



Containerboard Interlaboratory Testing Program

Participant Summary Report #650 - November 2023

[Introduction to the Containerboard Program](#)

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

Analysis	Sample	Analysis Name
<u>201</u>	<u>BX17</u>	<u>Top to Bottom Box Compression Strength, Corrugated Boxes</u>
<u>202</u>	<u>EC15</u>	<u>Edgewise Compressive Strength, by T811, Corrugated Board</u>
<u>203</u>	<u>EC15</u>	<u>Edgewise Compressive Strength by T839, Corrugated Board</u>
<u>205</u>	<u>42H3</u>	<u>Bursting Strength (Mullen), 42 lb Linerboard</u>
<u>206</u>	<u>52J1</u>	<u>Bursting Strength (Mullen), 52 lb Linerboard</u>
<u>215</u>	<u>42H3</u>	<u>Ring Crush, 42 lb Linerboard</u>
<u>216</u>	<u>52J1</u>	<u>Ring Crush, 52 lb Linerboard</u>
<u>223</u>	<u>42H3</u>	<u>STFI, 42 lb Linerboard</u>
<u>224</u>	<u>52J1</u>	<u>STFI, 52 lb Linerboard</u>
<u>228</u>	<u>42H3</u>	<u>Roughness - Stylus Method, 42 lb Linerboard</u>
<u>229</u>	<u>42H3</u>	<u>Roughness - Sheffield Method, 42 lb Linerboard</u>
<u>231</u>	<u>42H</u>	<u>Internal Bond, 42 lb Linerboard</u>
<u>234</u>	<u>42H</u>	<u>COF Inclined Plane (Slide Angle), 42 lb Linerboard</u>
<u>237</u>	<u>42H3</u>	<u>Air Resistance, 42 lb Linerboard</u>
<u>240</u>	<u>CM13</u>	<u>Flat Crush Strength (CMT), 26 lb Corrugating Medium</u>
<u>250</u>	<u>CM13</u>	<u>Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium</u>
<u>255</u>	<u>CM13</u>	<u>Ring Crush (RCT), 26 lb Corrugating Medium</u>
<u>261</u>	<u>CM13</u>	<u>STFI, 26 lb Corrugating Medium</u>

Collaborative Testing Services, Inc.
CONTAINERBOARD INTERLABORATORY TESTING PROGRAM

INTRODUCTION

The Interlaboratory Testing Program for Containerboard is operated and maintained by Collaborative Testing Services, Inc. (CTS), with technical guidance provided by the Containerboard Group of the American Forest & Paper Association. The tests are conducted on a monthly basis.

For these tests samples of linerboard and corrugating medium, that each have been separately randomized from narrow rolls, are distributed for testing weekly. One weight of medium (26 lb.) is used for Concora Flat Crush Strength, Corrugated Fluted Crush Strength, Ring Crush Strength, and STFI Compression. Two weights of linerboard are tested each month for Mullen Burst, Ring Crush, and STFI Compression: 42 lb. - every month; 35 lb. and 56 lb. - alternate months. The participants return their test results for analysis and receive a monthly report.

Please refer to the section, "EXPLANATION OF TABLES", for definitions of terms and guidelines to interpreting the results.

USE OF AVERAGE MEAN AS A COLLABORATIVE REFERENCE VALUE

The samples of linerboard and corrugating medium, which have been randomized and placed in sealed packages for distribution in this program, may be used as collaborative reference materials. The values most representative of each material are the Cumulative Grand Means in the latest reports, given at the bottom right of each table. Comparisons can only be made within one lot of material; therefore check your measurements against the Cumulative Grand Means with the same lot code as on the packages being tested.

Material	Lot Code	Dates in Use
26# Corrugating Medium	CM13	September 2023 - Current
	CM12	June 2022 - August 2023
35# Corrugating Medium	35E3	June 2022 - Current
	35E2	June 2020 - April 2022
42# Corrugating Medium	42H3	October 2023 - Current
	42H1	April 2022 - November 2022
52# Corrugating Medium	52J1	November 2023 - Current
	56G2	May 2021 - May 2022

ABOUT CTS

Founded in 1971, Collaborative Testing Services, Inc. (CTS) is a privately-owned company that specializes in interlaboratory tests for a wide variety of industries including rubber, plastics, fasteners and metals, containerboard, paper, color, agriculture, hemp, and wine, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality control objectives. Labs from the U.S., as well as more than 100 countries, currently participate in the CTS programs.

For further information, contact:
Collaborative Testing Services, Inc
21331 Gentry Drive
Sterling, VA 20166 USA
Voice: 571-434-1925
Fax: 571-434-1937
containerboard@cts-interlab.com

EXPLANATION OF TABLES

Each analysis is divided into three time spans. On the left side of the table are the individual laboratory results for each week of the month; in the center are each lab's statistical data for the month; and on the right are each lab's cumulative data for up to 16 weeks. At the bottom of the table are the consensus statistics for all the participants for each of the three time spans.

Definitions of Terms Used

Weekly Results

Laboratory Data

- WebCode - A six character laboratory identifier used to maintain information on a confidential basis. The WebCode is unique for each cycle and will change for each report. Your WebCode can be found in your Individual Report (Current Month Performance Report) and your datasheet.
- Weekly Means - The average of the test results obtained by the participant for each week that data were reported.

Consensus Data

- Wk Mean - For each week, the average of the Means for all the participants, excluding those laboratories flagged with an 'X'.
- Avg SD - For each week, the average of the within-laboratory standard deviations (SD's) for all the participants, excluding those laboratories flagged with an 'X'. The Avg SD is an indication of the variation of measurements within an average laboratory.
- SD btwn Labs - For each week, the standard deviation of the laboratory Means about the Wk Mean, excluding those laboratories flagged with an 'X'. The SD LABS is an indication of the precision of measurement between the laboratories.
- Labs Incl - The number of laboratory Means included in the Wk Mean for that week.
- Labs Excl - The number of laboratory Means reported but excluded from the Wk Mean for that week because of outlying results ('X' following Mean).
- Labs not rcvd - The number of laboratories failing to report for that week.

Monthly Results

Laboratory Data

- Mean - For each laboratory, the average of all the weekly Means reported for this month.
- CPV - **Comparative Performance Value**, an indication of how well a laboratory's Mean agrees with the other participants. The CPV is a ratio indicating the number of standard deviations from the consensus mean (Monthly Mean). The closer a laboratory's CPV is to zero, the more consistent its results are with the other participants' data.
- SD - For each laboratory, the average of the weekly within-lab standard deviations (SD's) for all reported Weekly Means this month.
- SD Wk - The standard deviation among the laboratory's weekly Means, including those Means flagged with an 'X'. The SD Wks is an indication of that laboratory's ability to obtain constant results from week to week.

Consensus Data

- Month Mean - The average of the Means for all the participants, excluding those laboratories flagged with an 'X,' reporting data for this month.
- Avg SD - For the current month, the average of the within-laboratory standard deviations (SD's) for all the participants, excluding those laboratories flagged with an 'X'.
- SD btwn Labs - For the current month, the standard deviation of the laboratory Means about the Month Mean, excluding those laboratories flagged with an 'X'.
- SD btwn Group - For the current month, the standard deviation of the laboratory Means within the group about the Month Mean, excluding those laboratories flagged with an 'X'.
- SD btwn Wks - For the current month, the average of the laboratory between week standard deviations (SD Wks') for all the participants, excluding those laboratories flagged with an 'X'.

Cumulative Results

Laboratory Data

- Mean - For each lab, the average of all the monthly Means reported for the weeks shown.
- CPV - **Comparative Performance Value**, an indication of how well a laboratory's cumulative mean agrees with the other participants. The CPV is a ratio indicating the number of standard deviations from the consensus mean (Monthly Mean).
- SDr - For each laboratory, the average of the weekly within-lab standard deviations (SD's) for the weeks shown.
- SD Wk - The standard deviation among the laboratory's weekly Means for the weeks shown, including those Means flagged with an 'X'. The SD Wks is an indication of that laboratory's ability to obtain constant results from week to week.
- Wks - The number of weeks included in the cumulative period.
- Inst - The two letter instrument code. Codes are summarized at the bottom of the last analysis page.

Consensus Data

- Grand Mean - The average of the Means for all the participants, excluding those laboratories flagged with an 'X,' reporting data for the number of weeks included in the cumulative period.
- Avg SD - For the cumulative period, the average of the within-laboratory standard deviations (SD's) for all the participants, excluding those laboratories flagged with an 'X'.
- SD btwn Labs - For the cumulative period, the standard deviation of the laboratory Means about the Month Mean, excluding those laboratories flagged with an 'X'.
- SD btwn Wks - For the cumulative period, the average of the laboratory between week standard deviations for all the participants, excluding those laboratories flagged with an 'X'.
- Labs Incd - The number of laboratory Means included in the Grand Mean.

Any laboratory that receives a 'flag' following a mean or standard deviation should refer to the chart below for an explanation of the data flag symbol:

<u>Flag</u>	<u>Explanation</u>
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Data Flags "X" and "*" indicate a laboratory's performance on an average value differed from the consensus.

Data Flags "H" and "L" indicate a laboratory's performance on a standard deviation differed from the consensus.

Flags assigned to Weekly Means, Monthly Mean and Cumulative Mean:

- X Excluded from the weekly means, monthly means and/or the cumulative mean. Immediate review of data and/or testing procedure is recommended.
- * Included in the weekly means, monthly means and/or the cumulative mean; however, lab should review testing procedure and monitor future results.

Flags assigned to Weekly Means:

- H Indicates high within-laboratory standard deviation. The laboratory SD for each week is not shown, but laboratory average SD and consensus average SD values are shown.
- L Indicates low within-laboratory standard deviation. The laboratory SD for each week is not shown, but laboratory monthly average SD and consensus average SD values are shown.

Flags assigned to Monthly SD Wks and Cumulative SD Wks:

- H Indicates high variability between weekly means (high week-to-week variation).
- L Indicates low variability between weekly means (low week-to-week variation).



Containerboard Interlaboratory Testing Program
 Analysis 201
Top to Bottom Box Compression Strength, Corrugated Boxes - BX17
 TAPPI Official Test Method T804

Report #650
November 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3YVXAG	874.2	0.32	83.06	867.1	0.52	43.48	4	EX
47A4CR	818.6	-0.54	114.79	812.5	-0.64	9.77	4	EX
7RPZEA	806.1	-0.74	65.28	850.8	0.18	36.75	4	LS
88VRKW	890.6	0.58	70.30	889.2	0.99	36.91	4	LG
8E84DN	843.8	-0.15	110.59	853.4	0.23	63.73	4	EX
8JMB2N	843.2	-0.16	47.76	827.7	-0.32	14.24	4	EX
962HQL	887.5	0.53	51.11	833.4	-0.19	37.32	4	LG
98TG6K	897.2	0.68	93.80	887.6	0.96	51.30	4	ER
9ER4UY	777.4	-1.19	56.42	777.4	-1.39	0.00	1	LL
9JJ6A8	691.9	-2.52 *	142.99	749.3	-1.99 *	43.94	4	ET
9UZXNU	778.8	-1.17	52.86	793.1	-1.05	10.46	4	LG
9ZR3GX	917.1	0.99	75.16	898.5	1.19	22.91	4	LM
B9AKPM	874.8	0.33	93.51	844.9	0.05	29.23	4	TB
DAJA4J	875.3	0.34	169.21 H	839.4	-0.07	43.55	4	LS
EG2WPN	810.1	-0.68	79.27	760.9	-1.74	49.38	4	LL
EJPETE	886.1	0.51	75.13	860.5	0.38	47.70	4	LM
FC28LL	787.2	-1.03	42.82	835.2	-0.16	45.06	4	XX
FGTK8U	789.4	-1.00	31.63	802.7	-0.85	14.70	4	ER
FVDZCE	984.7	2.05 *	44.55	901.9	1.27	81.32	4	LG
GQWRNF	926.6	1.14	74.55	897.7	1.18	36.80	4	EX
P4ECLF	966.0	1.76	60.05	891.2	1.04	75.30	4	ES
P4R2M8	849.2	-0.07	51.99	838.2	-0.09	31.23	4	LS
PYY6XF	861.9	0.13	40.36	867.0	0.52	6.45 L	4	LO
QE8AXT	839.1	-0.22	57.61	850.9	0.18	54.92	4	LG
UCBXFB	919.4	1.03	47.29	852.6	0.21	88.29	4	ER
UQTQ4G	745.2	-1.69	25.11	720.6	-2.60 *	83.27	3	EX
VFQMQL	871.5	0.28	22.98	881.7	0.84	8.92	3	ER
XT43A9	876.4	0.36	95.37	883.6	0.88	23.70	4	ER
ZHHDQT	860.8	0.11	73.06	864.4	0.47	24.77	4	EX

Consensus (All Labs) Results			
Month Mean	853.45	Grand Mean	842.52
Avg SD	77.91	Avg SD Months	45.87
SD btwn Labs	64.07	SD btwn Labs	46.92
Labs Incl	29	Labs Incl	29



Containerboard Interlaboratory Testing Program
Analysis 201
Top to Bottom Box Compression Strength, Corrugated Boxes - BX17
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Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	849.92	44.54	3.54	8
Clip sealing	853.97	72.77	0.51	20
Staple sealing	871.52	0.00	18.07	1

Key to Instrument Codes Reported by Participants

ER	Emerson 6200 Series	ES	Emerson 8510
ET	Emerson 7200	EX	Emerson Apparatus (Model not specified)
LG	TLS / L.A.B. Validator Series	LL	Lansmont 76-5K
LM	Lansmont 122-15k	LO	Lansmont 152-30k
LS	Lansmont Squeezer	TB	TMI Monitor/Compression Tester, Model 17-70
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program
 Analysis 202
Edgewise Compressive Strength, by T811, Corrugated Board - EC15
 TAPPI Official Test Method T811

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WebCode	Monthly Results				Cumulative Results				
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3YVXAG	43.4	-0.20	3.18		44.4	0.18	0.82	4	LC
47A4CR	43.6	-0.14	2.25		43.0	-0.27	1.37	3	LC
7MARQB	48.9	1.41	3.28		49.0	1.70	1.26	4	XX
7RPZEA	45.0	0.26	2.58		42.0	-0.61	3.13	4	LD
8283ZM	41.4	-0.78	1.21	L	41.6	-0.73	2.06	4	TS
88VRKW	45.8	0.49	1.03	L	44.1	0.07	1.60	4	EX
FC28LL	43.2	-0.27	2.43		41.7	-0.71	1.74	4	TS
KECM69	46.3	0.65	9.73	H	47.3	1.12	1.22	4	XX
NBXHJM	160.8	34.18	5.39	X	159.4	38.00	1.50	4	LD
RWM4RZ	46.8	0.78	0.74	L	46.5	0.86	0.30	L 3	LD
XT43A9	36.5	-2.22	4.02	*	38.9	-1.61	3.68	4	EN

Consensus (All Labs) Results			
Month Mean	44.08	Grand Mean	43.85
Avg SD	3.90	Avg SD Months	1.97
SD btwn Labs	3.41	SD btwn Labs	3.04
Labs Incd	10	Labs Incd	10

Key to Instrument Codes Reported by Participants

EN	Emerson 2200	EX	Emerson (model not specified)
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
TS	TMI Digital Crush Tester, Model 17-56	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 203
Edgewise Compressive Strength by T839, Corrugated Board - EC15
 TAPPI Official Test Method T839

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WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3YVXAG	40.9	-1.97 *	1.01	46.3	0.01	4.03	4	LC
47A4CR	47.1	-0.02	1.84	48.0	0.55	0.79	3	LC
4RA7PU	53.2	1.88	1.05	52.9	2.18 *	0.61	4	LC
7RPZEA	46.2	-0.31	1.47	45.4	-0.28	0.52	4	LD
8283ZM	44.2	-0.91	0.91 L	44.6	-0.55	1.28	4	TS
88VRKW	42.4	-1.49	2.83	45.0	-0.43	2.26	4	LY
8JMB2N	45.4	-0.55	0.84 L	44.2	-0.69	3.61	4	TL
962HQL	45.8	-0.42	2.08	44.6	-0.55	1.08	4	EM
96JCQW	48.6	0.44	1.36	48.6	0.74	0.00	1	LD
98TG6K	42.2	-1.55	1.07	43.9	-0.81	2.02	4	LD
9ER4UY	46.6	-0.19	2.20	42.4	-1.29	5.88	2	LC
9JJ6A8	48.6	0.46	1.21	47.0	0.23	3.42	4	TD
9ZR3GX	46.5	-0.19	1.08	45.7	-0.20	0.69	4	EM
B9AKPM	55.2	2.53 *	0.79 L	50.9	1.50	3.80	4	LD
BH3VA6	45.9	-0.38	1.43	43.5	-0.92	2.01	4	TD
DAJA4J	46.8	-0.13	1.36	43.8	-0.83	2.28	4	EM
EJPETE	47.9	0.24	1.64	46.7	0.13	2.37	4	TG
FC28LL	49.5	0.74	1.78	46.7	0.13	2.57	4	TS
FGTK8U	46.7	-0.13	1.19	46.2	-0.02	0.68	4	EM
FVDZCE	49.3	0.67	1.73	49.5	1.06	0.33	2	EM
GQWRNF	45.2	-0.62	1.04	44.5	-0.60	0.90	4	CT
J284U9	50.8	1.13	1.51	51.4	1.66	3.04	4	TG
JHRUT9	44.3	-0.91	1.40	42.8	-1.16	1.30	3	IX
KECM69	52.6	1.70	9.63 H	48.8	0.82	2.63	4	XX
KT9VZG	46.0	-0.35	1.65	44.8	-0.50	1.15	4	TU
LVWQZU	48.5	0.41	0.70 L	48.8	0.81	1.41	4	EM
NA4PM4	32.5	-4.60 X	2.71	38.3	-2.62 *	7.22 H	4	XX
P4ECLF	46.3	-0.28	1.51	47.1	0.28	0.72	4	LD
P4R2M8	51.2	1.27	2.15	50.9	1.51	1.06	4	EM
PYY6XF	37.2	-3.12 X	1.13	41.3	-1.66	2.74	4	LD
QE8AXT	48.9	0.53	2.33	49.5	1.06	0.91	4	MK
UCBXFB	43.9	-1.01	1.24	46.1	-0.08	1.62	4	LD
VFQMQL	51.7	1.42	0.99	50.2	1.28	2.89	3	LD
XNTRJY	46.7	-0.15	1.02	45.8	-0.16	0.98	4	BU
XT43A9	44.3	-0.91	2.39	44.6	-0.55	0.75	4	EN
YQYNF3	49.3	0.67	1.22	49.3	1.00	0.48	4	TH
ZHHDQT	43.7	-1.08	1.53	45.1	-0.41	1.44	4	LD
ZU9ARR	45.4	-0.55	1.79	44.3	-0.64	1.44	4	TK



Containerboard Interlaboratory Testing Program
 Analysis 203
Edgewise Compressive Strength by T839, Corrugated Board - EC15
 TAPPI Official Test Method T839

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Consensus (All Labs) Results			
Month Mean	47.15	Grand Mean	46.31
Avg SD	2.22	Avg SD Months	2.48
SD btwn Labs	3.19	SD btwn Labs	3.04
Labs Incl	36	Labs Incl	38

Key to Instrument Codes Reported by Participants

BU Buchel Digital Crush Tester	CT Con-Ten
EM Emerson 1200 Series	EN Emerson 2200
IX Instron (model not specified)	LC L&W Crush Tester 48
LD L&W Crush Tester 248	LY L&W 830
MK Mark-10 ESM303	TD TMI Digital Crush Tester, Model 17-09
TG TMI Digital Crush Tester, 17-76	TH TMI Monitor/Compression Tester, Model 17-76
TK TLS Compression Tester, Model 5184	TL Tech-Lab Systems Compression
TS TMI Digital Crush Tester, Model 17-56	TU TMI Universal Crush Tester (TMI K440)
XX Instrument make/model not specified by lab	



Containerboard Interlaboratory Testing Program
 Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42H3
 TAPPI Official Test Method T807

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2TCDF3	116.1	115.2	112.4	110.5	113.5	-0.45	8.6	2.6	112.6	-0.52	8.7	3.4	8	LC
3AFAC8_AL	115.7	111.6	113.1	No DATA	113.5	-0.47	11.0	2.0	113.8	-0.27	9.2	1.5	5	AL
3XLUPQ	119.5	126.9 *	113.6	122.8	120.7	1.17	11.1	5.6	120.5	1.24	11.3	4.4	8	LC
47A4CR	115.5	115.9	112.8	110.6	113.7	-0.42	5.6	2.5	114.5	-0.11	7.9	2.3	8	AH
64H9MX	121.7	120.0	120.7	121.4	121.0	1.23	5.6	0.8	121.7	1.51	5.7	1.6	8	LA
7RPZEA	119.5	115.4	120.7	120.0	118.9	0.77	9.6	2.4	116.9	0.44	8.4	2.8	8	LA
88VRKW	128.5 *	128.1 *	124.2 *	126.5	126.8	2.57 *	10.2	2.0	123.5	1.92	9.3	4.3	8	LA
8UMZRC	108.8	110.0	110.1	106.3	108.8	-1.53	8.9	1.8	108.8	-1.40	8.4	2.0	8	LA
98TG6K	113.6	108.9	114.9	110.7	112.0	-0.80	9.7	2.7	110.5	-1.00	9.2	2.6	8	LZ
B9AKPM	104.8	109.8	110.6	108.7	108.4	-1.61	7.7	2.6	111.0	-0.89	7.0	4.4	8	XX
CFNQYY_AL	90.8 X	87.8 X	88.9 X	87.4 X	88.7	-6.10 X	5.5	1.5	99.1	-3.56 X	6.5	11.3 H	8	XX
DEBGLR_AL	107.8 H	114.2	115.8	111.3 H	112.3	-0.75	12.6	3.5	114.2	-0.18	10.9	3.4	8	AL
DG3DBL	116.2	116.3	116.7	115.6	116.2	0.15	5.4	0.5 L	115.8	0.20	5.9	1.2 L	8	AH
EQY36R	118.4	115.0	116.9	110.1	115.1	-0.10	6.6	3.6	113.3	-0.38	7.2	4.5	7	LA
EQY36R_AL	102.3 *	97.4 X	100.8 X	100.5 *	100.3	-3.47 X	7.6	2.1	111.6	-0.76	8.1	14.3 H	7	AL
GQWRNF	120.0	117.0	113.0	123.0	118.3	0.62	9.4	4.3	120.1	1.16	10.5	5.0	8	XX
HZHFWM	127.0 *	118.8	117.4 L	No DATA	121.1	1.26	5.1	5.2	120.0	1.14	4.9	3.8	7	AH
JKVPBQ_AL	115.7	116.9	116.0	115.8	116.1	0.12	5.5	0.5	115.2	0.05	5.7	1.5	6	AL
JWRV7A	114.1	114.9	113.8	114.6	114.3	-0.27	6.1	0.5 L	114.5	-0.10	6.4	0.8 L	8	LJ
KECM69	113.0	117.8	116.2 L	115.6	115.7	0.03	8.0	2.0	115.9	0.22	7.8	2.1	8	LC
KHQGJK	112.3	114.4	117.6	110.4	113.6	-0.43	10.8	3.1	113.6	-0.30	10.8	3.1	4	LZ
KLPV7B_AL	113.1	117.4	118.0	121.0	117.4	0.42	9.1	3.3	118.0	0.68	8.6	2.9	8	AL
LBLZN6	117.3 L	117.0 L	117.5 L	117.3 L	117.3	0.40	1.7	0.2 L	117.7	0.62	4.9	3.4	8	LA
LQGHCV	121.7	121.7 L	121.4 L	121.7 L	121.6	1.38	3.0	0.2 L	119.4	0.99	3.3	2.4	8	AH
LT4ZFM_AL	137.0 XH	141.2 XH	138.0 XH	141.3 XH	139.3	5.41 X	27.9	2.2	139.3	5.49 X	27.9	2.2	4	AL
M399VM_AL	111.1	114.3	113.2	117.7	114.1	-0.33	11.3	2.8	115.8	0.19	10.9	3.8	8	AL
MRQQ3F	115.4	114.0	115.7	113.0	114.5	-0.23	8.5	1.3	114.4	-0.13	9.7	4.1	8	ME
NBXHJM	106.3	100.1 X	110.0	102.1 *	104.6	-2.48 *	9.1	4.4	111.5	-0.79	9.4	8.3	8	LA
NLE33J_AL	122.6	128.8 *	121.7	127.6 *	125.1	2.18 *	11.4	3.5	124.9	2.23 *	9.7	3.5	8	AL
NNLHCB	116.8	115.2	114.8	116.2	115.8	0.05	6.1	0.9	115.8	0.19	6.1	1.0 L	8	TP
NV4QZ8_AL	109.5	113.7	115.3	118.6	114.3	-0.29	8.8	3.8	113.6	-0.31	10.0	3.4	8	AL
NVGKDL	120.4	118.5	121.1	116.4	119.1	0.81	10.9	2.1	119.3	0.98	15.7	5.2	8	LJ
P4ECLF	108.9	114.8	117.0	112.6	113.3	-0.50	8.9	3.5	113.2	-0.40	9.3	2.5	8	LA
P7JYBT	113.0	119.3	116.7	123.2	118.1	0.57	10.9	4.3	119.1	0.92	9.9	3.8	8	LC
PLULMG	114.5	117.7	119.1	119.2	117.6	0.47	7.8	2.2	103.8	-2.51 *	7.6	15.2 H	8	TB



Containerboard Interlaboratory Testing Program
 Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42H3
 TAPPI Official Test Method T807

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
PNHCJU_AL	109.0	104.2 *	106.3 *	110.6	107.5	-1.82	10.5	2.8	108.4	-1.47	9.3	3.0	8	AL
PR2CPM_AL	116.9	113.6	113.6	116.9	115.2	-0.07	8.2	1.9	114.8	-0.04	8.7	1.8	6	AL
QDEG3A_AL	115.8	118.6	109.1	109.5	113.2	-0.52	9.1	4.7	112.1	-0.65	8.9	5.0	8	AL
QKWVU8	126.6 *	132.3 X	133.9 X	127.1	130.0	3.28 X	9.2	3.7	130.2	3.43 X	8.7	3.6	8	AX
R86KK7	121.3	118.4	112.8 H	118.8	117.8	0.52	11.1	3.6	116.9	0.44	9.7	2.7	8	LC
R86KK7_AL	115.7	118.4	121.9	116.1	118.0	0.56	9.3	2.9	116.6	0.38	10.2	3.1	8	AL
U99Z6H	118.0 L	121.4	113.8	NO DATA	117.7	0.50	4.7	3.8	117.4	0.54	5.7	3.1	6	AX
U99Z6H_AL	91.4 X	94.1 X	92.8 X	NO DATA	92.8	-5.18 X	6.2	1.4	103.8	-2.51 *	6.7	12.1 H	6	AL
UCBXFB	117.4	114.5	116.0	113.9	115.5	-0.02	8.9	1.6	115.6	0.13	8.4	1.2 L	8	AH
VDYNCN	115.6	118.4	116.1	112.8	115.8	0.05	8.6	2.3	114.1	-0.20	8.9	3.9	8	XX
VFQMQ	116.7 L	109.0 L	110.9 L	109.5 L	111.5	-0.91	2.2	3.5	111.5	-0.78	2.2	3.5	4	LA
WENHCA_AI	118.9	127.0 *	124.2 *	122.3	123.1	1.72	7.4	3.4	123.7	1.97 *	7.1	2.5	8	AL
WMJEBK	115.4	116.1	115.0	116.5	115.8	0.05	5.5	0.7	115.5	0.13	5.1	0.7 L	8	LA
XMDTZA	109.7	112.7	113.2	114.3	112.5	-0.70	9.9	2.0	112.1	-0.65	9.0	2.2	8	LC
Y4GM8A	114.0	116.4 H	116.3	107.4	113.5	-0.46	11.0	4.2	112.6	-0.52	9.9	3.9	8	LA
YYAV44	115.2	109.2	116.5	104.7	111.4	-0.94	10.8	5.5	114.8	-0.04	10.8	6.0	8	LB
ZHHDQT	106.4	113.2	110.8	105.2	108.9	-1.51	9.3	3.7	108.8	-1.39	8.0	2.6	8	AH

Consensus (All Labs) Results									
Wk Mean	115.37	116.31	115.63	114.92	Month Mean	115.53	Grand Mean	114.96	
Avg SDr	8.59	8.87	8.63	8.76	Avg SD	8.70	Avg SD	8.62	
SD btwn Labs	5.54	4.97	3.92	6.43	SD btwn Labs	4.40	SD btwn Labs	4.44	
Labs Incd	49	46	47	46	SD btwn Wks	3.04	SD btwn Wks	4.81	
Labs Excl	3	6	5	2	Labs Incd	47	Labs Incd	49	
Labs not Rcvd	0	0	0	4					

Key to Instrument Codes Reported by Participants

AH	Perkins Model AH	AL	L & W Autoline 400
AX	Perkins Mullen Tester (model not specified)	LA	L&W Bursting Strength Tester
LB	L&W Burst-O-Matic	LC	L&W Autoline (205 Enrollment)
LJ	L&W Bursting Strength Tester J-Type	LZ	L&W (model not specified)
ME	Messmer Automatic Burst Tester ME-06	TB	TMI Monitor/Burst 1000
TP	Technidyne PROFILE/Plus	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 206
Bursting Strength (Mullen), 52 lb Linerboard - 52J1
 TAPPI Official Test Method T807

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2TCDF3	108.8	114.1	108.1	111.7	110.6	-0.15	10.2	2.8	110.6	-0.15	10.2	2.8	4	LC
3AFAC8_AL	114.6	112.8	112.6	No DATA	113.3	0.49	8.9	1.1	113.3	0.49	8.9	1.1	3	AL
3XLUPQ	108.8	117.4	116.1	115.2	114.4	0.76	13.0	3.8	114.4	0.76	13.0	3.8	4	LC
47A4CR	109.0	114.1	102.5	104.6	107.5	-0.90	11.9	5.1	107.5	-0.90	11.9	5.1	4	AH
64H9MX	113.9	117.9	111.9	113.1	114.2	0.71	8.0	2.6	114.2	0.71	8.0	2.6	4	LA
7RPZEA	114.7	109.1	118.5	111.2	113.4	0.52	9.2	4.1	113.4	0.52	9.2	4.1	4	LA
88VRKW	119.9	111.7	115.9	121.0	117.1	1.42	12.7	4.2	117.1	1.42	12.7	4.2	4	LA
8UMZRC	105.2	111.8	113.6	108.2	109.7	-0.38	10.5	3.7	109.7	-0.38	10.5	3.7	4	LA
98TG6K	107.7	109.4	106.7	110.8	108.7	-0.62	11.4	1.8	108.7	-0.62	11.4	1.8	4	LZ
B9AKPM	107.8	102.6	103.8	107.9	105.5	-1.39	7.7	2.7	105.5	-1.39	7.7	2.7	4	XX
CFNQYY_AL	103.2	107.5	104.3	106.0	105.2	-1.45	7.3	1.9	105.2	-1.45	7.3	1.9	4	XX
DEBGLR_AL	122.3 *	114.8	113.0	115.3	116.3	1.23	9.6	4.1	116.3	1.23	9.6	4.1	4	AL
DG3DBL	116.8	115.5	115.0	115.4	115.7	1.07	6.5	0.8	115.7	1.07	6.5	0.8	4	AH
EQY36R	104.9	110.6	113.2	115.8	111.1	-0.03	8.9	4.7	111.1	-0.03	8.9	4.7	4	LA
EQY36R_AL	111.8	114.7	127.5 X	110.9	116.2	1.20	7.6	7.7 H	116.2	1.20	7.6	7.7 H	4	AL
GQWRNF	112.5	103.0	105.5	108.5	107.4	-0.94	11.3	4.1	107.4	-0.94	11.3	4.1	4	XX
HZHFWM	108.2	118.4	110.6	No DATA	112.4	0.28	9.6	5.3	112.4	0.28	9.6	5.3	3	AH
JKVPBQ_AL	103.7	108.4	101.9	108.4	105.6	-1.37	11.7	3.3	105.6	-1.37	11.7	3.3	4	AL
JWRV7A	114.9	113.1	115.5	115.7	114.8	0.86	6.2	1.2	114.8	0.86	6.2	1.2	4	LJ
KHQGJK	121.8 *	108.5	111.4	114.9	114.2	0.70	9.3	5.7	114.2	0.70	9.3	5.7	4	LZ
KLPV7B_AL	109.4	116.3	112.1	104.5	110.6	-0.16	11.1	4.9	110.6	-0.16	11.1	4.9	4	AL
LBLZN6	120.9 L	119.2 L	119.0 L	119.7 L	119.7	2.04 *	2.2	0.9	119.7	2.04 *	2.2	0.9	4	LA
LQGHCV	131.5XL	132.5 XL	131.5 XL	131.3 XL	131.7	4.94 X	3.6	0.5 L	131.7	4.94 X	3.6	0.5 L	4	AH
LT4ZFM_AL	134.2XH	126.7 XH	130.4 XH	124.3 *H	128.9	4.26 X	25.1	4.3	128.9	4.26 X	25.1	4.3	4	XX
M399VM_AL	112.4	110.8	104.8	102.7	107.7	-0.86	13.3	4.7	107.7	-0.86	13.3	4.7	4	XX
MRQQ3F	108.9	106.5	108.2	110.1	108.4	-0.68	11.2	1.5	108.4	-0.68	11.2	1.5	4	LA
NBXHJM	102.6	99.6 *	106.3	100.9 *	102.4	-2.14 *	13.3	2.9	102.4	-2.14 *	13.3	2.9	4	LA
NLE33J_AL	115.5	104.3	119.3	109.6	112.2	0.22	9.6	6.6	112.2	0.22	9.6	6.6	4	AL
NNLHCB	115.9	115.6	115.7	115.3	115.6	1.06	5.6	0.3 L	115.6	1.06	5.6	0.3 L	4	TP
NV4QZ8_AL	107.6	114.9	112.4	114.8	112.4	0.28	10.9	3.4	112.4	0.28	10.9	3.4	4	AL
NVGKDL	112.6	105.0 H	107.0	108.3 H	108.2	-0.73	15.6	3.2	108.2	-0.73	15.6	3.2	4	LZ
P4ECLF	104.5	105.7	107.3	107.5	106.3	-1.21	9.4	1.4	106.3	-1.21	9.4	1.4	4	LA
P7JYBT	113.4	115.9	106.7	107.7	110.9	-0.08	10.6	4.4	110.9	-0.08	10.6	4.4	4	XX
PLULMG	128.0 X	112.5	115.6	115.2	117.8	1.59	12.1	6.9	117.8	1.59	12.1	6.9	4	TB
PNHCJU_AL	100.6 *	108.9	104.6	102.8	104.2	-1.70	10.7	3.5	104.2	-1.70	10.7	3.5	4	AL



Containerboard Interlaboratory Testing Program
 Analysis 206
Bursting Strength (Mullen), 52 lb Linerboard - 52J1
 TAPPI Official Test Method T807

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
PR2CPM_AL	108.2	104.7	110.3	108.7	108.0	-0.79	9.2	2.4	108.0	-0.79	9.2	2.4	4	AL
QDEG3A_AL	109.5	107.7	110.7	102.3	107.6	-0.89	11.7	3.7	107.6	-0.89	11.7	3.7	4	AL
QKWVU8	116.4	113.2	125.6 X	122.4 *	119.4	1.97 *	12.4	5.6	119.4	1.97 *	12.4	5.6	4	XX
R86KK7	108.8	108.9	114.6	116.4	112.2	0.23	13.2	3.9	112.2	0.23	13.2	3.9	4	LC
R86KK7_AL	105.4	113.8	112.1	114.1	111.4	0.02	13.4	4.1	111.4	0.02	13.4	4.1	4	XX
U99Z6H	113.6	113.4	114.4	NO DATA	113.8	0.62	6.9	0.5 L	113.8	0.62	6.9	0.5 L	3	AH
U99Z6H_AL	112.4	107.6	111.9	NO DATA	110.6	-0.15	10.2	2.6	110.6	-0.15	10.2	2.6	3	AL
UCBXXFB	114.6	114.2	109.2	112.7	112.7	0.34	9.1	2.5	112.7	0.34	9.1	2.5	4	AH
VDYNCN	110.2	104.5	105.2	108.6	107.1	-1.00	11.7	2.7	107.1	-1.00	11.7	2.7	4	XX
VFQMQ	113.5	107.7	113.9	113.8	112.2	0.24	13.2	3.0	112.2	0.24	13.2	3.0	4	XX
WENHCA_AI	121.6 *	118.8	116.9	119.1	119.1	1.89	9.0	1.9	119.1	1.89	9.0	1.9	4	AL
WMJEBK	109.7	111.7	112.9	110.9	111.3	0.01	10.4	1.3	111.3	0.01	10.4	1.3	4	LA
XMDTZA	106.4	112.5	106.9	111.0	109.2	-0.50	10.0	3.0	109.2	-0.50	10.0	3.0	4	LA
Y4GM8A	109.3	104.6	107.3	110.8	108.0	-0.79	12.9	2.7	108.0	-0.79	12.9	2.7	4	LA
YYAV44	117.5	106.0	118.5	104.4	111.6	0.08	12.2	7.4	111.6	0.08	12.2	7.4	4	LB
ZHHDQT	109.2	105.6	103.2	111.6	107.4	-0.93	13.0	3.7	107.4	-0.93	13.0	3.7	4	AH

Consensus (All Labs) Results													
Wk Mean	111.27	110.73	110.79	111.41	Month Mean	111.25			Grand Mean	111.25			
Avg SDr	10.43	11.53	10.10	10.83	Avg SD	10.61			Avg SD	10.61			
SD btwn Labs	5.28	4.81	4.81	5.38	SD btwn Labs	4.14			SD btwn Labs	4.14			
Labs Incd	48	49	47	46	SD btwn Wks	3.83			SD btwn Wks	3.83			
Labs Excl	3	2	4	1	Labs Incd	49			Labs Incd	49			
Labs not Rcvd	0	0	0	4									

Key to Instrument Codes Reported by Participants

AH	Perkins Model AH	AL	L & W Autoline 400
LA	L&W Bursting Strength Tester	LB	L&W Burst-O-Matic
LC	L&W Autoline (206 Enrollment)	LJ	L&W Bursting Strength Tester J-Type
LZ	L&W (model not specified)	TB	TMI Monitor/Burst 1000
TP	Technidyne PROFILE/Plus	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 215
Ring Crush, 42 lb Linerboard - 42H3
 TAPPI Official Test Method T822

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2TCDF3	95.4	95.6	96.2	90.1	94.3	-0.15	4.3	2.8	95.3	0.16	3.6	2.2	8	LD
3XLUPQ	94.4	96.3	93.9	95.2	94.9	0.03	2.3	1.1	94.0	-0.21	2.5	1.3	8	LD
47A4CR	96.1	95.9	94.6	95.6	95.5	0.21	2.2	0.7	94.9	0.05	2.5	1.8	8	LC
4RA7PU	93.4	91.3 L	88.7	91.6	91.2	-1.06	2.6	1.9	93.3	-0.42	3.0	2.9	8	LC
64H9MX	87.4 *	95.2	92.9	94.2	92.4	-0.71	3.6	3.5	90.6	-1.21	3.4	3.5	8	LC
7RPZEA	94.6	94.8	93.9	94.7	94.5	-0.10	2.8	0.4 L	94.3	-0.15	2.5	1.1	8	LD
88VRKW	93.0	94.8	94.3	92.0	93.5	-0.39	2.2	1.3	93.6	-0.32	2.6	1.3	8	LG
8X9Q6M	97.5	98.9	96.6	99.8	98.2	1.00	3.1	1.4	97.7	0.88	3.6	1.3	8	MB
98TG6K	95.6	96.7	93.8	96.3	95.6	0.23	2.7	1.3	96.2	0.43	2.6	1.6	8	LD
B6DVH3	93.7 L	94.0 L	94.1 L	94.2 L	94.0	-0.25	0.4	0.2 L	96.0	0.38	0.5	2.2	8	MZ
CFNQYY	92.2	92.2	90.9	92.2	91.9	-0.88	2.4	0.7	92.4	-0.68	2.4	1.6	8	LD
DEBGLR	95.4	97.0	96.1	98.8	96.8	0.60	3.2	1.5	96.4	0.50	3.2	1.9	8	LD
GN6VZL	102.4 *	102.1	99.7	99.1	100.8	1.78	4.0	1.7	101.1	1.88	3.4	1.4	8	TU
J284U9	96.5	94.8 L	96.8	97.0	96.2	0.42	2.4	1.0	96.1	0.40	2.8	1.9	8	TH
JWRV7A	93.3	94.6	95.0	93.1	94.0	-0.24	2.7	0.9	93.0	-0.52	2.8	1.3	8	LD
KHQGJK	89.6	88.2	94.8	95.8	92.1	-0.81	2.8	3.7	92.1	-0.78	2.8	3.7	4	LC
LBLZN6	96.0 L	96.3 L	95.7 L	96.1 L	96.0	0.36	0.7	0.2 L	97.4	0.77	1.6	3.2	8	TU
LQGHCV	93.6	92.8	92.9 L	92.4	92.9	-0.57	2.0	0.5	93.1	-0.48	2.1	0.5 L	8	LD
LT4ZFM	92.7	93.9	69.7 X	72.1 XH	82.1	-3.76 X	5.3	13.0 H	82.1	-3.71 X	5.3	13.0 H	4	LC
LVWQZU	96.7	95.1	95.2	96.4	95.8	0.30	3.1	0.8	96.2	0.43	3.3	0.8 L	8	EM
M399VM	100.3	100.2 L	101.4 *	102.8 *	101.2	1.88	2.1	1.2	100.0	1.53	2.6	1.6	8	LD
ME4FQX	96.9 L	97.1	94.7 L	95.3	96.0	0.34	1.9	1.2	95.3	0.16	2.0	1.1	8	RS
MRQQ3F	103.8 *L	105.6 *	No DATA	100.7	103.4	2.53 *	3.7	2.5	102.8	2.36 *	3.9	3.3	7	LX
NBXHJM	91.2 H	88.6 H	86.0 *H	92.0 H	89.5	-1.59	18.2	2.7	87.4	-2.17 *	17.0	3.2	8	LB
NLE33J	102.7 *	100.7	75.0 XH	77.5 XH	89.0	-1.73	6.5	14.8 H	91.1	-1.06	6.1	12.5 H	8	LZ
NNLHCB	94.1	94.4	95.0	96.3	94.9	0.03	3.1	1.0	96.0	0.36	2.9	2.1	8	TH
NV4QZ8	70.9 XH	70.3 XH	71.0 XH	70.4 XH	70.6	-7.15 X	8.4	0.4 L	69.1	-7.54 X	8.2	1.8	8	LD
P7JYBT	96.0	98.1	97.4	99.2	97.7	0.85	3.6	1.3	98.2	1.01	3.5	1.9	8	MB
PLULMG	93.5	88.6	93.4	92.7	92.0	-0.83	2.8	2.3	93.6	-0.35	3.6	2.4	8	LD
PR2CPM	97.1	99.4	99.3	99.5	98.8	1.18	3.4	1.2	96.4	0.49	4.5	2.8	8	LC
QKWVU8	88.4	88.3	88.5	91.0	89.0	-1.71	3.6	1.3	89.6	-1.51	3.5	2.4	8	LD
R86KK7	93.5	91.5	96.0	92.9	93.5	-0.40	3.7	1.9	89.7	-1.49	3.5	4.5	8	LD
TDN9TG	98.3	100.3	100.4	102.1 *	100.3	1.61	3.0	1.6	99.5	1.41	2.9	1.3	8	LD
TK7J94	90.8	87.6	87.5 *	89.4	88.8	-1.78	3.6	1.6	87.0	-2.28 *	4.4	2.4	8	EM
UCBXFB	94.6	93.4	95.3	94.1	94.3	-0.15	3.3	0.8	94.2	-0.16	2.8	1.6	8	LD



Containerboard Interlaboratory Testing Program
 Analysis 215
Ring Crush, 42 lb Linerboard - 42H3
 TAPPI Official Test Method T822

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
XMDTZA	90.9	93.0	L 92.2	93.1	92.3	-0.74	2.3	1.0	92.9	-0.55	2.4	1.2	8	LD
XT43A9	95.5	97.6	96.3	95.7	96.3	0.43	2.3	1.0	95.3	0.16	2.9	1.4	8	LC
YYAV44	100.5	93.0	95.8	97.6	96.7	0.56	2.9	3.1	96.7	0.58	3.2	2.5	8	LD
ZRMJFG	93.8	L 94.0	L 94.1	L 94.5	94.1	-0.21	0.5	0.3	96.1	0.39	0.5	2.1	8	MZ
ZU9ARR	94.6	L 95.0	L 94.9	94.2	94.7	-0.05	1.7	0.4	94.8	0.01	1.7	0.3	L 8	MB

Consensus (All Labs) Results														
Wk Mean	95.02	95.04	94.55	95.33	Month Mean	94.82	Grand Mean	94.75						
Avg SDr	4.14	4.41	3.89	3.80	Avg SD	4.17	Avg SD	4.11						
SD btwn Labs	3.62	3.97	3.31	3.28	SD btwn Labs	3.38	SD btwn Labs	3.41						
Labs Incl	39	39	36	37	SD btwn Wks	2.90	SD btwn Wks	2.96						
Labs Excl	1	1	3	3	Labs Incl	38	Labs Incl	38						
Labs not Rcvd	0	0	1	0										

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	LB	L&W Crush Tester 240
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LG	L&W 753	LX	L&W 506
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
MZ	Messmer Buchel (model not specified)	RS	Regmed Digital Crush Tester CT-2000
TH	TMI Compression Tester, Model 17-76	TU	TMI Universal Crush Tester (TMI K440)



Containerboard Interlaboratory Testing Program

Analysis 216

Report #650

November 2023

Ring Crush, 52 lb Linerboard - 52J1

TAPPI Official Test Method T822

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2TCDF3	130.0	131.3	134.8 H	128.3	131.1	0.90	5.2	2.8	131.1	0.90	5.2	2.8	4	LD
3XLUPQ	128.9	127.5	125.0	121.3	125.7	-0.55	2.7	3.3	125.7	-0.55	2.7	3.3	4	LD
47A4CR	126.0	127.4	128.1	131.6	128.3	0.14	3.3	2.4	128.3	0.14	3.3	2.4	4	LC
4RA7PU	126.2	123.9	121.6	126.9 L	124.6	-0.83	3.3	2.4	124.6	-0.83	3.3	2.4	4	LC
64H9MX	122.8	126.6	129.5	128.3	126.8	-0.25	5.0	2.9	126.8	-0.25	5.0	2.9	4	LC
7RPZEA	125.6	128.2	129.3	128.0	127.8	0.01	3.6	1.6	127.8	0.01	3.6	1.6	4	LD
88VRKW	126.5	126.6	125.4	123.2	125.4	-0.62	3.5	1.6	125.4	-0.62	3.5	1.6	4	LY
8X9Q6M	127.2	136.6	126.4	129.3	129.9	0.58	5.0	4.7	129.9	0.58	5.0	4.7	4	MB
98TG6K	129.9	128.7	128.7	130.8	129.5	0.48	3.7	1.0	129.5	0.48	3.7	1.0	4	LD
B6DVH3	125.1 L	124.8 L	125.2 L	125.3 L	125.1	-0.71	0.6	0.2 L	125.1	-0.71	0.6	0.2 L	4	MZ
CFNQYY	122.7	122.6	121.6	125.9	123.2	-1.21	4.5	1.9	123.2	-1.21	4.5	1.9	4	LD
DEBGLR	130.7	128.7	129.0	127.1	128.9	0.31	3.3	1.5	128.9	0.31	3.3	1.5	4	LD
GN6VZL	127.8	128.2	128.6	128.0 H	128.1	0.11	4.8	0.3 L	128.1	0.11	4.8	0.3 L	4	TU
J284U9	127.9	125.6	125.9	127.3	126.7	-0.28	3.5	1.1	126.7	-0.28	3.5	1.1	4	TH
JWRV7A	124.6	121.4	122.3	122.9	122.8	-1.31	3.5	1.3	122.8	-1.31	3.5	1.3	4	LD
KHQGJK	122.1	123.9	125.3	125.7	124.2	-0.93	4.2	1.7	124.2	-0.93	4.2	1.7	4	LC
LBLZN6	125.1 L	125.2 L	125.5 L	125.4 L	125.3	-0.64	0.8	0.2 L	125.3	-0.64	0.8	0.2 L	4	TU
LQGHCV	120.3	122.2	122.9	121.9	121.8	-1.58	2.2	1.1	121.8	-1.58	2.2	1.1	4	LD
LT4ZFM	120.2	113.9 *H	80.7 XH	83.1 XH	99.5	-7.54 X	7.8	20.5 H	99.5	-7.54 X	7.8	20.5 H	4	LC
LVWQZU	125.0 L	126.5	127.0	125.6	126.0	-0.45	3.1	0.9	126.0	-0.45	3.1	0.9	4	EM
M399VM	136.2	133.5	134.1	134.2	134.5	1.81	3.1	1.2	134.5	1.81	3.1	1.2	4	LD
ME4FQX	132.1	135.3	134.0	132.3	133.4	1.52	2.5	1.5	133.4	1.52	2.5	1.5	4	RS
MRQQ3F	138.0 *	137.5	No DATA	131.3 H	135.6	2.10 *	5.7	3.8	135.6	2.10 *	5.7	3.8	3	LY
NBXHJM	88.3 XH	96.0 XH	88.4 XH	91.4 XH	91.0	-9.80 X	17.2	3.6	91.0	-9.80 X	17.2	3.6	4	LB
NLE33J	133.9	132.5	108.1 XH	133.4	127.0	-0.20	8.1	12.6 H	127.0	-0.20	8.1	12.6 H	4	LZ
NNLHCB	123.6	124.8	120.1	122.8	122.8	-1.31	3.5	2.0	122.8	-1.31	3.5	2.0	4	TH
NV4QZ8	83.1 XH	82.3 XH	81.8 XH	81.0 XH	82.1	-12.18 X	12.0	0.9	82.1	-12.18 X	12.0	0.9	4	LD
P7JYBT	127.9	125.4	125.1	125.9	126.1	-0.43	4.6	1.3	126.1	-0.43	4.6	1.3	4	MB
PLULMG	127.8	122.6	131.2 H	128.7 H	127.6	-0.04	5.0	3.6	127.6	-0.04	5.0	3.6	4	LD
PR2CPM	131.7	138.3 *	137.1 *	136.1 *	135.8	2.16 *	3.9	2.9	135.8	2.16 *	3.9	2.9	4	LC
QKWVU8	103.4XH	107.4 XH	122.9	122.1 H	114.0	-3.67 X	6.5	10.0 H	114.0	-3.67 X	6.5	10.0 H	4	LD
R86KK7	127.9	124.6	128.2	128.8	127.4	-0.09	5.0	1.9	127.4	-0.09	5.0	1.9	4	LD
TDN9TG	130.4	131.3	129.3	131.9	130.7	0.80	3.9	1.1	130.7	0.80	3.9	1.1	4	LD
TK7J94	115.9 *	115.3 *	115.2 *	118.2 *	116.2	-3.08 X	4.5	1.4	116.2	-3.08 X	4.5	1.4	4	EM
UCBXFB	124.4	125.6	124.7	123.1	124.4	-0.88	3.3	1.0	124.4	-0.88	3.3	1.0	4	LD



Containerboard Interlaboratory Testing Program
 Analysis 216
Ring Crush, 52 lb Linerboard - 52J1
 TAPPI Official Test Method T822

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
XMDTZA	125.1	127.8	125.6	124.3	125.7	-0.54	3.4	1.5	125.7	-0.54	3.4	1.5	4	LD
XT43A9	131.3	130.7	124.3	128.3	128.7	0.25	3.6	3.2	128.7	0.25	3.6	3.2	4	LC
YYAV44	132.8	129.4	128.5	127.9	129.6	0.51	4.6	2.2	129.6	0.51	4.6	2.2	4	LD
ZRMJFG	124.5 L	124.5 L	124.5 L	125.0 L	124.6	-0.83	0.6	0.2 L	124.6	-0.83	0.6	0.2 L	4	TH
ZU9ARR	135.3 L	135.4 L	135.1 L	135.1	135.2	2.00 *	1.6	0.1 L	135.2	2.00 *	1.6	0.1 L	4	MB

Consensus (All Labs) Results										
Wk Mean	127.39	127.41	126.91	127.35	Month Mean	127.72	Grand Mean	127.72		
Avg SDr	3.48	4.20	3.71	3.92	Avg SD	3.94	Avg SD	3.94		
SD btwn Labs	4.69	5.41	4.60	4.12	SD btwn Labs	3.75	SD btwn Labs	3.75		
Labs Incl	37	37	35	37	SD btwn Wks	2.96	SD btwn Wks	2.96		
Labs Excl	3	3	4	3	Labs Incl	35	Labs Incl	35		
Labs not Rcvd	0	0	1	0						

Key to Instrument Codes Reported by Participants

EM Emerson 1200	LB L&W Crush Tester 240
LC L&W Crush Tester 48	LD L&W Crush Tester 248
LY L&W Crush Tester 958	LZ L&W Crush Tester (model not specified)
MB Messmer Buchel K440	MZ Messmer Buchel (model not specified)
RS Regmed Digital Crush Tester CT-2000	TH TMI Compression Tester, Model 17-76
TU TMI Universal Crush Tester (TMI K440)	



Containerboard Interlaboratory Testing Program
 Analysis 223
STFI, 42 lb Linerboard - 42H3
 TAPPI Official Test Method T826

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
26MKRH	23.0	17.6 X	22.0	23.4	21.5	-1.92	2.0	2.7 H	21.8	-1.72	2.1	1.8 H	8	LU
2TCDF3	22.9	23.5 H	22.0	23.3	22.9	-0.64	1.9	0.7	23.3	-0.37	1.8	0.6	8	LA
3XLUPQ	23.9	23.8	23.3	23.3	23.5	-0.07	1.6	0.3	23.5	-0.20	1.6	0.4	8	LA
47A4CR	22.6	22.6	23.2	22.6	22.7	-0.80	1.9	0.3	23.0	-0.62	1.8	0.4	8	LU
64H9MX	24.7	24.5	24.6	24.4	24.6	0.85	1.7	0.1 L	24.1	0.43	1.7	0.5	8	LA
76P2RB	25.2	23.5	24.2	24.2	24.3	0.58	1.5	0.7	23.9	0.24	1.8	0.8	8	XX
78DJW3	23.0	23.1	22.5 L	23.2	22.9	-0.63	1.4	0.3	22.8	-0.77	1.6	0.3	8	LW
7RPZEA	23.3	22.9	23.5	22.6	23.1	-0.51	1.6	0.4	23.0	-0.62	1.7	0.3	8	LZ
88VRKW	24.0	23.9	23.7	23.5	23.8	0.12	1.8	0.2	24.0	0.27	1.9	0.5	8	BK
8UMZRC	24.4	24.5	24.8	24.8	24.6	0.90	2.0	0.2	24.6	0.84	2.1	0.5	8	LH
8X9Q6M	23.5	25.2	22.4	21.8 L	23.2	-0.37	1.4	1.5	23.4	-0.26	1.7	1.1	8	LA
98TG6K	23.7	23.8	23.1	23.3	23.5	-0.13	1.6	0.3	23.9	0.20	1.7	0.5	8	LY
B6DVH3	24.5 L	24.9 L	24.5 L	24.2 L	24.5	0.82	0.4	0.3	25.5	1.73	0.4	1.1	8	LZ
CDNCRN	23.3 H	23.1	23.0 H	21.9 H	22.8	-0.74	2.7	0.7	21.6	-1.90	2.4	1.9 H	8	LH
CFNQYY_AL	23.7	22.8	23.2	23.7	23.3	-0.26	1.7	0.4	23.4	-0.28	1.8	0.3	8	XX
CQQ6W7	24.7	24.6	23.3	24.0	24.1	0.47	1.2	0.6	23.9	0.22	1.4	0.6	8	XX
DEBGLR_AL	24.0	23.5	24.0	24.3	24.0	0.30	1.8	0.4	24.1	0.43	1.6	0.4	8	AL
EQY36R	24.4	21.3	22.2	25.0	23.2	-0.37	1.8	1.7	23.1	-0.55	1.7	1.3	7	LY
EQY36R_AL	24.0	21.2	21.4	25.5	23.0	-0.55	1.2	2.1 H	22.4	-1.14	1.3	1.7	7	AL
GN6VZL	24.8	24.8	24.8	24.9 H	24.8	1.10	2.0	0.0 L	24.9	1.11	1.9	0.1 L	8	LA
GRAHNY	22.8	23.1	22.8	22.6	22.9	-0.70	1.5	0.2	23.1	-0.51	1.5	0.5	8	LH
HZHFWM	25.6	25.8	25.7	No DATA	25.7	1.91	2.1	0.1 L	25.3	1.58	1.9	0.6	7	LU
JKVPBQ	No DATA	26.5 *	25.4	24.1	25.3	1.56	2.0	1.2	25.2	1.39	2.0	0.9	5	LU
KECM69	23.5 L	23.2 L	24.0	25.7	24.1	0.44	1.5	1.1	24.2	0.51	1.6	0.9	8	LA
KHQGJK	20.8 *	20.7 *	22.2	21.2 *	21.2	-2.20 *	1.7	0.7	21.2	-2.30 *	1.7	0.7	4	LY
KLPV7B_AL	25.8	25.9	26.4 *	24.9	25.7	1.92	1.7	0.6	25.5	1.71	1.8	0.7	8	AL
LBLZN6	20.8 *	21.6	21.4	22.3	21.5	-1.91	1.9	0.6	234.7	197.52X	1.9	228.0 H	8	XX
LT4ZFM_AL	52.7 XH	49.5 XH	43.6 XH	42.8 XH	47.2	21.47 X	45.1	4.8 H	47.2	22.01 X	45.1	4.8 H	4	AL
M399VM_AL	23.4	22.3 L	22.1 L	23.9	22.9	-0.62	1.1	0.9	23.4	-0.29	1.7	0.8	8	AL
MRQQ3F	24.2	23.4	21.9	23.6	23.2	-0.35	2.0	1.0	23.0	-0.58	2.0	1.7 H	7	LZ
NA4PM4	25.0	23.9 L	24.1	23.4	24.1	0.42	1.8	0.7	23.4	-0.29	1.7	0.9	8	XX
NBXHJM	22.3	24.3	23.1	22.0 H	22.9	-0.66	2.0	1.0	23.7	0.06	2.2	1.2	8	LH
NLE33J_AL	22.2 L	22.7	23.3	23.4	22.9	-0.64	1.3	0.6	23.2	-0.46	1.4	0.5	8	AL
NV4QZ8	22.8	22.5	23.0	22.7	22.7	-0.80	2.0	0.2	22.4	-1.17	2.0	0.4	8	LY
NV4QZ8_AL	24.0	23.5	23.2	22.6	23.3	-0.28	1.6	0.6	23.6	-0.09	1.6	0.6	8	AL



Containerboard Interlaboratory Testing Program
 Analysis 223
STFI, 42 lb Linerboard - 42H3
 TAPPI Official Test Method T826

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst								
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks									
NVGKDL	25.1	24.4	24.3	24.0	H	24.5	0.77	2.2	0.4	24.2	0.46	2.2	0.7	8	LH							
P7JYBT	25.1	24.7	23.9	25.1		24.7	0.98	1.9	0.6	24.2	0.49	1.6	0.7	8	LA							
PLULMG	22.7	23.7	H	25.2	25.0	24.2	0.50	2.3	1.2	24.1	0.39	2.2	0.9	8	LW							
PNHCJU_AL	24.6	23.3	23.6	24.1		23.9	0.25	1.8	0.6	23.8	0.12	1.8	0.6	8	AL							
PR2CPM	21.8	23.9	23.8	24.7		23.5	-0.07	1.5	1.3	24.1	0.37	1.5	1.3	6	LU							
PTXJ8T	25.0	25.3	25.1	25.0	L	25.1	1.32	1.2	0.2	25.1	1.32	1.2	0.2	L	8	LH						
PYY6XF	24.6	23.8	23.2	24.3		24.0	0.33	1.8	0.6	24.2	0.52	1.8	0.5	8	LH							
QDEG3A_AL	28.9	X	28.3	X	29.3	X	30.0	XH	29.1	4.99	X	2.1	0.7	28.5	4.57	X	2.1	1.7	H	8	AL	
QKWVU8	23.7	23.9	24.1	23.6		23.8	0.18	1.6	0.2	24.0	0.31	1.8	0.7	8	LH							
R86KK7	19.4	X	18.5	X	22.4	22.7	20.7	-2.63	*	1.9	2.1	H	20.8	-2.72	*	1.8	1.5	8	LZ			
R86KK7_AL	46.2	XL	53.2	XL	31.0	XL	45.4	XL	43.9	18.52	X	0.0	9.3	H	44.3	19.30	X	0.0	6.2	H	8	AL
TDN9TG	25.6	27.2	*	25.5	26.2	*	26.1	2.25	*	1.8	0.8	25.7	1.87	1.7	0.7	8	LH					
U99Z6H	23.9	23.9	24.9	NO DATA	24.3	0.58	2.1	0.6	24.0	0.33	1.9	0.5	6	LU								
U99Z6H_AL	23.1	22.1	23.9	NO DATA	23.0	-0.54	1.6	0.9	23.2	-0.45	1.4	0.6	6	AL								
UCBXFB	22.5	22.4	23.4	23.0	22.8	-0.73	1.6	0.5	23.2	-0.41	1.6	0.6	8	LU								
VDYNCN	22.5	21.9	21.9	L	22.5	22.2	-1.30	1.4	0.3	22.2	-1.35	1.4	0.4	8	LH							
VFQMQL	25.3	26.1	25.5	24.7	25.4	1.60	1.6	0.6	25.4	1.61	1.6	0.6	4	LA								
WENHCA_AI	25.9	23.3	23.2	24.0	24.1	0.44	1.6	1.2	23.7	0.02	1.9	1.0	8	AL								
WMJEBK	24.1	23.7	24.2	23.9	24.0	0.32	1.9	0.2	24.0	0.30	1.9	0.2	L	8	LZ							
XMDTZA	23.5	23.0	22.9	23.1	23.1	-0.46	1.8	0.3	23.4	-0.26	2.5	0.6	8	LA								
XT43A9	22.7	22.6	23.0	22.9	22.8	-0.75	1.7	0.2	22.4	-1.17	1.6	0.6	8	LZ								
Y4GM8A	24.1	22.7	22.9	23.0	23.2	-0.40	1.7	0.6	23.1	-0.50	1.9	0.4	8	LY								
YYAV44	25.4	24.4	24.3	22.0	24.1	0.39	1.6	1.4	24.2	0.47	1.8	1.0	8	LU								
ZRMJFG	24.5	L	24.5	L	24.3	L	24.5	L	24.5	0.75	0.5	0.1	L	25.4	1.66	0.4	1.1	8	LZ			

Consensus (All Labs) Results									
Wk Mean	23.82	23.66	23.56	23.66	Month Mean	23.62	Grand Mean	23.66	
Avg SDr	1.78	1.65	1.74	1.70	Avg SD	1.72	Avg SD	1.76	
SD btwn Labs	1.18	1.32	1.15	1.09	SD btwn Labs	1.10	SD btwn Labs	1.07	
Labs Incl	54	54	56	53	SD btwn Wks	0.88	SD btwn Wks	0.85	
Labs Excl	4	5	3	3	Labs Incl	56	Labs Incl	55	
Labs not Rcvd	1	0	0	3					

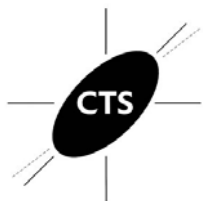


Containerboard Interlaboratory Testing Program
Analysis 223
STFI, 42 lb Linerboard - 42H3
TAPPI Official Test Method T826

Report #650
November 2023

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	BK	Buchel Strip Compression Tester BK-155
LA	L&W Autoline (223 Enrollment)	LH	L&W 282
LU	L&W 52 without moisture correction(was 53)	LW	L&W 53 with moisture correction (was 53M)
LY	L&W 152 without moisture correction	LZ	L&W (model not specified)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 224

Report #650

November 2023

STFI, 52 lb Linerboard - 52J1

TAPPI Official Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
26MKRH	31.2	32.4	32.2	33.0	32.2	-0.60	2.6	0.7	32.2	-0.60	2.6	0.7	4	LU
2TCDF3	32.1	32.6	33.0	32.9	32.6	-0.26	2.2	0.4	32.6	-0.26	2.2	0.4	4	LA
3XLUPQ	32.8	34.4	32.4	32.3	33.0	0.00	2.2	1.0	33.0	0.00	2.2	1.0	4	LU
47A4CR	34.3	32.1	32.7	33.1	33.0	0.06	2.5	0.9	33.0	0.06	2.5	0.9	4	LU
64H9MX	35.3	35.5	34.5	34.6	35.0	1.64	2.1	0.5	35.0	1.64	2.1	0.5	4	LA
76P2RB	35.4	33.4	34.3	34.9	34.5	1.25	2.3	0.9	34.5	1.25	2.3	0.9	4	XX
78DJW3	32.2	30.2	31.4	31.9	31.4	-1.24	2.1	0.9	31.4	-1.24	2.1	0.9	4	LW
7RPZEA	32.2	32.5	32.6	32.0	32.3	-0.52	2.5	0.3	32.3	-0.52	2.5	0.3	4	LZ
88VRKW	34.0	34.3	33.1	33.7	33.8	0.65	2.6	0.5	33.8	0.65	2.6	0.5	4	BK
8UMZRC	33.6	32.9	34.3	33.8	33.7	0.58	2.5	0.6	33.7	0.58	2.5	0.6	4	LH
8X9Q6M	33.9	33.7	30.8	32.1	32.6	-0.26	2.6	1.4	32.6	-0.26	2.6	1.4	4	LA
98TG6K	32.2	32.9	33.9	33.2	33.1	0.08	2.2	0.7	33.1	0.08	2.2	0.7	4	LZ
B6DVH3	32.6 L	34.7 L	33.7 L	34.3 L	33.9	0.73	0.4	0.9	33.9	0.73	0.4	0.9	4	LZ
CDNCRN	40.0 XH	32.7	32.4 H	31.0 H	34.0	0.88	3.6	4.0 H	34.0	0.88	3.6	4.0 H	4	LH
CFNQYY_AL	33.5	32.3	32.4	32.8	32.8	-0.16	2.3	0.5	32.8	-0.16	2.3	0.5	4	XX
CQQ6W7	33.5	34.1	34.8	34.5	34.3	1.06	2.0	0.6	34.3	1.06	2.0	0.6	4	XX
DEBGLR_AL	34.4	33.4	33.1	33.5	33.6	0.50	2.3	0.6	33.6	0.50	2.3	0.6	4	AL
EQY36R	32.9	30.1	31.0	35.0	32.2	-0.58	2.1	2.2	32.2	-0.58	2.1	2.2	4	LH
EQY36R_AL	31.7	29.3 *L	30.1 *L	32.9	31.0	-1.59	1.5	1.6	31.0	-1.59	1.5	1.6	4	AL
GN6VZL	34.4	34.1	32.4	34.6	33.9	0.75	2.3	1.0	33.9	0.75	2.3	1.0	4	LA
GRAHNY	32.3	33.3	31.2	31.3	32.0	-0.77	2.1	1.0	32.0	-0.77	2.1	1.0	4	LH
HZHFWM	34.5	35.7	34.8	No DATA	35.0	1.65	2.3	0.6	35.0	1.65	2.3	0.6	3	LU
JKVPBQ	No DATA	34.5	33.5	36.3 *	34.8	1.48	2.4	1.5	34.8	1.48	2.4	1.5	3	LU
KECM69	31.8	32.6 L	31.7 L	34.4	32.6	-0.27	1.4	1.3	32.6	-0.27	1.4	1.3	4	LA
KHQGJK	33.1 H	29.7 *	31.7	30.4	31.2	-1.41	2.7	1.5	31.2	-1.41	2.7	1.5	4	LW
KLPV7B_AL	35.7	34.6	35.2	34.6	35.0	1.66	2.1	0.6	35.0	1.66	2.1	0.6	4	AL
LBLZN6	28.9 *	28.1 X	27.5 X	27.9 X	28.1	-3.95 X	2.2	0.6	28.1	-3.95 X	2.2	0.6	4	XX
LT4ZFM_AL	41.5 XH	53.1 XH	46.0 XH	39.2 XH	45.0	9.75 X	20.0	6.1 H	45.0	9.75 X	20.0	6.1 H	4	XX
M399VM_AL	31.9	33.8	32.7	33.2 L	32.9	-0.05	2.3	0.8	32.9	-0.05	2.3	0.8	4	XX
MRQQ3F	32.7	32.7	33.7	32.6	32.9	-0.04	2.2	0.5	32.9	-0.04	2.2	0.5	4	LZ
NA4PM4	34.0	32.5	33.7	33.5	33.4	0.38	2.0	0.6	33.4	0.38	2.0	0.6	4	XX
NBXHJM	30.8 H	30.6	31.0	31.6	31.0	-1.58	3.0	0.5	31.0	-1.58	3.0	0.5	4	LH
NLE33J_AL	31.7	30.9	31.3	31.4	31.3	-1.31	2.2	0.3	31.3	-1.31	2.2	0.3	4	AL
NV4QZ8	31.0	31.2	30.8	30.4 *	30.9	-1.70	2.4	0.4	30.9	-1.70	2.4	0.4	4	LY
NV4QZ8_AL	32.4	32.2	33.2	32.7	32.6	-0.27	2.3	0.5	32.6	-0.27	2.3	0.5	4	AL



Containerboard Interlaboratory Testing Program

Analysis 224

Report #650

November 2023

STFI, 52 lb Linerboard - 52J1

TAPPI Official Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
NVGKDL	33.7	33.0	33.0	33.7	33.4	0.33	2.5	0.4	33.4	0.33	2.5	0.4	4	LZ
P7JYBT	33.4	34.3	33.5	34.2	33.8	0.73	2.3	0.5	33.8	0.73	2.3	0.5	4	LA
PLULMG	32.4 H	33.4	33.6	35.5	33.7	0.62	3.0	1.3	33.7	0.62	3.0	1.3	4	LW
PNHCJU_AL	32.7 L	33.3	33.0	34.7	33.4	0.38	2.3	0.9	33.4	0.38	2.3	0.9	4	AL
PR2CPM	33.9	33.5	34.9	33.8	34.0	0.89	2.4	0.6	34.0	0.89	2.4	0.6	4	LU
PTXJ8T	34.2	34.0	33.5	33.0	33.7	0.57	2.5	0.5	33.7	0.57	2.5	0.5	4	LH
PYY6XF	35.1	34.2	33.7	33.5	34.1	0.95	2.1	0.7	34.1	0.95	2.1	0.7	4	LH
QDEG3A_AL	39.8 X	39.7 X	39.4 X	40.5 X	39.8	5.60 X	2.5	0.5	39.8	5.60 X	2.5	0.5	4	AL
QKWVU8	33.8 L	34.3 L	33.6 L	33.8 L	33.9	0.75	1.0	0.3	33.9	0.75	1.0	0.3	4	LH
R86KK7	27.2 X	27.4 X	31.9	32.8	29.8	-2.55 *	2.0	2.9 H	29.8	-2.55 *	2.0	2.9 H	4	LZ
R86KK7_AL	43.1 XL	38.1 XL	41.6 XL	39.6 XL	40.6	6.22 X	0.0	2.2 H	40.6	6.22 X	0.0	2.2 H	4	XX
TDN9TG	35.0	34.7	33.3	34.5	34.4	1.17	2.4	0.7	34.4	1.17	2.4	0.7	4	LH
U99Z6H	33.7	33.3	33.6	NO DATA	33.5	0.46	2.7	0.2 L	33.5	0.46	2.7	0.2 L	3	LA
U99Z6H_AL	33.3 L	31.1	34.1	NO DATA	32.8	-0.09	1.6	1.6	32.8	-0.09	1.6	1.6	3	AL
UCBXFB	31.2	31.7	31.7	30.7	31.3	-1.34	2.5	0.5	31.3	-1.34	2.5	0.5	4	LU
VDYNCN	30.9	32.0	31.0	30.9	31.2	-1.43	1.9	0.5	31.2	-1.43	1.9	0.5	4	LH
VFQMQL	28.9 *L	28.0 XL	28.0 XL	28.6 XL	28.4	-3.74 X	1.2	0.4	28.4	-3.74 X	1.2	0.4	4	LA
WENHCA_AI	30.3 L	33.3 L	33.8	33.7	32.8	-0.14	2.0	1.6	32.8	-0.14	2.0	1.6	4	AL
WMJEBK	31.8	30.6	31.4	30.9	31.2	-1.45	2.7	0.6	31.2	-1.45	2.7	0.6	4	LZ
XMDTZA	33.1	32.5	31.9	32.5	32.5	-0.38	2.3	0.5	32.5	-0.38	2.3	0.5	4	LW
XT43A9	31.6	32.0	30.8	31.2	31.4	-1.26	2.0	0.5	31.4	-1.26	2.0	0.5	4	LZ
Y4GM8A	31.8	31.1	33.2	31.9	32.0	-0.77	2.4	0.9	32.0	-0.77	2.4	0.9	4	LU
YYAV44	34.8	33.5	33.8	33.7	33.9	0.81	2.0	0.6	33.9	0.81	2.0	0.6	4	LU
ZRMJFG	33.2 L	34.7 L	34.3 L	34.8 L	34.2	1.04	0.5	0.7	34.2	1.04	0.5	0.7	4	LZ

Consensus (All Labs) Results														
Wk Mean	32.86	32.87	32.84	33.10	Month Mean	32.95			Grand Mean	32.95				
Avg SDr	2.34	2.28	2.24	2.16	Avg SD	2.27			Avg SD	2.27				
SD btwn Labs	1.51	1.49	1.26	1.42	SD btwn Labs	1.23			SD btwn Labs	1.23				
Labs Incl	53	53	54	51	SD btwn Wks	1.10			SD btwn Wks	1.10				
Labs Excl	5	6	5	5	Labs Incl	54			Labs Incl	54				
Labs not Rcvd	1	0	0	3										



Containerboard Interlaboratory Testing Program
Analysis 224
STFI, 52 lb Linerboard - 52J1
TAPPI Official Test Method T826

Report #650
November 2023

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	BK	Buchel Strip Compression Tester BK-155
LA	L&W Autoline (224 Enrollment)	LH	L&W 282
LU	L&W 52 without moisture correction (was 53)	LW	L&W 53 with moisture correction (was 53M)
LY	L&W 152 with moisture correction	LZ	L&W (model not specified)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program
 Analysis 228
Roughness - Stylus Method, 42 lb Linerboard - 42H
 TAPPI Official Test Method T575

Report #650
November 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2TCDF3	150.6	0.11	15.74	132.9	-0.89	17.75	4	LA
64H9MX	159.8	0.57	12.54	159.3	0.83	9.26	3	EV
76P2RB	136.3	-0.62	15.58	141.5	-0.33	6.44	3	XX
7RPZEA	132.6	-0.81	12.42	135.8	-0.70	5.54	3	LS
8UMZRC	139.4	-0.47	18.72	135.1	-0.75	3.96	4	EV
8X9Q6M	142.0	-0.33	12.61	151.4	0.31	17.91	4	LA
98TG6K	151.4	0.15	13.29	149.7	0.20	2.33	L 4	EV
DEBGLR	194.1	2.32 *	25.85	181.2	2.25 *	18.31	2	LS
EQY36R_AL	179.7	1.59	14.81	142.7	-0.25	24.94	4	AL
GN6VZL	158.1	0.49	14.23	161.1	0.95	7.59	4	LA
KHQGJK	159.4	0.55	26.04	160.7	0.92	1.77	2	LS
KLPV7B_AL	117.1	-1.60	13.14	123.3	-1.52	8.35	4	AL
LT4ZFM_AL	143.8	-0.24	22.72	141.1	-0.36	2.94	3	AL
NLE33J_AL	120.5	-1.43	11.90	130.5	-1.05	19.83	4	AL
NV4QZ8	173.6	1.28	37.84 H	166.2	1.28	19.52	3	XX
NVGKDL	130.6	-0.91	10.19	172.3	1.68	60.89 H	4	LS
P7JYBT	146.9	-0.08	25.78	165.9	1.26	19.02	4	LA
PLULMG	123.2	-1.29	12.19	127.2	-1.26	4.42	4	XX
PNHCJU_AL	162.8	0.73	17.31	152.5	0.38	17.24	4	AL
PR2CPM	147.0	-0.08	20.57	143.0	-0.23	3.74	4	EV
QDEG3A_AL	169.4	1.06	28.25	169.9	1.52	10.15	4	AL
R86KK7	170.9	1.14	7.22 L	57.2	-5.84 X	98.48 H	3	LA
R86KK7_AL	151.9	0.17	13.16	140.5	-0.40	10.04	3	AL
U99Z6H_AL	180.1	1.61	32.93 H	142.8	-0.25	32.33	3	AL
UCBXFB	148.2	-0.02	10.47	151.5	0.32	6.15	4	EV
UQTQ4G	137.2	-0.58	5.81 L	131.2	-1.01	7.11	4	LS
WENHCA_AL	113.4	-1.79	18.01	122.3	-1.59	13.67	4	AL
WMJEBK	140.9	-0.39	19.48	140.0	-0.43	0.86 L	4	LS
XMDTZA	131.7	-0.86	10.28	135.3	-0.74	3.24	4	LA
XT43A9	143.5	-0.26	6.01 L	144.6	-0.13	3.65	4	EV

Consensus (All Labs) Results			
Month Mean	148.53	Grand Mean	146.60
Avg SD	18.49	Avg SD Months	17.26
SD btwn Labs	19.65	SD btwn Labs	15.32
Labs Incd	30	Labs Incd	29



Containerboard Interlaboratory Testing Program
Analysis 228
Roughness - Stylus Method, 42 lb Linerboard - 42H
TAPPI Official Test Method T575

Report #650
November 2023

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	EV	Emveco Microgag Model 210-R
LA	L&W Autoline (228 Enrollment)	LS	L&W 263
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program
 Analysis 229
Roughness - Sheffield Method, 42 lb Linerboard - 42H3
 TAPPI Official Test Method T538

Report #650
November 2023

WebCode	Monthly Results				Cumulative Results				Inst
	Mean	CPV	SD		Mean	CPV	SD Months	Months	
47A4CR	382.5	0.48	11.85		379.6	0.81	4.17	2	XX
7RPZEA	378.5	0.23	12.62	H	378.4	0.68	0.25	2	XX
CFNQYY_AL	395.0	1.24	1.97	L	389.7	1.90 *	7.52	2	XX
DEBGLR_AL	364.4	-0.63	8.03		363.9	-0.87	0.73	2	AL
EQY36R_AL	378.1	0.21	8.12		368.5	-0.37	13.58	2	AL
KECM69	376.1	0.09	8.39		377.0	0.54	1.27	2	XX
KLPV7B_AL	364.5	-0.62	13.83	H	363.8	-0.87	0.99	2	AL
M399VM_AL	379.9	0.32	5.00		377.0	0.54	4.10	2	AL
NBXHJM	343.5	-1.91 *	5.35		186.0	-19.90 X	222.68	2	LA
NV4QZ8_AL	359.5	-0.93	6.77		361.5	-1.12	2.76	2	AL
PNHCJU_AL	362.1	-0.77	4.43		363.6	-0.89	2.12	2	AL
R86KK7_AL	366.9	-0.48	7.40		363.9	-0.86	4.24	2	AL
TK7J94	373.2	-0.09	4.88		364.8	-0.77	11.92	2	TS
VFQML	413.9	2.39 *	1.37	L	413.9	4.49 X	0.00	1	LA
XKCKVZ	382.4	0.47	5.95		384.0	1.28	2.19	2	TS

Consensus (All Labs) Results			
Month Mean	374.70	Grand Mean	371.96
Avg SD	7.88	Avg SD Months	5.92
SD btwn Labs	16.40	SD btwn Labs	9.34
Labs Incd	15	Labs Incd	13

Key to Instrument Codes Reported by Participants

- | | |
|--|---|
| AL L & W Autoline 400
TS TMI Monitor/Smoothness | LA L & W Autoline (229 Enrollment)
XX Instrument make/model not specified by lab |
|--|---|



Containerboard Interlaboratory Testing Program
 Analysis 231
Internal Bond, 42 lb Linerboard - 42H
 TAPPI Official Test Method T569

Report #650
November 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3JZELR	138.8	0.50	4.15	144.6	0.97	5.69	4	TM
3XLUPQ	131.4	0.11	6.15	128.2	-0.07	5.09	4	HZ
47A4CR	149.4	1.06	3.77	149.5	1.28	0.88	L 4	HY
64H9MX	119.4	-0.53	3.44	122.4	-0.44	2.75	4	TM
8UMZRC	134.8	0.29	9.07	139.1	0.61	3.24	4	TM
98TG6K	149.7	1.08	8.52	143.2	0.88	4.69	4	HZ
CDNCRN	58.6	-3.77	X 1.21	L 115.1	-0.91	39.02	H 4	HY
CFNQYY	158.2	1.53	10.21	151.3	1.39	8.79	4	HY
DEBGLR	121.5	-0.42	6.49	116.6	-0.81	3.40	4	TM
JKVPBQ	115.4	-0.75	9.74	122.1	-0.47	5.14	4	TM
KECM69	116.4	-0.69	4.01	111.3	-1.15	5.95	4	SC
LT4ZFM	108.8	-1.10	13.18	120.6	-0.56	12.68	3	SC
M399VM	141.8	0.66	4.76	148.8	1.23	6.48	4	LZ
NLE33J	99.0	-1.62	3.94	115.8	-0.87	11.45	4	TM
NV4QZ8	119.8	-0.51	2.68	121.5	-0.50	1.94	3	TM
PNHCJU	169.4	2.13	* 26.42	H 148.9	1.24	14.60	4	TM
PR2CPM	108.2	-1.13	2.39	100.5	-1.84	12.62	4	TM
PVYT3G	118.1	-0.60	1.59	L 116.7	-0.80	2.97	4	SC
UCBXFB	129.8	0.02	3.96	130.7	0.08	1.69	L 4	TM
UQTQ4G	146.8	0.92	7.79	145.8	1.04	5.28	4	HY
VCQKPC	104.2	-1.34	4.44	109.1	-1.29	9.44	4	XX
XMDTZA	137.0	0.40	6.60	144.9	0.98	9.11	4	HY

Consensus (All Labs) Results			
Month Mean	129.42	Grand Mean	129.37
Avg SD	8.61	Avg SD Months	11.07
SD btwn Labs	18.78	SD btwn Labs	15.74
Labs Incd	21	Labs Incd	22

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	129.13	19.51	0.29	16
Modified Scott Bond Mechanics	142.73	6.25	13.31	3



Containerboard Interlaboratory Testing Program
Analysis 231
Internal Bond, 42 lb Linerboard - 42H
TAPPI Official Test Method T569

Report #650
November 2023

Key to Instrument Codes Reported by Participants

HY	Huygen Digitized Scott Internal Bond Tester	HZ	Huygen Internal Bond Tester with AccuPress
LZ	L&W (model not specified)	SC	Scott Internal Bond Tester (Manual)
TM	TMI Monitor/Internal Bond Tester	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 234
COF Inclined Plane (Slide Angle), 42 lb Linerboard - 42H
 TAPPI Official Test Method T815

Report #650
November 2023

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SD	Mean	CPV	SD Months	Months
3AFAC8	26.6	-0.18	3.51	28.2	0.05	3.98	4
47A4CR	27.9	0.15	1.05	25.2	-1.08	2.96	4
4DTA9X	27.4	0.03	0.89	27.4	-0.24	0.60	3
7RPZEA	31.6	1.14	2.07	30.9	1.06	1.71	4
8UMZRC	29.5	0.58	0.73	29.1	0.42	1.79	4
98TG6K	30.8	0.93	3.49	28.9	0.32	4.63	4
CDNCRN	29.2	0.51	1.48	80.3	19.62 X	106.52 H	4
CFNQYY	29.4	0.56	1.52	29.0	0.37	1.41	4
DEBGLR	24.0	-0.87	2.12	24.7	-1.27	0.66	4
HZHFWM	20.8	-1.72	1.64	28.0	-0.01	6.29 H	3
JKVPBQ	34.4	1.89	3.21	31.8	1.40	2.46	4
KECM69	22.6	-1.24	1.67	23.8	-1.59	1.90	4
KHQGJK	28.8	0.40	1.30	29.6	0.59	1.13	2
KLPV7B	31.8	1.20	3.23	31.1	1.16	2.66	4
LJXYHG	26.8	-0.13	0.84	26.3	-0.65	0.60	4
LT4ZFM	34.4	1.88	1.82	34.6	2.47 *	0.97	3
M399VM	24.6	-0.71	1.52	26.9	-0.41	1.77	4
NLE33J	31.6	1.14	4.28	31.1	1.15	2.16	4
NNLHCB	27.8	0.14	7.29 H	26.7	-0.51	2.12	4
NV4QZ8	28.2	0.24	2.05	28.1	0.02	1.40	3
NVGKDL	22.0	-1.40	1.22	21.3	-2.55 *	0.96	4
P7JYBT	25.3	-0.52	2.17	28.0	-0.03	1.88	4
PLULMG	31.4	1.09	6.66 H	29.4	0.50	2.26	4
PNHCJU	29.0	0.46	3.67	29.0	0.37	0.71	4
PR2CPM	22.6	-1.24	2.61	28.9	0.33	4.76	4
QDEG3A	18.4	-2.35 *	2.97	24.4	-1.37	4.01	4
QKWVU8	29.4	0.56	2.07	28.9	0.34	2.00	4
U99Z6H	28.4	0.30	1.82	31.5	1.29	2.84	3
UCBXFB	23.6	-0.97	1.82	24.5	-1.32	2.09	4
UQTQ4G	28.2	0.24	1.48	28.3	0.09	0.12 L	3
WENHCA	25.6	-0.44	1.52	26.3	-0.67	1.77	4
WMJEBK	27.8	0.14	0.84	27.4	-0.24	0.57	4
XMDTZA	23.6	-0.97	2.30	27.1	-0.37	3.47	4
XT43A9	24.0	-0.86	3.22	29.0	0.37	3.56	4



Containerboard Interlaboratory Testing Program
Analysis 234
COF Inclined Plane (Slide Angle), 42 lb Linerboard - 42H
TAPPI Official Test Method T815

Report #650
November 2023

Consensus (All Labs) Results

Month Mean	27.28	Grand Mean	28.03
Avg SD	2.77	Avg SD Months	2.59
SD btwn Labs	3.78	SD btwn Labs	2.66
Labs Incl	34	Labs Incl	33

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program
Analysis 237

Report #650
November 2023

Air Resistance, 42 lb Linerboard - 42H

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD	Months	Inst
2TCDF3	32.1	-0.13	1.69	32.9	0.40	1.25	4	LA
3AFAC8_AL	33.6	0.56	1.78	32.6	0.15	0.94	4	AL
47A4CR	33.1	0.34	3.51	33.7	0.95	1.17	4	TP
76P2RB	34.0	0.72	2.26	33.0	0.47	1.64	3	XX
7QTTX4	28.7	-1.65	1.29	30.9	-1.03	1.74	4	LP
7RPZEA	32.4	0.00	3.11	32.0	-0.27	1.43	4	GA
8UMZRC	31.4	-0.43	2.88	31.5	-0.58	0.30	4	LP
8X9Q6M	32.0	-0.16	2.44	32.0	-0.25	0.68	4	LA
98TG6K	33.7	0.59	2.22	33.1	0.54	1.07	4	LP
CFNQYY	31.4	-0.42	2.32	31.8	-0.36	0.88	4	TP
CFNQYY_AL	28.5	-1.77	1.91	31.0	-0.93	1.76	4	XX
DEBGLR_AL	32.7	0.17	2.40	31.8	-0.41	1.03	4	AL
EQY36R_AL	31.1	-0.60	1.98	33.3	0.71	1.66	4	AL
GN6VZL	33.6	0.55	3.01	34.1	1.22	0.34	4	LA
HZHFWM	33.6	0.56	3.07	34.4	1.47	0.73	3	GG
JKVPBQ_AL	33.3	0.42	1.89	32.5	0.07	1.00	4	AL
KHQGJK	23.9	-3.85 X	2.23	25.2	-5.09 X	1.84	2	XX
KLPV7B_AL	30.7	-0.76	2.36	30.1	-1.61	0.47	4	AL
LJXYHG	31.7	-0.29	2.76	31.2	-0.81	0.71	4	TD
LT4ZFM_AL	33.8	0.67	3.65	32.9	0.39	1.76	3	AL
M399VM_AL	31.9	-0.23	2.19	33.7	0.98	1.28	4	AL
NBXHJM	35.9	1.61	3.64	26.8	-3.97 X	14.83 H	4	LA
NLE33J_AL	30.2	-0.98	2.89	31.5	-0.57	1.19	4	AL
NV4QZ8	31.6	-0.35	1.66	32.0	-0.24	0.69	3	LP
NV4QZ8_AL	36.4	1.84	2.30	35.0	1.92	1.23	3	AL
NVGKDL	27.8	-2.08 *	3.11	29.3	-2.15 *	1.21	4	TD
P7JYBT	32.0	-0.18	2.05	30.1	-1.62	1.65	4	LA
PLULMG	35.5	1.42	1.67	35.1	1.96 *	1.02	3	LP
PNHCJU_AL	31.2	-0.53	3.34	32.0	-0.27	0.78	4	AL
PR2CPM_AL	33.1	0.35	2.49	32.9	0.41	0.91	4	AL
PT8UNH	32.6	0.08	1.40	32.8	0.30	0.58	4	LP
QDEG3A_AL	37.3	2.25 *	2.16	36.6	3.04 X	0.95	4	AL
R86KK7_AL	31.1	-0.60	3.20	31.3	-0.77	1.14	3	XX
TDN9TG	33.5	0.51	2.84	34.0	1.17	0.93	4	XX
U99Z6H	36.2	1.76	1.84	34.2	1.32	1.84	3	GG
U99Z6H_AL	27.1	-2.39 *	2.08	30.0	-1.70	2.48 H	3	AL
UCBXFB	31.6	-0.36	3.17	33.2	0.58	1.30	4	GA
UQTQ4G	33.3	0.42	0.82 L	32.3	-0.04	0.85	4	LP
VFQMQL	31.7	-0.29	0.88 L	31.6	-0.57	0.22	3	LP



Containerboard Interlaboratory Testing Program
Analysis 237

Report #650
November 2023

Air Resistance, 42 lb Linerboard - 42H3

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
WENHCA_AL	30.1	-1.02	3.49	30.4	-1.40	0.66	4	AL
WMJEBK	32.1	-0.12	2.18	32.2	-0.13	0.35	4	LP
XMDTZA	33.5	0.51	2.51	33.3	0.69	0.56	4	LP

Consensus (All Labs) Results			
Month Mean	32.37	Grand Mean	32.35
Avg SD	2.50	Avg SD Months	1.17
SD btwn Labs	2.20	SD btwn Labs	1.41
Labs Incl	41	Labs Incl	39

Key to Instrument Codes Reported by Participants

- | | |
|---|---|
| AL L & W Autoline 400 | GA Gurley Precision #4340 Automatic Densometer |
| GG Gurley Precision #4320 Densometer | LA L&W Autoline (237 Enrollment) |
| LP L&W Air Permeance Tester SE 166 | TD TMI Gurley Densometer |
| TP Technidyne Profile/ plus Roughness & Porosity | XX Instrument make/model not specified by lab |



Containerboard Interlaboratory Testing Program
 Analysis 240
Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM13
 TAPPI Official Test Method T809

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
3XLUPQ	56.0	54.3	56.5	57.3	56.0	-0.78	3.0	1.3	55.3	-0.95	3.0	0.9	12	LD
47A4CR	57.3	56.3 H	59.9	59.9	58.3	0.25	4.6	1.8	59.2	0.39	4.1	1.7	12	LC
4HPYP6	56.3	56.1	56.2	56.3	56.2	-0.69	3.7	0.1 L	55.6	-0.86	3.2	0.6	12	LD
64H9MX	58.3	58.5	58.6	58.8 L	58.6	0.34	2.0	0.2 L	58.6	0.20	2.3	1.1	12	LC
7QTTX4	56.2	57.4	59.9	60.2	58.4	0.29	3.0	2.0	56.2	-0.66	3.5	2.1	12	LD
88VRKW	58.7	57.2	57.7	57.4	57.8	0.00	2.8	0.7	57.9	-0.07	3.5	1.4	12	LZ
8X9Q6M	52.8	50.5 *	51.8	* NO DATA	51.7	-2.67 *	3.9	1.2	52.8	-1.83	4.0	2.4	11	MB
98TG6K	54.9	55.9	57.6	54.4	55.7	-0.91	3.7	1.4	55.8	-0.79	3.1	1.3	12	LZ
AELAPJ	62.6	66.9 *	62.2	H NO DATA	63.9	2.70 *	4.8	2.6	63.0	1.74	5.0	2.0	11	LD
B6DVH3	56.5 L	58.6 L	58.8 L	59.1 L	58.3	0.21	0.6	1.2	58.7	0.24	0.6	1.0	8	XX
BK6YMY	67.3 *	66.6 *	66.8 *	67.6 X	67.1	4.10 X	3.6	0.4	63.6	1.94 *	3.3	3.0	12	LC
CFNQYY	55.9	57.6	56.6	55.4	56.4	-0.61	3.8	1.0	56.3	-0.62	3.4	2.0	12	LD
CQQ6W7	59.7	60.5	58.2 L	59.1	59.4	0.70	2.8	1.0	59.8	0.61	3.1	0.8	12	LD
GN6VZL	62.7	60.5	61.5	59.3	61.0	1.43	4.0	1.4	61.2	1.11	3.8	1.5	12	TU
GRAHNY	56.5	58.5	59.2	59.5	58.4	0.30	3.8	1.3	59.2	0.39	3.2	1.4	12	LD
HGM4X2	61.4	58.5	60.3	63.7 *	61.0	1.41	4.2	2.2	60.6	0.89	5.0	2.0	12	LD
JF4CPG	57.1	54.9	58.0	55.5	56.4	-0.62	4.1	1.4	56.4	-0.59	4.1	1.4	4	LD
JWRV7A	58.3	57.1	56.4	58.6	57.6	-0.08	3.3	1.0	58.0	-0.01	3.1	1.1	12	LD
KYVNXM	63.9	59.8	62.1	60.6	61.6	1.68	3.0	1.8	61.8	1.30	3.6	2.5	12	LD
LBLZN6	56.6 L	57.1 L	56.7 L	56.7 L	56.7	-0.45	1.1	0.2 L	56.3	-0.60	2.4	3.1	12	TU
LJXYHG	56.9	55.9	57.8	54.6	56.3	-0.65	4.3	1.4	56.0	-0.71	3.8	1.9	12	LZ
M399VM	57.3	55.7	57.7	55.2	56.5	-0.57	3.5	1.2	55.2	-1.00	3.5	1.7	12	LD
M47FDT	57.6	56.1	56.2	56.4	56.6	-0.53	1.9	0.7	55.7	-0.81	2.3	1.1	8	TH
MRQQ3F	61.8	64.0	58.4	59.1	60.8	1.35	3.5	2.6	60.6	0.89	4.1	1.9	11	LD
NA4PM4	59.0 L	60.9 L	58.2 L	62.6 *L	60.2	1.05	0.8	2.0	59.3	0.42	1.1	1.7	12	XX
NBXHJM	58.3	54.1	55.7	57.1	56.3	-0.64	4.1	1.8	57.1	-0.32	4.7	2.1	12	LD
NV4QZ8	55.3	55.5	55.5	56.5	55.7	-0.91	4.1	0.6	53.0	-1.76	3.3	2.1	12	LD
P7JYBT	54.8	51.2	55.5 H	55.0	54.1	-1.60	4.5	2.0	54.3	-1.32	4.1	1.4	12	MB
PLULMG	58.5	62.1	59.8	60.3	60.2	1.06	2.6	1.5	60.5	0.84	3.3	3.0	12	LD
PNHCJU	54.3	55.1	57.9	55.9	55.8	-0.87	4.9	1.5	57.7	-0.13	4.1	4.3 H	12	LD
PR2CPM	60.4	60.0	60.1	NO DATA	60.2	1.06	2.8	0.2 L	59.4	0.46	3.1	1.1	7	LC
PT8UNH	55.2	58.6	58.7	59.8	58.1	0.13	3.6	2.0	58.1	0.02	3.6	1.4	12	LD
PTXJ8T	54.0	53.7	55.4	55.3	54.6	-1.40	2.9	0.9	53.6	-1.56	3.1	1.2	12	LD
PVYT3G	52.7	58.5	56.2	53.7	55.3	-1.09	3.6	2.6	54.5	-1.23	4.4	1.8	12	LC
PYY6XF	56.4	59.8	63.8	59.1	59.8	0.88	4.4	3.0	60.7	0.92	4.9	2.6	12	LD



Containerboard Interlaboratory Testing Program
Analysis 240

Report #650
November 2023

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM13

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
QKWVU8	59.0 H	60.2	63.1	62.1	61.1	1.47	5.4	1.9	64.0	2.08 *	4.4	4.1 H	12	LD
R86KK7	56.9	57.1	58.3 H	54.6	56.7	-0.46	4.6	1.6	56.5	-0.54	4.0	1.4	12	LD
T77WQP	58.5 L	58.2 L	58.4 L	58.2 L	58.3	0.24	0.6	0.2 L	58.4	0.13	0.6	0.1 L	12	LD
TDN9TG	51.1 *	56.7	54.7	57.1	54.9	-1.28	3.2	2.8	55.2	-0.99	3.3	1.6	12	LD
TMDTC9	65.0 *	64.7	65.5 *	67.1 X	65.6	3.44 X	3.2	1.1	64.4	2.23 *	4.1	1.5	12	LD
UCBXFB	54.1	54.4	58.6	56.0	55.8	-0.88	2.5	2.1	54.0	-1.40	3.3	1.9	12	LD
UQTQ4G	57.0 L	55.2 L	56.4	57.1 L	56.4	-0.59	2.0	0.8	56.5	-0.54	2.2	0.7	6	LD
VDYNCN	58.7	59.2	56.7	57.4	58.0	0.11	2.9	1.2	57.3	-0.26	2.7	1.2	12	EM
W8NXCZ	61.0	57.3	55.3	59.5	58.3	0.22	3.4	2.5	58.2	0.04	3.5	1.9	8	LD
WBUHAM	66.4 *	66.7 *H	62.8	68.1 X	66.0	3.63 X	4.3	2.3	66.6	2.99 X	5.1	1.6	12	TX
WENHCA	55.5	55.1	57.4	58.1	56.5	-0.56	3.5	1.5	56.5	-0.53	3.7	2.3	12	LZ
WMJEBK	58.5	59.0	57.2	59.3	58.5	0.32	1.9	0.9	58.3	0.09	2.1	0.6	12	LD
XMDTZA	61.3	62.3	59.0	56.7	59.8	0.90	3.1	2.5	59.3	0.42	3.4	1.7	11	XX
XT43A9	57.8	56.4	59.7	60.6	58.6	0.36	4.3	1.9	58.1	0.02	4.1	1.5	12	EN
Y4GM8A	58.3	56.2	53.0	55.8	55.8	-0.86	4.0	2.2	55.6	-0.85	4.2	2.4	12	LD
YLLULC	64.2	68.1 *	66.7 *	67.0 X	66.5	3.85 X	3.7	1.7	63.1	1.75	3.5	2.9	12	TB
YYAV44	56.7	58.4	59.0	59.4	58.4	0.27	3.5	1.2	61.1	1.06	4.4	5.1 H	12	LD
ZU9ARR	60.4	59.9	59.7	59.6	59.9	0.94	1.7	0.4	60.0	0.69	1.7	0.5 L	12	MB

Consensus (All Labs) Results														
Wk Mean	58.15	58.28	58.55	57.91	Month Mean	57.77			Grand Mean	58.05				
Avg SDr	3.47	3.55	3.45	3.36	Avg SD	3.45			Avg SD	3.52				
SD btwn Labs	3.41	3.74	3.05	2.30	SD btwn Labs	2.27			SD btwn Labs	2.87				
Labs Incl	53	53	53	46	SD btwn Wks	1.63			SD btwn Wks	2.04				
Labs Excl	0	0	0	4	Labs Incl	49			Labs Incl	52				
Labs not Rcvd	0	0	0	3										

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	EN	Emerson 2200 Series
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TB	TMI Monitor/Compression Tester, 17-70	TH	TMI Compression Tester, Model 17-76
TU	TMI Universal Crush Tester (TMI K440)	TX	TMI Crush Tester (model not specified)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program
Analysis 250

Report #650
November 2023

Fluted Edge Crush Strength (FCF), 26 lb Corrugating Medium - CM13

TAPPI Official Test Method T843

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
47A4CR	70.1	69.5	70.1	67.1	69.2	0.63	2.8	1.4	68.2	0.49	3.5	2.5	12	LC
7QTTX4	71.1	72.4	71.1	71.8	71.6	1.17	3.3	0.6	70.4	1.03	3.5	2.0	12	LD
88VRKW	64.1	65.6	64.1	65.2	64.8	-0.40	3.7	0.8	64.5	-0.42	3.8	1.0	12	LZ
B6DVH3	62.9 L	64.1 L	62.6 L	62.0 L	62.9	-0.83	0.8	0.9	64.0	-0.55	0.9	1.3	8	XX
CFNQYY	70.4	71.1	68.9	68.0	69.6	0.72	2.8	1.4	69.0	0.69	3.6	1.7	12	LD
KYVNXM	72.7	67.2	73.3	70.6	70.9	1.02	2.7	2.7	70.4	1.03	3.2	2.2	12	LD
M399VM	69.2	69.2	69.0	71.7	69.8	0.76	3.7	1.3	70.0	0.94	3.5	1.9	12	LD
NA4PM4	70.6 L	70.8 L	72.2 L	71.5 L	71.3	1.10	1.1	0.7	70.3	1.01	1.0	1.1	12	XX
NBXHJM	56.6 *H	54.2 XH	57.1 *H	55.5 *	55.8	-2.46 *	6.7	1.3	55.9	-2.55 *	7.7	1.2	12	LD
NV4QZ8	57.9 *H	57.0 XH	56.3 *H	57.0 *	57.1	-2.18 *	6.2	0.6	57.2	-2.21 *	5.9	1.1	12	LD
PLULMG	70.1	68.4	68.8	68.9	69.0	0.59	2.5	0.7	67.0	0.19	3.4	3.6	12	LD
PNHCJU	66.2	69.1	64.5	69.0	67.2	0.16	3.1	2.2	65.0	-0.31	3.6	4.8 H	12	LD
PR2CPM	72.2	70.6	66.5	No DATA	69.8	0.76	3.4	2.9	68.8	0.64	4.5	4.5 H	7	LC
PT8UNH	65.0	68.1	64.1	62.9	65.0	-0.34	3.5	2.2	65.8	-0.10	3.8	1.6	12	LD
R86KK7	65.0	61.7 *	64.5	64.4	63.9	-0.60	3.5	1.5	63.0	-0.79	4.1	1.7	12	XX
W8NXCZ	66.9	69.3	67.3	69.6	68.3	0.41	3.9	1.4	68.4	0.55	4.4	1.4	8	LD
WENHCA	61.8	61.8 *	63.3	63.2 H	62.5	-0.92	4.4	0.8	62.0	-1.03	4.6	1.8	12	LZ
WMJEBK	67.2	68.0	66.3	67.4	67.2	0.17	2.2	0.7	67.5	0.32	2.4	1.0	12	LD
XMDTZA	72.1	69.7	68.7	68.5	69.8	0.76	3.1	1.7	69.6	0.84	3.5	1.7	11	XX
YYAV44	66.9	67.9	64.1	65.4	66.1	-0.10	3.2	1.7	66.8	0.14	3.3	1.4	12	LD
ZU9ARR	64.5	64.7	64.8	64.3	64.6	-0.44	1.8	0.2 L	66.6	0.09	1.7	1.5	12	MB

Consensus (All Labs) Results												
Wk Mean	66.82	67.84	66.08	66.19	Month Mean	66.49	Grand Mean	66.22				
Avg SDr	3.76	3.13	3.59	3.20	Avg SD	3.52	Avg SD	3.89				
SD btwn Labs	4.52	3.01	4.34	4.54	SD btwn Labs	4.33	SD btwn Labs	4.06				
Labs Incl	21	19	21	20	SD btwn Wks	1.50	SD btwn Wks	2.21				
Labs Excl	0	2	0	0	Labs Incl	21	Labs Incl	21				
Labs not Rcvd	0	0	0	1								

Key to Instrument Codes Reported by Participants

- LC L&W Crush Tester 48
- LD L&W Crush Tester 248
- LZ L&W Crush Tester (model not specified)
- MB Messmer Buchel K440
- XX Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM13
 TAPPI Official Test Method T822

Report #650
November 2023

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
3XLUPQ	42.3	42.0	45.1	43.3	43.2	0.18	3.0	1.4	42.9	0.21	2.6	1.4	12	LD
47A4CR	42.2	46.0	43.0	48.6 *	45.0	0.92	2.8	2.9 H	43.1	0.29	2.9	2.4	12	LC
4HPYP6	45.5	43.4	43.1	42.3	43.6	0.34	2.2	1.4	44.5	0.98	2.8	1.2	12	LC
7QTTX4	38.8	40.0	42.1	40.7	40.4	-1.00	2.5	1.4	40.9	-0.81	2.7	1.7	12	LD
7RPZEA	41.3	41.6	40.3	40.2	40.9	-0.80	3.4	0.7	40.7	-0.89	3.6	1.2	12	LD
AELAPJ	45.4	45.9 L	44.9 H	No DATA	45.4	1.11	3.9	0.5	45.7	1.58	3.6	1.4	11	EM
B6DVH3	43.9 L	43.6 L	43.9 L	43.9 L	43.8	0.45	0.6	0.1 L	44.4	0.93	0.6	0.5 L	12	TX
BK6YMY	43.2	45.8	45.6	44.3	44.7	0.82	2.7	1.2	41.0	-0.74	2.4	3.0	12	XX
CFNQYY	44.8	46.1	46.3	45.6	45.7	1.24	3.4	0.7	43.8	0.65	3.2	1.7	12	LD
HGM4X2	42.6	41.2	41.7 H	41.8	41.8	-0.40	4.4	0.6	39.9	-1.30	4.0	1.9	12	LD
J284U9	39.6	41.5	41.3	41.2 L	40.9	-0.79	2.9	0.9	41.9	-0.32	3.0	2.0	12	TH
JF4CPG	46.5	44.4	45.6	44.1 H	45.1	1.00	5.2	1.1	45.1	1.30	5.2	1.1	4	LD
JWRV7A	41.4	41.5	41.6	41.3	41.4	-0.56	3.4	0.2 L	41.9	-0.29	3.7	1.1	12	LD
LBLZN6	54.2 XL	53.9 XL	52.7 XL	53.7 XL	53.6	4.57 X	1.0	0.6	46.5	1.98 *	1.4	6.0 H	12	TU
M399VM	43.0	47.5 *	45.4	45.8	45.4	1.13	2.3	1.9	44.0	0.75	3.2	1.9	12	LD
M47FDT	36.1 *	36.4 X	38.2	36.4 *	36.8	-2.52 *	1.8	1.0	36.3	-3.10 X	2.1	1.1	8	TH
MRQQ3F	40.8	43.5 H	44.1	42.7	42.8	0.01	3.8	1.4	43.2	0.35	3.9	1.7	11	LZ
P7JYBT	45.8	43.8	43.0	46.2	44.7	0.81	3.2	1.5	43.9	0.69	3.2	1.7	12	MB
PT8UNH	38.8	41.2	40.1	40.6	40.2	-1.09	3.2	1.0	40.6	-0.94	3.4	1.9	12	LD
PYY6XF	43.1	43.4	42.0	44.1	43.2	0.16	2.1	0.9	41.1	-0.70	3.6	2.3	12	LD
R86KK7	40.2	39.7	37.3 *	40.6	39.5	-1.39	3.6	1.5	38.9	-1.79	3.4	2.0	12	LD
T77WQP	44.1 L	44.0 L	44.1 L	44.1 L	44.1	0.55	0.6	0.0 L	44.3	0.88	0.6	0.2 L	12	LD
TDN9TG	43.3	44.6	45.1	43.9	44.2	0.61	2.9	0.8	45.1	1.27	3.3	1.1	8	LD
TMDTC9	36.7 *	40.7	38.4	37.8	38.4	-1.83	2.5	1.7	39.2	-1.67	2.8	1.5	12	LD
VFQML	42.0	41.4	42.8	43.0	42.3	-0.20	2.9	0.7	40.5	-1.00	3.2	2.0	8	LD
W8NXCZ	44.2	43.3	44.6	43.8 H	44.0	0.51	4.1	0.6	43.8	0.63	4.0	0.6	8	LD
WBUHAM	45.5	44.7 H	47.8 *	48.9 *	46.7	1.67	3.8	2.0	41.3	-0.63	3.2	4.6 H	12	LZ
XMDTZA	44.8	42.7	42.9	43.0	43.4	0.26	3.5	1.0	42.4	-0.04	3.4	1.6	11	XX
YLLULC	43.5	42.0	42.1	41.3	42.2	-0.22	2.8	0.9	41.0	-0.78	2.7	2.6	12	XX
ZU9ARR	40.8	40.2	40.5	40.5	40.5	-0.96	1.7	0.2	41.4	-0.58	1.6	0.9	12	MB



Containerboard Interlaboratory Testing Program
 Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM13
 TAPPI Official Test Method T822

Report #650
November 2023

Consensus (All Labs) Results									
Wk Mean	42.42	43.06	42.86	42.85	Month Mean	42.76	Grand Mean	42.53	
Avg SDr	2.92	3.14	3.07	3.26	Avg SD	3.10	Avg SD	3.15	
SD btwn Labs	2.66	2.07	2.52	2.80	SD btwn Labs	2.38	SD btwn Labs	2.01	
Labs Incd	29	28	29	28	SD btwn Wks	1.21	SD btwn Wks	2.17	
Labs Excld	1	2	1	1	Labs Incd	29	Labs Incd	29	
Labs not Rcvd	0	0	0	1					

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	TH	TMI Compression Tester, Model 17-76
TU	TMI Universal Crush Tester (TMI K440)	TX	TMI Digital Crush Tester (model not specified)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 261

Report #650

November 2023

STFI, 26 lb Corrugating Medium - CM13

TAPPI Official Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
26MKRH	13.4 L	13.3	13.3 L	13.0	13.3	-0.63	0.8	0.2	13.3	-0.41	1.0	0.2	8	LU
47A4CR	14.1	13.3	13.2	13.6	13.6	-0.20	1.1	0.4	13.6	0.14	1.1	0.3	12	LU
4HPYP6	14.9	14.2 H	14.7	15.1	14.7	1.59	1.3	0.4	13.7	0.28	1.2	0.8	12	LH
76P2RB	14.3	13.6	13.9	14.1	14.0	0.44	1.1	0.3	13.9	0.51	1.1	0.4	12	XX
7RPZEA	13.6	13.5	12.7	13.4	13.3	-0.61	1.0	0.4	13.3	-0.38	1.1	0.4	12	LZ
8X9Q6M	12.9	13.7	12.6	12.5	12.9	-1.14	1.2	0.5	13.1	-0.71	1.2	0.5	12	LA
B6DVH3	13.5 L	14.2 L	14.3 L	14.3 L	14.1	0.59	0.2	0.4	14.4	1.36	0.2	0.4	12	LZ
DEBGLR	13.4	14.0	14.1	14.4	14.0	0.44	1.1	0.4	14.1	0.88	1.2	0.3	12	LA
GN6VZL	14.4	14.6	14.7	15.2	14.7	1.58	1.1	0.3	15.0	2.21 *	1.0	0.9	12	LA
KYVNXM	14.9	13.7	14.6 L	14.5	14.4	1.11	0.8	0.5	14.2	1.06	0.9	0.5	12	LA
M399VM	14.2 L	14.3	14.1 L	13.6	14.1	0.57	0.7	0.3	13.4	-0.20	0.9	0.7	12	LA
MRQQ3F	11.5 XL	12.0 *L	12.1 *	12.6	12.0	-2.49 *	1.2	0.4	12.0	-2.38 *	1.3	0.5	11	XX
NA4PM4	14.5 H	14.2	13.2	13.8	13.9	0.34	1.2	0.6	13.5	-0.11	1.1	0.5	12	XX
NNLHCB	13.8	14.0	13.3	13.1	13.5	-0.21	1.1	0.4	13.4	-0.24	1.2	0.3	12	TT
NV4QZ8	13.1	13.0	12.9 H	13.2	13.1	-0.93	1.2	0.1	12.5	-1.61	1.5	0.5	12	LB
P7JYBT	14.5	13.8	13.5	14.7 H	14.1	0.66	1.1	0.6	14.0	0.67	1.2	0.3	12	LA
PNHCJU	14.1	13.0	13.6 H	14.2	13.7	0.06	1.2	0.5	13.8	0.43	1.1	0.4	12	LA
PYY6XF	13.3	14.2	14.0	13.3	13.7	0.03	1.0	0.5	13.8	0.38	1.1	0.4	12	XX
QKWVU8	13.9 L	14.2	13.6 L	14.1	13.9	0.40	0.6	0.3	13.7	0.29	1.1	0.5	12	LH
R86KK7	11.2 XH	17.0 XH	12.9 L	13.6	13.7	-0.03	1.3	2.4 H	12.6	-1.49	1.1	1.7 H	12	LZ
T36WG6	13.4	13.8	13.8	13.3	13.6	-0.17	1.1	0.3	13.4	-0.29	1.1	0.4	12	TX
UCBXFB	12.7	12.4	13.0	13.2	12.8	-1.30	1.2	0.3	13.0	-0.81	1.1	0.4	12	LU
UQTQ4G	13.1	13.0	12.9	13.2	13.1	-0.94	0.9	0.1	13.1	-0.73	0.9	0.1 L	6	LH
VDYNCN	13.2	13.4	12.4	12.8	13.0	-1.12	1.0	0.4	13.1	-0.75	1.0	0.4	12	LH
VFQML	15.2 *H	15.2 *H	14.7	15.5 *	15.1	2.20 *	1.6	0.3	14.6	1.70	1.4	0.6	8	LH
W8NXCZ	13.2	14.2	13.9	13.2 H	13.6	-0.10	1.3	0.5	13.5	0.00	1.3	0.4	8	LB
WMJEBK	13.7	13.4	14.0	13.3	13.6	-0.15	1.1	0.3	13.7	0.21	1.1	0.3	8	LA

Consensus (All Labs) Results														
Wk Mean	13.81	13.70	13.55	13.73	Month Mean	13.68			Grand Mean	13.55				
Avg SDr	1.05	1.08	1.11	1.04	Avg SD	1.08			Avg SD	1.11				
SD btwn Labs	0.67	0.68	0.73	0.79	SD btwn Labs	0.66			SD btwn Labs	0.64				
Labs Incl	25	26	27	27	SD btwn Wks	0.61			SD btwn Wks	0.57				
Labs Excl	2	1	0	0	Labs Incl	27			Labs Incl	27				
Labs not Rcvd	0	0	0	0										



Containerboard Interlaboratory Testing Program
Analysis 261
STFI, 26 lb Corrugating Medium - CM13
TAPPI Official Test Method T826

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Key to Instrument Codes Reported by Participants

LA	L&W Autoline	LB	L&W Model 152
LH	L&W 282	LU	L&W 52 without moisture correction (was 53)
LZ	L&W (model not specified)	TT	TMI Short Span Compression, 17-34 (MB K455)
TX	TMI (model not specified)	XX	Instrument make/model not specified by lab

End of Report