-0.01	45.80	2.94	1.24
642MQ7		66.66	1.08	0.53	44.53	1.67	0.70
68V8AB		67.30	1.72	0.84	44.30	1.44	0.61
9CCZX8		62.82	-2.76	-1.35	41.05	-1.81	-0.76
9KU7UD		65.54	-0.03	-0.02	41.66	-1.20	-0.51
A2UFEB		65.73	0.16	0.08	40.80	-2.06	-0.87
BUPZ4T		66.48	0.90	0.44	42.12	-0.74	-0.31
DGXRBP		65.90	0.32	0.16	43.50	0.64	0.27
DJNV4W		67.93	2.36	1.15	42.58	-0.28	-0.12
H62XNN		64.46	-1.12	-0.54	40.25	-2.61	-1.10
LGRZ6T		65.11	-0.46	-0.23	44.84	1.98	0.84
LXBPRM		61.51	-4.06	-1.98	41.02	-1.84	-0.78
LZ2TKU	X	72.22	6.64	3.24	50.04	7.18	3.03
NPTXGF		67.40	1.82	0.89	40.70	-2.16	-0.91
PRRDLW		64.30	-1.28	-0.62	43.40	0.54	0.23
Q4RUXQ		67.40	1.82	0.89	43.20	0.34	0.14
RDJLFU		65.54	-0.04	-0.02	47.20	4.34	1.83
TQCL94		62.33	-3.25	-1.58	40.63	-2.23	-0.94
V7HPNE		65.70	0.12	0.06	46.80	3.94	1.66
WQEBEQ		62.85	-2.73	-1.33	36.70	-6.16	-2.60
XPGGFK		66.13	0.55	0.27	43.88	1.02	0.43

	Sample SB05	Summary Statistics	Sample SB06
Grand Means	65.575 psi		42.857 psi
SD Btwn Labs	2.048 psi		2.371 psi
Statistics based on 25 of 28 reporting participants			

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

3MBLJB (X) - Data for Sample SB05 are low. Inconsistent in testing within determinations for Sample SB05.

49FX9G (X) - Extreme data.

LZ2TKU (X) - Data for both samples are high.

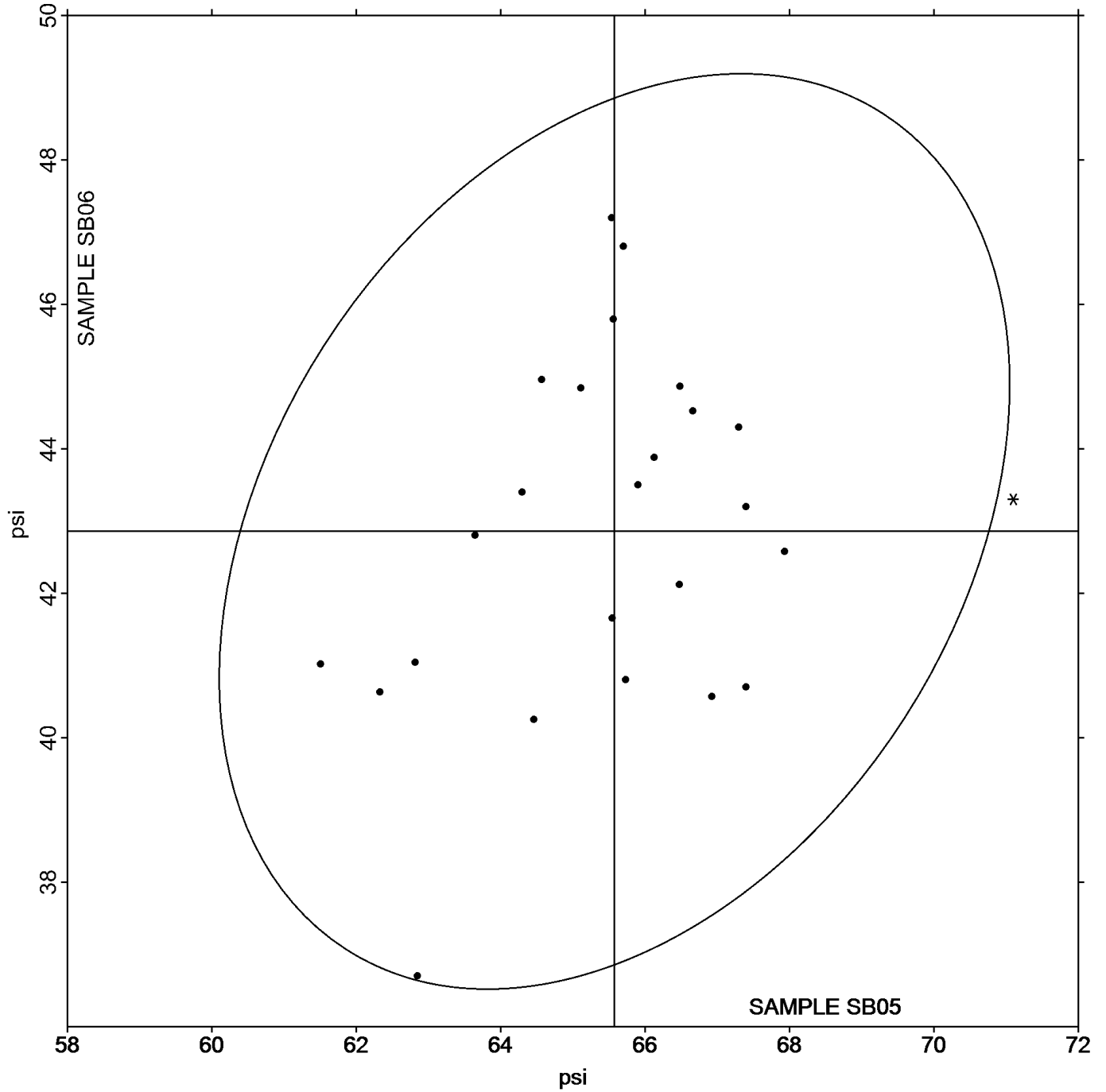


TAPPI-CTS Interlaboratory Testing Program  
Analysis 310  
Bursting Strength - Packaging Papers

Grand Mean Sample **SB05** = 65.575 psi

Grand Mean Sample **SB06** = 42.857 psi

**ANALYSIS 310**



TAPPI-CTS Interlaboratory Testing Program  
 Analysis 311  
 Tearing Strength - Newsprint

WebCode	Data Flag	Sample SK05			Sample SK06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
BEZMQR	X	32.07	10.85	13.46	32.29	12.76	16.52
BUPZ4T		21.13	-0.09	-0.11	19.43	-0.11	-0.15
NVKGZ4		21.85	0.63	0.78	19.91	0.37	0.48
UXQVA6		19.80	-1.42	-1.76	18.65	-0.89	-1.15
V9P3C9	X	30.53	9.31	11.55	31.48	11.94	15.46
VBBRPT		21.51	0.29	0.36	20.02	0.48	0.62
YU4PXH		20.99	-0.23	-0.29	18.66	-0.88	-1.13
ZR2FRR		22.05	0.83	1.03	20.56	1.02	1.32

Sample SK05		Summary Statistics	Sample SK06	
Grand Means	21.221 Grams		19.538 Grams	
SD Btwn Labs	0.806 Grams		0.772 Grams	
Statistics based on 6 of 8 reporting participants				

**Comments on assigned Data Flags for Test #311**

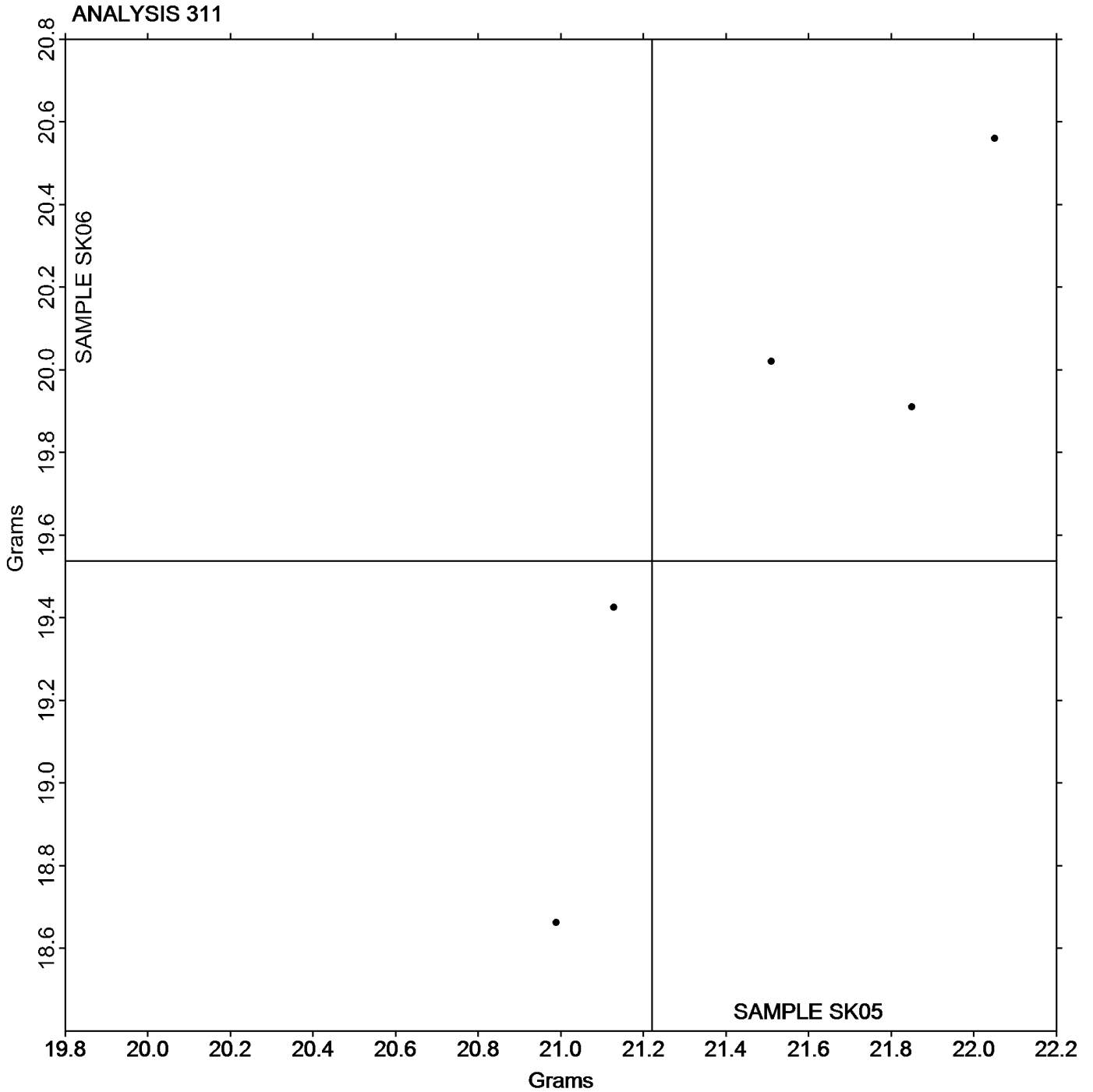
BEZMQR (X) - Extreme data.

V9P3C9 (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program  
Analysis 311  
Tearing Strength - Newsprint

Grand Mean Sample **SK05** = 21.221 Grams

Grand Mean Sample **SK06** = 19.538 Grams



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

TAPPI-CTS Interlaboratory Testing Program  
Analysis 312  
Tearing Strength - Printing Papers

WebCode	Data Flag	Sample SC05			Sample SC06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2CVKGH		73.42	-9.15	-1.60	63.76	-5.14	-1.18
3AGGT8		73.04	-9.53	-1.67	65.51	-3.40	-0.78
3MBLJB	X	71.60	-10.97	-1.92	34.20	-34.70	-7.97
3Q23DX		85.49	2.92	0.51	69.63	0.72	0.17
3WLQPA	X	209.42	126.85	22.19	172.90	104.00	23.88
476MA8	X	16.50	-66.07	-11.56	15.70	-53.20	-12.22
49FX9G		85.82	3.25	0.57	70.33	1.43	0.33
4A9BRH		73.40	-9.17	-1.60	60.50	-8.40	-1.93
4HJJ9J		85.96	3.39	0.59	70.86	1.96	0.45
4NP9UX		89.25	6.68	1.17	72.26	3.35	0.77
4QQHHK	*	74.60	-7.97	-1.39	58.64	-10.26	-2.36
4WNEP6		86.08	3.51	0.61	70.38	1.48	0.34
634VGZ		79.76	-2.81	-0.49	67.92	-0.98	-0.23
642MQ7		73.37	-9.20	-1.61	62.65	-6.25	-1.44
8A2LE2	X	89.66	7.09	1.24	85.02	16.12	3.70
8CMKEH		75.68	-6.89	-1.21	63.82	-5.08	-1.17
8YV2RY		90.05	7.48	1.31	73.57	4.67	1.07
97BMZN		81.18	-1.39	-0.24	66.84	-2.06	-0.47
9BT27N	X	96.72	14.15	2.48	72.86	3.96	0.91
9FXLN9		77.10	-5.47	-0.96	63.70	-5.20	-1.20
9H838J		78.34	-4.23	-0.74	66.38	-2.52	-0.58
9KU7UD		90.65	8.08	1.41	73.27	4.36	1.00
9TPPCD	*	78.96	-3.61	-0.63	71.35	2.45	0.56
A2UFEB		89.84	7.27	1.27	74.25	5.34	1.23
ACTFM9		77.40	-5.17	-0.90	66.20	-2.70	-0.62
ALY3V9		87.80	5.23	0.91	75.70	6.80	1.56
ANBEV4		74.40	-8.17	-1.43	61.20	-7.70	-1.77
BUPZ4T		87.62	5.05	0.88	72.72	3.81	0.88
C33TAN		70.40	-12.17	-2.13	61.60	-7.30	-1.68
D94LGN		83.46	0.89	0.16	69.04	0.14	0.03
DJNV4W		84.23	1.66	0.29	70.36	1.46	0.33
DU8A7Y		87.72	5.15	0.90	74.06	5.16	1.18
DWEK89		85.00	2.43	0.42	69.36	0.46	0.10
HDZUV7		77.60	-4.97	-0.87	64.40	-4.50	-1.03
HJPALY		82.66	0.09	0.02	70.28	1.38	0.32
JRX9RT		79.25	-3.32	-0.58	66.60	-2.31	-0.53
JYGCYV		89.94	7.37	1.29	74.74	5.84	1.34
KJY9NK		76.26	-6.31	-1.10	63.08	-5.82	-1.34
KZ9UBG		77.10	-5.47	-0.96	63.60	-5.30	-1.22
LXBPRM		81.14	-1.43	-0.25	69.37	0.47	0.11
LZ2TKU	X	41.60	-40.97	-7.17	35.30	-33.60	-7.72
NM8MM		86.94	4.37	0.76	69.34	0.44	0.10
NN46M4		88.63	6.06	1.06	73.16	4.26	0.98

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 312**  
**Tearing Strength - Printing Papers**

WebCode	Data Flag	Sample SC05			Sample SC06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
NUPX2N		87.95	5.38	0.94	73.23	4.33	0.99
P87UCZ		84.56	1.99	0.35	68.20	-0.70	-0.16
PLPXXF		86.43	3.86	0.68	71.82	2.92	0.67
PTLGX6		84.30	1.73	0.30	71.30	2.40	0.55
RHZU29		88.62	6.05	1.06	72.92	4.02	0.92
RL6RWF		91.00	8.43	1.47	74.40	5.50	1.26
T8YNM2		80.63	-1.94	-0.34	64.22	-4.68	-1.08
TG72MM		91.35	8.78	1.54	76.13	7.23	1.66
TQCL94		80.40	-2.17	-0.38	68.42	-0.48	-0.11
U8VYYZ	*	78.32	-4.25	-0.74	71.07	2.16	0.50
V9D7CN		85.80	3.23	0.56	71.20	2.30	0.53
WKTEUA		75.47	-7.10	-1.24	62.80	-6.10	-1.40
WQEBEQ		82.86	0.29	0.05	70.10	1.20	0.27
WWBC36		80.19	-2.38	-0.42	67.98	-0.92	-0.21
XZ97K7		87.93	5.36	0.94	73.27	4.37	1.00
YE2628		85.12	2.55	0.45	70.71	1.81	0.41
ZVZHBF		88.34	5.77	1.01	72.68	3.78	0.87

	Sample SC05	Summary Statistics	Sample SC06
Grand Means	82.571 Grams		68.905 Grams
SD Btwn Labs	5.716 Grams		4.354 Grams
Statistics based on 54 of 60 reporting participants			

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

3MBLJB (X) - Extreme data for Sample SC06.

3WLQPA (X) - Extreme data.

476MA8 (X) - Extreme data.

8A2LE2 (X) - Data for Sample SC06 are high. Inconsistent in testing within determinations for Sample SC06.

9BT27N (X) - Inconsistent in testing between samples.

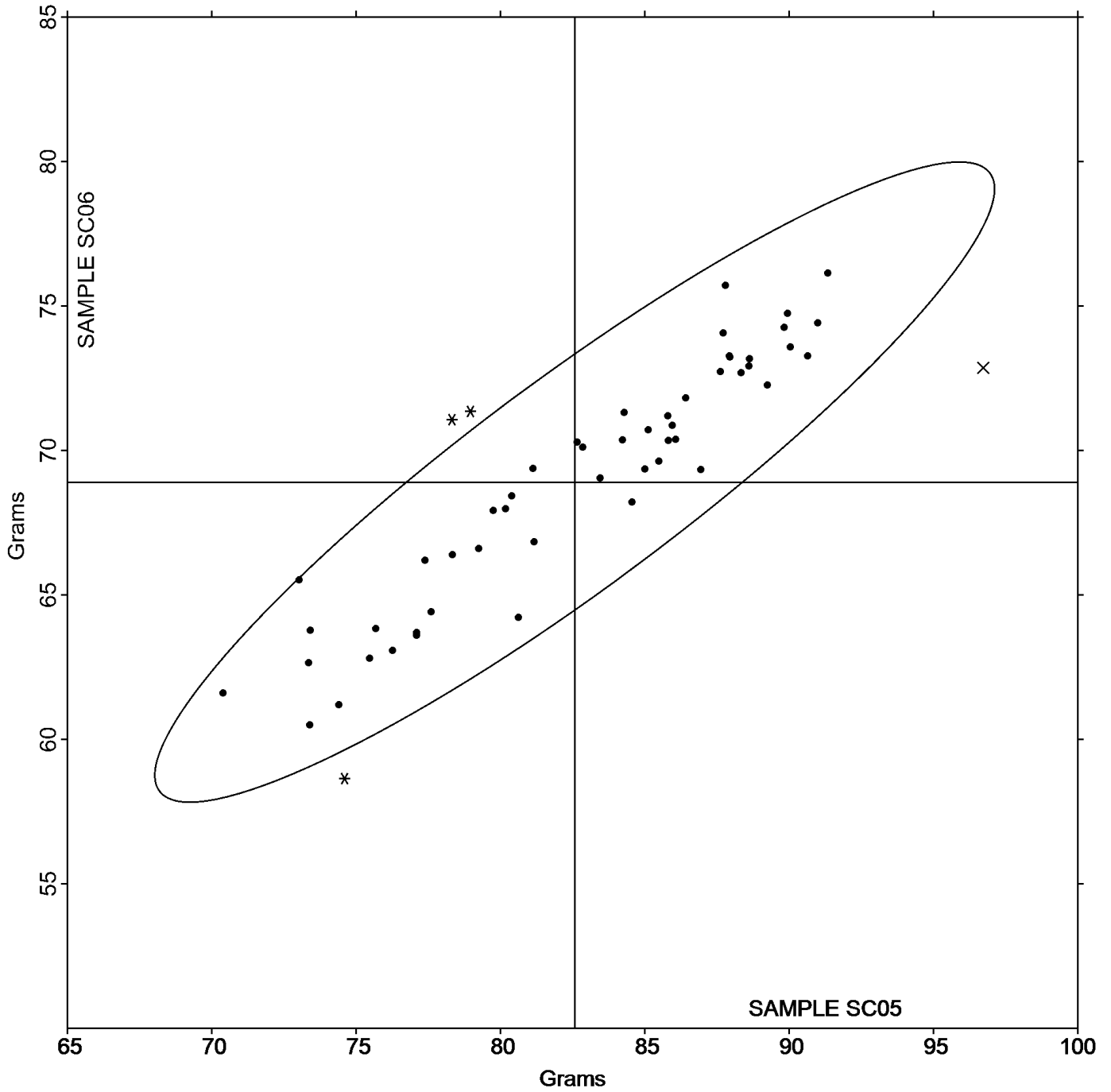
LZ2TKU (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program  
Analysis 312  
Tearing Strength - Printing Papers

Grand Mean Sample **SC05** = 82.571 Grams

Grand Mean Sample **SC06** = 68.905 Grams

**ANALYSIS 312**



## TAPPI-CTS Interlaboratory Testing Program

## Analysis 314

## Tearing Strength - Packaging Papers

WebCode	Data Flag	Sample SD05			Sample SD06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3DGH2G		136.0	-12.4	-1.05	172.5	-9.4	-0.56
3LLURJ		144.9	-3.5	-0.30	162.3	-19.6	-1.17
3MBLJB	X	31.7	-116.7	-9.87	36.2	-145.8	-8.68
3X7WF7		133.8	-14.6	-1.24	162.6	-19.4	-1.15
4LLHQ4		152.0	3.6	0.30	196.4	14.4	0.86
4TYQR6		141.5	-6.9	-0.59	162.3	-19.7	-1.17
7M9AVB		146.2	-2.2	-0.19	188.8	6.8	0.41
8GCQQD		148.9	0.5	0.04	201.5	19.5	1.16
9CCZX8	*	178.5	30.1	2.54	215.5	33.5	2.00
AR44V3		167.6	19.2	1.62	207.4	25.4	1.52
BUPZ4T		152.6	4.2	0.35	186.1	4.1	0.25
CR2HMY		149.8	1.4	0.12	189.3	7.3	0.44
D94LGN		142.4	-6.0	-0.51	175.6	-6.3	-0.38
DGXRBP		134.4	-14.0	-1.19	172.0	-10.0	-0.59
DVDUUY		152.0	3.5	0.30	174.1	-7.9	-0.47
H62XNN	X	36.6	-111.9	-9.46	49.0	-133.0	-7.92
JUL7XU		132.2	-16.2	-1.37	160.3	-21.6	-1.29
K6F436		142.9	-5.6	-0.47	182.7	0.7	0.04
KH763Q		159.7	11.3	0.95	193.9	12.0	0.71
LGRZ6T		151.1	2.6	0.22	189.7	7.8	0.46
LRE2K3		137.2	-11.2	-0.95	159.6	-22.4	-1.33
NEDGUL	X	39.9	-108.6	-9.18	48.8	-133.2	-7.93
PRRDLW		129.6	-18.8	-1.59	162.0	-20.0	-1.19
Q4RUXQ		121.4	-27.1	-2.29	147.7	-34.2	-2.04
RDJLFU		161.8	13.4	1.13	199.7	17.8	1.06
UU6XYE	X	32.4	-116.0	-9.81	39.1	-142.9	-8.51
V4QTXZ		144.5	-4.0	-0.34	164.5	-17.4	-1.04
V7HPNE		144.7	-3.7	-0.32	180.3	-1.7	-0.10
VC2L3J		167.4	19.0	1.60	215.0	33.0	1.97
VGJ96A		147.1	-1.3	-0.11	172.6	-9.4	-0.56
VZNE7H		146.8	-1.6	-0.14	183.2	1.2	0.07
XUWN2Y		155.6	7.2	0.61	184.3	2.4	0.14
YHC264		147.4	-1.0	-0.09	171.6	-10.4	-0.62
YJTPQA		151.5	3.1	0.26	189.9	7.9	0.47
YU4PXH		148.3	-0.2	-0.02	178.7	-3.2	-0.19
ZF6ZJW		166.7	18.3	1.54	206.4	24.5	1.46
ZRMUJB		161.2	12.8	1.08	199.0	17.1	1.02
ZTBW3Y		149.4	1.0	0.08	184.9	3.0	0.18
ZUTCH7		148.4	0.0	0.00	176.0	-6.0	-0.35

## TAPPI-CTS Interlaboratory Testing Program

## Analysis 314

## Tearing Strength - Packaging Papers

	Sample SD05	Summary Statistics	Sample SD06
Grand Means	148.44 Grams		181.96 Grams
SD Btwn Labs	11.83 Grams		16.79 Grams
Statistics based on 35 of 39 reporting participants			

**Comments on assigned Data Flags for Test #314**

3MBLJB (X) - Extreme data.

H62XNN (X) - Extreme data.

NEDGUL (X) - Extreme data.

UU6XYE (X) - Extreme data.



# TAPPI-CTS Interlaboratory Testing Program

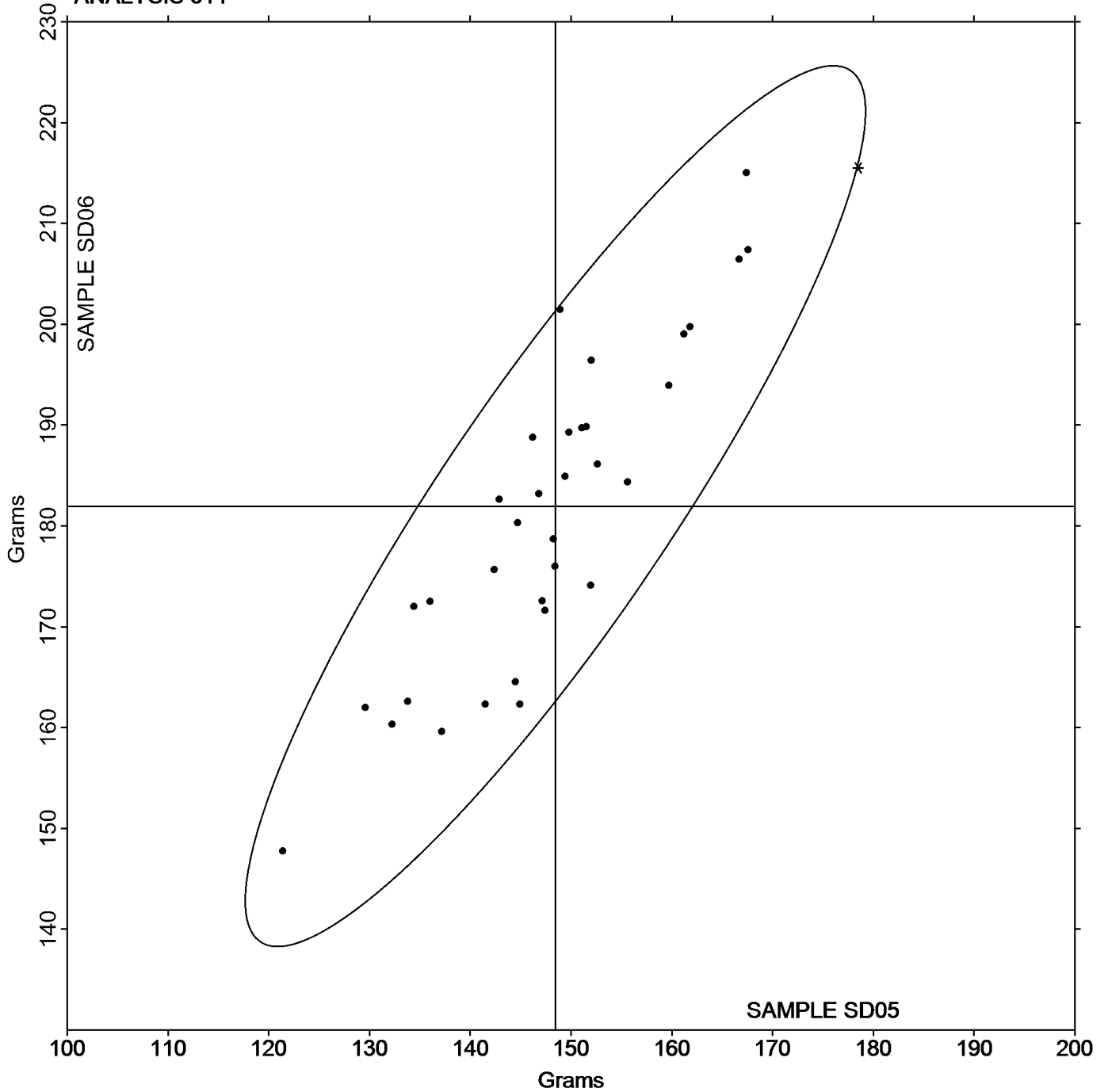
## Analysis 314

### Tearing Strength - Packaging Papers

Grand Mean Sample **SD05** = 148.44 Grams

Grand Mean Sample **SD06** = 181.96 Grams

#### ANALYSIS 314



TAPPI-CTS Interlaboratory Testing Program  
 Analysis 320  
 Tensile Breaking Strength - Newsprint

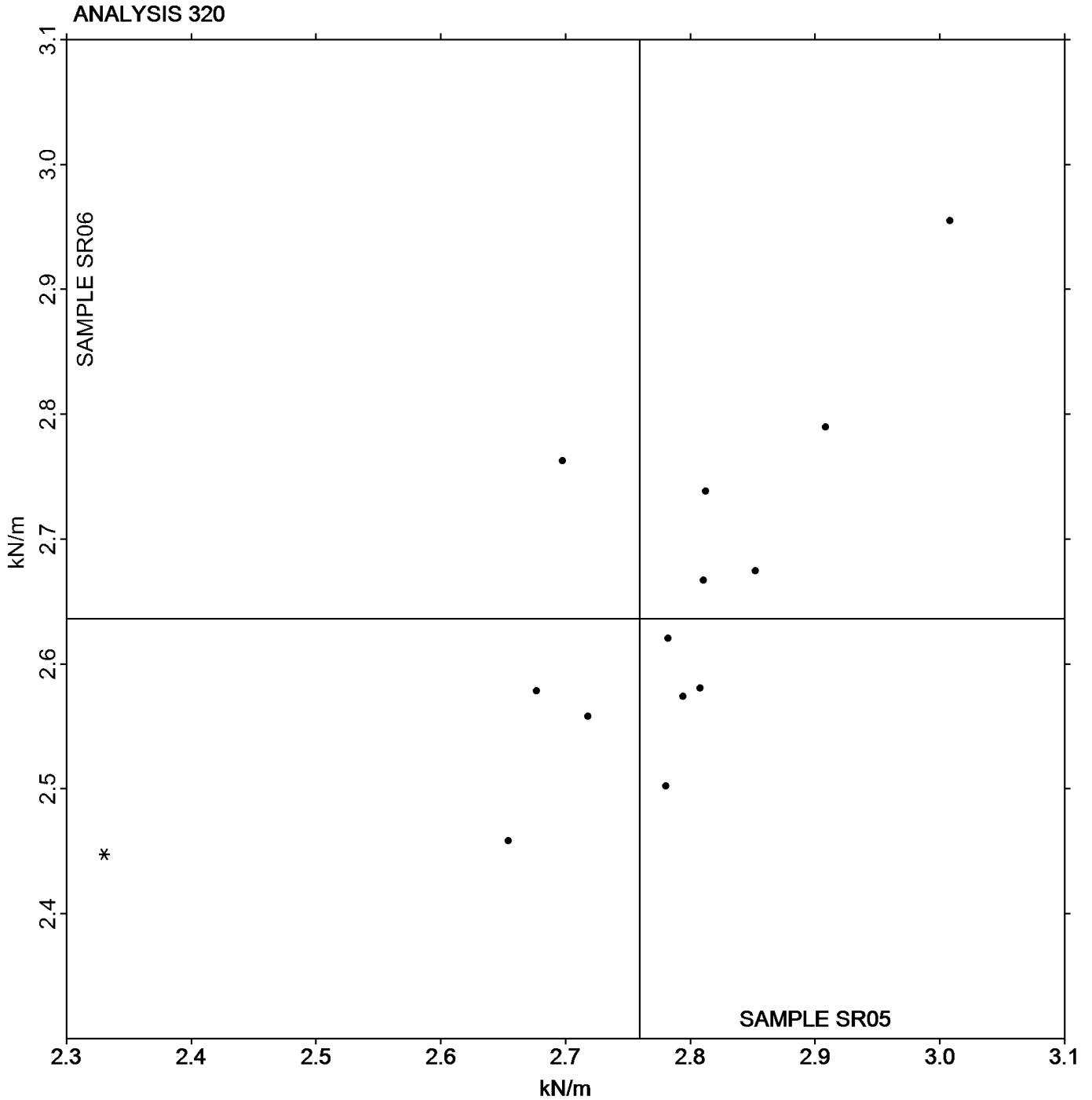
WebCode	Data Flag	Sample SR05			Sample SR06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
642MQ7		2.718	-0.041	-0.27	2.558	-0.078	-0.56
BEZMQR		2.781	0.021	0.14	2.502	-0.134	-0.96
FBD7WU		2.812	0.053	0.34	2.739	0.102	0.73
NM8MM		2.677	-0.083	-0.53	2.578	-0.058	-0.41
NPTXGF		2.808	0.048	0.31	2.580	-0.056	-0.40
NVKGZ4		2.794	0.035	0.22	2.574	-0.062	-0.44
PTLGX6		2.810	0.051	0.33	2.667	0.031	0.22
QDBTMP		3.008	0.249	1.61	2.955	0.319	2.27
UXQVA6		2.852	0.093	0.60	2.675	0.038	0.27
V9P3C9		2.782	0.023	0.15	2.620	-0.016	-0.11
VBBRPT		2.697	-0.062	-0.40	2.763	0.127	0.90
YKLTDJ		2.654	-0.105	-0.68	2.458	-0.178	-1.27
YU4PXH		2.908	0.149	0.96	2.790	0.153	1.09
ZR2FRR	*	2.330	-0.429	-2.78	2.448	-0.189	-1.34

		Summary Statistics	
	Sample SR05		Sample SR06
Grand Means	2.7594 kN/m		2.6362 kN/m
SD Btwn Labs	0.1545 kN/m		0.1403 kN/m
Statistics based on 14 of 14 reporting participants			

TAPPI-CTS Interlaboratory Testing Program  
Analysis 320  
Tensile Breaking Strength - Newsprint

Grand Mean Sample **SR05** = 2.7594 kN/m

Grand Mean Sample **SR06** = 2.6362 kN/m



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

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 321**  
**Tensile Energy Absorption - Newsprint**

WebCode	Data Flag	Sample SR05			Sample SR06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
642MQ7		16.72	-0.34	-0.33	14.83	-1.56	-0.93
BEZMQR		16.24	-0.82	-0.79	14.09	-2.29	-1.36
FBD7WU		15.62	-1.44	-1.39	15.21	-1.17	-0.70
NM8MM		17.39	0.32	0.31	17.02	0.64	0.38
NPTXGF		18.26	1.20	1.15	16.59	0.21	0.12
NVKGZ4		17.70	0.64	0.61	15.54	-0.85	-0.50
QDBTMP		17.78	0.71	0.68	19.77	3.38	2.01
UXQVA6	X	24.88	7.82	7.52	22.24	5.86	3.48
V9P3C9		15.91	-1.15	-1.11	14.83	-1.56	-0.92
VBBRPT		15.76	-1.31	-1.26	18.10	1.72	1.02
YKLTDJ		18.05	0.99	0.95	16.87	0.49	0.29
YU4PXH		18.27	1.21	1.16	17.39	1.00	0.60

		Summary Statistics			
		Sample SR05		Sample SR06	
Grand Means		17.065	Joules/sq m	16.385	Joules/sq m
SD Btwn Labs		1.039	Joules/sq m	1.682	Joules/sq m
Statistics based on 11 of 12 reporting participants					

**Comments on assigned Data Flags for Test #321**

UXQVA6 (X) - Extreme data.

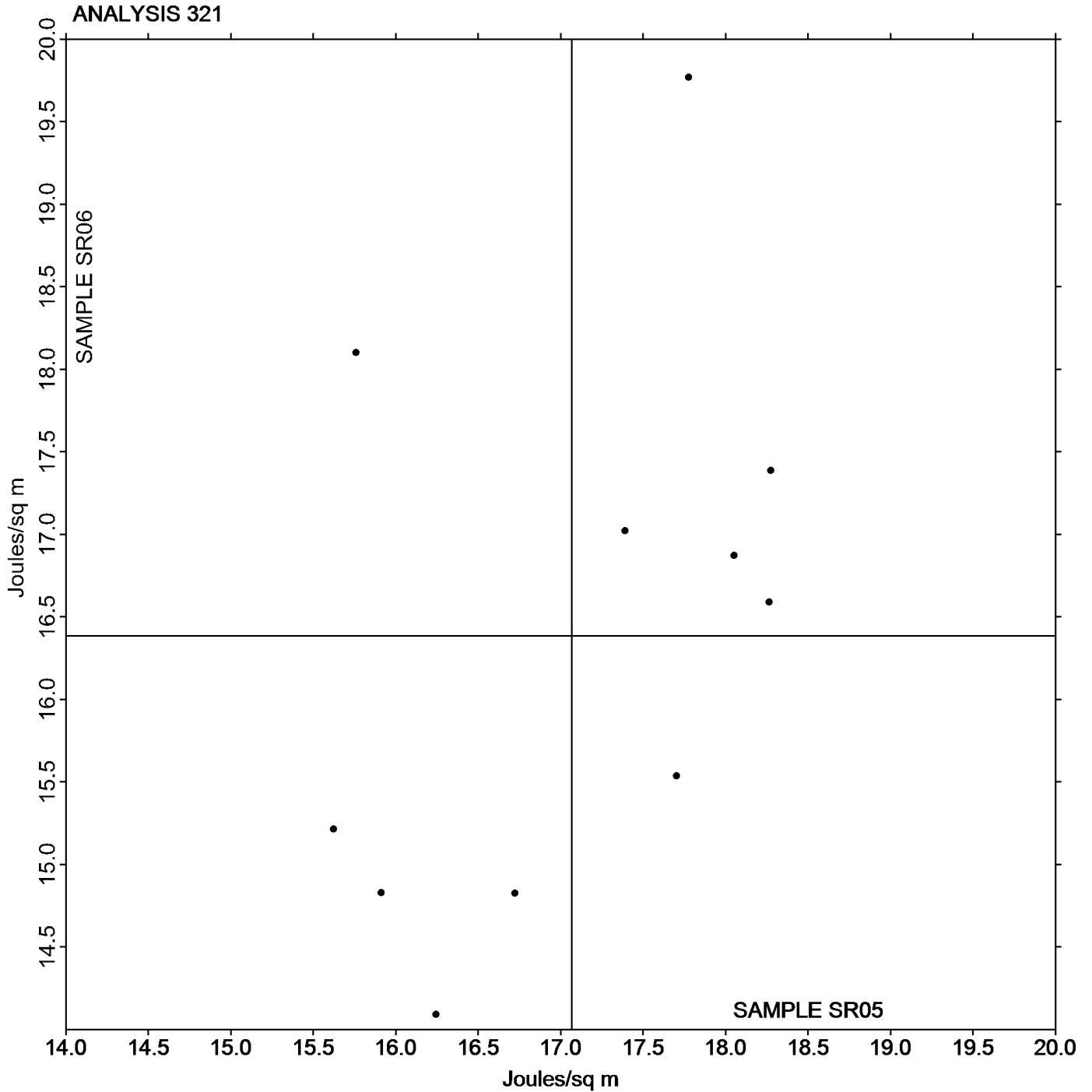
# TAPPI-CTS Interlaboratory Testing Program

## Analysis 321

### Tensile Energy Absorption - Newsprint

Grand Mean Sample **SR05** = 17.065 Joules/sq m

Grand Mean Sample **SR06** = 16.385 Joules/sq m



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

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 322**  
**Elongation to Break - Newsprint**

WebCode	Data Flag	Sample SR05			Sample SR06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
642MQ7		1.039	-0.069	-0.59	0.979	-0.155	-1.01
FBD7WU		1.227	0.118	1.00	1.286	0.152	0.99
NM8MM		1.113	0.004	0.04	1.122	-0.012	-0.08
NPTXGF		1.092	-0.016	-0.14	1.078	-0.056	-0.37
NVKGZ4		1.057	-0.051	-0.43	1.001	-0.133	-0.87
PTLGX6		1.100	-0.008	-0.07	1.160	0.026	0.17
QDBTMP		0.966	-0.142	-1.20	1.085	-0.049	-0.32
UXQVA6	X	1.755	0.647	5.47	1.727	0.593	3.87
V9P3C9		0.950	-0.158	-1.34	0.940	-0.194	-1.27
VBBRPT		1.231	0.123	1.04	1.336	0.202	1.32
YKLTDJ		1.346	0.238	2.01	1.418	0.284	1.86
YU4PXH		1.072	-0.036	-0.31	1.070	-0.064	-0.42

		Summary Statistics			
		Sample SR05		Sample SR06	
Grand Means		1.1084	Percent	1.1341	Percent
SD Btwn Labs		0.1183	Percent	0.1531	Percent
Statistics based on 11 of 12 reporting participants					

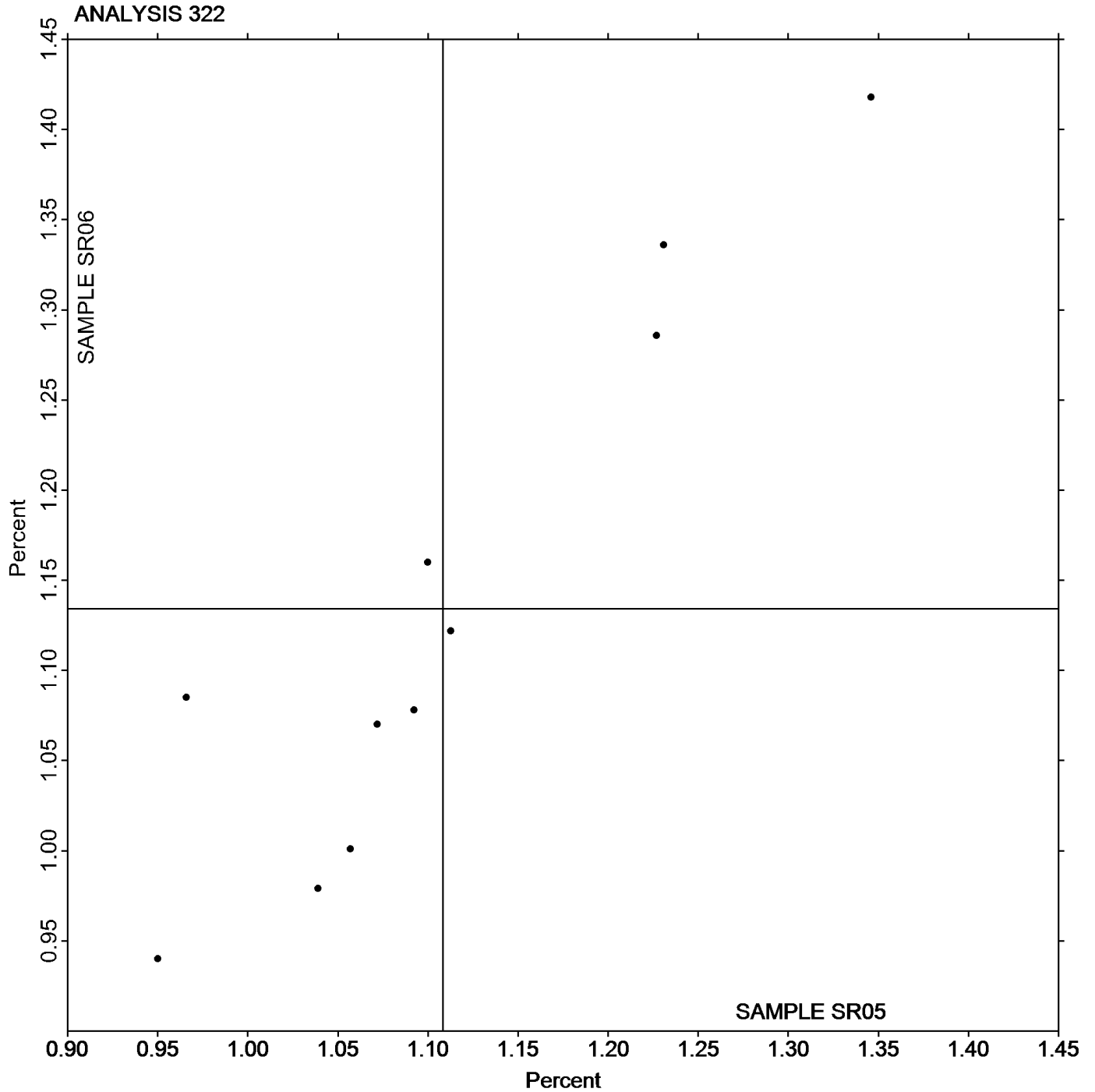
**Comments on assigned Data Flags for Test #322**

UXQVA6 (X) - Data for both samples are high.

TAPPI-CTS Interlaboratory Testing Program  
Analysis 322  
Elongation to Break - Newsprint

Grand Mean Sample **SR05** = 1.1084 Percent

Grand Mean Sample **SR06** = 1.1341 Percent



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

TAPPI-CTS Interlaboratory Testing Program  
Analysis 325  
Tensile Breaking Strength - Printing Papers

WebCode	Data Flag	Sample SF05			Sample SF06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2CVKGH		7.114	0.313	0.67	4.312	0.160	0.55	TO
3AGGT8		6.221	-0.580	-1.25	3.799	-0.353	-1.21	XX
3QDMLT		6.537	-0.264	-0.57	3.764	-0.388	-1.33	RE
3X7WF7		6.682	-0.119	-0.26	4.182	0.030	0.10	IM
4NP9UX		6.611	-0.190	-0.41	3.998	-0.154	-0.53	LI
4QQHHK	*	7.950	1.150	2.48	4.990	0.838	2.88	LH
4WNEP6		6.228	-0.573	-1.24	3.788	-0.364	-1.25	LH
642MQ7		6.283	-0.518	-1.12	4.013	-0.139	-0.48	LH
7KGD6W		6.816	0.015	0.03	4.337	0.185	0.64	TB
8A2LE2		7.411	0.611	1.32	4.538	0.386	1.32	TJ
8CMKEH		7.079	0.278	0.60	4.187	0.035	0.12	TI
8YV2RY		6.322	-0.478	-1.03	3.889	-0.263	-0.90	IM
97BMZN		7.537	0.736	1.59	4.522	0.370	1.27	TB
9BT27N		6.467	-0.333	-0.72	3.715	-0.437	-1.50	LH
9H838J		7.320	0.520	1.12	4.369	0.217	0.74	MR
9KU7UD		6.911	0.110	0.24	4.130	-0.022	-0.08	LI
9TPPCD		7.338	0.538	1.16	4.285	0.133	0.46	TP
A2UFEB		6.311	-0.490	-1.06	3.913	-0.239	-0.82	LI
ACTFM9		6.270	-0.531	-1.14	4.027	-0.125	-0.43	TF
ANBEV4		6.884	0.084	0.18	4.099	-0.053	-0.18	TC
BGLB6C		7.684	0.884	1.91	4.785	0.633	2.17	TJ
BUPZ4T		6.511	-0.290	-0.62	3.989	-0.163	-0.56	LH
DJNV4W	X	6.635	-0.166	-0.36	3.970	-0.182	-0.63	XX
DP8PW3		6.671	-0.130	-0.28	4.254	0.102	0.35	TP
DU8A7Y		6.320	-0.481	-1.04	3.719	-0.433	-1.49	ID
DWEK89		6.515	-0.285	-0.62	4.037	-0.115	-0.39	TB
HJPALY		6.493	-0.308	-0.66	3.947	-0.205	-0.70	BU
JRX9RT		7.532	0.731	1.58	4.470	0.318	1.09	LX
JYGCYV		6.487	-0.314	-0.68	3.653	-0.499	-1.71	SP
KJY9NK		7.738	0.937	2.02	4.839	0.687	2.36	TJ
KZ9UBG		7.172	0.372	0.80	4.423	0.271	0.93	TO
LXBPRM		6.852	0.051	0.11	4.120	-0.032	-0.11	LH
LZ2TKU		6.494	-0.307	-0.66	4.001	-0.151	-0.52	DL
NN46M4		6.374	-0.426	-0.92	3.912	-0.240	-0.83	IM
NRNTN4		7.420	0.619	1.34	4.434	0.282	0.97	TB
NUPX2N		6.807	0.006	0.01	4.225	0.073	0.25	LI
P87UCZ		6.444	-0.356	-0.77	4.105	-0.047	-0.16	LH
PLPXXF		6.936	0.136	0.29	4.215	0.063	0.22	LH
QAAVTN		6.385	-0.415	-0.90	4.180	0.028	0.10	LA
RHZU29		6.742	-0.059	-0.13	3.951	-0.201	-0.69	LH
RL6RWF		6.413	-0.387	-0.83	3.883	-0.269	-0.92	IK
T8YNM2		6.657	-0.144	-0.31	3.795	-0.357	-1.23	XX
TG72MM		6.798	-0.003	-0.01	4.355	0.203	0.70	LH



**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 325**  
**Tensile Breaking Strength - Printing Papers**

WebCode	Data Flag	Sample SF05			Sample SF06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
TQCL94		6.833	0.033	0.07	3.988	-0.164	-0.56	TA
U8VYYZ		5.893	-0.908	-1.96	3.876	-0.276	-0.95	LA
UP7HLK		7.706	0.906	1.95	4.660	0.508	1.74	XX
V9D7CN		7.105	0.305	0.66	4.199	0.047	0.16	LH
WQEBEQ		6.569	-0.231	-0.50	4.175	0.023	0.08	TP
WWBC36		6.732	-0.069	-0.15	4.253	0.101	0.35	LA
XPGGFK		6.556	-0.245	-0.53	4.057	-0.095	-0.33	TB
XZ97K7		7.074	0.273	0.59	4.233	0.081	0.28	LH
YE2628		6.584	-0.217	-0.47	4.165	0.013	0.04	LE
ZVZHBF		6.842	0.041	0.09	4.150	-0.002	-0.01	TO

Summary Statistics			
	Sample SF05		Sample SF06
Grand Means	6.8006 kN/m		4.1520 kN/m
SD Btwn Labs	0.4639 kN/m		0.2911 kN/m
Statistics based on 52 of 53 reporting participants			

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

DJNV4W (X) - Data appears to be transposed between Analysis #325 and Analysis #327. Data switched by CTS.

**Instrument Code List**

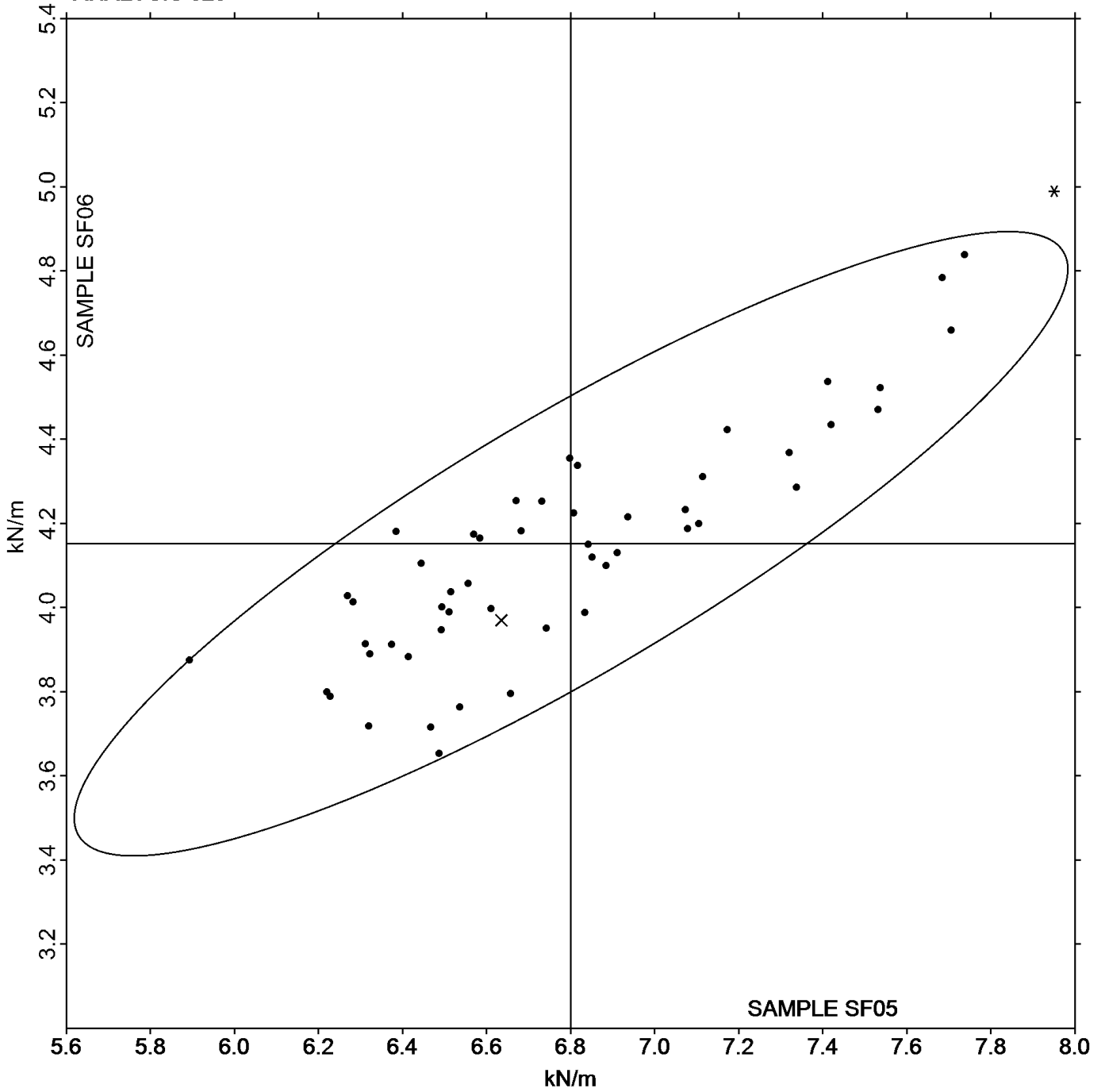
- |   |  |
|---|--|
| (BU) - Buchel                             | (DL) - EMIC DL500 Universal Testing Machines       |
| (ID) - Instron 4201/4202                  | (IK) - Instron 4400 Series                         |
| (IM) - Instron 5500 Series                | (LA) - L & W Tensile - Autoline 300                |
| (LE) - L & W Tensile Tester 066           | (LH) - L & W Alwetron TH1 (Horizontal) SE 060/065F |
| (LI) - L & W Tensile Tester SE 062        | (LX) - L & W (model not specified)                 |
| (MR) - MTS Alliance RT series             | (RE) - Regmed                                      |
| (SP) - Schopper Type Tensile Tester (TMI) | (TA) - Testometric AX                              |
| (TB) - Thwing-Albert EJA/1000             | (TC) - Thwing-Albert Electro-Hydraulic, Model 30LT |
| (TF) - Thwing-Albert EJA Vantage-1        | (TI) - Thwing-Albert QC II                         |
| (TJ) - Thwing-Albert QC II-XS             | (TO) - Thwing-Albert QC-1000                       |
| (TP) - TMI Monitor/Tensile 100 (84-21-01) | (XX) - Instrument make/model not specified by lab  |

TAPPI-CTS Interlaboratory Testing Program  
Analysis 325  
Tensile Breaking Strength - Printing Papers

Grand Mean Sample SF05 = 6.8006 kN/m

Grand Mean Sample SF06 = 4.1520 kN/m

ANALYSIS 325



## TAPPI-CTS Interlaboratory Testing Program

## Analysis 327

## Tensile Energy Absorption - Printing Papers

WebCode	Data Flag	Sample SF05			Sample SF06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2CVKGH	*	121.28	22.61	2.36	45.82	9.62	2.85	TO
3AGGT8		89.49	-9.18	-0.96	33.92	-2.29	-0.68	XX
3QDMLT		101.31	2.64	0.28	34.39	-1.82	-0.54	RE
3X7WF7		100.48	1.82	0.19	38.12	1.91	0.57	IM
4NP9UX		99.13	0.46	0.05	37.42	1.21	0.36	LI
4QQHHK		97.94	-0.73	-0.08	38.11	1.90	0.56	LH
4WNEP6		92.38	-6.28	-0.66	36.95	0.74	0.22	LH
642MQ7		88.98	-9.68	-1.01	34.19	-2.02	-0.60	LH
7KGD6W		102.19	3.53	0.37	36.41	0.20	0.06	TB
8CMKEH		102.30	3.64	0.38	36.48	0.28	0.08	TI
8YV2RY		106.07	7.40	0.77	36.18	-0.03	-0.01	IM
97BMZN	*	118.17	19.51	2.04	38.64	2.43	0.72	TB
9BT27N		84.58	-14.09	-1.47	34.13	-2.08	-0.62	LH
9H838J		102.03	3.37	0.35	34.80	-1.41	-0.42	MR
9KU7UD		100.60	1.94	0.20	34.51	-1.70	-0.50	LI
A2UFEB		93.11	-5.55	-0.58	32.92	-3.29	-0.98	LI
BGLB6C		82.95	-15.71	-1.64	31.04	-5.17	-1.53	TJ
BUPZ4T		96.25	-2.41	-0.25	34.71	-1.50	-0.44	LH
DJNV4W	X	95.80	-2.86	-0.30	33.06	-3.15	-0.93	XX
DU8A7Y		97.84	-0.82	-0.09	33.66	-2.55	-0.76	ID
DWEK89		104.24	5.57	0.58	37.07	0.87	0.26	TB
HJPALY		99.45	0.79	0.08	38.23	2.02	0.60	BU
JRX9RT		100.49	1.83	0.19	36.07	-0.14	-0.04	LX
KZ9UBG		99.92	1.25	0.13	36.50	0.29	0.09	TO
LXBPRM		105.32	6.65	0.69	38.18	1.97	0.58	LH
LZ2TKU		105.27	6.61	0.69	36.56	0.35	0.10	DL
NN46M4		103.78	5.11	0.53	37.29	1.08	0.32	IM
NRNTN4		95.71	-2.95	-0.31	33.08	-3.12	-0.93	TB
NUPX2N		95.67	-2.99	-0.31	35.34	-0.87	-0.26	LI
P87UCZ		89.55	-9.11	-0.95	35.71	-0.50	-0.15	LH
PLPXXF		95.09	-3.57	-0.37	34.68	-1.53	-0.45	LH
RHZU29		96.05	-2.61	-0.27	34.67	-1.54	-0.46	LH
RL6RWF		98.94	0.28	0.03	38.46	2.26	0.67	IK
T8YNM2		102.23	3.56	0.37	35.80	-0.41	-0.12	XX
TG72MM		99.20	0.53	0.06	39.72	3.51	1.04	LH
U8VYYZ		77.20	-21.46	-2.24	29.93	-6.28	-1.86	LA
WQEBEQ	*	73.80	-24.86	-2.60	27.16	-9.05	-2.69	TP
WWBC36	*	99.15	0.49	0.05	41.25	5.04	1.49	LA
XPGGFK		108.27	9.61	1.00	40.18	3.97	1.18	TB
XZ97K7		100.98	2.31	0.24	35.99	-0.22	-0.06	LH
ZVZHBF		119.17	20.51	2.14	44.04	7.84	2.33	TF

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 327**  
**Tensile Energy Absorption - Printing Papers**

	Summary Statistics	
	Sample SF05	Sample SF06
Grand Means	98.664 Joules/sq m	36.208 Joules/sq m
SD Btwn Labs	9.581 Joules/sq m	3.370 Joules/sq m
Statistics based on 40 of 41 reporting participants		

**Comments on assigned Data Flags for Test #327**

DJNV4W (X) - Data appears to be transposed between Analysis #327 and Analysis #325. Data switched by CTS.

**Analysis Notes:**

7KGD6W - Data appear to be reported as kg-m/sq m, not J/sq m as indicated on datasheet. Units corrected by CTS.

9H838J - Data appear to be reported as inch-lb/sq inch, not J/sq m as indicated on datasheet. Units corrected by CTS.

BGLB6C - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

XPGGFK - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

**Instrument Code List**

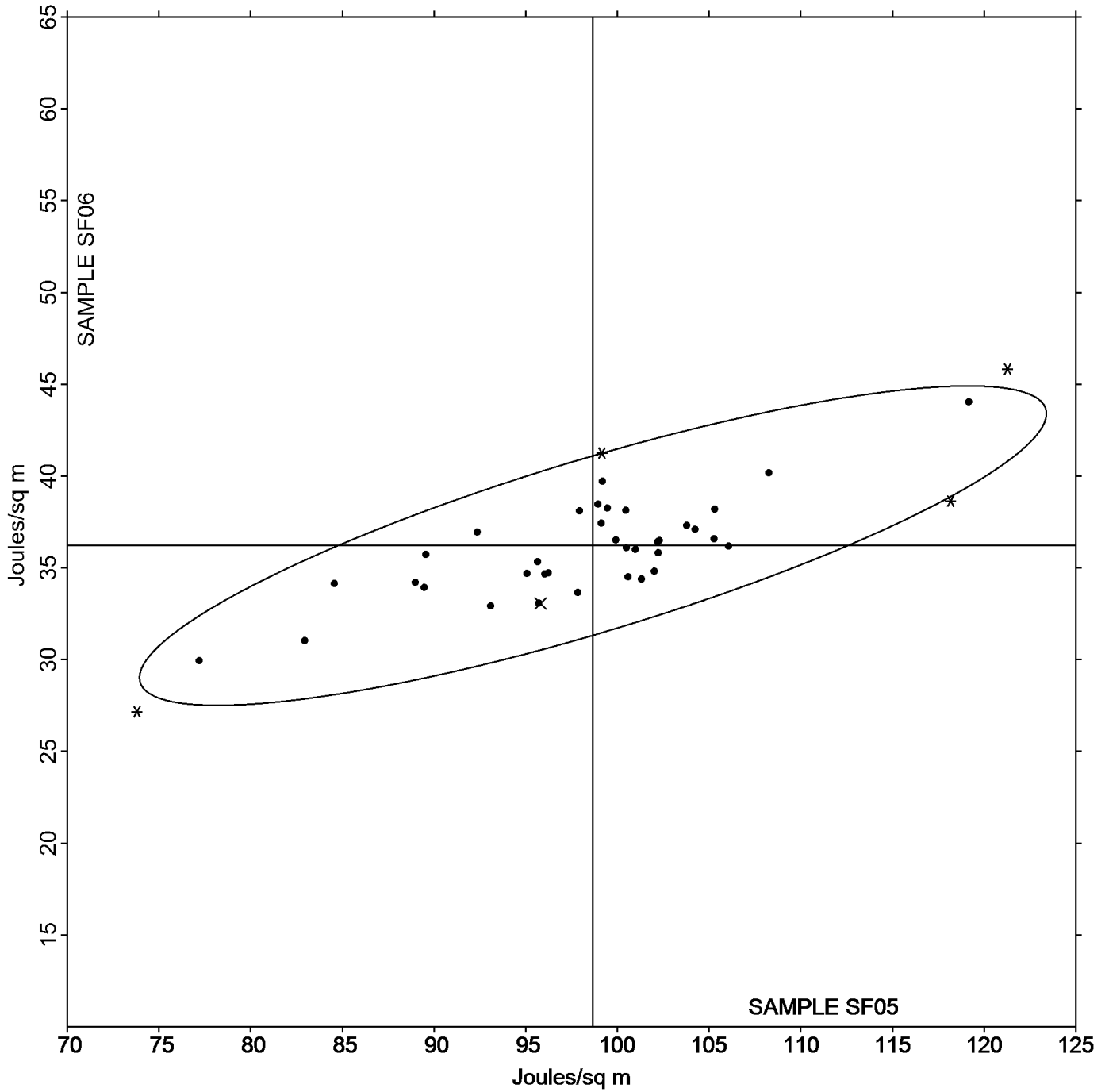
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| (BU) - Buchel<br>(ID) - Instron 4201<br>(IM) - Instron 5500 Series<br>(LH) - L & W Alwetron TH1 (Horizontal) SE 060<br>(LX) - L & W (model not specified)<br>(RE) - Regmed<br>(TF) - Thwing-Albert EJA Vantage-1<br>(TJ) - Thwing-Albert QC II-XS<br>(TP) - TMI Monitor/Tensile 100 (84-21-01) | (DL) - EMIC DL500 Universal Testing Machines<br>(IK) - Instron 4400 Series<br>(LA) - L & W Tensile - Autoline 300<br>(LI) - L & W Tensile Tester SE 062<br>(MR) - MTS Alliance RT series<br>(TB) - Thwing-Albert EJA/1000<br>(TI) - Thwing-Albert QC II<br>(TO) - Thwing-Albert QC-1000<br>(XX) - Instrument make/model not specified by lab |
|--|--|

TAPPI-CTS Interlaboratory Testing Program  
Analysis 327  
Tensile Energy Absorption - Printing Papers

Grand Mean Sample **SF05** = 98.664 Joules/sq m

Grand Mean Sample **SF06** = 36.208 Joules/sq m

**ANALYSIS 327**



## TAPPI-CTS Interlaboratory Testing Program

## Analysis 328

## Elongation to Break - Printing Papers

WebCode	Data Flag	Sample SF05			Sample SF06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2CVKGH	X	2.963	0.752	3.54	1.980	0.603	5.27	TO
3AGGT8		2.228	0.017	0.08	1.449	0.072	0.63	XX
3QDMLT		2.412	0.201	0.95	1.405	0.028	0.25	RE
3X7WF7		2.250	0.039	0.18	1.418	0.041	0.36	IM
4NP9UX		2.223	0.012	0.06	1.424	0.047	0.41	LI
4QQHHK		1.856	-0.355	-1.67	1.219	-0.158	-1.37	LH
4WNEP6		2.239	0.028	0.13	1.496	0.119	1.04	LH
642MQ7		2.096	-0.115	-0.54	1.310	-0.067	-0.58	LH
7KGD6W		2.248	0.037	0.18	1.346	-0.030	-0.27	TB
8CMKEH		2.211	0.000	0.00	1.394	0.017	0.15	TI
8YV2RY		2.516	0.306	1.44	1.445	0.069	0.60	IM
97BMZN		2.332	0.122	0.57	1.329	-0.048	-0.42	TB
9BT27N		1.901	-0.310	-1.46	1.330	-0.047	-0.41	LH
9H838J		2.137	-0.074	-0.35	1.284	-0.093	-0.81	MR
9KU7UD		2.152	-0.059	-0.28	1.285	-0.092	-0.80	LI
A2UFEB		2.171	-0.040	-0.19	1.289	-0.088	-0.76	LI
ACTFM9		2.090	-0.121	-0.57	1.330	-0.047	-0.41	TF
BGLB6C	*	1.686	-0.525	-2.47	1.081	-0.296	-2.58	TJ
BUPZ4T		2.195	-0.016	-0.07	1.329	-0.048	-0.41	LH
DJNV4W		2.130	-0.081	-0.38	1.281	-0.096	-0.83	XX
DU8A7Y		2.267	0.056	0.27	1.366	-0.010	-0.09	ID
DWEK89		2.439	0.228	1.07	1.463	0.086	0.75	TB
HJPALY		2.333	0.122	0.58	1.536	0.159	1.39	BU
JRX9RT		2.039	-0.172	-0.81	1.277	-0.100	-0.87	LX
KJY9NK	X	2.520	0.309	1.45	1.080	-0.297	-2.59	TJ
KZ9UBG		2.039	-0.172	-0.81	1.236	-0.141	-1.23	TG
LXBPRM		2.262	0.051	0.24	1.410	0.033	0.29	LH
LZ2TKU		2.578	0.367	1.73	1.556	0.179	1.57	DL
NN46M4		2.579	0.368	1.73	1.548	0.171	1.49	XX
NRNTN4	X	50.597	48.386	227.61	32.560	31.183	272.09	TB
NUPX2N	X	2.103	-0.108	-0.51	4.222	2.845	24.83	LI
P87UCZ		2.065	-0.146	-0.69	1.335	-0.042	-0.36	LH
PLPXXF		2.019	-0.192	-0.90	1.273	-0.104	-0.90	LH
RHZU29		2.100	-0.111	-0.52	1.329	-0.048	-0.41	LH
RL6RWF		2.360	0.149	0.70	1.525	0.149	1.30	IK
T8YNM2		2.372	0.161	0.76	1.476	0.099	0.87	XX
TG72MM		2.139	-0.072	-0.34	1.377	0.000	0.00	LH
U8VYYZ	X	2.451	0.240	1.13	1.709	0.332	2.90	LA
WQEBEQ		2.337	0.126	0.59	1.422	0.045	0.40	TP
WWBC36		1.777	-0.434	-2.04	1.225	-0.152	-1.32	LA
XPGGFK		2.523	0.312	1.47	1.573	0.196	1.71	TB
XZ97K7		2.120	-0.091	-0.43	1.321	-0.056	-0.48	LH
ZVZHBFB		2.586	0.376	1.77	1.617	0.241	2.10	TO

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 328**  
**Elongation to Break - Printing Papers**

	Summary Statistics	
	Sample SF05	Sample SF06
Grand Means	2.2108 Percent	1.3765 Percent
SD Btwn Labs	0.2126 Percent	0.1146 Percent
Statistics based on 38 of 43 reporting participants		

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

- 2CVKGH (X) - Data for both samples are high.
- KJY9NK (X) - Inconsistent in testing between samples.
- NRNTN4 (X) - Extreme data.
- NUPX2N (X) - Extreme data for Sample SF06.
- U8VYYZ (X) - Data for Sample SF06 are high. Inconsistent in testing within the determinations for both samples.

**Instrument Code List**

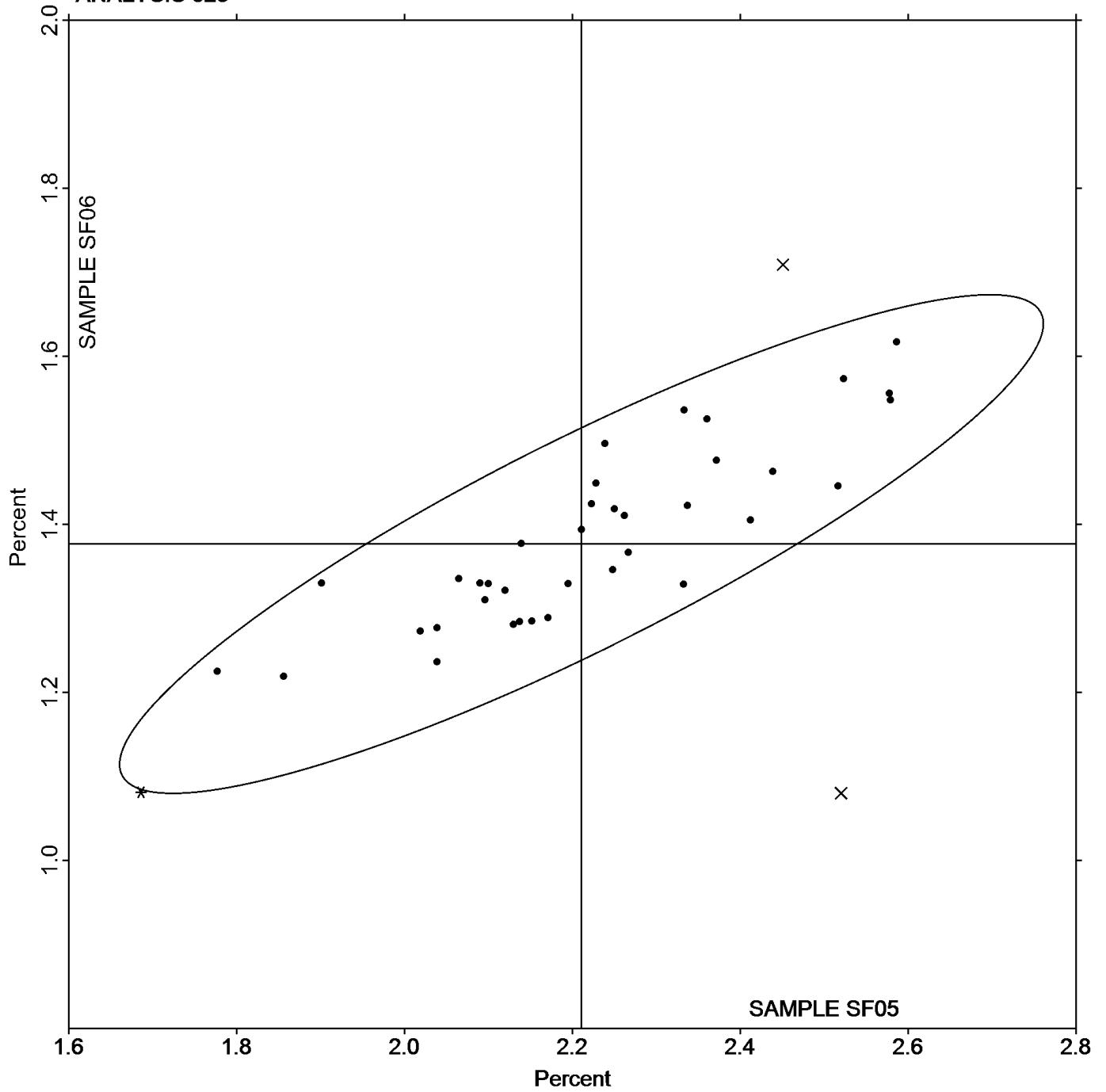
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| <ul style="list-style-type: none"> <li>(BU) - Buchel</li> <li>(ID) - Instron 4201</li> <li>(IM) - Instron 5500</li> <li>(LH) - L &amp; W Alwetron TH1 (Horizontal) SE 060</li> <li>(LX) - L &amp; W (model not specified)</li> <li>(RE) - Regmed</li> <li>(TF) - Thwing-Albert EJA Vantage-1</li> <li>(TI) - Thwing-Albert QC II</li> <li>(TO) - Thwing-Albert QC-1000</li> <li>(XX) - Instrument make/model not specified by lab</li> </ul> | <ul style="list-style-type: none"> <li>(DL) - EMIC DL500 Universal Testing Machines</li> <li>(IK) - Instron 4400 Series</li> <li>(LA) - L &amp; W Tensile - Autoline 300</li> <li>(LI) - L &amp; W Tensile Tester SE 062</li> <li>(MR) - MTS Alliance RT series</li> <li>(TB) - Thwing-Albert EJA/1000</li> <li>(TG) - Thwing-Albert QC</li> <li>(TJ) - Thwing-Albert QC II-XS</li> <li>(TP) - TMI Monitor/Tensile 100 (84-21-01)</li> </ul> |
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TAPPI-CTS Interlaboratory Testing Program  
Analysis 328  
Elongation to Break - Printing Papers

Grand Mean Sample **SF05** = 2.2108 Percent

Grand Mean Sample **SF06** = 1.3765 Percent

**ANALYSIS 328**





TAPPI-CTS Interlaboratory Testing Program  
Analysis 330  
Tensile Breaking Strength - Packaging Papers

WebCode	Data Flag	Sample SE05			Sample SE06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2BPTXH		12.38	1.49	2.27	9.944	0.999	1.69	TA
3DGH2G		11.48	0.59	0.90	9.268	0.324	0.55	TO
3E266J		11.00	0.11	0.16	9.075	0.131	0.22	TB
3MBLJB		11.15	0.26	0.40	8.986	0.041	0.07	IF
3Q23DX		10.64	-0.25	-0.38	8.707	-0.237	-0.40	LE
49FX9G		10.72	-0.17	-0.27	8.564	-0.381	-0.65	IK
4FDQEP		10.37	-0.52	-0.79	8.466	-0.478	-0.81	LW
4TYQR6		11.64	0.75	1.15	9.275	0.330	0.56	IM
8GCQQD		11.06	0.17	0.26	8.959	0.015	0.02	LA
9CCZX8		9.90	-0.99	-1.52	8.000	-0.944	-1.60	TP
AEMF7J		10.24	-0.66	-1.00	8.759	-0.186	-0.31	LA
AR44V3	*	9.97	-0.93	-1.42	9.030	0.086	0.15	TH
BUPZ4T		10.27	-0.62	-0.95	8.376	-0.568	-0.96	LH
CR2HMY		9.45	-1.44	-2.20	8.117	-0.827	-1.40	TK
D94LGN	*	10.68	-0.21	-0.32	7.928	-1.016	-1.72	TB
DGXRBP		10.81	-0.08	-0.12	8.832	-0.113	-0.19	LW
FT77EZ		10.10	-0.79	-1.21	8.259	-0.685	-1.16	IM
K6F436	*	12.23	1.34	2.05	10.672	1.727	2.93	LA
KH763Q		10.58	-0.31	-0.47	8.550	-0.395	-0.67	TH
LGRZ6T		10.75	-0.14	-0.21	8.844	-0.100	-0.17	LH
LRE2K3		11.26	0.37	0.57	9.033	0.089	0.15	LW
PKCPV2		11.21	0.32	0.49	9.142	0.197	0.33	TO
PRRDLW		11.96	1.07	1.63	9.898	0.954	1.62	IK
Q4RUXQ		10.75	-0.14	-0.21	8.805	-0.139	-0.24	IK
Q92B6T		11.09	0.20	0.30	8.983	0.039	0.07	LE
U64PNT		10.93	0.04	0.06	9.189	0.245	0.42	TH
V4QTXZ		11.59	0.70	1.08	9.698	0.754	1.28	LH
VC2L3J		10.99	0.10	0.15	8.894	-0.051	-0.09	TH
VGJ96A		11.77	0.88	1.35	9.907	0.962	1.63	TP
VZNE7H		10.59	-0.30	-0.47	8.339	-0.605	-1.03	SP
WQEBEQ		10.35	-0.54	-0.83	8.819	-0.125	-0.21	TO
XUWN2Y		11.22	0.33	0.51	9.422	0.478	0.81	TP
YHC264		11.45	0.56	0.85	9.407	0.463	0.78	TO
YJTPQA		10.29	-0.60	-0.92	8.232	-0.713	-1.21	XX
ZF6ZJW		10.58	-0.31	-0.47	8.889	-0.055	-0.09	ID
ZRMUJB		10.63	-0.26	-0.40	8.732	-0.213	-0.36	LW
ZTBW3Y	X	9.20	-1.69	-2.59	10.963	2.019	3.42	IF
ZUTCH7	X	9.86	-1.03	-1.58	9.369	0.425	0.72	TK

TAPPI-CTS Interlaboratory Testing Program  
Analysis 330  
Tensile Breaking Strength - Packaging Papers

	Sample SE05	Summary Statistics	Sample SE06
Grand Means	10.891 kN/m		8.9444 kN/m
SD Btwn Labs	0.653 kN/m		0.5900 kN/m
Statistics based on 36 of 38 reporting participants			

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

ZTBW3Y (X) - Data for Sample SE06 are high. Inconsistent in testing within determinations for Sample SE05.

ZUTCH7 (X) - Inconsistent in testing between samples and within the determinations for Sample SE05.

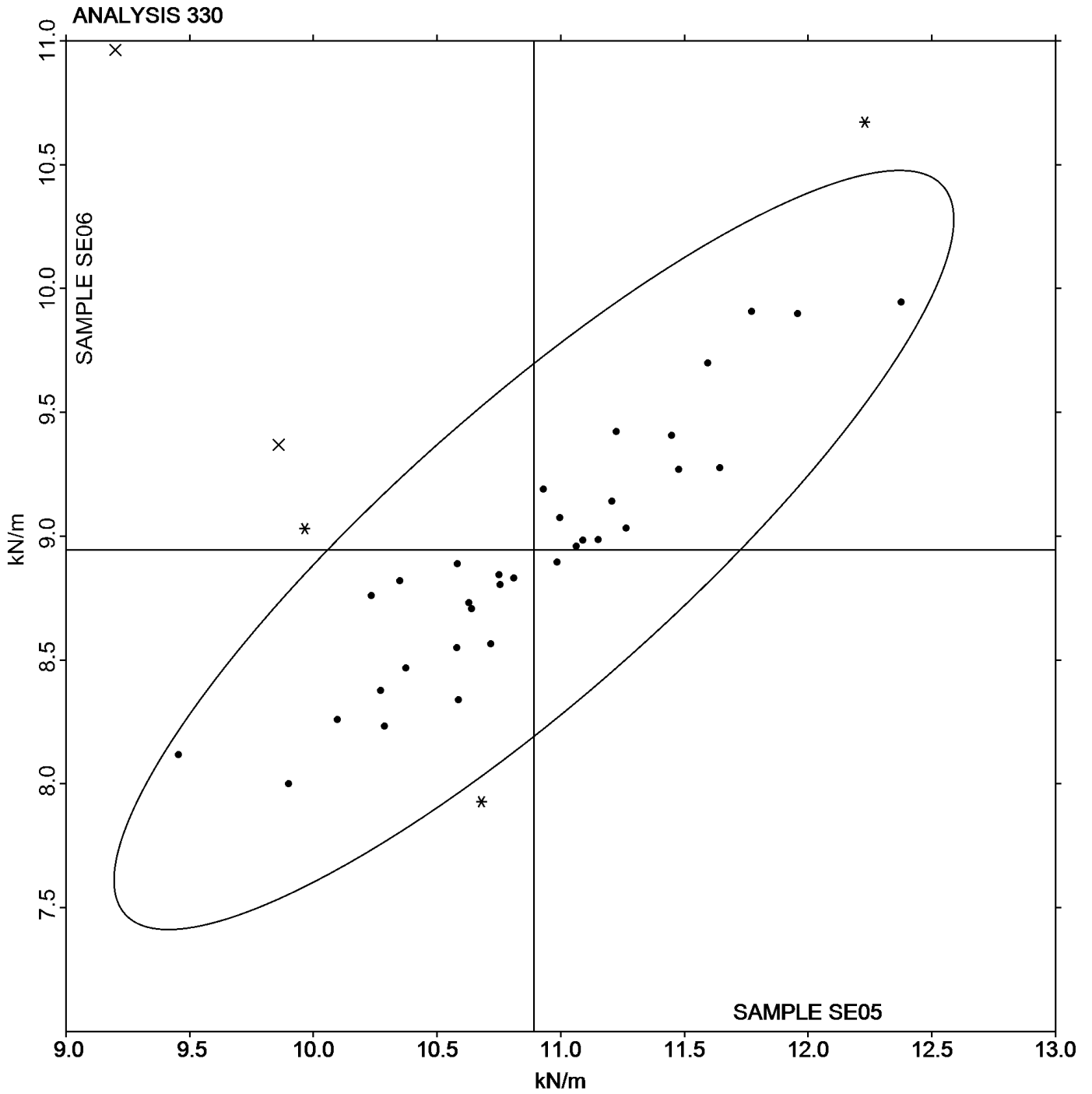
**Instrument Code List**

(ID) - Instron 4201	(IF) - Instron 3340 Series
(IK) - Instron 4400 Series	(IM) - Instron 5500 Series
(LA) - L & W Autoline	(LE) - L & W Tensile Tester 066
(LH) - L & W Alwetron TH1 (Horizontal) SE 060	(LW) - L & W Tensile Tester SE062
(SP) - Schopper Type Tensile Tester (TMI)	(TA) - Thwing-Albert Tensile Tester
(TB) - Thwing-Albert EJA/1000	(TH) - Thwing-Albert QC-3A
(TK) - Thwing-Albert Model 37-4	(TO) - Thwing-Albert QC-1000
(TP) - TMI Monitor/Tensile 100 (84-21-01)	(XX) - Instrument make/model not specified by lab

TAPPI-CTS Interlaboratory Testing Program  
Analysis 330  
Tensile Breaking Strength - Packaging Papers

Grand Mean Sample **SE05** = 10.891 kN/m

Grand Mean Sample **SE06** = 8.9444 kN/m



TAPPI-CTS Interlaboratory Testing Program  
Analysis 331  
Tensile Energy Absorption - Packaging Papers

WebCode	Data Flag	Sample SE05			Sample SE06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DGH2G		183.9	14.5	0.88	83.73	-0.45	-0.04	TO
3E266J		186.9	17.6	1.07	96.32	12.15	1.22	TB
3MBLJB		210.4	41.1	2.49	106.34	22.17	2.23	IN
49FX9G		184.2	14.8	0.90	79.82	-4.36	-0.44	TH
4TYQR6		176.3	6.9	0.42	82.16	-2.01	-0.20	IM
8GCQQD		148.4	-21.0	-1.27	73.92	-10.26	-1.03	LA
9CCZX8		154.1	-15.3	-0.93	79.40	-4.77	-0.48	TP
AEMF7J		168.3	-1.1	-0.07	91.52	7.35	0.74	LA
AR44V3		168.0	-1.3	-0.08	91.93	7.75	0.78	TH
BUPZ4T		152.8	-16.6	-1.01	71.64	-12.53	-1.26	LH
CR2HMY		141.1	-28.3	-1.72	83.62	-0.55	-0.06	TK
DGXRBP		162.3	-7.1	-0.43	77.35	-6.83	-0.69	LW
FT77EZ		145.4	-24.0	-1.45	72.63	-11.54	-1.16	IM
K6F436	X	167.0	-2.4	-0.15	93.12	8.95	0.90	LA
KH763Q		159.5	-9.9	-0.60	74.72	-9.45	-0.95	TH
LGRZ6T		165.9	-3.4	-0.21	76.91	-7.26	-0.73	LH
LRE2K3		155.0	-14.4	-0.87	70.05	-14.12	-1.42	LW
PKCPV2		181.8	12.5	0.76	90.19	6.02	0.60	XX
PRRDLW		164.8	-4.6	-0.28	89.53	5.36	0.54	XX
Q4RUXQ		182.1	12.7	0.77	96.81	12.64	1.27	IK
Q92B6T		178.9	9.5	0.58	84.72	0.55	0.05	LE
U64PNT		175.4	6.1	0.37	101.11	16.93	1.70	TH
V4QTXZ		161.6	-7.7	-0.47	75.79	-8.39	-0.84	LH
VC2L3J		186.1	16.7	1.01	90.66	6.48	0.65	TH
VGJ96A	X	116.6	-52.7	-3.20	45.07	-39.11	-3.93	TP
WQEBEQ		165.8	-3.6	-0.22	88.44	4.27	0.43	TO
YHC264		197.9	28.5	1.73	94.90	10.73	1.08	TO
YJTPQA		156.2	-13.2	-0.80	69.74	-14.43	-1.45	XX
ZRMUJB		159.9	-9.4	-0.57	78.73	-5.44	-0.55	LW

Sample SE05		Summary Statistics	Sample SE06	
Grand Means	169.37 Joules/sq m		84.173 Joules/sq m	
SD Btwn Labs	16.47 Joules/sq m		9.958 Joules/sq m	
Statistics based on 27 of 29 reporting participants				

### Comments on assigned Data Flags for Test #331

K6F436 (X) - Data appears to be transposed between Analysis #331 and Analysis #332. Data switched by CTS.

VGJ96A (X) - Data appears to be transposed between Analysis #331 and Analysis #332. Data switched by CTS.

TAPPI-CTS Interlaboratory Testing Program  
Analysis 331  
Tensile Energy Absorption - Packaging Papers

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**Analysis Notes:**

3DGH2G - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

3E266J - Data appear to be reported as ft-lb/sq ft, not inch-lb/sq inch as indicated on datasheet. Units corrected by CTS.

3MBLJB - Data appear to be reported as J/sq m, not kg-m/sq m as indicated on datasheet. Units corrected by CTS.

9CCZX8 - Data appear to be reported as J/sq m, not kg-m/sq m as indicated on datasheet. Units corrected by CTS.

**Instrument Code List**

(IK) - Instron 4400 Series

(IM) - Instron 5500 Series

(IN) - Instron 3360 Series

(LA) - L & W Autoline

(LE) - L & W Tensile Tester 066

(LH) - L & W Alwetron TH1 (Horizontal) SE 060

(LW) - L & W Tensile Tester SE062

(TB) - Thwing-Albert EJA/1000

(TH) - Thwing-Albert QC-3A

(TK) - Thwing-Albert Model 37-4

(TO) - Thwing-Albert QC-1000

(TP) - TMI Monitor/Tensile 100 (84-21-01)

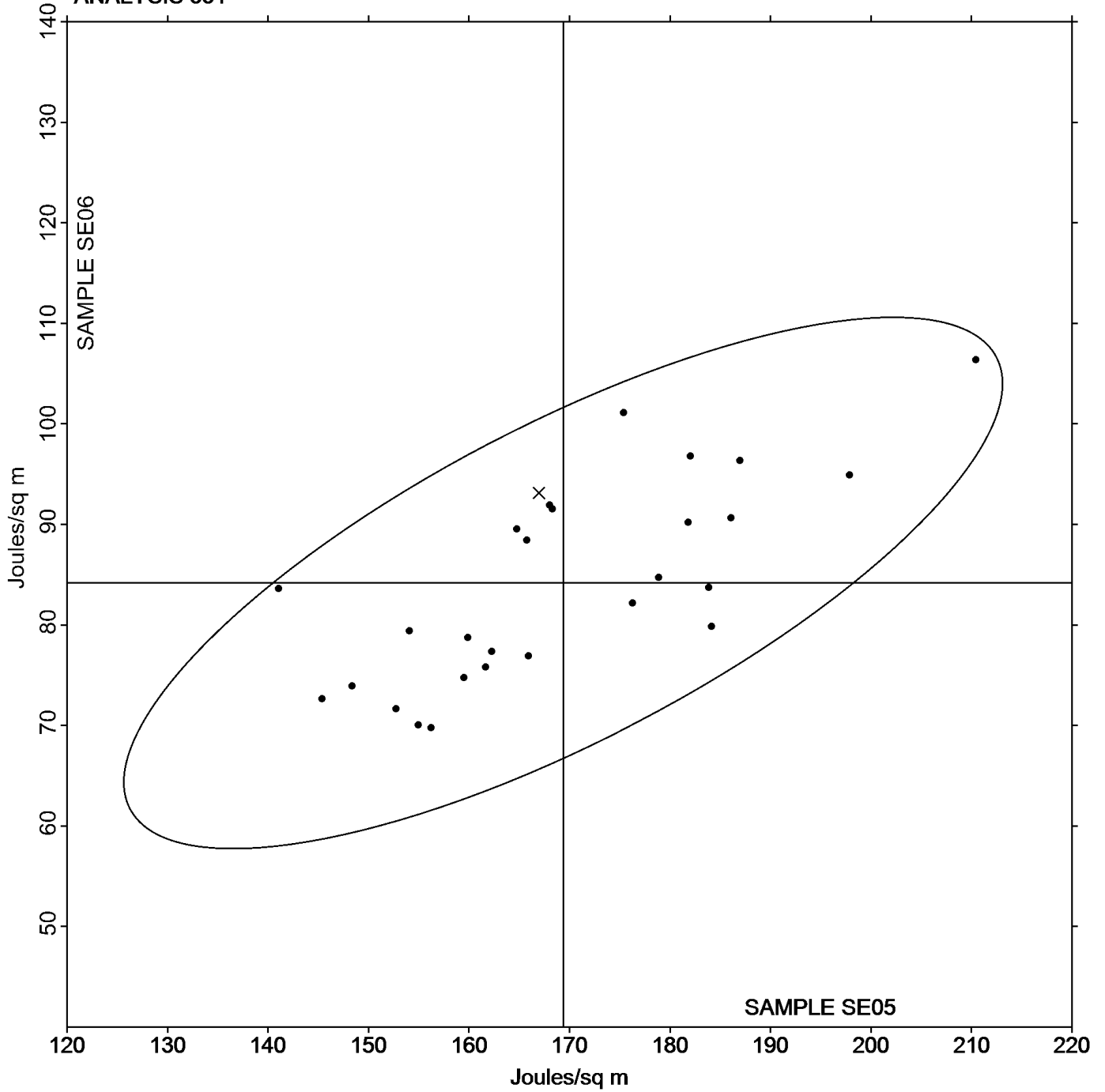
(XX) - Instrument make/model not specified by lab

TAPPI-CTS Interlaboratory Testing Program  
Analysis 331  
Tensile Energy Absorption - Packaging Papers

Grand Mean Sample **SE05** = 169.37 Joules/sq m

Grand Mean Sample **SE06** = 84.173 Joules/sq m

**ANALYSIS 331**



**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 332**  
**Elongation to Break - Packaging Papers**

WebCode	Data Flag	Sample SE05			Sample SE06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3DGH2G		2.408	0.047	0.21	1.476	-0.047	-0.25	TO
3E266J		2.580	0.219	0.98	1.710	0.187	0.98	TB
3MBLJB		2.162	-0.199	-0.90	1.437	-0.086	-0.45	IN
49FX9G		2.627	0.266	1.20	1.575	0.052	0.27	TH
4FDQEP		2.246	-0.115	-0.52	1.395	-0.128	-0.68	LW
4TYQR6		2.415	0.054	0.24	1.482	-0.041	-0.22	IM
8GCQQD		2.187	-0.174	-0.78	1.499	-0.024	-0.13	LA
9CCZX8		2.830	0.469	2.11	1.873	0.350	1.84	TP
AEMF7J		2.033	-0.328	-1.48	1.328	-0.195	-1.03	LA
AR44V3		2.639	0.278	1.25	1.704	0.181	0.95	TH
BUPZ4T		2.182	-0.179	-0.81	1.315	-0.208	-1.10	LH
CR2HMY		2.242	-0.119	-0.54	1.611	0.087	0.46	TK
D94LGN		2.244	-0.117	-0.53	1.254	-0.269	-1.42	TB
DGXRBP		2.200	-0.161	-0.72	1.398	-0.125	-0.66	LW
FT77EZ		2.456	0.095	0.43	1.703	0.180	0.95	IM
K6F436	X	1.991	-0.370	-1.66	1.340	-0.183	-0.97	LA
KH763Q		2.320	-0.041	-0.19	1.440	-0.083	-0.44	TH
LGRZ6T		2.280	-0.081	-0.37	1.360	-0.163	-0.86	XX
LRE2K3		2.070	-0.291	-1.31	1.250	-0.273	-1.44	LW
PKCPV2		2.560	0.199	0.89	1.690	0.167	0.88	XX
PRRDLW		2.030	-0.331	-1.49	1.440	-0.083	-0.44	XX
Q4RUXQ		2.639	0.277	1.25	1.800	0.277	1.46	IK
Q92B6T		2.362	0.001	0.00	1.458	-0.065	-0.34	LE
U64PNT		2.612	0.251	1.13	1.910	0.387	2.04	TH
V4QTXZ		2.064	-0.297	-1.34	1.249	-0.274	-1.45	LH
VC2L3J		2.708	0.347	1.56	1.786	0.263	1.39	TH
VGJ96A	X	2.949	0.588	2.64	1.726	0.203	1.07	TP
WQEBEQ		2.429	0.068	0.30	1.604	0.081	0.43	TO
YHC264		2.636	0.275	1.24	1.704	0.181	0.95	TO
YJTPQA		2.243	-0.118	-0.53	1.320	-0.203	-1.07	XX
ZF6ZJW		2.206	-0.155	-0.70	1.524	0.001	0.00	XX
ZRMUJB		2.226	-0.135	-0.61	1.401	-0.122	-0.64	LW

Sample SE05		Summary Statistics	Sample SE06	
Grand Means	2.3612 Percent		1.5232	Percent
SD Btw Labs	0.2223 Percent		0.1897	Percent
Statistics based on 30 of 32 reporting participants				

TAPPI-CTS Interlaboratory Testing Program  
Analysis 332  
Elongation to Break - Packaging Papers

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

K6F436 (X) - Data appears to be transposed between Analysis #332 and Analysis #331. Data switched by CTS.

VGJ96A (X) - Data appears to be transposed between Analysis #332 and Analysis #331. Data switched by CTS.

**Instrument Code List**

(IK) - Instron 4400 Series

(IM) - Instron 5500 Series

(IN) - Instron 3360 Series

(LA) - L & W Autoline 300

(LE) - L & W Tensile Tester 066

(LH) - L & W Alwetron TH1 (Horizontal) SE 060

(LW) - L & W Tensile Tester SE062

(TB) - Thwing-Albert EJA/1000

(TH) - Thwing-Albert QC-3A

(TK) - Thwing-Albert Model 37-4

(TO) - Thwing-Albert QC-1000

(TP) - TMI Monitor/Tensile 100 (84-21-01)

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

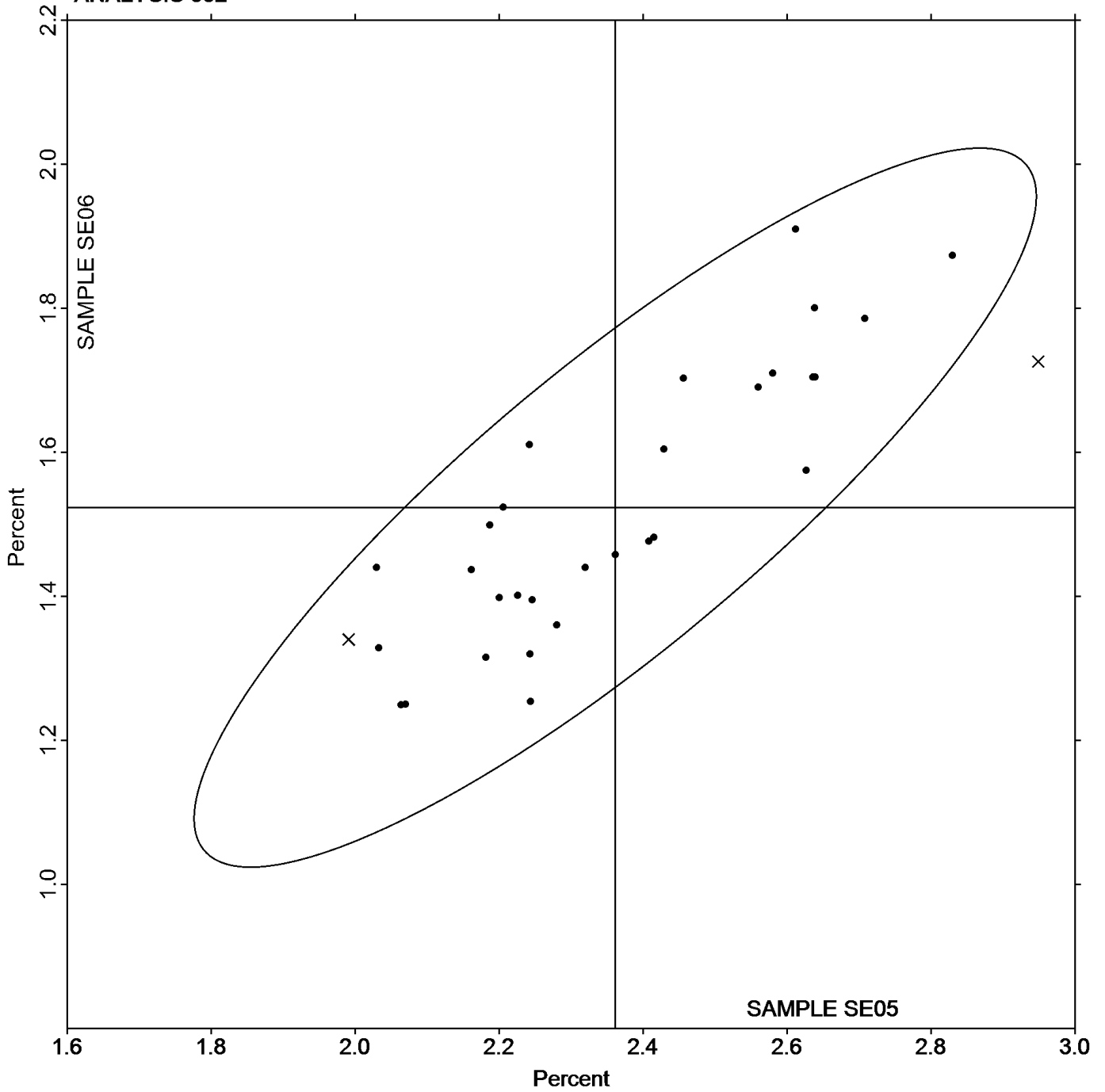


TAPPI-CTS Interlaboratory Testing Program  
Analysis 332  
Elongation to Break - Packaging Papers

Grand Mean Sample **SE05** = 2.3612 Percent

Grand Mean Sample **SE06** = 1.5232 Percent

**ANALYSIS 332**



**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 334**  
**Folding Endurance (MIT) - Double Folds**

WebCode	Data Flag	Sample SG05			Sample SG06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4FDQEP		24.80	2.56	0.36	84.60	2.01	0.10	MT
8A2LE2		17.50	-4.74	-0.66	43.70	-38.89	-1.84	XX
8YV2RY		28.70	6.46	0.90	88.10	5.51	0.26	MT
ACTFM9		34.20	11.96	1.67	83.10	0.51	0.02	MT
D94LGN		17.10	-5.14	-0.72	72.50	-10.09	-0.48	XX
DU8A7Y		26.70	4.46	0.62	72.40	-10.19	-0.48	MT
F36HGA		16.40	-5.84	-0.81	88.20	5.61	0.27	MT
HJPALY		28.50	6.26	0.87	93.30	10.71	0.51	MT
K6F436		27.70	5.46	0.76	106.80	24.21	1.15	XX
KJY9NK		11.60	-10.64	-1.48	93.10	10.51	0.50	MT
NN46M4		14.90	-7.34	-1.02	47.60	-34.99	-1.66	MT
NUPX2N		34.20	11.96	1.67	103.20	20.61	0.98	MT
TYJ8T7		12.20	-10.04	-1.40	71.80	-10.79	-0.51	XX
U8VYYZ		27.20	4.96	0.69	123.40	40.81	1.93	MT
XUWN2Y		18.90	-3.34	-0.46	59.10	-23.49	-1.11	MT
YE2628		18.70	-3.54	-0.49	103.60	21.01	1.00	MT
Z63MGB		25.40	3.16	0.44	91.30	8.71	0.41	MT
ZUTCH7		15.60	-6.64	-0.92	60.90	-21.69	-1.03	MT

		Summary Statistics			
		Sample SG05		Sample SG06	
Grand Means		22.239	Double Folds	82.594	Double Folds
SD Btwn Labs		7.180	Double Folds	21.096	Double Folds
Statistics based on 18 of 18 reporting participants					

**Instrument Code List**

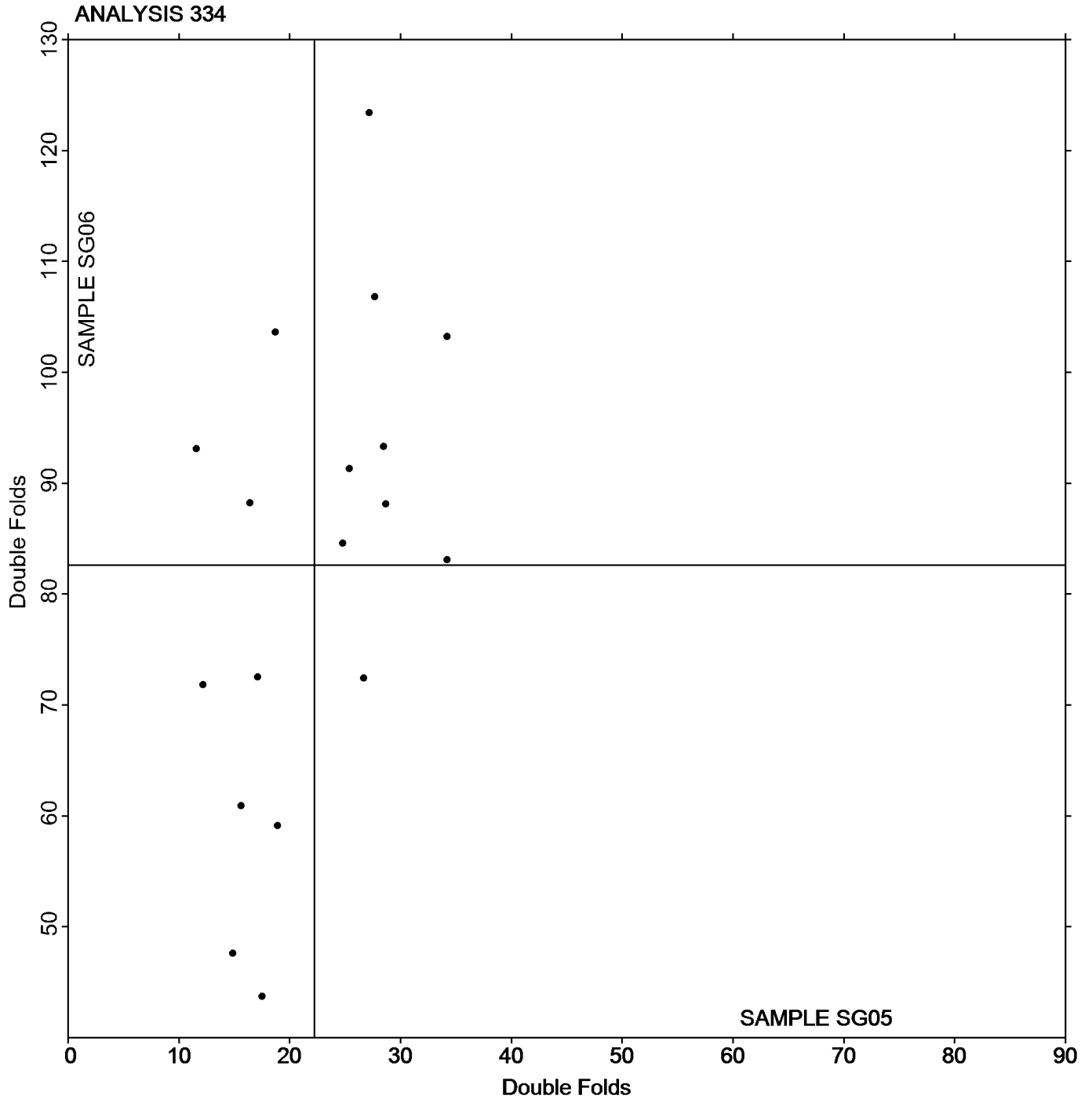
(MT) - MIT - Tinius Olsen

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

TAPPI-CTS Interlaboratory Testing Program  
Analysis 334  
Folding Endurance (MIT) - Double Folds

Grand Mean Sample **SG05** = 22.239 Double Folds

Grand Mean Sample **SG06** = 82.594 Double Folds



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

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 336**  
**Bending Resistance, Gurley Type**

WebCode	Data Flag	Sample SH05			Sample SH06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2CVKGH		508.9	-53.9	-1.58	308.1	-25.8	-1.37
49FX9G		603.8	41.0	1.20	353.0	19.0	1.00
4A9BRH	*	576.1	13.3	0.39	370.7	36.7	1.94
4LLHQ4		602.7	39.9	1.17	349.0	15.1	0.80
4WNEP6	X	373.2	-189.6	-5.55	280.2	-53.8	-2.84
7KGD6W		552.8	-10.0	-0.29	325.8	-8.2	-0.43
8YV2RY		532.8	-30.1	-0.88	325.4	-8.6	-0.45
9H838J		509.5	-53.3	-1.56	306.4	-27.6	-1.46
ANBEV4		552.2	-10.6	-0.31	332.4	-1.6	-0.08
D94LGN		573.2	10.4	0.30	351.8	17.8	0.94
HDZUV7		529.4	-33.4	-0.98	306.9	-27.1	-1.43
HJPALY		585.0	22.1	0.65	348.5	14.5	0.77
KJY9NK		540.6	-22.2	-0.65	324.0	-9.9	-0.53
RL6RWF		612.7	49.9	1.46	340.8	6.8	0.36
U8VYYZ		539.4	-23.4	-0.68	310.7	-23.3	-1.23
V9D7CN		549.9	-12.9	-0.38	333.0	-1.0	-0.05
WKTEUA	X	377.2	-185.6	-5.43	321.0	-13.0	-0.69
XZ97K7		611.6	48.8	1.43	344.9	11.0	0.58
ZR2FRR		587.2	24.4	0.71	346.3	12.3	0.65

		Summary Statistics			
		Sample SH05		Sample SH06	
Grand Means		562.81	Gurley Units	333.98	Gurley Units
SD Btwn Labs		34.19	Gurley Units	18.93	Gurley Units
Statistics based on 17 of 19 reporting participants					

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

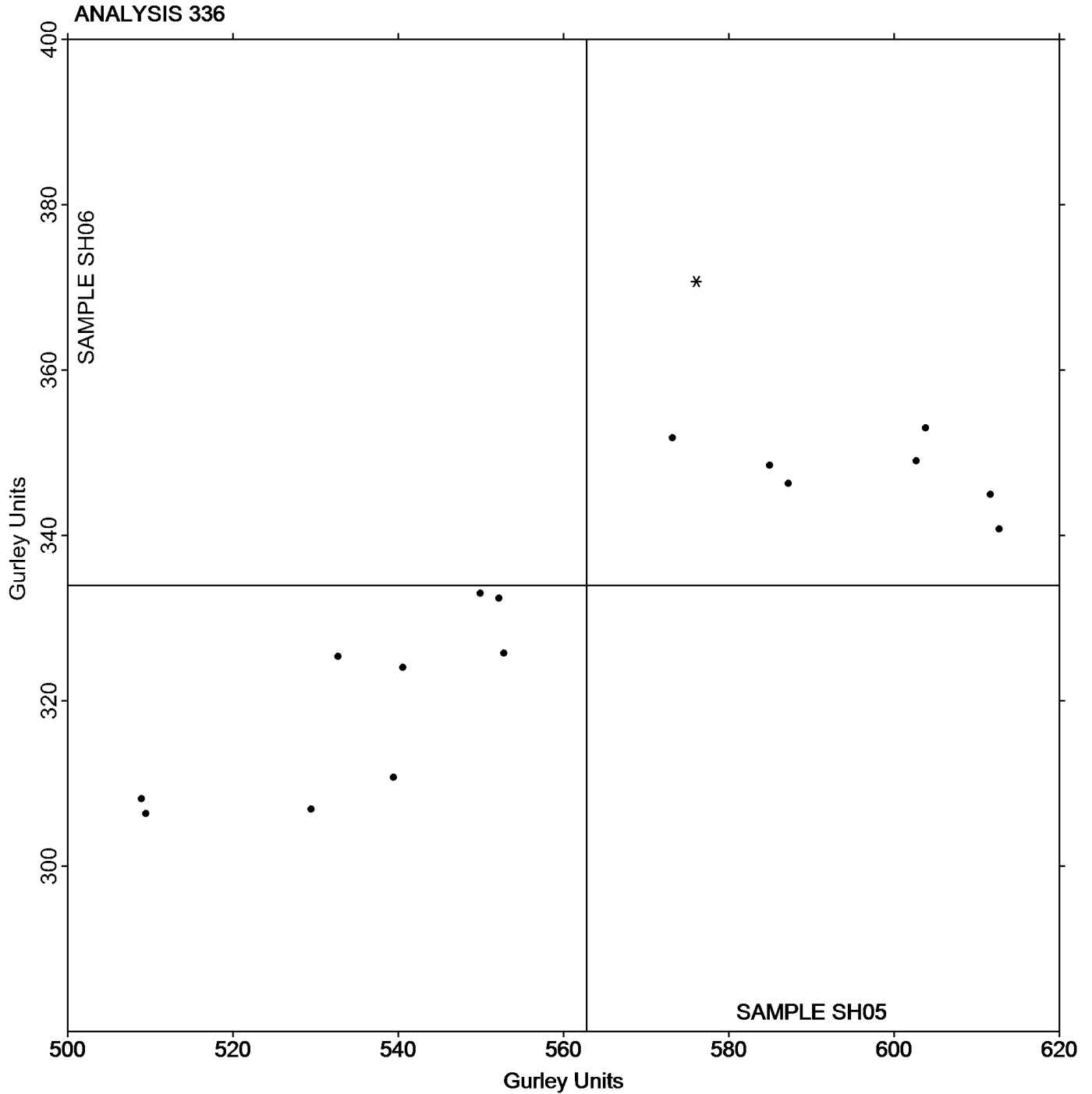
4WNEP6 (X) - Data for both samples are low.

WKTEUA (X) - Data for Sample SH05 are low.

TAPPI-CTS Interlaboratory Testing Program  
Analysis 336  
Bending Resistance, Gurley Type

Grand Mean Sample **SH05** = 562.81 Gurley Units

Grand Mean Sample **SH06** = 333.98 Gurley Units



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

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 338**  
**Bending Resistance, Taber Type - 0 to 10 Units**

WebCode	Data Flag	Sample SJ05			Sample SJ06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3MBLJB		7.060	0.109	0.25	4.370	-0.015	-0.04
476MA8		6.797	-0.154	-0.35	4.389	0.004	0.01
49FX9G		7.399	0.448	1.02	4.528	0.143	0.43
8A2LE2	X	3.950	-3.001	-6.87	2.459	-1.926	-5.72
8YV2RY		7.013	0.062	0.14	4.356	-0.029	-0.09
9H838J	X	3.383	-3.568	-8.17	2.074	-2.311	-6.87
BGLB6C		6.463	-0.488	-1.12	3.818	-0.567	-1.68
DP8PW3		6.961	0.010	0.02	4.454	0.069	0.21
DU8A7Y		6.842	-0.109	-0.25	4.454	0.069	0.21
DWEK89		7.171	0.220	0.50	4.558	0.173	0.51
LRE2K3		6.060	-0.891	-2.04	3.890	-0.495	-1.47
UP7HLK		6.483	-0.468	-1.07	3.901	-0.484	-1.44
WWBC36		7.739	0.788	1.80	4.804	0.419	1.25
XZ97K7		7.241	0.290	0.66	4.926	0.541	1.61
Z63MGB		7.138	0.187	0.43	4.554	0.169	0.50

Summary Statistics		
	Sample SJ05	Sample SJ06
Grand Means	6.9513 Taber Units	4.3848 Taber Units
SD Btwn Labs	0.4370 Taber Units	0.3365 Taber Units
Statistics based on 13 of 15 reporting participants		

**Comments on assigned Data Flags for Test #338**

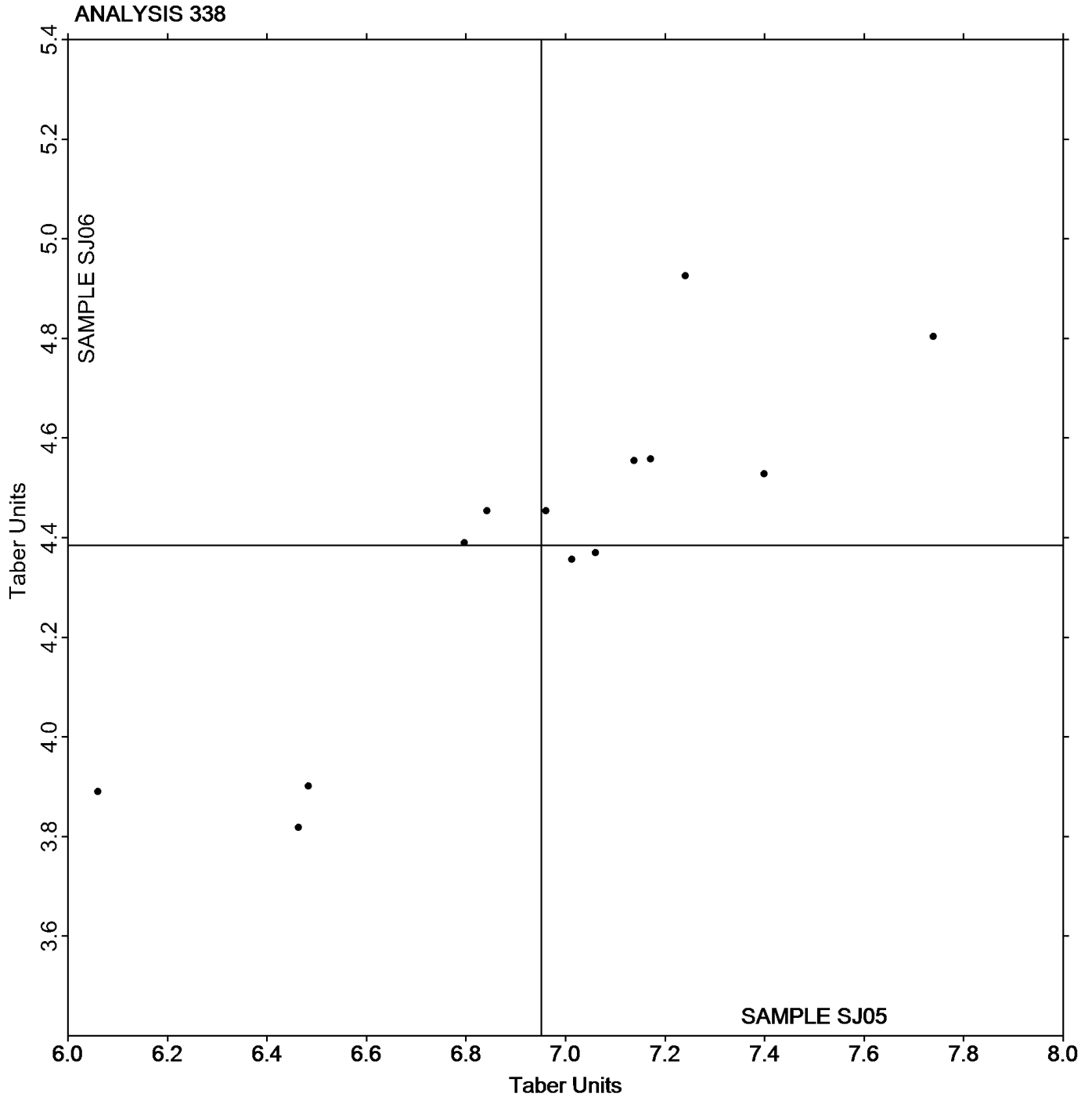
8A2LE2 (X) - Extreme data.

9H838J (X) - Extreme data.

TAPPI-CTS Interlaboratory Testing Program  
Analysis 338  
Bending Resistance, Taber Type - 0 to 10 Units

Grand Mean Sample **SJ05** = 6.9513 Taber Units

Grand Mean Sample **SJ06** = 4.3848 Taber Units



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

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 339**  
**Bending Resistance, Taber Type - 10 to 100 Taber Units**

WebCode	Data Flag	Sample SQ05			Sample SQ06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
3E266J		34.30	-1.38	-0.76	21.77	-0.16	-0.14
3X7WF7		37.75	2.07	1.14	22.80	0.87	0.79
4FDQEP		36.30	0.62	0.34	22.45	0.52	0.47
4LLHQ4		34.86	-0.82	-0.45	20.21	-1.72	-1.56
8YV2RY		37.22	1.54	0.85	23.66	1.73	1.57
9TPPCD		33.38	-2.30	-1.26	20.42	-1.51	-1.37
AEMF7J		33.75	-1.93	-1.06	21.86	-0.07	-0.06
HJPALY		36.70	1.02	0.56	22.58	0.65	0.59
KZ9UBG		36.85	1.17	0.64	21.70	-0.23	-0.21
LRE2K3		33.20	-2.48	-1.36	21.35	-0.58	-0.53
LZ2TKU		33.49	-2.19	-1.20	20.45	-1.48	-1.34
Q92B6T		35.97	0.29	0.16	22.00	0.07	0.06
RL6RWF		37.01	1.33	0.73	21.96	0.03	0.03
UXQVA6		38.71	3.03	1.67	23.81	1.88	1.70

		Summary Statistics	
	Sample SQ05		Sample SQ06
Grand Means	35.678 Taber Units		21.930 Taber Units
SD Btwn Labs	1.819 Taber Units		1.104 Taber Units
Statistics based on 14 of 14 reporting participants			

**Analysis Notes:**

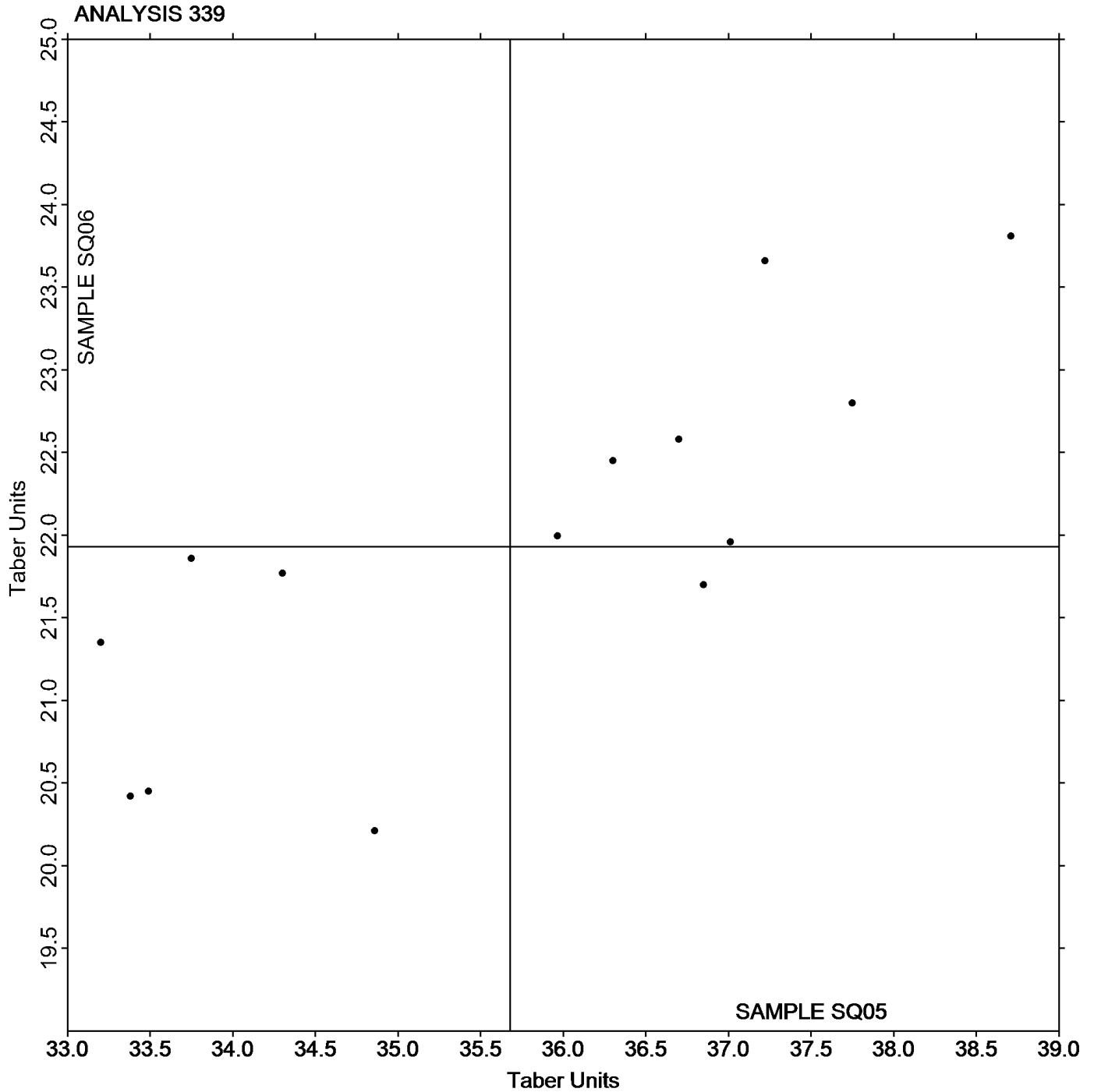
3E266J - Data appear to be reported as g-cm, not mN-m as indicated on datasheet. Units corrected by CTS.



TAPPI-CTS Interlaboratory Testing Program  
Analysis 339  
Bending Resistance, Taber Type - 10 to 100 Taber Units

Grand Mean Sample **SQ05** = 35.678 Taber Units

Grand Mean Sample **SQ06** = 21.930 Taber Units



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

TAPPI-CTS Interlaboratory Testing Program  
 Analysis 340

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

WebCode	Data Flag	Sample ST05			Sample ST06		
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV
2BPTXH		252.0	11.5	1.12	267.5	19.0	1.58
3LLURJ		251.6	11.1	1.08	253.4	4.9	0.41
9CCZX8		231.7	-8.8	-0.86	231.4	-17.2	-1.43
9UJ9K8	X	114.4	-126.1	-12.25	92.8	-155.7	-12.98
JUL7XU		251.7	11.2	1.09	240.4	-8.1	-0.68
K6V8Q6		233.2	-7.3	-0.71	245.2	-3.3	-0.28
LRE2K3		229.5	-11.0	-1.07	240.0	-8.5	-0.71
NEDGUL		234.4	-6.1	-0.59	239.7	-8.9	-0.74
U64PNT		235.8	-4.7	-0.46	243.2	-5.3	-0.44
V7HPNE		233.8	-6.7	-0.65	253.8	5.3	0.44
Y7646A		230.0	-10.5	-1.02	242.5	-6.0	-0.50
YU4PXH		235.4	-5.1	-0.49	243.1	-5.4	-0.45
ZF6ZJW		258.8	18.3	1.77	273.5	25.0	2.08
ZTBW3Y		248.5	8.0	0.78	257.2	8.7	0.72

Summary Statistics		
	Sample ST05	Sample ST06
Grand Means	240.49 Taber Units	248.52 Taber Units
SD Btwn Labs	10.29 Taber Units	12.00 Taber Units
Statistics based on 13 of 14 reporting participants		

**Comments on assigned Data Flags for Test #340**

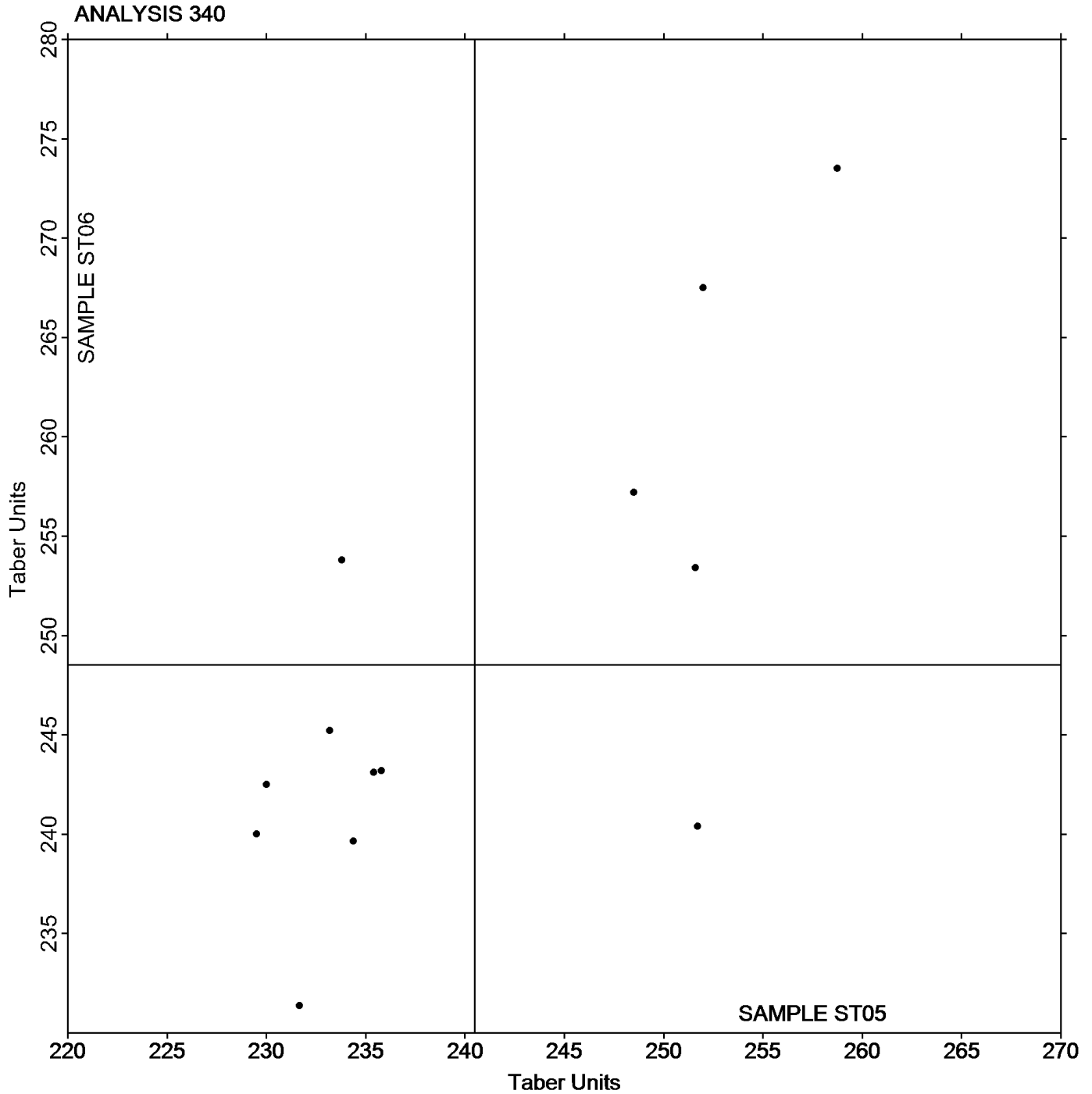
9UJ9K8 (X) - Extreme data.

### TAPPI-CTS Interlaboratory Testing Program Analysis 340

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

Grand Mean Sample **ST05** = 240.49 Taber Units

Grand Mean Sample **ST06** = 248.52 Taber Units



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

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 343**  
**Z-Direction Tensile**

WebCode	Data Flag	Sample SM05			Sample SM06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3E266J		91.54	9.10	0.75	96.26	8.57	0.63	TA
49FX9G		98.42	15.98	1.32	103.04	15.35	1.13	TL
4FDQEP		72.14	-10.30	-0.85	76.38	-11.31	-0.84	LW
4NP9UX		67.65	-14.79	-1.23	72.75	-14.94	-1.10	LW
7M9AVB		95.24	12.80	1.06	103.02	15.33	1.13	TA
8YV2RY		75.46	-6.98	-0.58	80.23	-7.47	-0.55	TZ
9TPPCD	*	92.95	10.51	0.87	85.89	-1.81	-0.13	XX
9UJ9K8		88.08	5.64	0.47	97.88	10.19	0.75	CA
ALY3V9		64.72	-17.72	-1.47	77.70	-9.99	-0.74	LW
C33TAN		84.24	1.80	0.15	95.06	7.37	0.54	XX
DU8A7Y		63.48	-18.96	-1.57	65.54	-22.15	-1.64	CD
K6F436		89.34	6.90	0.57	95.58	7.89	0.58	LW
NRNTN4		92.70	10.26	0.85	101.34	13.65	1.01	TA
PKCPV2		83.60	1.16	0.10	85.80	-1.89	-0.14	TA
Q7WK3K		86.32	3.88	0.32	84.16	-3.53	-0.26	DT
Q92B6T		83.89	1.45	0.12	90.17	2.47	0.18	TA
RL6RWF		63.20	-19.24	-1.60	64.60	-23.09	-1.71	CA
U64PNT		71.26	-11.18	-0.93	77.78	-9.91	-0.73	LW
UU6XYE		87.74	5.30	0.44	93.48	5.79	0.43	TL
UXQVA6		75.19	-7.25	-0.60	76.99	-10.71	-0.79	TZ
XPGGFK		104.08	21.64	1.79	117.92	30.23	2.23	CD

Sample SM05		Summary Statistics	Sample SM06	
Grand Means	82.440 psi		87.694 psi	
SD Btw Labs	12.063 psi		13.540 psi	
Statistics based on 21 of 21 reporting participants				

**Instrument Code List**

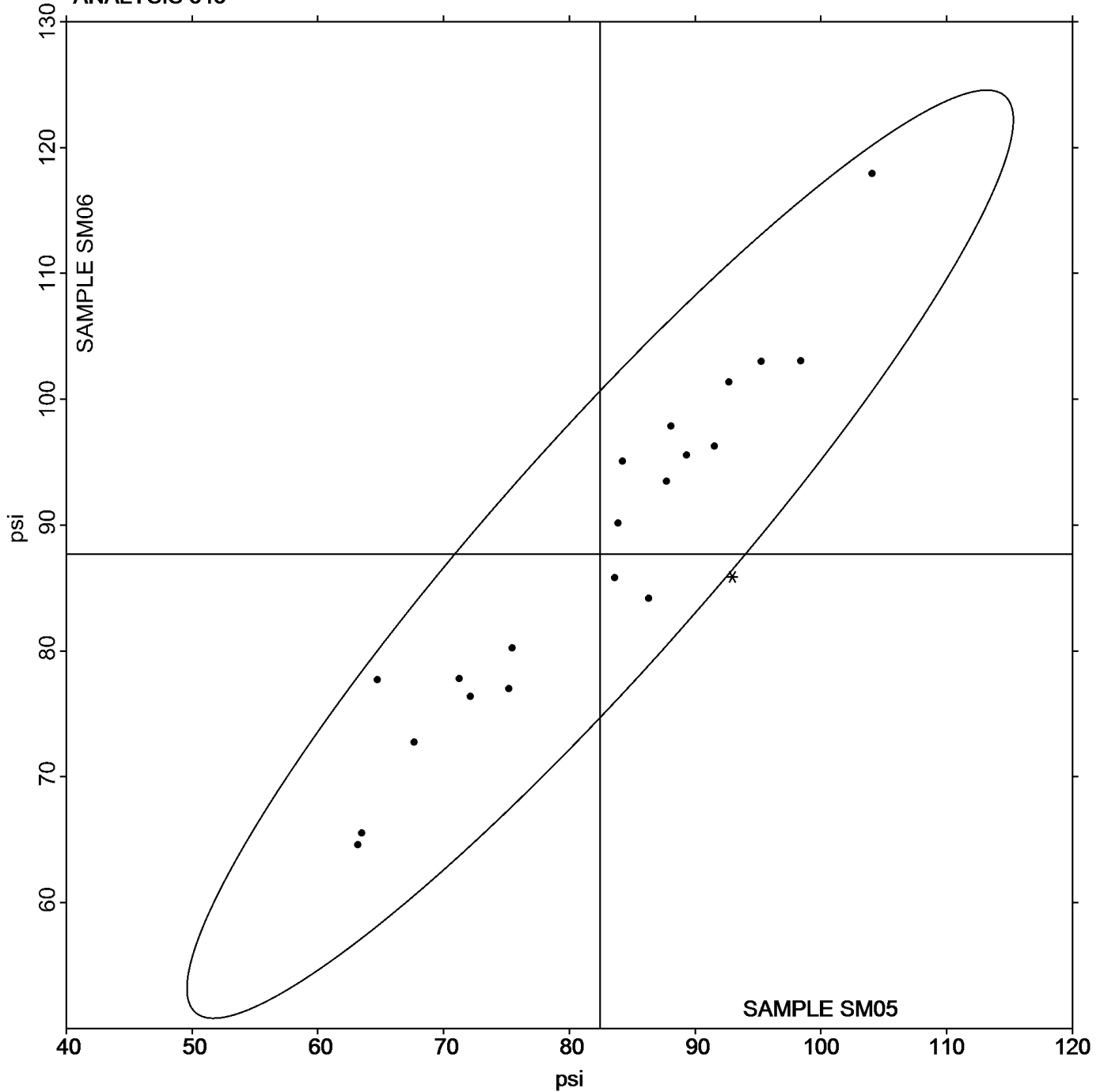
- |                                     |   |
|-------------------------------------|---|
| (CA) - CSI CS-163                   | (CD) - CSI CS-163D                                |
| (DT) - Dek-Tron DCS-163A ZDT Tester | (LW) - L & W ZD Tensile Tester                    |
| (TA) - Thwing-Albert Tensile Tester | (TL) - TMI Lab Master                             |
| (TZ) - TMI Monitor/ZDT Tester       | (XX) - Instrument make/model not specified by lab |

TAPPI-CTS Interlaboratory Testing Program  
Analysis 343  
Z-Direction Tensile

Grand Mean Sample **SM05** = 82.440 psi

Grand Mean Sample **SM06** = 87.694 psi

**ANALYSIS 343**



**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 345**  
**Z-Direction Tensile, Recycled Paperboard**

WebCode	Data Flag	Sample SZ05			Sample SZ06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
3LLURJ		41.44	2.58	0.87	45.36	3.51	1.30	TL
4BYEKP		38.64	-0.22	-0.07	42.40	0.55	0.20	TL
8GCQQD		40.64	1.78	0.60	44.75	2.90	1.08	XX
9CCZX8	X	33.50	-5.35	-1.80	27.96	-13.89	-5.15	LW
CYLKNA		42.06	3.20	1.08	42.44	0.59	0.22	TL
E496NU		41.08	2.22	0.75	42.96	1.11	0.41	XX
HJPALY		40.80	1.94	0.65	44.40	2.55	0.95	CA
JUL7XU		34.64	-4.22	-1.42	38.82	-3.03	-1.12	TZ
K6V8Q6		37.22	-1.64	-0.55	38.96	-2.89	-1.07	TL
KUJ8M4		38.02	-0.84	-0.28	38.74	-3.11	-1.15	LW
Q4RUXQ		43.83	4.98	1.67	45.98	4.13	1.53	PG
V7HPNE		33.20	-5.66	-1.90	39.40	-2.45	-0.91	CA
WYGQTJ		37.62	-1.24	-0.41	42.98	1.13	0.42	DP
Y7646A		40.00	1.14	0.38	43.00	1.15	0.43	CA
YU4PXH		38.60	-0.26	-0.09	39.36	-2.49	-0.92	CA
ZTBW3Y		35.04	-3.82	-1.28	38.18	-3.67	-1.36	TZ

Sample SZ05		Summary Statistics	Sample SZ06	
Grand Means	38.855 psi		41.849 psi	
SD Btwn Labs	2.980 psi		2.694 psi	
Statistics based on 15 of 16 reporting participants				

**Comments on assigned Data Flags for Test #345**

9CCZX8 (X) - Data for Sample SZ06 are low.

**Instrument Code List**

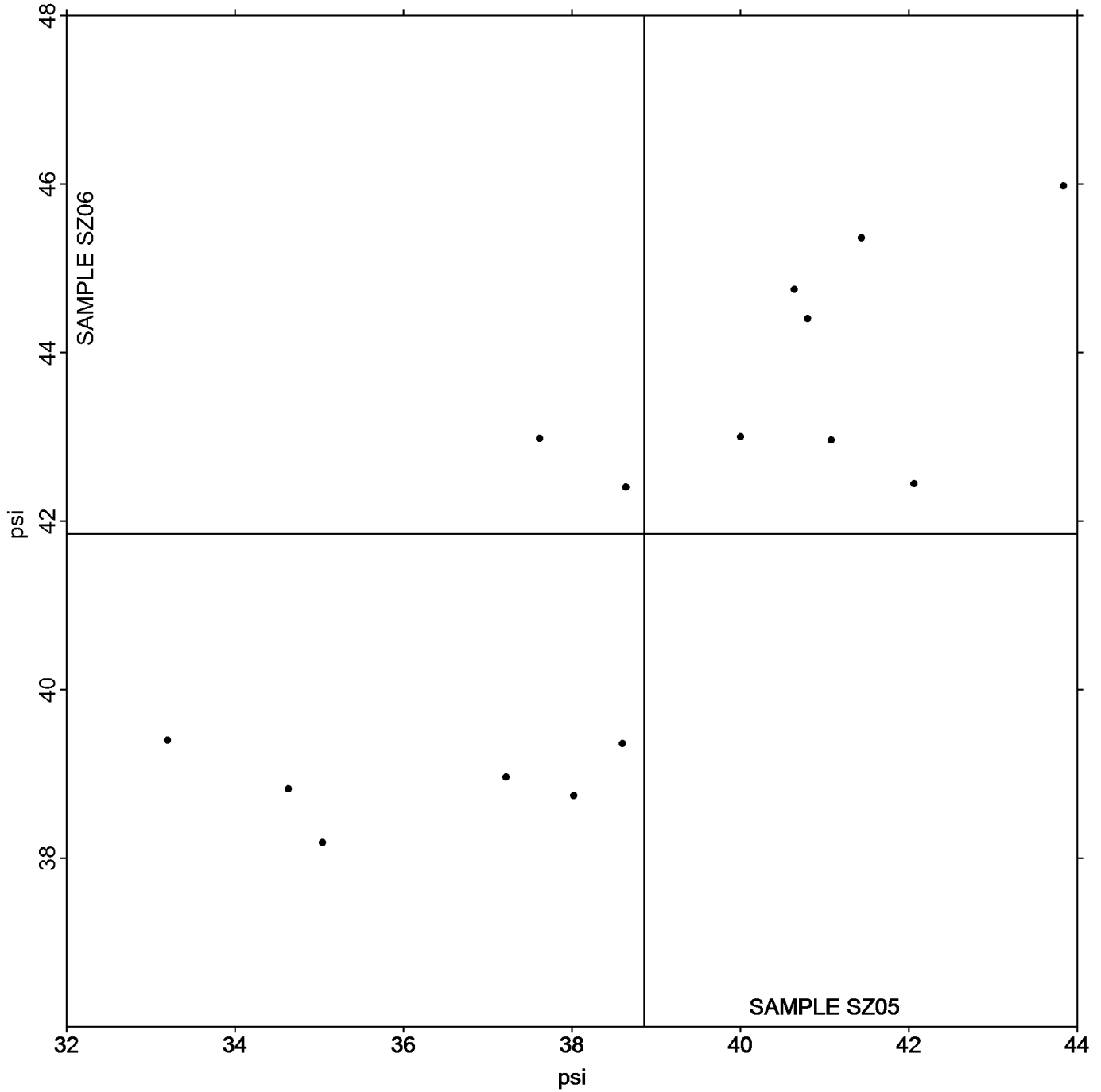
- |   |                                      |
|---|--------------------------------------|
| (CA) - CSI CS-163                                 | (DP) - Dek-Tron XP Series            |
| (LW) - L & W ZD Tensile Tester                    | (PG) - Perkins Model A Mullen Tester |
| (TL) - TMI Lab Master                             | (TZ) - TMI Monitor/ZDT Tester        |
| (XX) - Instrument make/model not specified by lab |                                      |

TAPPI-CTS Interlaboratory Testing Program  
Analysis 345  
Z-Direction Tensile, Recycled Paperboard

Grand Mean Sample **SZ05** = 38.855 psi

Grand Mean Sample **SZ06** = 41.849 psi

**ANALYSIS 345**



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

**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 348**  
**Internal Bond Strength - Modified Scott Mechanics**

WebCode	Data Flag	Sample SN05			Sample SN06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
2CVKGH		130.8	1.6	0.25	105.8	2.5	0.45	HY
3DGH2G		129.6	0.4	0.06	111.2	7.9	1.41	HY
3E266J		135.0	5.8	0.90	101.2	-2.1	-0.37	HZ
3QDMLT		126.8	-2.4	-0.38	102.5	-0.8	-0.14	HY
4FDQEP		130.4	1.2	0.18	102.4	-0.9	-0.16	HY
4QQHHK		123.3	-5.9	-0.92	95.8	-7.5	-1.34	HZ
7KGD6W		123.2	-6.1	-0.94	100.6	-2.7	-0.48	HY
7M9AVB		138.8	9.6	1.50	110.6	7.3	1.30	HY
8YV2RY	*	143.8	14.6	2.28	97.0	-6.3	-1.12	HY
97BMZN		131.8	2.6	0.40	98.2	-5.1	-0.90	HY
DU8A7Y		127.2	-2.0	-0.31	100.4	-2.9	-0.51	HY
HJPALY	X	112.6	-16.6	-2.59	140.4	37.1	6.60	XX
JUL7XU	X	147.5	18.3	2.86	128.2	25.0	4.44	HZ
K6F436		129.4	0.2	0.03	115.4	12.1	2.16	XX
KJY9NK		123.0	-6.2	-0.97	99.6	-3.7	-0.65	HY
P87UCZ		131.6	2.4	0.37	112.0	8.7	1.55	HY
Q92B6T		141.0	11.8	1.84	107.2	3.9	0.70	HY
U64PNT		121.4	-7.8	-1.22	99.2	-4.1	-0.73	HZ
UXQVA6		122.0	-7.2	-1.13	103.6	0.3	0.06	HY
XZ97K7		123.8	-5.4	-0.84	95.8	-7.5	-1.34	KR
YHC264		125.2	-4.0	-0.63	105.8	2.5	0.45	HZ
ZVZHBF		126.2	-3.0	-0.47	101.4	-1.9	-0.33	HY

		Summary Statistics	
	Sample SN05		Sample SN06
Grand Means	129.21 1000th ft-lbs		103.28 1000th ft-lbs
SD Btw Labs	6.41 1000th ft-lbs		5.62 1000th ft-lbs
Statistics based on 20 of 22 reporting participants			

**Comments on assigned Data Flags for Test #348**

HJPALY (X) - Extreme data.

JUL7XU (X) - Data for both samples are high. Inconsistent in testing within the determinations for both samples.

**Instrument Code List**

(HY) - Huygen Digitized Scott Internal Bond Tester  
 (KR) - Kumagai Riki Kogyo Internal Bond Tester

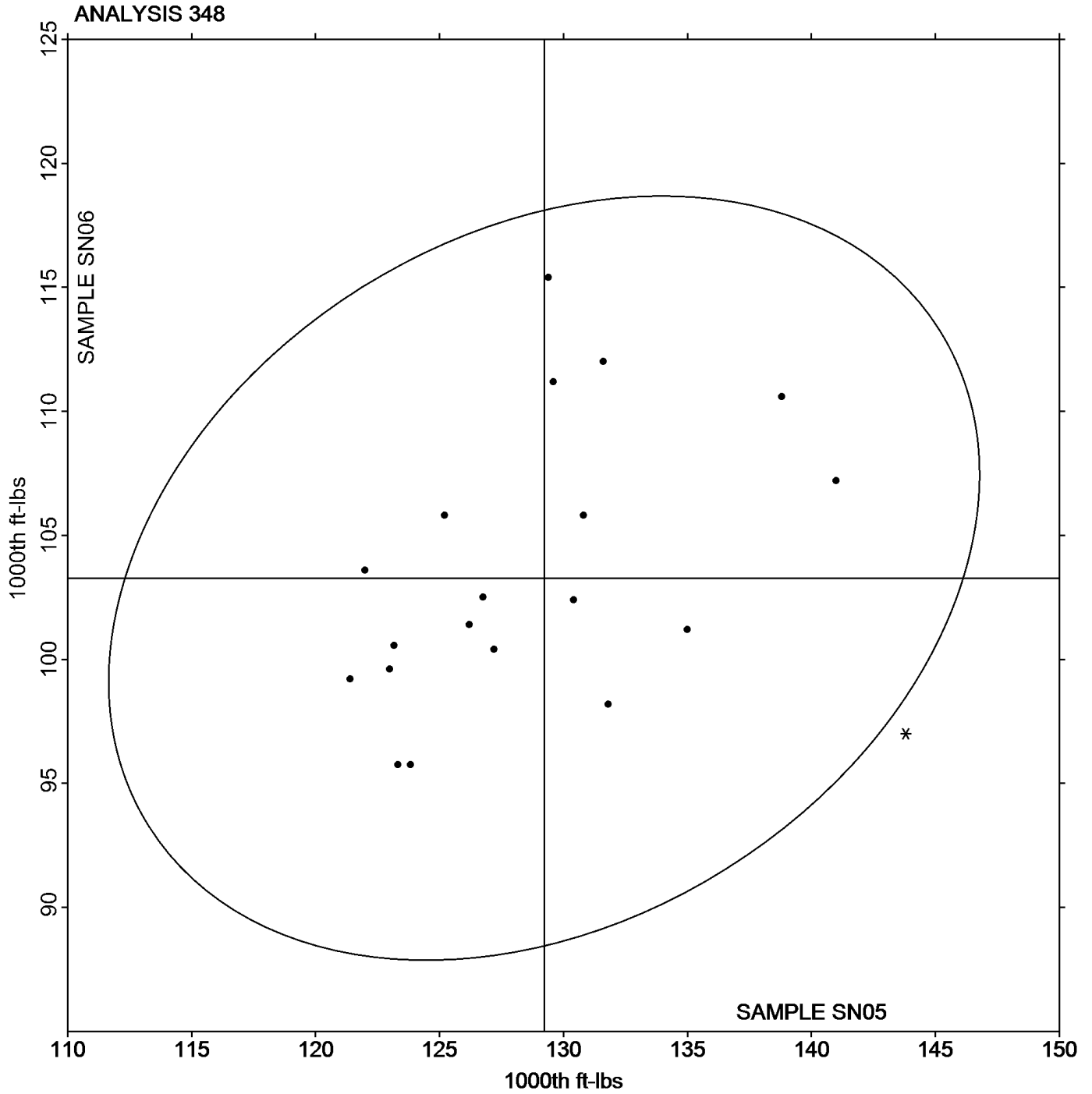
(HZ) - Huygen Internal Bond Tester with AccuPress  
 (XX) - Instrument make/model not specified by lab



TAPPI-CTS Interlaboratory Testing Program  
Analysis 348  
Internal Bond Strength - Modified Scott Mechanics

Grand Mean Sample **SN05** = 129.21 1000th ft-lbs

Grand Mean Sample **SN06** = 103.28 1000th ft-lbs



**TAPPI-CTS Interlaboratory Testing Program**  
**Analysis 349**  
**Internal Bond Strength - Scott Bond Models**

WebCode	Data Flag	Sample SP05			Sample SP06			Instr Code
		Lab Mean	Diff from Grand Mean	CPV	Lab Mean	Diff from Grand Mean	CPV	
4BYEKP	X	110.4	1.1	0.06	85.60	-0.77	-0.07	TM
642MQ7		125.5	16.2	0.96	87.08	0.71	0.06	XX
8A2LE2		119.0	9.7	0.57	96.80	10.43	0.90	TM
9CCZX8		100.1	-9.2	-0.55	79.28	-7.10	-0.61	TM
BUPZ4T		80.8	-28.6	-1.70	67.20	-19.17	-1.65	TM
D23QK6		138.8	29.5	1.75	106.00	19.63	1.69	XX
DGXRBP		98.4	-10.9	-0.65	82.52	-3.85	-0.33	SC
LRE2K3		107.3	-2.1	-0.12	95.90	9.53	0.82	SC
LZ2TKU		105.0	-4.3	-0.26	79.79	-6.58	-0.57	TM
Q4RUXQ		109.2	-0.1	-0.01	82.80	-3.57	-0.31	TM

Summary Statistics	
Sample SP05	Sample SP06
Grand Means	109.34 1000th ft-lbs
SD Btwn Labs	16.84 1000th ft-lbs
	86.374 1000th ft-lbs
	11.587 1000th ft-lbs
Statistics based on 9 of 10 reporting participants	

**Analysis Notes:**

4BYEKP - Data appear to be off by a factor of 1/1000; data converted by CTS (x1000).

**Instrument Code List**

(SC) - Scott Internal Bond Tester (Manual)

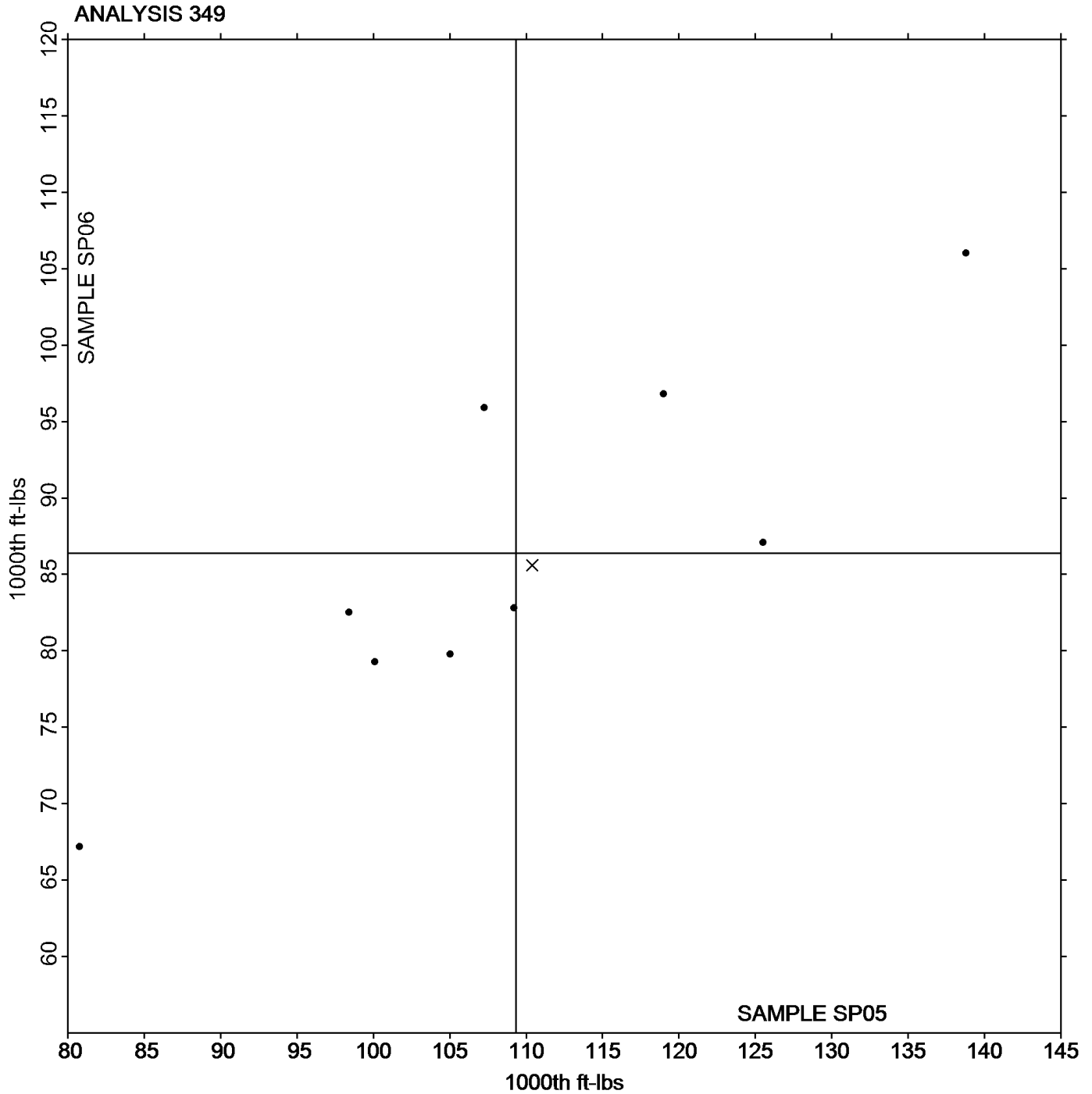
(TM) - TMI Monitor/Internal Bond Tester

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

TAPPI-CTS Interlaboratory Testing Program  
Analysis 349  
Internal Bond Strength - Scott Bond Models

Grand Mean Sample **SP05** = 109.34 1000th ft-lbs

Grand Mean Sample **SP06** = 86.374 1000th ft-lbs



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