



Containerboard Interlaboratory Testing Program

Participant Summary Report #647 - August 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>42H2</u>	<u>Bursting Strength (Mullen), 42 lb Linerboard</u>
<u>207</u>	<u>35E3</u>	<u>Bursting Strength (Mullen), 35 lb Linerboard</u>
<u>215</u>	<u>42H2</u>	<u>Ring Crush, 42 lb Linerboard</u>
<u>217</u>	<u>35E3</u>	<u>Ring Crush, 35 lb Linerboard</u>
<u>223</u>	<u>42H2</u>	<u>STFI, 42 lb Linerboard</u>
<u>225</u>	<u>35E3</u>	<u>STFI, 35 lb Linerboard</u>
<u>228</u>	<u>42H</u>	<u>Roughness - Stylus Method, 42 lb Linerboard</u>
<u>229</u>	<u>42H2</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>42H2</u>	<u>Air Resistance, 42 lb Linerboard</u>
<u>240</u>	<u>CM12</u>	<u>Flat Crush Strength (CMT), 26 lb Corrugating Medium</u>
<u>250</u>	<u>CM12</u>	<u>Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium</u>
<u>255</u>	<u>CM12</u>	<u>Ring Crush (RCT), 26 lb Corrugating Medium</u>
<u>261</u>	<u>CM12</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	CM12	July 2021 - Current
	CM11	April 2019 - June 2021
35# Corrugating Medium	35E3	June 2022 - Current
	35E2	June 2020 - April 2022
42# Corrugating Medium	42H2	December 2022 - Current
	42H1	April 2022 - November 2022
56# Corrugating Medium	56G3	July 2022 - 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.

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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 #647
August 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2U96P9	885.5	0.83	35.32	884.3	0.94	14.74	4	ER
3AQZFQ	845.2	-0.06	94.80	849.7	0.24	29.51	4	LG
3LUJF6	865.2	0.38	46.58	797.1	-0.83	46.66	4	TB
47J7QK	788.7	-1.30	82.77	788.7	-1.00	0.00	1	EX
6CH7C7	802.4	-1.00	52.44	934.9	1.97 *	114.43 H	4	LS
6NBM28	831.6	-0.35	42.04	829.7	-0.17	71.19	4	LG
8CUQ2L	876.8	0.64	71.16	861.5	0.48	25.51	4	EX
AP62FY	805.6	-0.93	33.42	755.9	-1.67	88.65	4	LG
BJZKJK	692.6	-3.41 X	66.53	746.6	-1.86	38.12	4	LL
C49VEF	802.0	-1.01	59.96	839.3	0.02	31.08	4	LM
EJBE3G	828.0	-0.43	42.16	844.2	0.13	48.23	4	LG
GHRAJA	822.2	-0.56	101.05	815.4	-0.46	12.02	4	ER
H3A2VB	902.3	1.20	106.41	837.4	-0.01	82.58	4	EX
HDCAL9	874.6	0.59	82.34	887.2	1.00	20.06	4	LM
J9W2XA	802.6	-0.99	71.77	780.4	-1.17	40.42	4	LG
NDQQ6P	872.9	0.55	97.29	839.4	0.03	59.76	4	LS
PQTK47	809.7	-0.84	19.77	813.3	-0.50	18.83	4	EX
R8RJ46	844.2	-0.08	124.57	802.6	-0.72	65.64	4	EX
RGUV9L	816.6	-0.69	110.84	842.4	0.09	55.30	4	EX
TDEJ74	935.0	1.92 *	67.55	917.1	1.61	53.30	4	ES
TFL26Y	875.3	0.60	55.57	876.6	0.78	22.70	4	LO
TP6AR3	821.6	-0.58	135.59	879.5	0.84	58.85	4	XX
TUXDJL	761.7	-1.89	28.84	764.6	-1.50	16.14	4	ET
UT4VAX	944.5	2.13 *	46.60	871.0	0.67	50.03	4	ER
V6GF7Y	817.9	-0.66	105.02	793.3	-0.91	22.33	4	EX
XGJQQQ	847.3	-0.01	34.79	891.3	1.08	53.59	4	LN
XP7ZLD	878.8	0.68	127.93	799.9	-0.78	66.12	4	LS
XRMWPY	925.2	1.70	90.06	913.1	1.53	43.16	4	ER
XVL8KY	854.0	0.14	92.20	848.7	0.22	17.39	4	ER

Consensus (All Labs) Results			
Month Mean	847.76	Grand Mean	838.10
Avg SD	80.34	Avg SD Months	51.57
SD btwn Labs	45.46	SD btwn Labs	49.15
Labs Incl	28	Labs Incl	29



Containerboard Interlaboratory Testing Program
Analysis 201

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August 2023

Top to Bottom Box Compression Strength, Corrugated Boxes - BX17

TAPPI Official Test Method T804

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	853.45	27.77	5.69	8
Clip sealing	843.38	51.82	4.39	19
Staple sealing	885.54	0.00	37.78	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	LN	Lansmont 152-50k
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

Report #647
August 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3AQZFQ	42.5	-0.06	1.63	42.4	-0.02	0.68	4	EX
AP62FY	45.9	0.76	2.54	45.9	1.03	0.00	1	EM
M4TEN4	48.7	1.41	1.72	45.4	0.87	3.21	4	XX
NDQQ6P	37.6	-1.23	1.88	40.2	-0.65	2.38	4	LD
Q6TLG8	39.2	-0.85	3.28	39.0	-1.00	1.59	4	TS
QEU994	36.0	-1.63	2.23	36.0	-1.92 *	0.00	1	XX
RGUV9L	45.3	0.62	1.51	44.2	0.53	1.21	4	LC
TP6AR3	42.9	0.04	2.22	42.8	0.11	1.34	4	TS
XKB7NC	47.3	1.07	1.51	46.8	1.31	2.02	4	XX
XVL8KY	42.3	-0.12	3.86 H	41.5	-0.27	1.18	4	EN
YKGQ4T	159.5	27.93 X	5.32 H	160.5	34.92 X	4.32 H	4	LD

Consensus (All Labs) Results			
Month Mean	42.76	Grand Mean	42.43
Avg SD	2.36	Avg SD Months	1.86
SD btwn Labs	4.18	SD btwn Labs	3.38
Labs Incl	10	Labs Incl	10

Key to Instrument Codes Reported by Participants

- | | |
|--|--|
| EM Emerson 1200 Series
EX Emerson (model not specified)
LD L&W Crush Tester 248
XX Instrument make/model not specified by lab | EN Emerson 2200
LC L&W Crush Tester 48
TS TMI Digital Crush Tester, Model 17-56 |
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Containerboard Interlaboratory Testing Program
 Analysis 203
Edgewise Compressive Strength by T839, Corrugated Board - EC15
 TAPPI Official Test Method T839

Report #647
August 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2U96P9	52.0	1.83	0.95	50.3	1.45	1.57	4	LD
3AQZFQ	43.9	-0.50	1.17	44.1	-0.65	0.90	4	LY
3LDD9T	42.6	-0.85	2.45	43.0	-1.01	1.07	4	TK
3LUJF6	47.8	0.62	1.91	47.3	0.43	1.02	4	LD
4B84Q8	44.8	-0.23	0.83	44.7	-0.44	0.71	4	BU
6CH7C7	50.5	1.39	2.42	53.8	2.66 *	2.73	4	EM
6NBM28	50.4	1.36	1.58	50.3	1.45	0.79	4	MK
8CUQ2L	44.0	-0.47	1.75	46.0	-0.02	1.37	4	LD
C49VEF	43.6	-0.57	2.07	45.6	-0.15	1.53	4	TG
EJBE3G	45.2	-0.14	1.39	45.9	-0.04	0.65	4	EM
FZ89YF	42.1	-1.01	1.97	43.5	-0.85	1.11	4	BU
GCWRRQ	53.1	2.14 *	1.80	51.7	1.94 *	2.54	4	LC
GHRAJA	46.9	0.37	1.01	46.5	0.18	0.28 L	4	EM
HDCAL9	45.7	0.03	1.10	46.3	0.09	2.50	4	EM
HT6UFB	32.0	-3.90 X	2.88 H	42.1	-1.35	10.17 H	4	XX
JX8CZV	47.6	0.56	0.87	47.1	0.37	2.45	4	EM
M4TEN4	48.4	0.80	1.14	44.9	-0.38	3.53	4	XX
NDQQ6P	45.3	-0.08	1.50	44.0	-0.68	2.25	4	LD
NTGN97	44.8	-0.23	2.68	46.6	0.21	1.27	4	TU
PQTK47	39.1	-1.86	1.96	44.7	-0.44	4.17	4	TL
Q6TLG8	46.5	0.24	0.74 L	43.5	-0.86	2.00	4	TS
R8RJ46	44.0	-0.47	1.85	45.2	-0.26	1.13	4	CT
RGUV9L	48.9	0.95	0.95	48.1	0.70	0.94	4	LC
TDEJ74	47.7	0.59	1.87	47.8	0.61	0.99	4	LD
TFL26Y	43.1	-0.73	1.68	43.6	-0.83	1.23	4	LD
TP6AR3	47.4	0.52	1.30	45.3	-0.26	1.80	4	TS
TUXDJL	42.1	-1.00	1.58	47.4	0.48	3.99	4	TD
UNDLZY	48.0	0.69	1.66	48.6	0.87	0.79	4	TG
UT4VAX	42.1	-1.00	2.41	47.0	0.34	3.29	4	LD
UXRU9K	41.4	-1.22	1.08	43.6	-0.81	1.60	4	TD
WF9N6R	38.2	-2.11 *	1.29	38.2	-2.65 *	0.00	1	LC
WLQ782	49.7	1.15	1.54	48.9	0.97	1.69	4	TH
XP7ZLD	41.9	-1.07	1.25	42.6	-1.15	0.97	4	EM
XRMWPY	47.8	0.63	2.19	46.6	0.21	1.60	4	LD
XVL8KY	44.5	-0.31	2.35	45.6	-0.15	1.20	4	EN



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	45.62	Grand Mean	46.01
Avg SD	1.68	Avg SD Months	2.59
SD btwn Labs	3.50	SD btwn Labs	2.93
Labs Incl	34	Labs Incl	35

Key to Instrument Codes Reported by Participants

<p>BU Buchel Digital Crush Tester</p> <p>EM Emerson 1200 Series</p> <p>LC L&W Crush Tester 48</p> <p>LY L&W 830</p> <p>TD TMI Digital Crush Tester, Model 17-09</p> <p>TH TMI Monitor/Compression Tester, Model 17-76</p> <p>TL Tech-Lab Systems Compression</p> <p>TU TMI Universal Crush Tester (TMI K440)</p>	<p>CT Con-Ten</p> <p>EN Emerson 2200</p> <p>LD L&W Crush Tester 248</p> <p>MK Mark-10 ESM303</p> <p>TG TMI Digital Crush Tester, 17-76</p> <p>TK TLS Compression Tester, Model 5184</p> <p>TS TMI Digital Crush Tester, Model 17-56</p> <p>XX Instrument make/model not specified by lab</p>
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Containerboard Interlaboratory Testing Program
 Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42H2
 TAPPI Official Test Method T807

Report #647
August 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	
29DCWR_AL	118.8	114.2	122.1	115.7	117.7	0.08	11.5	3.5	117.4	0.27	9.9	4.0	16	AL
2RAHPR_AL	115.3	111.2	117.4	121.2	116.3	-0.18	9.1	4.2	116.8	0.14	7.7	2.8	16	AL
2U96P9	117.7	112.8	113.5	113.0	114.2	-0.54	9.4	2.3	114.2	-0.46	9.4	2.3	4	LA
34X69R	128.9	120.7 H	119.2	117.9	121.7	0.79	11.0	4.9	120.9	1.07	10.7	4.0	16	LC
3AQZfq	125.5	126.8 *	123.2	119.8	123.8	1.18	11.0	3.1	123.6	1.70	9.9	3.1	16	AH
3LUJF6	110.9	108.7	110.8	112.9	110.8	-1.15	7.4	1.7	110.8	-1.25	8.3	3.3	16	XX
7E9QTN_AL	133.2 *H	132.8 XH	128.0 *H	134.2 *H	132.0	2.65 *	19.4	2.8	132.0	3.62 X	20.4	2.9	16	AL
7VTGTN	123.6	121.6	116.6	121.2	120.8	0.63	5.2	3.0	119.7	0.80	5.3	2.0	14	AH
8CUQ2L	119.6	119.6	120.8	110.4	117.6	0.06	8.8	4.8	115.3	-0.22	8.9	3.5	16	AH
8QCA6N_AL	120.5	121.2	121.4	123.8	121.7	0.80	7.8	1.4	119.9	0.84	7.7	2.0	16	AL
8Y6QBJ	115.2	117.8	120.0 L	120.0	118.3	0.18	3.8	2.3	116.5	0.06	5.0	2.6	13	AX
8Y6QBJ_AL	123.3	117.2	118.9	115.0 L	118.6	0.24	6.7	3.5	117.1	0.21	7.8	2.6	13	AL
CAPHXJ	113.8	108.2	111.4	112.8	111.6	-1.02	5.8	2.4	111.2	-1.14	6.8	2.3	14	XX
CL6CMJ_AL	110.8	112.6 H	114.3	115.2	113.2	-0.72	10.7	2.0	114.2	-0.46	10.5	3.1	16	AL
CYTNQF_AL	121.7	No DATA	120.3	No DATA	121.0	0.68	7.6	1.0	119.2	0.69	7.9	2.9	9	AL
D8TLLU	115.3	116.0	116.2	118.2	116.4	-0.15	6.2	1.2	116.4	0.05	6.2	1.0	16	AH
DCTXHU	114.8	115.8	115.8	116.9	115.8	-0.26	6.4	0.9	115.8	-0.10	6.0	1.1	16	TP
DQD2GC_AL	118.3	116.1	117.4	116.5	117.1	-0.03	8.9	1.0	115.6	-0.13	9.2	3.6	16	AL
F32XFF	119.3	116.4	119.3	114.6	117.4	0.03	8.5	2.3	118.9	0.61	9.2	2.6	16	LA
F32XFF_AL	115.1	116.8	119.2	119.2	117.6	0.06	7.1	2.0	117.4	0.26	6.8	2.1	16	AL
FTV63E	115.9	114.8	115.1	116.4	115.6	-0.30	6.6	0.7	115.7	-0.12	5.7	1.0	16	LJ
GWCPM9_AL	129.9 *	129.7 X	129.0 *H	128.1	129.2	2.14 *	13.0	0.8	124.4	1.87	11.1	4.7	16	AL
HVCZ3C_AL	124.3	119.0	122.2	117.8	120.8	0.64	8.5	3.0	116.6	0.09	4.9	4.4	16	XX
J37RMB	109.8	111.6	114.9	112.6	112.2	-0.90	10.9	2.1	111.0	-1.19	8.9	3.1	16	LC
JRCBXA	128.3	119.7	119.1	117.6	121.2	0.70	6.9	4.8	119.7	0.79	7.3	4.3	16	LA
KJ66KQ	117.2	114.6	122.5	120.7	118.8	0.27	10.2	3.5	117.6	0.31	9.2	3.0	15	LC
M4TEN4	118.1	113.4	114.6	117.6	115.9	-0.24	7.0	2.3	115.0	-0.27	7.6	2.1	16	LC
M89WQ8	116.0	111.5	110.3	108.6	111.6	-1.01	8.8	3.2	111.8	-1.01	9.8	2.9	16	LC
MZ8LJN	114.5	115.2	115.0	116.8	115.4	-0.34	5.3	1.0	115.7	-0.12	6.1	0.6 L	16	LA
NDQQ6P	119.8	121.7	116.6	111.7	117.4	0.03	8.3	4.4	115.1	-0.25	8.9	3.9	16	LA
NKRN82_AL	110.4	113.0	110.0	110.9	111.1	-1.11	6.1	1.3	110.1	-1.39	6.5	3.0	16	XX
NLNGN6	117.2	110.4	119.1	117.9	116.2	-0.20	9.7	3.9	118.7	0.56	9.0	3.4	16	TB
NXW8HZ	116.5	113.5	116.1	108.9	113.8	-0.63	8.3	3.5	114.1	-0.47	8.8	2.8	16	LA
PX7MZ7	113.0	116.4	119.1	121.1	117.4	0.02	9.4	3.5	115.0	-0.27	9.8	3.8	16	XX
QMQZNK	121.0 L	121.5 L	121.4 L	121.2 L	121.3	0.72	2.9	0.2 L	123.4	1.65	2.9	1.6	16	AH



Containerboard Interlaboratory Testing Program
 Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42H2
 TAPPI Official Test Method T807

Report #647
August 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	
QU8KZX	110.1	107.9	110.2	114.6	110.7	-1.18	9.0	2.8	108.8	-1.69	8.4	3.0	13	LA
QU8KZX_AL	126.3	121.7	No DATA	131.2 *	126.4	1.64	10.2	4.8	124.5	1.89	10.2	3.8	12	AL
R8RJ46	120.0	127.0 *	119.0	124.0	122.5	0.94	8.9	3.7	119.0	0.64	10.0	3.6	16	XX
R9RAJZ	123.1	141.6 X	118.4	133.1 *	129.1	2.12 *	11.8	10.4 H	127.7	2.63 *	10.1	9.6 H	16	LB
RYDL8K_AL	111.5	105.4 *	110.5	112.3	109.9	-1.32	7.6	3.1	110.1	-1.39	9.6	3.7	16	AL
TDEJ74	110.3	113.3	112.6	109.3	111.4	-1.05	10.3	1.9	112.2	-0.91	9.9	3.4	16	LA
TMYRU7_AL	119.1	119.1	114.8	112.2	116.3	-0.17	9.6	3.4	117.4	0.27	8.2	4.4	8	AL
U2DKMV	121.0	118.9	122.3 H	124.2	121.6	0.78	11.7	2.2	120.3	0.94	10.7	2.7	16	LJ
UPNNLX_AL	113.0 H	115.9	123.2	118.0	117.5	0.05	11.2	4.3	118.2	0.44	10.3	3.3	15	AL
UT4VAX	109.1	116.0	103.0 *	110.4	109.6	-1.37	9.0	5.3	111.2	-1.15	9.3	3.6	16	LZ
V6GF7Y	111.8	114.7	108.6	114.9	112.5	-0.85	10.3	3.0	113.7	-0.57	8.9	3.0	16	AH
VJU44Z	114.0	114.6	119.2	119.6	116.9	-0.07	9.1	3.0	117.6	0.32	8.9	3.0	16	LA
WQQ7XY	116.9	112.0	118.0	113.1	115.0	-0.40	7.3	2.9	115.6	-0.14	4.2	2.3	16	LA
X8B8ZF	111.9	112.7	111.3	110.5	111.6	-1.01	8.3	0.9	108.8	-1.68	11.5	4.3	16	LA
XRMWPY	117.3	115.1	116.9	113.5	115.7	-0.28	9.1	1.8	115.6	-0.13	9.0	2.6	16	AH
YKQ4T	105.4 *	106.8	107.5	100.1 *	104.9	-2.21 *	10.0	3.3	106.4	-2.24 *	9.0	3.8	16	LA
YX4R6T	111.5	112.9	111.9	108.9	111.3	-1.07	8.0	1.7	111.4	-1.11	7.9	3.6	16	ME
ZNNPLC	129.9 *	130.9 X	126.8	132.9 *	130.1	2.31 *	10.1	2.5	119.6	0.78	7.0	8.1 H	16	AX

Consensus (All Labs) Results									
Wk Mean	117.65	115.50	117.01	117.10	Month Mean	117.25	Grand Mean	116.22	
Avg SDr	8.76	8.86	8.87	9.50	Avg SD	9.15	Avg SD	8.53	
SD btwn Labs	6.10	4.69	5.23	6.72	SD btwn Labs	5.57	SD btwn Labs	4.38	
Labs Incl	53	48	52	52	SD btwn Wks	3.25	SD btwn Wks	3.53	
Labs Excl	0	4	0	0	Labs Incl	53	Labs Incl	52	
Labs not Rcvd	0	1	1	1					

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 207
Bursting Strength (Mullen), 35 lb Linerboard - 35E3
 TAPPI Official Test Method T807

Report #647
August 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	
29DCWR_AL	97.4	93.0	93.9	95.5	95.0	1.13	7.5	1.9	93.4	0.50	9.0	3.3	12	AL
2RAHPR_AL	88.9	89.2	88.2	93.3 L	89.9	-0.39	5.3	2.3	92.0	0.04	6.2	2.8	12	AL
2U96P9	90.7	87.6	91.0	87.6	89.2	-0.59	7.4	1.9	89.2	-0.83	7.4	1.9	4	XX
34X69R	98.2 H	98.3 H	96.9	94.8 H	97.0	1.77	12.2	1.7	95.0	1.02	10.1	2.8	12	LC
3AQZfq	99.3 *	100.1	94.1	95.3	97.2	1.81	9.5	2.9	97.2	1.72	8.9	2.5	12	AH
3LUJF6	87.4	89.5	85.7	90.9	88.4	-0.84	6.9	2.3	87.3	-1.43	7.0	2.2	12	XX
7E9QTN_AL	103.8XH	100.3 H	103.4 XH	111.2 XH	104.7	4.07 X	17.5	4.6	104.7	4.08 X	17.5	4.6	4	AL
7VTGTN	93.6	94.4	94.0	No DATA	94.0	0.85	6.5	0.4 L	95.7	1.24	6.1	2.2	7	AH
8CUQ2L	91.2	93.2	91.2	92.0	91.9	0.22	9.1	0.9	91.5	-0.10	7.8	2.4	12	AH
8QCA6N_AL	92.2	92.3	95.6	92.5	93.1	0.59	5.1	1.6	94.5	0.84	5.3	1.8	12	AL
8Y6QBJ	94.0	94.2	93.0	94.2	93.9	0.80	4.8	0.6	93.5	0.54	5.1	2.0	7	AX
8Y6QBJ_AL	92.4	91.4	93.6	89.7	91.8	0.18	5.3	1.7	91.4	-0.15	6.1	1.7	7	AL
CAPHXJ	91.8	92.6	90.6	91.9	91.7	0.16	4.7	0.8	90.5	-0.41	5.9	2.8	11	XX
CL6CMJ_AL	92.3	92.0	90.6	91.5	91.6	0.12	7.0	0.8	92.5	0.20	7.9	2.5	12	AL
CYTNQF_AL	90.4	No DATA	92.2	No DATA	91.3	0.03	7.0	1.2	92.3	0.14	6.2	2.1	7	AL
D8TLLU	92.3	90.0	91.0	91.0	91.1	-0.03	5.8	0.9	91.2	-0.21	6.2	0.9	12	AH
DCTXHU	90.7	91.7	92.8	91.5	91.7	0.15	5.4	0.9	91.5	-0.12	5.6	1.0	12	TP
DQD2GC_AL	91.4	99.1	95.4	90.9	94.2	0.91	9.3	3.8	91.1	-0.25	8.7	3.5	12	AL
F32XFF	95.6 L	96.1	95.6	95.7	95.7	1.37	7.4	0.2 L	96.6	1.51	8.0	2.7	12	LA
F32XFF_AL	92.1	95.5	92.6	92.3	93.1	0.58	6.0	1.6	93.7	0.60	5.0	1.7	12	AL
FTV63E	92.4	91.4	91.1	90.1	91.2	0.02	5.3	1.0	91.7	-0.04	5.3	0.8 L	12	LJ
GWCPM9_AL	105.1 X	101.0 *	104.6 X	101.3 *H	103.0	3.56 X	10.0	2.1	98.5	2.12 *	7.3	4.8	11	XX
HVCZ3C_AL	93.3	86.0	88.7	89.9	89.5	-0.51	7.8	3.0	90.9	-0.29	4.8	2.0	12	XX
J37RMB	84.2	88.8	91.1	88.6	88.2	-0.91	7.2	2.9	88.3	-1.12	7.3	2.5	12	LA
JRCBXA	100.3 *	95.4	90.2	93.5	94.9	1.10	6.7	4.2	96.2	1.39	5.9	4.1	12	LA
KJ66KQ	89.6	91.8	88.7	90.3	90.1	-0.33	6.1	1.3	91.0	-0.26	7.0	1.9	12	LC
M89WQ8	86.3	88.5 L	89.0	85.3	87.3	-1.18	6.1	1.8	89.0	-0.89	6.5	3.5	12	LC
MZ8LJN	91.8 L	91.2 L	91.7 L	93.1 L	92.0	0.23	2.7	0.8	91.3	-0.16	2.8	0.8 L	12	LA
NDQQ6P	91.8	94.4	93.0	90.5	92.4	0.37	6.6	1.7	90.0	-0.57	7.5	3.1	12	LA
NKRN82_AL	87.1	88.2	89.5	91.4	89.0	-0.65	5.5	1.8	88.8	-0.95	5.0	1.7	12	XX
NLNGN6	88.0	106.9 X	100.6 *	98.2	98.4	2.18 *	8.4	7.8 H	97.4	1.76	8.9	8.6 H	11	TB
NXW8HZ	89.9	87.1	93.3	91.7	90.5	-0.21	8.4	2.6	89.8	-0.63	8.5	1.8	12	LA
PX7MZ7	91.2	87.3	90.2	94.6	90.8	-0.12	6.6	3.0	88.7	-1.00	8.4	3.6	12	XX
QMQZNK	101.0 *L	101.5 *L	101.3 *L	101.2 *	101.3	3.03 X	3.1	0.2 L	99.9	2.55 *	2.9	2.7	12	AH
QU8KZX	86.6	86.5	87.2	84.5	86.2	-1.50	8.6	1.2	86.7	-1.64	7.4	2.0	9	AH



Containerboard Interlaboratory Testing Program
 Analysis 207
Bursting Strength (Mullen), 35 lb Linerboard - 35E3
 TAPPI Official Test Method T807

Report #647
August 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
QU8KZX_AL	89.8	92.0	No DATA	87.8	89.9	-0.40	6.9	2.1	90.5	-0.43	9.5	2.0	8	AL
R8RJ46	87.0 H	94.5	95.5	96.5	93.4	0.66	10.7	4.3	93.3	0.46	10.0	3.2	12	XX
R9RAJZ	92.1	99.0 H	95.2	102.4 *	97.2	1.80	10.6	4.5	95.5	1.16	9.6	4.4	12	LB
RYDL8K_AL	83.5	83.8	87.5	84.6	84.8	-1.91	7.0	1.9	60.9	-9.83 X	6.3	36.1 H	12	AL
TDEJ74	87.8	92.6	85.5	88.9	88.7	-0.75	7.0	3.0	88.7	-1.00	8.3	3.0	12	LA
TMYRU7_AL	90.1	91.3	83.2 *	91.7	89.1	-0.63	7.4	4.0	89.1	-0.87	7.4	4.0	4	AL
U2DKMV	94.5	89.6	90.8 H	95.0	92.5	0.39	8.5	2.7	91.4	-0.14	9.0	3.1	12	LJ
UPNNLX_AL	86.9	90.4	87.3	87.9	88.1	-0.92	8.4	1.6	89.2	-0.82	8.2	2.6	12	AL
UT4VAX	87.6	88.9	90.2	86.9	88.4	-0.84	8.5	1.5	87.5	-1.37	8.2	2.4	12	LA
V6GF7Y	87.7	88.2	88.0	90.4	88.6	-0.79	8.1	1.2	90.2	-0.51	8.6	3.1	12	AH
VJU44Z	86.6	93.8	90.0	87.7	89.5	-0.51	7.8	3.2	91.2	-0.21	6.9	2.8	12	LA
WQQ7XY	87.0	90.8	91.9 L	92.5	90.6	-0.19	5.1	2.5	91.2	-0.22	3.3	1.6	12	LA
X8B8ZF	87.0	83.3 *	82.3 *	89.3	85.5	-1.72	9.4	3.3	85.6	-1.98 *	8.1	3.3	12	LA
XRMWPY	94.4	91.5	97.0	95.0	94.5	0.99	7.3	2.3	94.2	0.76	7.8	2.4	12	AH
YKGG4T	82.4 *	85.1	82.2 *	80.8 *	82.6	-2.58 *	6.8	1.8	81.9	-3.15 X	6.9	2.4	12	LA
YX4R6T	94.3	88.3	89.7	93.6	91.5	0.09	7.2	2.9	91.9	0.03	7.2	2.9	12	ME
ZNNPLC	115.8XH	110.0 X	109.9XH	100.3	109.0	5.37 X	13.3	6.4 H	105.3	4.26 X	11.1	7.2 H	12	AX

Consensus (All Labs) Results									
Wk Mean	90.90	91.89	91.24	91.96	Month Mean	91.19	Grand Mean	91.83	
Avg SDr	7.80	7.22	7.26	7.46	Avg SD	7.40	Avg SD	7.30	
SD btwn Labs	4.14	4.42	4.05	4.39	SD btwn Labs	3.32	SD btwn Labs	3.15	
Labs Includ	49	49	48	49	SD btwn Wks	2.55	SD btwn Wks	2.93	
Labs Exclcd	3	2	3	1	Labs Includ	48	Labs Includ	48	
Labs not Rcvd	0	1	1	2					

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 (207 Enrollment)
LJ	L&W Bursting Strength Tester J-Type	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 215
Ring Crush, 42 lb Linerboard - 42H2
 TAPPI Official Test Method T822

Report #647
August 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	
34X69R	94.3	94.4	93.9	95.1	94.4	-0.59	2.7	0.5	95.6	-0.29	2.9	3.0	16	LD
3AQZFK	95.8	97.8	97.2 L	96.8 L	96.9	0.10	2.4	0.8	95.6	-0.30	2.6	1.5	16	LG
3LDD9T	93.2 L	93.8 L	93.3 L	93.1 L	93.4	-0.89	1.7	0.3 L	94.0	-1.00	1.6	0.6 L	16	MB
4UQLAU	98.2	97.0	97.6	97.6	97.6	0.29	3.3	0.5	99.1	1.21	3.3	2.2	16	MB
7E9QTN	61.1 XH	84.0 X	66.3 X	65.6 X	69.3	-7.61 X	6.9	10.1 H	77.9	-7.94 X	5.7	14.7 H	16	LC
CAPHXJ	98.9	96.5	97.9	94.5	96.9	0.11	3.0	1.9	91.3	-2.17 *	5.7	7.1 H	14	TU
CGTBHE	102.9	101.5	101.8 L	103.2	102.3	1.61	3.3	0.8	101.7	2.33 *	2.4	2.9	16	LD
CL6CMJ	96.5	98.0 L	98.5 L	96.3	97.3	0.21	2.5	1.1	94.3	-0.88	3.2	2.9	16	LD
CYTNQF	97.7	98.5	101.0	101.1	99.6	0.84	4.5	1.7	98.7	1.06	4.5	1.6	16	LC
DCTXHU	93.4	96.4	94.1	94.7	94.6	-0.53	2.7	1.3	95.1	-0.50	3.1	1.3	16	MZ
DQD2GC	104.2 L	103.8 *	104.5 *	103.9 L	104.1	2.11 *	2.9	0.3 L	100.5	1.81	2.6	2.6	16	LD
F32XFF	93.0	96.0	95.7	96.9	95.4	-0.32	2.9	1.7	96.4	0.07	3.6	2.8	16	LD
FTV63E	95.1	94.7	93.5	95.1	94.6	-0.55	3.3	0.8	95.4	-0.38	2.9	0.9	16	LD
GCWRQQ	95.6	95.8	97.0	94.1	95.6	-0.26	3.5	1.2	94.4	-0.81	3.0	1.6	16	LC
GWCPM9	105.9 *	102.5 *	106.2 *	103.5	104.5	2.22 *	2.7	1.8	98.1	0.80	3.6	6.9 H	16	LZ
J37RMB	92.2	95.8	96.0	92.3	94.1	-0.68	3.3	2.1	93.8	-1.07	2.8	1.4	16	LD
JRCBXA	93.5	92.8	93.0	95.0	93.6	-0.83	3.7	1.0	93.7	-1.13	3.1	1.8	16	LC
JX8CZV	95.6	95.5	95.4	94.9 L	95.3	-0.34	2.6	0.3 L	93.2	-1.33	2.6	2.5	16	EM
KJ66KQ	89.6 H	91.8	88.7 *	90.3	90.1	-1.80	6.1	1.3	96.7	0.18	4.1	4.2	16	MB
M89WQ8	94.2	100.7	97.6	98.8	97.8	0.35	5.4	2.7	96.7	0.19	4.0	2.2	16	LD
NDQQ6P	95.9	96.0	97.4	96.1	96.4	-0.05	3.6	0.7	97.2	0.40	3.0	1.3	16	LD
NEW93L	97.8 L	97.5 L	98.1 L	98.6 L	98.0	0.41	0.5	0.5	95.3	-0.44	0.5	1.8	16	MZ
NKRN82	97.0	97.0	96.2	93.6	95.9	-0.17	3.1	1.6	96.8	0.21	2.8	1.1	16	LD
NLAVE4	104.6 *	94.2	92.9	90.7	95.6	-0.26	4.6	6.2 H	99.5	1.38	4.0	5.0	16	TU
NLNGN6	98.9	87.8 *	93.3	92.6	93.1	-0.95	3.1	4.5 H	95.2	-0.48	3.5	5.5	16	LD
PN2FK7	96.2	97.9	94.6	99.5	97.1	0.14	3.5	2.1	96.4	0.03	3.8	1.9	16	RS
QMZZNK	93.8	94.3	93.3 L	93.6	93.7	-0.78	2.9	0.4	95.5	-0.34	2.5	1.6	16	LD
R9RAJZ	109.1 X	93.3	102.4	106.9 *	102.9	1.78	3.9	7.0 H	97.5	0.55	4.3	6.5 H	16	LD
RWBPY4	96.6	98.9	100.1	102.1	99.4	0.81	3.0	2.3	98.5	0.95	3.7	3.3	16	LD
UNDLZY	93.4	95.4	95.8	94.6	94.8	-0.50	2.9	1.1	96.6	0.14	2.8	4.4	16	TH
UT4VAX	97.5	98.3	97.3	99.5	98.1	0.45	3.0	1.0	95.1	-0.50	3.0	2.4	16	LD
V6GF7Y	94.8	94.0 L	97.0 L	96.8 L	95.6	-0.25	2.3	1.5	96.4	0.06	2.7	1.2	13	LC
VJU44Z	97.4	97.0	96.9	96.5 L	96.9	0.11	3.0	0.4 L	96.6	0.13	3.3	1.3	16	LD
WQQ7XY	97.8 L	101.0 L	100.0	97.4	99.1	0.70	2.1	1.7	96.4	0.05	1.2	2.2	16	TU
XRMWPY	95.4	94.8	91.6 L	94.0 L	94.0	-0.72	2.2	1.7	95.9	-0.18	2.8	2.2	16	LD



Containerboard Interlaboratory Testing Program
 Analysis 215
Ring Crush, 42 lb Linerboard - 42H2
 TAPPI Official Test Method T822

Report #647
August 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	
XUL9AD	98.0 L	97.6 L	98.4 L	98.3 L	98.1	0.43	0.5	0.4	95.5	-0.32	0.5	1.7	16	MZ
XVL8KY	95.0	90.9	92.3	95.9	93.5	-0.84	3.2	2.3	93.0	-1.43	3.0	1.6	16	EN
XYEFKY	86.6 *	89.5 *	88.2 *	90.1	88.6	-2.21 *	3.8	1.5	86.3	-4.34 X	3.9	3.2	16	EM
YKGG4T	97.3 H	96.9 H	98.4 H	98.0 H	97.7	0.32	20.2	0.7	97.0	0.30	20.5	2.7	16	LB
YX3ZQX	99.9	92.2	98.0	94.8	96.2	-0.09	5.9	3.4	98.6	0.99	5.1	3.6	16	LD
YX4R6T	103.8	108.0 X	104.5 *	102.1	104.6	2.25 *	3.8	2.5	101.5	2.28 *	3.4	3.4	16	LX
ZNNPLC	88.6	93.3	89.6	91.7	90.8	-1.59	2.9	2.1	92.6	-1.58	2.9	2.0	16	LD

Consensus (All Labs) Results													
Wk Mean	96.40	96.02	96.55	96.60	Month Mean	96.54			Grand Mean	96.27			
Avg SDr	4.26	4.35	4.85	4.79	Avg SD	4.57			Avg SD	4.57			
SD btwn Labs	4.08	3.34	4.05	3.90	SD btwn Labs	3.59			SD btwn Labs	2.31			
Labs Incl	40	40	41	41	SD btwn Wks	2.19			SD btwn Wks	3.11			
Labs Excl	2	2	1	1	Labs Incl	41			Labs Incl	40			
Labs not Rcvd	0	0	0	0									

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
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 217
Ring Crush, 35 lb Linerboard - 35E3
 TAPPI Official Test Method T822

Report #647
August 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	
34X69R	83.4	82.1	82.9	83.0	82.9	0.28	3.1	0.6	82.2	0.12	3.3	1.8	12	LD
3AQZFK	82.8	83.6	83.4	82.7	83.1	0.35	3.4	0.4	82.2	0.11	3.1	1.2	12	LG
3LDD9T	80.1 L	80.4	80.8 L	80.8	80.5	-0.44	1.7	0.4 L	80.5	-0.91	1.8	0.3 L	12	MB
4UQLAU	81.5	81.4	83.4	85.1 H	82.9	0.28	5.2	1.7	81.6	-0.23	6.1	4.6	12	MB
7E9QTN	48.1 X	66.2 X	55.1 X	55.2 X	56.2	-7.99 X	4.5	7.5 H	63.1	-11.04 X	5.8	11.4 H	8	LC
CAPHXJ	79.8	79.8	79.5	79.7	79.7	-0.70	2.5	0.2 L	79.0	-1.74	5.4	5.2	11	TU
CGTBHE	86.4	87.9	87.1	86.8	87.0	1.57	3.1	0.6	88.6	3.83 X	3.0	2.0	12	LD
CL6CMJ	81.5	84.9	86.7	87.3	85.1	0.97	4.1	2.6	81.4	-0.39	3.8	3.4	12	LD
CYTNQF	84.9	85.7	82.5	85.0	84.5	0.79	3.8	1.4	83.5	0.84	5.4	1.6	12	LC
DCTXHU	80.6	83.9	79.0	77.4	80.2	-0.53	3.8	2.8	80.6	-0.85	3.6	2.0	12	TX
DQD2GC	90.2 *	87.6	86.2	91.2 *	88.8	2.12 *	2.9	2.3	84.7	1.57	2.5	3.8	12	LD
F32XFF	80.4	84.2	83.6	81.8	82.5	0.17	3.6	1.8	81.4	-0.36	3.5	2.2	12	LD
FTV63E	81.9	80.8	80.5	81.6	81.2	-0.24	3.0	0.6	81.8	-0.10	2.8	0.8 L	12	LD
GCWRQQ	80.6	83.3	82.8	80.5	81.8	-0.05	3.7	1.5	78.7	-1.92 *	3.7	3.3	12	LC
GWCPM9	83.9	81.6	87.1	87.9	85.1	0.97	3.4	2.9	86.2	2.43 *	4.4	2.5	12	LZ
J37RMB	85.0	82.3	81.1	81.6	82.5	0.16	2.8	1.8	83.0	0.58	3.5	1.9	12	LD
JRCBXA	80.1	83.1	84.8	84.0	83.0	0.32	4.2	2.1	78.8	-1.89	3.9	3.9	12	LC
JX8CZV	82.0	81.5	80.8	83.3	81.9	-0.03	3.5	1.1	82.2	0.10	3.4	1.4	12	EM
KJ66KQ	102.0 XL	101.2 X	100.3 X	100.0 X	100.9	5.86 X	2.9	0.9	90.3	4.86 X	4.2	7.9	12	MB
M89WQ8	79.9	84.0	79.9	79.9	80.9	-0.32	4.7	2.0	82.5	0.29	4.6	2.8	12	LD
NDQQ6P	82.7	84.0	84.0	80.8	82.9	0.28	3.1	1.5	81.7	-0.20	3.4	1.6	12	LD
NEW93L	85.0 L	85.8 L	85.5 L	85.6 L	85.5	1.08	0.5	0.4 L	84.2	1.26	0.8	1.1 L	12	TH
NKRN82	82.9	81.8	81.7	82.6	82.3	0.09	3.1	0.6	82.4	0.24	2.8	0.9 L	12	LD
NLAVE4	89.2	82.8	82.1	83.2	84.3	0.72	2.9	3.3	82.8	0.44	7.3	9.3 H	12	TU
NLNGN6	82.5	71.0 X	77.7	77.0	77.0	-1.53	4.5	4.7 H	80.4	-0.95	5.0	4.8	10	LC
PN2FK7	76.3	79.7	81.0	78.5	78.8	-0.97	3.4	2.0	81.8	-0.10	3.9	3.5	12	RS
QMZZNK	75.0	74.5 *	74.1 *	73.3 *	74.2	-2.40 *	2.3	0.7	75.9	-3.57 X	2.1	1.4	12	LD
R9RAJZ	89.6 *	74.7 *	88.6	82.7	83.9	0.60	3.1	6.8 H	81.6	-0.23	3.2	6.2	12	LC
RWBPY4	79.8	84.8	87.0	84.7	84.1	0.65	3.2	3.1	82.0	0.00	3.0	3.8	12	LD
UNDLZY	80.0	77.7	79.8	80.4	79.5	-0.78	3.3	1.2	81.7	-0.21	3.2	2.0	12	TH
UT4VAX	82.9	85.1 H	83.9	86.1	84.5	0.79	4.0	1.4	81.9	-0.08	4.0	2.4	12	LD
V6GF7Y	83.1	84.8	83.2	83.2	83.6	0.50	3.6	0.8	83.6	0.92	3.3	0.7 L	9	LC
VJU44Z	78.9	80.2	84.0	81.3	81.1	-0.27	4.4	2.1	82.1	0.07	4.0	2.1	12	LZ
WQQ7XY	83.2	81.7	83.1	80.0	82.0	0.01	2.9	1.5	82.4	0.24	1.7	2.1	12	TU
XRMWPY	82.3	81.3	83.2	81.1	82.0	0.00	3.0	1.0	82.4	0.21	3.0	1.1 L	12	LD



Containerboard Interlaboratory Testing Program
 Analysis 217
Ring Crush, 35 lb Linerboard - 35E3
 TAPPI Official Test Method T822

Report #647
August 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	
XUL9AD	85.3 L	85.4 L	85.7 L	85.9 L	85.6	1.12	0.4	0.3 L	84.1	1.22	0.7	1.5	12	XX
XVL8KY	80.9	81.9	78.8	78.6	80.1	-0.58	4.0	1.6	79.6	-1.43	3.7	1.2	12	EN
XYEFKY	73.7 *	75.9 *	75.9	73.8 *	74.8	-2.21 *	3.1	1.2	74.4	-4.48 X	4.6	2.0	12	EM
YKGQ4T	71.1 *H	72.6 XH	72.8 *H	67.8 XH	71.1	-3.37 X	13.1	2.3	81.5	-0.33	11.9	14.7 H	12	LB
YX3ZQX	75.7	69.1 XH	75.8	75.7	74.1	-2.44 *	6.3	3.3	75.7	-3.69 X	5.2	2.8	12	LD
YX4R6T	81.1	86.5 H	86.9	81.7 H	84.1	0.65	5.7	3.1	85.8	2.22 *	4.9	4.5	12	LX
ZNNPLC	77.5	82.6	76.3	78.7	78.8	-0.98	3.5	2.8	80.4	-0.95	3.9	2.1	12	LD

Consensus (All Labs) Results									
Wk Mean	81.59	82.41	82.07	81.91	Month Mean	81.96	Grand Mean	82.01	
Avg SDr	4.32	3.65	3.75	3.43	Avg SD	3.58	Avg SD	4.28	
SD btwn Labs	3.96	3.16	3.78	3.76	SD btwn Labs	3.23	SD btwn Labs	1.71	
Labs Incl	40	37	40	39	SD btwn Wks	2.22	SD btwn Wks	4.02	
Labs Excl	2	5	2	3	Labs Incl	39	Labs Incl	36	
Labs not Rcvd	0	0	0	0					

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
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	RS	Regmed Digital Crush Tester CT-2000
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 223
STFI, 42 lb Linerboard - 42H2
 TAPPI Official Test Method T826

Report #647
August 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	
29DCWR_AL	25.3	25.8	24.6	25.0	25.2	1.10	1.7	0.5	25.3	1.48	1.8	0.6	16	AL
2RAHPR	23.2 H	23.0	22.7	23.7	23.1	-0.65	2.3	0.4	22.4	-1.36	1.8	0.8	15	LU
2U96P9	25.0	26.1	25.7	23.9 H	25.2	1.09	2.0	0.9	24.6	0.81	1.8	0.8	16	LA
2WZ3ET	22.6	23.1	23.0	23.4 L	23.0	-0.75	1.7	0.3	22.9	-0.94	1.6	0.6	16	LW
34X69R	23.7	25.9	23.5	23.1	24.0	0.12	1.8	1.2	24.0	0.22	1.9	0.9	16	LA
3AQZfq	24.6	23.8	24.5	24.5	24.4	0.41	1.8	0.4	24.4	0.54	1.9	0.4	16	BK
4UQLAU	24.6	25.2	24.8	24.0	24.7	0.67	2.2	0.5	24.3	0.44	2.0	0.8	16	LA
7DLDup	25.3	23.5	24.8	24.6	24.5	0.56	1.6	0.8	23.9	0.11	2.1	0.8	16	XX
7E9QTN_AL	44.3 XH	45.4 XH	45.3 XH	49.0 XH	46.0	19.02 X	22.5	2.1 H	47.3	23.27 X	22.6	3.4 H	16	AL
7VTGTN	25.1	24.9	25.5	25.5	25.3	1.18	1.9	0.3	25.1	1.25	1.8	0.5	14	LU
8QCA6N_AL	23.5	23.1	23.9	22.9 L	23.3	-0.48	1.8	0.5	23.6	-0.21	1.8	0.7	16	AL
8Y6QBJ	25.2	24.5	25.4	24.6	24.9	0.90	1.8	0.4	23.9	0.12	1.7	0.8	13	LU
8Y6QBJ_AL	23.8 L	23.7	23.9 L	23.8 L	23.8	-0.07	1.2	0.1 L	23.5	-0.30	1.5	0.5	13	AL
94BXZM	25.2	26.4	25.1	25.7	25.6	1.47	1.8	0.6	25.2	1.39	1.5	0.5	16	LH
CAPHXJ	24.2 H	23.0	23.6	22.2	23.2	-0.55	2.1	0.8	23.4	-0.43	2.4	0.7	14	TT
CGTBHE	26.2	25.6	26.4	25.1	25.8	1.65	1.8	0.6	25.9	2.06 *	1.7	0.4	16	LH
CL6CMJ_AL	24.8	24.0	24.0	24.5	24.3	0.37	1.7	0.4	24.3	0.46	1.8	0.6	16	AL
CYTNQF	23.9	No DATA	24.4	No DATA	24.2	0.24	1.7	0.4	23.4	-0.40	1.9	1.3	9	LU
DQD2GC_AL	24.8	24.1	23.6	25.3	24.5	0.49	1.4	0.7	24.1	0.29	1.5	0.8	16	AL
F32XFF_AL	22.2	23.4	23.9 H	24.1 H	23.4	-0.42	2.5	0.9	23.6	-0.26	2.0	0.6	16	AL
FCL74J	21.5 L	22.4 L	No DATA	21.1 L	21.6	-1.93	0.0	0.7	22.5	-1.34	3.3	3.1 H	7	LH
G477LD	23.2	22.8	23.0	22.0	22.8	-0.95	1.7	0.5	22.6	-1.21	1.9	0.4 L	16	LU
GWCPM9_AL	22.8	22.9	22.8 L	22.6	22.8	-0.96	1.3	0.1 L	22.7	-1.07	1.5	0.6	16	AL
HT6UFB	21.7	22.8	23.5	22.0	22.5	-1.20	1.6	0.8	22.5	-1.29	1.6	0.6	16	XX
HVCZ3C_AL	23.0	25.7 L	24.8 L	24.4	24.5	0.52	1.3	1.1	25.1	1.27	1.7	1.1	16	XX
J37RMB	23.9 H	23.4	22.9	23.4	23.4	-0.42	2.0	0.4	23.8	0.02	1.9	0.8	16	LA
JRCBXA	23.4	23.7	23.6 L	22.8	23.4	-0.44	1.6	0.4	23.8	-0.05	1.6	0.4	16	LA
KJ66KQ	24.5 L	26.3	27.0 *	26.4	26.0	1.86	2.1	1.1	24.7	0.85	1.6	1.1	16	LA
LNXLBP	23.6 H	23.9 H	23.7	24.0	23.8	-0.08	2.7	0.2	23.3	-0.47	2.9	0.6	16	LY
M4TEN4	21.9 L	25.7	23.9 L	22.4 L	23.5	-0.36	1.2	1.7	23.1	-0.66	1.7	1.2	16	LA
M89WQ8	23.5	24.2	25.8	26.2	24.9	0.90	1.7	1.3	23.8	-0.03	1.9	1.7	16	LA
MZ8LJN	24.3	24.0	24.4	23.9	24.2	0.25	2.0	0.2	24.4	0.54	1.9	0.3 L	16	LY
NDQQ6P	23.0	23.5	22.8	23.1	23.1	-0.68	1.7	0.3	23.1	-0.74	1.9	0.5	16	LZ
NEW93L	26.2 L	26.1 L	26.7 L	26.7 *L	26.4	2.16 *	0.3	0.3	25.1	1.27	0.4	1.0	16	LZ
NKRN82_AL	24.1	23.7	24.9 H	23.8	24.1	0.21	2.2	0.6	23.8	0.02	2.0	0.5	16	XX



Containerboard Interlaboratory Testing Program
 Analysis 223
STFI, 42 lb Linerboard - 42H2
 TAPPI Official Test Method T826

Report #647
August 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		
NLAVE4	25.4	22.6	L 25.5	21.7	L	23.8	-0.08	1.6	1.9	H	25.0	1.16	1.9	1.3	16	LA
NLNGN6	24.7	24.4	23.2	25.2		24.4	0.42	2.2	0.8		24.5	0.71	2.3	0.8	16	LW
NXW8HZ	23.2	23.7	23.2	22.3		23.1	-0.67	1.7	0.6		23.0	-0.76	1.7	0.6	16	LY
PX7MZ7	23.1	22.5	22.0	22.1		22.4	-1.26	1.6	0.5		23.1	-0.75	1.6	0.8	16	LH
QU8KZX	23.8	23.3	No DATA	21.8		22.9	-0.81	2.1	1.1		22.4	-1.38	2.1	2.6	12	LY
QU8KZX_AL	22.6	H 22.8	No DATA	21.0		22.1	-1.51	2.0	1.0		22.5	-1.31	1.7	1.3	12	AL
R9RAJZ	24.3	21.0	* 21.6	24.2		22.8	-0.96	1.8	1.7		23.1	-0.68	1.7	1.3	16	LU
RYDL8K_AL	24.7	24.1	24.8	23.9		24.4	0.42	1.9	0.4		24.3	0.44	2.0	0.9	16	AL
TFL26Y	25.1	25.1	H 24.3	L 24.3		24.7	0.70	2.0	0.5		24.7	0.84	1.8	0.6	16	LH
TMYRU7_AL	28.8	X 29.9	X 29.3	X 30.8	X	29.7	5.02	X 2.3	0.9		29.4	5.56	X 2.2	1.0	8	AL
U2DKMV	24.9	25.3	23.2	23.4		24.2	0.26	2.3	1.0		24.8	0.93	2.3	1.5	16	LH
UT4VAX	24.1	23.6	23.5	23.8		23.7	-0.12	2.0	0.3		23.3	-0.52	1.9	0.4	16	LY
V6GF7Y	23.2	23.9	23.2	23.3		23.4	-0.42	1.7	0.3		23.4	-0.44	1.6	0.3	L 13	LU
VFR4RG	26.1	26.5	24.1	H 26.1		25.7	1.56	3.9	1.1		25.4	1.53	3.2	1.1	8	ID
VJU44Z	22.7	23.5	22.4	22.6		22.8	-0.95	1.8	0.5		22.4	-1.35	1.8	0.4	16	LU
WQQ7XY	22.9	20.8	* 21.3	21.7	L	21.7	-1.91	1.8	0.9		21.3	-2.46	* 1.7	0.7	16	XX
X8B8ZF	24.2	24.9	25.2	24.4		24.7	0.69	2.2	0.4		24.2	0.38	2.1	0.6	16	LH
XRMWPY	22.8	22.8	23.8	22.4		22.9	-0.82	1.8	0.6		23.5	-0.35	1.8	0.8	16	LU
XUL9AD	26.2	L 26.2	L 26.6	L 26.6	L	26.4	2.16	* 0.3	0.2		25.0	1.17	0.4	1.0	16	LZ
XVL8KY	20.8	* 22.0	20.5	* 20.8	*	21.0	-2.45	* 2.0	0.6		21.6	-2.15	* 1.7	0.5	16	LY
YKGQ4T	21.7	H 21.8	25.5	H 25.6		23.7	-0.20	2.5	2.2	H	23.7	-0.09	1.9	1.2	16	LH
YX4R6T	24.7	No DATA	20.1	* 25.0		23.3	-0.52	2.1	2.7	H	25.7	1.89	2.7	7.5	H 15	LZ
ZANRXE	24.7	25.1	23.8	23.4		24.2	0.30	1.6	0.8		24.3	0.47	1.7	0.6	16	LH
ZNNPLC	23.3	L 23.9	L 24.2	L 23.8	L	23.8	-0.07	0.8	0.4		24.2	0.36	0.8	0.5	16	LH

Consensus (All Labs) Results									
Wk Mean	23.91	24.00	23.98	23.75	Month Mean	23.89	Grand Mean	23.82	
Avg SDr	1.90	1.76	2.13	1.74	Avg SD	1.89	Avg SD	1.90	
SD btwn Labs	1.24	1.37	1.43	1.46	SD btwn Labs	1.16	SD btwn Labs	1.01	
Labs Incl	57	55	54	56	SD btwn Wks	0.89	SD btwn Wks	1.38	
Labs Excl	2	2	2	2	Labs Incl	57	Labs Incl	57	
Labs not Rcvd	0	2	3	1					



Containerboard Interlaboratory Testing Program
Analysis 223
STFI, 42 lb Linerboard - 42H2
TAPPI Official Test Method T826

Report #647
August 2023

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	BK	Buchel Strip Compression Tester BK-155
ID	IDM Compression Tester	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)	TT	TMI Short Span Compression, 17-34 (MB K455)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 225

STFI, 35 lb Linerboard - 35E3

TAPPI Official Test Method T826

Report #647

August 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	
29DCWR_AL	24.4	25.7 *	25.0	25.4	25.1	1.86	1.7	0.5	25.2	1.90	2.0	0.6	12	AL
2RAHPR	22.5 H	21.5	21.7	24.5	22.6	-0.67	1.9	1.4	22.3	-0.95	1.6	0.9	11	LU
2U96P9	24.6	23.3	24.6	23.6 H	24.0	0.77	2.2	0.7	24.1	0.76	2.0	0.9	12	LA
2WZ3ET	22.8	22.8	22.5	24.3	23.1	-0.15	1.5	0.8	22.9	-0.41	1.8	0.6	12	LW
34X69R	23.5	23.8	23.2	23.3	23.4	0.21	1.8	0.3	23.6	0.34	1.7	0.4	12	LA
3AQZfq	23.9	22.9	24.3	23.8	23.7	0.48	1.7	0.6	23.7	0.44	1.7	0.5	12	LW
4UQLAU	23.2	23.0	23.5	23.3	23.3	0.01	1.7	0.2	22.5	-0.76	1.9	1.1	8	LA
7DLDup	24.3	24.2	23.6	23.9	24.0	0.76	1.8	0.3	23.7	0.38	1.6	0.4	8	XX
7E9QTN_AL	28.3 XH	33.1 XH	30.2 XH	34.7 XH	31.6	8.35 X	10.5	2.9 H	32.7	9.38 X	11.5	2.4 H	8	AL
7VTGTN	24.6	24.2	25.0	24.4	24.6	1.32	1.8	0.4	24.9	1.54	1.7	0.4	8	LU
8QCA6N_AL	22.8	22.5 L	23.0 L	23.3	22.9	-0.32	1.3	0.3	23.1	-0.16	1.5	0.8	12	XX
8Y6QBJ	23.8	23.4	23.5	23.6	23.6	0.31	2.0	0.2	23.6	0.26	1.9	0.2 L	7	LU
8Y6QBJ_AL	23.2 L	23.2	22.7	23.3	23.1	-0.17	1.5	0.3	22.7	-0.55	1.4	0.7	7	AL
94BXZM	25.5	24.9	25.0	24.8	25.0	1.80	1.5	0.3	25.0	1.69	1.4	0.2 L	12	LH
CAPHXJ	23.1	22.1	23.4	22.5	22.8	-0.46	1.9	0.6	23.3	-0.04	2.0	1.2	11	TT
CGTBHE	24.6	25.3 *	25.6 *	25.0	25.1	1.89	1.8	0.4	24.9	1.56	1.7	0.5	12	LH
CL6CMJ_AL	23.6	23.3	24.1	23.7	23.7	0.44	1.7	0.3	23.6	0.31	1.7	0.5	12	AL
CYTNQF	23.7 H	No DATA	23.4	No DATA	23.6	0.32	2.5	0.2	23.9	0.63	2.5	0.7	7	LU
DQD2GC_AL	23.1	23.7	23.4	23.2	23.3	0.09	1.5	0.3	23.2	-0.08	1.4	1.0	12	AL
F32XFF_AL	21.9	23.2	23.5	21.6	22.5	-0.70	1.7	0.9	23.0	-0.29	1.8	1.1	12	AL
FCL74J	21.3 L	21.7 L	No DATA	21.1 *L	21.4	-1.89	0.0	0.3	21.4	-1.94 *	0.0	0.3	3	LH
G477LD	22.7	22.6	22.8 L	21.6	22.4	-0.80	1.7	0.5	22.3	-0.97	1.6	0.4	8	LU
GWCPM9_AL	22.2 L	22.8 L	22.5	22.8 L	22.6	-0.68	1.1	0.3	22.1	-1.15	1.5	0.7	12	XX
HT6UFB	23.2 L	22.9	21.9 L	21.7	22.4	-0.82	1.3	0.7	22.5	-0.78	1.6	0.6	12	XX
HVCZ3C_AL	24.6	23.9	24.2	24.1	24.2	0.95	1.5	0.3	24.8	1.48	2.0	1.0	12	XX
J37RMB	23.3	24.1	23.3	23.5	23.5	0.30	1.6	0.4	23.7	0.43	1.8	0.4	12	LW
JRCBXA	23.1	23.4	22.8	22.4	22.9	-0.32	1.7	0.4	23.0	-0.34	1.5	0.5	12	LA
KJ66KQ	22.1	22.1 H	22.3	25.4 H	23.0	-0.27	2.3	1.6 H	24.5	1.15	1.9	1.5	12	LA
LNXLBP	23.2 H	23.0	22.9	23.1	23.1	-0.19	2.4	0.1 L	22.6	-0.65	2.4	0.7	12	LY
M4TEN4	22.3 L	21.9	22.6	23.7	22.6	-0.62	1.4	0.8	23.1	-0.24	1.5	0.7	12	LA
M89WQ8	22.9	23.0	23.1	24.5	23.4	0.12	1.9	0.8	23.5	0.24	1.9	0.9	12	LA
MZ8LJN	23.6	23.9	23.3	23.5	23.6	0.31	1.8	0.3	23.6	0.33	1.9	0.3 L	12	LA
NDQQ6P	23.8	22.9	23.2	22.5	23.1	-0.14	1.6	0.5	22.6	-0.75	1.8	0.7	12	LZ
NEW93L	24.7 L	24.4 L	25.0 L	24.8 L	24.7	1.48	0.4	0.3	24.0	0.66	0.5	1.1	12	LZ
NKRN82_AL	23.3	23.8	23.8	23.7	23.7	0.41	1.7	0.2	23.3	-0.03	1.7	0.4	12	XX



Containerboard Interlaboratory Testing Program
 Analysis 225
STFI, 35 lb Linerboard - 35E3
 TAPPI Official Test Method T826

Report #647
August 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	
NLAVE4	21.6	21.4	21.8 L	22.3 L	21.7	-1.50	1.0	0.4	24.0	0.69	1.7	2.1	12	LA
NLNGN6	24.5	23.6	22.5	23.5	23.5	0.28	1.9	0.8	23.8	0.45	2.1	1.5	11	LW
NXW8HZ	22.7	22.7	22.9	21.7	22.5	-0.76	1.5	0.5	22.4	-0.88	1.6	1.0	12	LU
PX7MZ7	22.7	22.2	22.5	22.0	22.4	-0.89	1.5	0.3	22.5	-0.76	1.6	0.5	12	LH
QU8KZX	22.9	23.5	No DATA	21.8	22.7	-0.52	1.9	0.9	21.6	-1.69	1.9	2.4 H	8	LH
QU8KZX_AL	22.0	22.4	No DATA	22.3	22.2	-1.01	2.0	0.2	21.6	-1.68	1.6	1.2	8	AL
R9RAJZ	23.1	20.8 *	20.6 *	23.6 H	22.0	-1.22	2.1	1.6 H	22.6	-0.70	1.8	1.0	12	LW
RYDL8K_AL	23.5	24.1	23.5	23.5	23.7	0.41	1.8	0.3	24.0	0.65	1.7	0.8	12	AL
TFL26Y	26.0 *H	24.1	24.7	24.3	24.8	1.53	2.2	0.9	24.5	1.20	1.9	0.7	12	LH
TMYRU7_AL	27.6 X	28.0 X	28.2 X	28.2 X	28.0	4.77 X	1.9	0.3	28.0	4.68 X	1.9	0.3 L	4	AL
U2DKMV	25.4	23.4	23.0	25.2	24.3	1.03	2.0	1.2	24.7	1.44	2.7	1.7	12	LH
UT4VAX	23.6	23.5	22.8	22.7	23.1	-0.10	1.7	0.5	22.7	-0.62	1.7	0.6	12	LY
V6GF7Y	23.2	22.7	23.0	23.1	23.0	-0.26	1.7	0.2	23.3	-0.04	1.8	0.6	9	LU
VFR4RG	23.4	24.2	24.1	23.6 L	23.8	0.60	1.5	0.4	23.8	0.53	1.5	0.4	4	ID
VJU44Z	21.6	22.1	21.7	22.4	21.9	-1.30	1.6	0.4	21.9	-1.36	1.7	0.5	12	LU
WQQ7XY	20.8 *	20.7 *	20.9 *	20.7 *	20.8	-2.47 *	1.8	0.1 L	20.7	-2.63 *	1.8	0.5	12	XX
X8B8ZF	24.7	24.4	23.9	24.6	24.4	1.15	2.2	0.3	24.1	0.76	2.0	0.6	12	LH
XRMWPY	23.0	23.1	22.9	23.2	23.1	-0.17	2.0	0.1	23.3	0.01	2.0	0.6	12	LU
XUL9AD	25.0 L	24.9 L	25.5 *L	25.5 L	25.2	1.97 *	0.3	0.3	24.1	0.81	0.5	1.2	12	LZ
XVL8KY	20.6 *	21.0 *	20.8 *	21.0 *	20.8	-2.41 *	1.9	0.2	21.2	-2.10 *	1.8	0.5	12	LY
YKGQ4T	24.2	23.5	23.8	24.9 H	24.1	0.84	2.2	0.6	23.5	0.23	2.0	0.7	12	LH
YX4R6T	24.6	No DATA	19.1 XH	22.9	22.2	-1.06	2.1	2.8 H	24.4	1.10	2.3	4.9 H	11	LZ
ZANRXE	23.5	23.6	22.4	22.6	23.0	-0.23	1.5	0.6	23.2	-0.11	1.6	0.6	12	LH
ZNNPLC	22.3	24.5	23.9	24.2	23.7	0.48	1.2	1.0	24.0	0.70	0.9	0.8	12	LH

Consensus (All Labs) Results									
Wk Mean	23.33	23.19	23.24	23.35	Month Mean	23.24	Grand Mean	23.30	
Avg SDr	1.78	1.72	1.66	1.78	Avg SD	1.75	Avg SD	1.78	
SD btwn Labs	1.13	1.08	1.12	1.18	SD btwn Labs	1.00	SD btwn Labs	1.00	
Labs Incl	57	55	53	56	SD btwn Wks	0.71	SD btwn Wks	1.09	
Labs Excl	2	2	3	2	Labs Incl	57	Labs Incl	57	
Labs not Rcvd	0	2	3	1					



Containerboard Interlaboratory Testing Program
Analysis 225
STFI, 35 lb Linerboard - 35E3
TAPPI Official Test Method T826

Report #647
August 2023

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	ID	IDM Compression Tester
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 (was 52M)	LZ	L&W (model not specified)
TT	TMI Short Span Compression, 17-34 (MB K455)	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 228
Roughness - Stylus Method, 42 Ib Linerboard - 42H2
 TAPPI Official Test Method T575

Report #647
August 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
29DCWR_AL	135.5	-0.51	10.86	121.4	-1.14	10.48	4	AL
2RAHPR	167.6	1.88	21.89	161.5	1.57	16.94	4	EV
47J7QK	135.9	-0.48	14.70	132.6	-0.39	3.17	3	LS
4UQLAU	164.8	1.67	23.72	158.0	1.33	9.07	4	LA
7E9QTN_AL	138.0	-0.33	21.43	133.1	-0.35	5.90	4	AL
8QCA6N_AL	141.9	-0.03	23.91	120.6	-1.20	16.60	4	AL
8Y6QBJ_AL	123.9	-1.38	13.53	117.0	-1.44	4.64	4	AL
CYTNQF	141.6	-0.06	10.06	129.5	-0.60	11.24	3	EV
GWCPM9_AL	159.8	1.30	13.14	128.5	-0.66	22.36	4	AL
HVCZ3C_AL	156.3	1.04	15.91	148.3	0.67	19.26	4	AL
J37RMB	136.8	-0.42	17.08	138.2	0.00	7.67	4	LA
KJ66KQ	192.3	3.72 X	22.54	165.0	1.81	18.77	4	LA
M89WQ8	114.7	-2.07 *	7.70	111.1	-1.84	15.32	4	LA
MZ8LJN	138.9	-0.26	15.37	139.8	0.10	2.56	4	LS
NLAVE4	151.9	0.71	22.25	155.2	1.15	3.26	4	LA
NLNGN6	131.0	-0.85	13.22	127.0	-0.77	4.03	4	XX
QU8KZX_AL	125.7	-1.25	11.18	121.1	-1.16	3.49	4	AL
RYDL8K_AL	135.1	-0.55	17.97	138.6	0.02	18.32	4	AL
TMYRU7_AL	159.1	1.25	22.12	154.4	1.09	6.70	2	AL
TTPAZV	131.0	-0.85	13.22	131.0	-0.49	0.00	1	EV
U2DKMV	221.6	5.91 X	47.23 H	192.0	3.63 X	29.38 H	4	LS
UT4VAX	148.4	0.45	9.86	149.0	0.72	2.98	4	EV
VJU44Z	147.0	0.35	11.53	137.1	-0.08	8.35	4	EV
X8B8ZF	136.3	-0.45	16.44	137.5	-0.05	2.56	4	EV
XRMWPY	155.6	0.99	11.42	152.4	0.96	5.04	4	EV
XVL8KY	140.5	-0.14	8.00	150.0	0.79	7.05	4	EV

Consensus (All Labs) Results			
Month Mean	142.39	Grand Mean	138.31
Avg SD	16.05	Avg SD Months	11.27
SD btwn Labs	13.40	SD btwn Labs	14.78
Labs Incd	24	Labs Incd	25

Key to Instrument Codes Reported by Participants

- | | | | |
|----|--|----|------------------------------|
| AL | L & W Autoline 400 | EV | Emveco Microgage 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 - 42H2
 TAPPI Official Test Method T538

Report #647
August 2023

WebCode	Monthly Results				Cumulative Results				Inst
	Mean	CPV	SD		Mean	CPV	SD Months	Months	
29DCWR_AL	366.0	-0.82	13.81	H	325.5	-3.80 X	85.01 H	4	AL
2U96P9	412.8	4.03 X	1.40	L	412.8	2.27 *	0.00	1	LA
CL6CMJ_AL	364.5	-0.97	3.97		364.0	-1.13	0.38 L	4	AL
DQD2GC_AL	383.4	0.98	5.50		386.7	0.45	3.03	4	AL
ETDNGU	382.1	0.85	8.63		398.4	1.27	23.15 H	3	TS
F32XFF_AL	372.6	-0.13	6.38		375.5	-0.33	2.66	4	AL
HVCZ3C_AL	373.8	-0.01	9.27		375.5	-0.32	3.55	4	XX
M4TEN4	380.7	0.70	6.95		381.5	0.09	2.12	4	XX
NDQQ6P	382.0	0.84	15.82	H	379.4	-0.05	6.97	4	XX
NKRN82_AL	381.7	0.81	2.85	L	382.2	0.15	0.97 L	4	XX
QU8KZX_AL	358.4	-1.60	9.30		358.5	-1.51	0.43 L	4	AL
RYDL8K_AL	364.3	-0.99	4.32		364.8	-1.07	3.36	4	AL
V6GF7Y	387.8	1.44	8.39		384.0	0.27	4.38	4	XX
XYEFKY	363.3	-1.09	6.21		378.7	-0.10	17.85	4	TS
YKGQ4T	2,928.9	264.58 X	18.81	H	993.8	42.70 X	1,290.08 H	4	LA

Consensus (All Labs) Results			
Month Mean	373.90	Grand Mean	380.14
Avg SD	8.59	Avg SD Months	8.98
SD btwn Labs	9.66	SD btwn Labs	14.37
Labs Incd	13	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 Ib Linerboard - 42H
 TAPPI Official Test Method T569

Report #647
August 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2RAHPR	125.8	-0.28	4.76	122.9	-0.38	8.34	4	TM
34X69R	120.6	-0.59	2.07	123.2	-0.36	2.13	4	HZ
47J7QK	152.0	1.32	10.02	149.9	1.29	4.96	3	HY
7E9QTN	119.0	-0.69	8.12	134.7	0.35	27.36	H 4	SC
CAFDTV	119.1	-0.69	4.37	118.7	-0.63	1.11	L 4	SC
CAPHXJ	138.5	0.49	13.37	H 125.9	-0.19	9.11	4	TM
CL6CMJ	115.9	-0.88	4.12	116.8	-0.75	0.79	L 4	TM
CYTNQF	97.4	-2.00	* 14.77	H 92.4	-2.26	* 4.65	3	TM
DQD2GC	153.8	1.43	5.26	101.8	-1.68	52.07	H 4	LZ
F32XFF	121.8	-0.52	3.91	124.3	-0.29	3.15	4	TM
FCL74J	148.0	1.07	0.00	L 148.6	1.21	0.85	2	HY
GWCPM9	117.8	-0.76	9.88	114.0	-0.93	3.48	4	TM
J37RMB	142.6	0.75	5.77	154.7	1.59	9.47	4	HY
JRCBXA	122.6	-0.47	5.55	123.6	-0.34	1.90	4	TM
LMLX2C	144.2	0.84	6.22	144.0	0.92	2.29	4	TM
M4TEN4	104.8	-1.55	5.02	106.8	-1.37	5.73	4	SC
NGCFJ2	104.6	-1.57	4.56	106.5	-1.39	3.35	3	XX
NKRN82	138.4	0.49	2.97	139.4	0.64	5.57	4	HY
RYDL8K	142.4	0.73	2.70	136.5	0.46	5.48	4	TM
UT4VAX	143.3	0.79	4.35	137.1	0.50	4.64	4	HZ
V6GF7Y	150.8	1.24	9.77	149.1	1.24	2.96	4	HY
X8B8ZF	142.2	0.72	4.66	142.7	0.84	3.44	4	TM
XRMWPY	132.4	0.12	5.86	126.3	-0.17	5.06	4	TM

Consensus (All Labs) Results			
Month Mean	130.35	Grand Mean	128.99
Avg SD	7.08	Avg SD Months	7.53
SD btwn Labs	16.45	SD btwn Labs	16.20
Labs Incl	23	Labs Incl	22

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	129.09	15.49	1.26	18
Modified Scott Bond Mechanics	149.07	5.80	18.72	3



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

Report #647
August 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 #647
August 2023

WebCode	Monthly Results				Cumulative Results			
	Mean	CPV	SD		Mean	CPV	SD Months	Months
29DCWR	34.1	1.66	1.42		32.5	1.65	1.45	4
2RAHPR	28.8	0.09	2.28		29.9	0.69	1.90	4
47J7QK	28.2	-0.09	0.84		28.0	0.03	0.20	L 3
7E9QTN	35.7	2.11 *	2.74		34.2	2.25 *	1.27	4
7VTGTN	32.4	1.15	1.52		30.0	0.72	3.83	4
8QCA6N	28.6	0.03	2.07		25.7	-0.79	2.35	4
8Y6QBJ	34.0	1.62	1.58		34.1	2.19 *	0.50	4
C6Z68G	28.0	-0.15	2.00		27.3	-0.22	1.27	4
CL6CMJ	25.4	-0.91	3.65		24.2	-1.33	1.51	4
CYTNQF	33.4	1.44	1.67		30.5	0.91	3.36	3
DCTXHU	25.9	-0.77	8.10	H	25.9	-0.72	0.00	1
DQD2GC	27.2	-0.38	4.22		27.1	-0.31	2.66	4
FCL74J	240.0	62.19 X	0.00	L	134.1	37.86 X	149.77	2
GH9GQC	25.6	-0.85	0.55	L	26.0	-0.70	0.87	4
GWCPM9	30.8	0.68	4.19		31.6	1.32	1.04	4
J37RMB	31.8	0.97	3.27		28.7	0.28	2.17	4
KJ66KQ	29.7	0.35	2.25		27.1	-0.31	2.36	4
M4TEN4	26.6	-0.56	1.14		26.7	-0.43	0.26	L 4
MZ8LJN	27.4	-0.32	0.89		27.5	-0.15	0.26	L 4
NDQQ6P	31.5	0.88	3.66		29.6	0.58	2.37	4
NKRN82	27.6	-0.27	1.52		28.0	0.03	2.12	4
NLNGN6	26.4	-0.62	8.71	H	27.4	-0.20	1.81	4
QNLFC3	26.4	-0.62	1.67		25.9	-0.73	0.50	3
RYDL8K	28.4	-0.03	5.86		30.9	1.06	1.70	4
TMYRU7	27.0	-0.44	2.62		27.2	-0.26	0.28	2
U2DKMV	21.0	-2.21 *	1.41		21.3	-2.35 *	0.47	4
UPNNLX	31.2	0.79	3.96		28.2	0.10	2.93	4
UT4VAX	24.6	-1.15	1.52		26.1	-0.67	2.94	4
V6GF7Y	21.4	-2.09 *	1.09		24.3	-1.30	2.73	4
VJU44Z	25.6	-0.85	2.70		24.8	-1.11	4.60	4
X8B8ZF	29.0	0.15	4.34		28.5	0.22	2.05	4
XRMWPY	26.6	-0.56	2.07		27.2	-0.27	6.23	H 4
XVL8KY	29.7	0.36	1.42		29.5	0.56	0.57	4
ZNNPLC	30.5	0.59	3.87		25.9	-0.72	3.29	4



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

Report #647
August 2023

Consensus (All Labs) Results

Month Mean	28.50	Grand Mean	27.92
Avg SD	3.34	Avg SD Months	2.37
SD btwn Labs	3.40	SD btwn Labs	2.80
Labs Incl	33	Labs Incl	33

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program
 Analysis 237
Air Resistance, 42 lb Linerboard - 42H2
 TAPPI Official Test Method T460

Report #647
August 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD	Months	Inst
29DCWR_AL	30.2	-1.32	2.57	30.9	-1.46	0.63	4	AL
2RAHPR_AL	32.6	0.14	2.08	33.0	0.57	0.77	4	AL
2U96P9	31.6	-0.46	1.18	32.9	0.50	1.13	4	LP
47J7QK	31.4	-0.62	2.36	32.2	-0.19	0.75	3	LP
4UQLAU	32.4	0.03	2.29	32.7	0.27	1.64	4	LA
624X3L	30.3	-1.27	1.13	30.3	-1.99 *	0.49	4	LP
7E9QTN_AL	30.9	-0.92	1.78	31.8	-0.61	0.68	4	AL
7VTGTN	34.6	1.35	2.23	33.3	0.86	1.00	4	GG
8QCA6N_AL	31.3	-0.64	2.18	30.6	-1.75	0.53	4	AL
8Y6QBJ	33.7	0.81	1.93	33.4	0.95	0.82	4	GG
8Y6QBJ_AL	31.4	-0.60	1.35	32.1	-0.31	0.59	4	AL
CAPHXJ	33.8	0.88	3.26	31.9	-0.48	1.74	4	GA
CGTBHE	33.5	0.67	2.59	31.5	-0.83	1.53	4	XX
CL6CMJ_AL	30.3	-1.24	2.14	31.0	-1.34	0.95	4	AL
CYTNQF_AL	34.1	1.06	1.62	32.8	0.33	0.98	4	AL
DQD2GC_AL	34.3	1.14	1.16	33.4	0.98	1.56	4	AL
ETY7PA	33.2	0.46	0.90 L	32.7	0.24	0.35	4	LP
F32XFF_AL	32.3	-0.07	2.40	32.4	-0.01	0.31	4	AL
GH9GQC	31.9	-0.29	2.66	31.7	-0.65	0.84	4	TD
GWCPM9_AL	33.1	0.44	2.18	33.6	1.11	1.38	3	AL
HVCZ3C_AL	33.3	0.55	1.43	33.0	0.54	0.72	4	XX
J37RMB	33.6	0.73	1.71	34.4	1.86	1.51	4	LP
KJ66KQ	28.0	-2.67 *	3.95 H	30.4	-1.88	1.72	4	LA
M89WQ8	33.3	0.53	1.32	31.6	-0.79	1.24	4	LA
MZ8LJN	31.8	-0.36	2.10	32.2	-0.15	0.50	4	LP
NDQQ6P	32.5	0.09	3.64	33.9	1.38	1.14	4	GA
NKRN82	31.3	-0.67	3.28	31.0	-1.33	0.57	4	TP
NKRN82_AL	32.2	-0.10	0.74 L	32.4	-0.04	0.31	4	XX
NLAVE4	34.3	1.14	2.85	32.9	0.50	1.69	4	LA
QU8KZX_AL	33.4	0.64	2.07	33.5	1.08	0.63	4	AL
RYDL8K_AL	32.4	0.01	2.44	32.1	-0.29	1.28	4	AL
TMYRU7_AL	35.3	1.78	2.08	35.6	3.04 X	0.45	2	AL
U2DKMV	30.3	-1.25	2.36	28.8	-3.40 X	3.05 H	4	TD
UPNNLX_AL	31.3	-0.65	1.74	33.1	0.69	1.23	4	AL
UT4VAX	34.3	1.14	2.28	34.1	1.60	1.98	4	LP
V6GF7Y	34.3	1.19	2.77	32.8	0.35	1.34	4	TP
VJU44Z	33.0	0.35	2.18	33.3	0.84	0.69	4	LP
X8B8ZF	32.0	-0.26	3.20	32.2	-0.23	0.47	4	LP
XRMWPY	33.7	0.80	4.27 H	33.4	0.94	0.94	4	GA



Containerboard Interlaboratory Testing Program
Analysis 237

Report #647
August 2023

Air Resistance, 42 lb Linerboard - 42H

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
YKGQ4T	32.6	0.11	1.62	31.0	-1.29	1.97	4	LA
YX3ZQX	28.0	-2.65 *	2.94	28.3	-3.86 X	2.97 H	4	GG

Consensus (All Labs) Results				
Month Mean		32.39	Grand Mean	32.40
Avg SD		2.35	Avg SD Months	1.12
SD btwn Labs		1.65	SD btwn Labs	1.06
Labs Incl		41	Labs Incl	38

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 - CM12
 TAPPI Official Test Method T809

Report #647
August 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
2JB84U	58.2 L	58.2 L	58.3 L	58.3 L	58.3	0.02	0.5	0.1 L	58.4	0.04	0.6	0.1 L	16	LD
34X69R	56.7	54.7	55.6 H	55.9	55.7	-0.90	4.3	0.8	55.8	-0.97	3.6	0.9	16	LD
3AQZFY	59.0	60.2	57.7	56.7	58.4	0.05	3.0	1.5	57.9	-0.14	3.4	1.3	16	LZ
3LDD9T	59.4	59.9	59.4	59.4	59.5	0.47	1.7	0.2 L	58.7	0.17	1.7	1.2	16	MB
47J7QK	No DATA	No DATA	No DATA	57.1	57.1	-0.42	3.0	0.0	56.9	-0.56	3.5	0.2 L	3	LD
4UQLAU	52.2 *	54.1	53.6	56.3	54.0	-1.50	3.3	1.7	54.9	-1.33	3.6	2.2	16	MB
624X3L	55.7	52.1 *	55.8	56.9	55.1	-1.12	3.8	2.1	57.7	-0.22	3.8	2.5	16	LD
7DL DUP	60.8	59.6	57.8	59.8	59.5	0.45	3.0	1.2	61.1	1.13	3.7	2.4	16	LD
8QCA6N	61.3	56.4	58.5	58.5	58.7	0.15	3.8	2.0	57.8	-0.20	4.1	2.2	16	LZ
94BXZM	51.3 *	55.5	54.5	52.4	53.4	-1.73	3.0	1.9	53.3	-1.95 *	2.9	1.3	16	LD
CAFDVG	55.0	54.2	58.0	54.7	55.5	-0.99	3.9	1.7	55.6	-1.07	3.8	2.5	16	LC
CGTBHE	46.6 X	55.1	55.3	55.5	53.1	-1.84	3.7	4.3 H	54.4	-1.53	3.3	3.3	16	LD
CYTNQF	60.7	63.5	58.6	63.0	61.5	1.16	2.8	2.3	61.4	1.21	3.5	1.9	15	LC
DQD2GC	56.3	58.0	57.5	55.7	56.9	-0.48	3.0	1.1	54.7	-1.40	2.7	1.7	16	LD
ETY7PA	57.9	57.3	57.4	57.4	57.5	-0.26	2.6	0.3 L	57.6	-0.26	3.3	0.9	16	LD
FTV63E	57.6	59.0	59.0	57.0	58.1	-0.04	2.6	1.0	58.6	0.12	3.3	0.8	16	LD
GH9GQC	59.2	56.6	54.1	56.7	56.7	-0.57	3.3	2.1	56.0	-0.91	3.5	1.5	16	LZ
HT6UFB	59.3 L	60.0 L	61.2 L	61.1 L	60.4	0.77	0.9	0.9	60.4	0.83	1.4	1.2	16	XX
J37RMB	58.0	59.8	60.7	59.5	59.5	0.46	3.2	1.1	58.9	0.22	3.8	1.0	16	XX
JRCBXA	60.2 L	60.1	60.1	58.2 L	59.7	0.51	2.1	1.0	59.1	0.31	2.8	1.3	16	LC
KJ66KQ	58.5	57.8	57.9	55.9	57.5	-0.25	3.6	1.2	57.3	-0.41	3.7	1.4	16	MB
LE8Z8D	64.8 *H	65.1 *	65.2 *	65.1 *	65.1	2.46 *	4.5	0.2 L	65.0	2.63 *	4.6	2.0	8	LD
LL8MWR	55.5	60.0	59.5	56.7	57.9	-0.11	4.1	2.1	57.1	-0.45	4.2	4.3 H	16	LD
LVHPRH	63.7	63.7	62.7	64.0 H	63.5	1.91	4.0	0.5	61.9	1.42	4.3	2.2	16	TX
LYYXX6	61.7	62.4	62.7	62.7	62.4	1.50	2.5	0.5	62.2	1.54	3.1	1.3	16	TB
MZ8LJN	57.4	57.4	58.0	58.0	57.7	-0.19	2.5	0.3	58.0	-0.11	2.3	0.3 L	16	LD
NDD6M2	57.2	61.4	57.4	61.8 H	59.5	0.45	4.0	2.5	59.5	0.47	4.0	2.5	4	LD
NDQQ6P	58.3	58.4	57.7	No DATA	58.1	-0.04	2.9	0.4	58.3	-0.01	3.1	1.0	15	LZ
NEW93L	57.4 L	58.5 L	58.5 L	59.2 L	58.4	0.06	0.8	0.7	59.5	0.47	0.8	1.0	16	XX
NKRN82	58.3	58.4	62.0	57.1	59.0	0.27	3.1	2.1	58.8	0.21	3.6	1.8	16	LD
NLAVE4	59.3	58.1	59.7	60.4	59.4	0.41	4.1	0.9	59.7	0.57	4.0	1.8	16	TU
NLNGN6	61.6	59.2	57.8	58.1	59.2	0.34	4.0	1.7	61.5	1.25	3.6	3.1	16	LD
NXW8HZ	58.0 H	58.3	56.3	55.5	57.0	-0.43	4.4	1.3	56.9	-0.56	6.3	2.1	16	LD
PX7MZ7	59.1	58.7	57.6	57.1	58.1	-0.03	3.1	0.9	57.9	-0.15	2.6	1.1	16	EM
R9RAJZ	55.4	56.6	57.6	58.0	56.9	-0.48	4.1	1.2	55.7	-1.01	5.2	3.1	16	LD



Containerboard Interlaboratory Testing Program
 Analysis 240
Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM12
 TAPPI Official Test Method T809

Report #647
August 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
RGFAQW	56.7	56.2	54.6	54.5	55.5	-0.98	2.7	1.1	56.3	-0.76	3.2	1.6	16	LD
RYDL8K	58.5	58.4	65.8 *H	57.9	60.2	0.69	4.3	3.8 H	57.6	-0.28	3.8	2.8	16	LD
TFL26Y	59.7	61.6	60.7 H	59.8	60.5	0.80	4.6	0.9	60.7	0.96	4.3	2.1	16	LD
UT4VAX	57.1	59.9	53.9 L	55.5	56.6	-0.58	3.0	2.5	57.8	-0.17	3.6	1.8	16	LZ
V6GF7Y	61.0	59.8	60.4	59.6	60.2	0.71	4.2	0.6	59.1	0.32	3.6	1.4	13	LC
VFR4RG	56.7	53.5	53.6	53.0	54.2	-1.45	3.5	1.7	55.5	-1.09	3.1	1.8	8	RS
W6Q4KV	60.9	60.9	60.4 L	60.7	60.7	0.90	1.8	0.2 L	60.9	1.05	2.0	0.9	16	LC
WQQ7XY	55.7	52.6 *	54.1	52.8	53.8	-1.59	3.0	1.4	56.6	-0.66	1.6	2.2	16	TU
XMPGTW	61.2	62.0	61.2	60.8	61.3	1.11	4.2	0.5	61.2	1.14	3.8	2.5	16	LD
XRMWPY	55.0	54.0	52.5	52.8	53.6	-1.68	3.3	1.2	53.8	-1.77	3.3	1.5	16	LD
XVL8KY	57.6	61.2	59.5	58.3	59.1	0.32	2.6	1.6	59.3	0.42	3.7	2.0	16	EN
YKGQ4T	53.9	55.6	53.0 H	50.2 *	53.2	-1.81	5.2	2.3	53.6	-1.84	4.3	1.6	16	LD
YX4R6T	60.2	58.4	58.7	62.6	60.0	0.63	3.8	1.9	59.7	0.54	3.8	1.7	14	LD
ZANRXE	64.7 *	64.7 *H	61.4	61.7	63.1	1.76	4.6	1.8	62.2	1.55	3.8	2.2	16	LD
ZNNPLC	61.2	61.9	60.8	61.7	61.4	1.14	3.8	0.5	61.5	1.24	3.8	1.5	16	LD

Consensus (All Labs) Results										
Wk Mean	58.44	58.55	58.25	57.99	Month Mean	58.23	Grand Mean	58.29		
Avg SDr	3.36	3.41	3.42	3.54	Avg SD	3.42	Avg SD	3.53		
SD btwn Labs	2.82	3.06	3.03	3.17	SD btwn Labs	2.78	SD btwn Labs	2.54		
Labs Incl	48	49	49	49	SD btwn Wks	1.61	SD btwn Wks	1.92		
Labs Excl	1	0	0	0	Labs Incl	50	Labs Incl	50		
Labs not Rcvd	1	1	1	1						

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
RS	Regmed Digital Crush Tester CT-2000	TB	TMI Monitor/Compression Tester, 17-70
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 #647
August 2023

Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium - CM12

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	
3AQZFQ	67.7	67.1	66.7	67.6	67.3	-0.64	3.5	0.4	66.6	-1.01	3.4	1.5	16	LZ
3LDD9T	66.7 L	66.2	66.7	66.6	66.6	-0.90	1.6	0.2 L	66.5	-1.05	1.6	0.9	16	MB
624X3L	73.1	71.6	70.9	71.5	71.8	0.97	3.4	0.9	72.0	1.18	3.5	1.7	16	LD
8QCA6N	64.2	66.8	66.4	64.5 *	65.5	-1.29	2.8	1.4	64.9	-1.71	4.2	2.5	16	LZ
CYTNQF	72.6	71.9	72.3	71.9	72.2	1.12	3.6	0.3 L	72.7	1.45	3.6	1.7	15	LC
DQD2GC	72.2	75.5 *L	77.3	72.4	74.3	1.89 *	3.4	2.5	72.3	1.29	3.0	2.2	16	LD
ETY7PA	69.1	66.7	69.3	67.2	68.1	-0.36	3.0	1.3	69.4	0.13	3.8	2.6	14	LD
HT6UFB	70.4 L	70.7 L	72.9 L	69.9 L	71.0	0.69	0.9	1.3	70.4	0.52	1.3	1.3	16	XX
J37RMB	68.8	70.4	73.4	70.5	70.8	0.61	3.9	1.9	70.7	0.63	3.7	1.5	16	XX
MZ8LJN	68.0	68.1	67.6	68.5	68.1	-0.36	2.3	0.4 L	68.3	-0.35	2.3	0.4 L	16	LD
NDD6M2	67.5 H	70.5	69.9	72.9	70.2	0.41	3.9	2.2	70.2	0.44	3.9	2.2	4	LD
NEW93L	65.4 L	64.9 L	64.5 L	65.4 L	65.1	-1.44	0.8	0.4	65.1	-1.61	0.7	0.6 L	16	XX
NKRN82	71.4	72.2	70.4	69.8	70.9	0.67	4.3	1.1	71.0	0.75	4.0	1.0	16	LD
NLNGN6	68.6	69.4	65.7	70.3	68.5	-0.21	3.1	2.0	67.6	-0.61	3.7	2.3	16	LD
R9RAJZ	62.7	65.2	70.4	70.0	67.1	-0.72	4.0	3.7	68.6	-0.19	3.9	3.6	16	LD
RYDL8K	67.1	68.2	54.6 *	70.5	65.1	-1.42	3.8	7.1 H	67.3	-0.72	4.2	3.8	16	LD
V6GF7Y	73.0	71.2	73.0	70.1	71.8	0.98	3.3	1.4	71.3	0.86	3.2	1.7	13	LC
YKGQ4T	62.6	55.5 XH	55.2 *H	55.8 XH	57.3	-4.24 X	7.4	3.6	59.7	-3.77 X	7.2	5.4 H	16	LD

Consensus (All Labs) Results													
Wk Mean	68.39	69.22	68.18	69.37	Month Mean	69.06			Grand Mean	69.11			
Avg SDr	3.27	3.04	3.72	3.41	Avg SD	3.21			Avg SD	3.35			
SD btwn Labs	3.32	2.88	5.81	2.42	SD btwn Labs	2.78			SD btwn Labs	2.49			
Labs Incl	18	17	18	17	SD btwn Wks	2.35			SD btwn Wks	2.07			
Labs Excl	0	1	0	1	Labs Incl	17			Labs Incl	17			
Labs not Rcvd	0	0	0	0									

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program
 Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM12
 TAPPI Official Test Method T822

Report #647
August 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	
2JB84U	44.4 L	44.3 L	44.2 L	44.4 L	44.3	0.38	0.5	0.1 L	44.6	0.42	0.5	0.2 L	16	LD
2U96P9	40.9	44.4	41.2	42.0	42.1	-0.57	2.5	1.6	42.8	-0.86	2.9	1.7	16	LD
34X69R	44.4	41.0	38.8	42.0	41.6	-0.80	2.6	2.3	43.4	-0.43	2.6	2.3	16	LD
3LDD9T	41.0	41.7	40.8 L	41.8	41.3	-0.90	1.6	0.5	42.5	-1.06	1.6	0.9	16	MB
624X3L	40.7	42.6	41.8	43.5	42.2	-0.54	2.9	1.2	43.5	-0.33	3.0	1.6	16	LD
9PUNPJ	40.1 H	37.7 *H	38.3	35.0 X	37.8	-2.40 *	5.3	2.1	37.1	-4.97 X	5.9	2.7	16	EM
CGTBHE	45.9	45.7	47.0	46.4	46.2	1.19	2.2	0.6	46.7	2.01 *	2.5	1.8	16	LD
DQD2GC	47.6	47.8	49.0 *	49.2 *	48.4	2.10 *	3.7	0.8	45.5	1.13	3.0	1.8	16	LD
ETY7PA	41.0	42.9	41.7	42.2	42.0	-0.62	3.8	0.8	42.1	-1.33	3.8	1.1	16	LD
FTV63E	42.7	44.0	42.8	43.4	43.2	-0.09	2.4	0.6	43.7	-0.16	2.9	0.7	16	LD
J37RMB	42.6	42.4	42.3	44.8	43.0	-0.17	3.9	1.2	44.2	0.15	3.4	1.5	16	XX
KJ66KQ	44.4	46.2	44.6	45.2	45.1	0.69	2.8	0.8	45.5	1.15	2.9	1.4	16	MB
LE8Z8D	44.5	43.5	45.2	43.0	44.0	0.25	4.2	1.0	43.5	-0.34	3.8	1.0	8	LD
LL8MWR	38.2	43.7	43.4	39.7 *	41.2	-0.94	3.6	2.7	42.0	-1.46	4.2	2.9	16	LD
LVPHR	38.3	40.3	40.2	40.1	39.7	-1.57	3.5	0.9	39.5	-3.25 X	3.2	2.8	16	LZ
LYYXX6	41.6	42.0	41.0	43.9	42.1	-0.56	1.8	1.3	42.5	-1.08	2.8	1.4	16	XX
NDQQ6P	43.0	43.8	43.8	45.6	44.0	0.24	3.0	1.1	43.9	-0.07	3.2	1.4	16	LD
NEW93L	45.1 L	44.3 L	46.1 L	45.6 L	45.3	0.79	0.7	0.8	44.2	0.13	0.7	1.0	16	TX
NKRN82	48.2	43.8	44.7	46.5	45.8	1.00	2.9	2.0	45.0	0.77	2.9	1.7	16	LD
RGFAQW	46.3	46.4	45.4	45.8	46.0	1.07	3.9	0.5	45.3	0.98	3.3	0.9	16	LC
TFL26Y	46.7	47.2	45.5	46.8	46.6	1.32	3.1	0.7	44.9	0.71	3.2	1.8	16	LD
UNDLZY	45.0	43.1	41.4	41.8	42.8	-0.26	2.6	1.6	43.1	-0.62	2.4	1.9	16	TH
V6GF7Y	41.5	44.6	43.6	43.4	43.3	-0.08	3.0	1.3	43.8	-0.09	3.4	2.0	13	LC
W6Q4KV	44.6	40.8 L	42.6	43.6	42.9	-0.23	3.1	1.6	41.3	-1.97 *	2.7	1.5	16	XX
WQQ7XY	46.3	43.0	44.0	46.3	44.9	0.62	2.6	1.7	45.1	0.80	1.4	1.4	16	TU
XMPGTW	40.2	42.1	39.2	42.1	40.9	-1.09	4.1	1.4	43.8	-0.10	3.7	3.4	16	EM
YX4R6T	48.4	46.7 H	46.2	43.3	46.2	1.15	4.0	2.1	46.3	1.66	3.8	1.7	14	LZ

Consensus (All Labs) Results														
Wk Mean	43.47	43.55	43.14	43.93	Month Mean	43.44	Grand Mean	43.97						
Avg SDr	3.27	3.02	3.38	2.84	Avg SD	3.15	Avg SD	2.97						
SD btwn Labs	2.89	2.27	2.61	2.22	SD btwn Labs	2.36	SD btwn Labs	1.37						
Labs Incl	27	27	27	26	SD btwn Wks	1.38	SD btwn Wks	1.69						
Labs Excl	0	0	0	1	Labs Incl	27	Labs Incl	25						
Labs not Rcvd	0	0	0	0										



Containerboard Interlaboratory Testing Program
Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM12
TAPPI Official Test Method T822

Report #647
August 2023

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
STFI, 26 lb Corrugating Medium - CM12
 TAPPI Official Test Method T826

Report #647
August 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	
2U96P9	14.2	15.2 H	14.0	15.2	14.7	0.51	1.6	0.6	14.7	1.13	1.3	0.6	16	LH
47J7QK	No DATA	No DATA	No DATA	13.2	13.2	-1.03	1.1	0.0	13.2	-1.85	1.1	0.1	L 3	LH
4UQLAU	16.6 *H	13.8	13.7	14.2	14.6	0.43	1.4	1.4 H	14.3	0.22	2.0	0.8	16	LA
CL6CMJ	14.0	13.6	13.9	14.8 L	14.1	-0.13	1.0	0.5	14.3	0.34	1.0	0.4	16	LA
DCTXHU	13.3	14.1	13.3	12.9	13.4	-0.85	1.2	0.5	13.5	-1.24	1.2	0.5	16	XX
DQD2GC	15.1 L	14.6 L	13.9	14.7 L	14.6	0.44	0.9	0.5	14.3	0.26	0.9	0.5	8	LA
G477LD	13.7	14.1	13.9	13.8	13.9	-0.32	1.0	0.2	13.8	-0.68	1.3	0.3	12	LU
HT6UFB	13.5 H	12.8	12.8	13.6	13.2	-1.11	1.2	0.5	13.0	-2.12 *	1.3	0.8	16	XX
KJ66KQ	14.7	15.4	14.6	14.6 H	14.8	0.69	1.3	0.4	15.0	1.59	1.9	0.8	16	LA
MZ8LJN	14.4	14.1	13.9	14.2	14.2	-0.04	1.1	0.2	14.4	0.58	1.1	0.3	16	LA
NDD6M2	13.7	13.6 L	14.8	14.6 L	14.2	0.00	0.8	0.6	14.2	0.08	0.8	0.6	4	LA
NDQQ6P	13.6	14.1	13.5	13.8	13.7	-0.48	1.0	0.3	13.8	-0.74	1.0	0.3	16	LZ
NEW93L	15.2 L	15.3 L	15.5 L	15.3 L	15.3	1.23	0.3	0.1	14.5	0.66	0.3	0.6	16	LZ
NLAVE4	16.7 *	16.3 *L	16.0 *L	16.4 *	16.3	2.37 *	0.9	0.3	15.2	1.97 *	1.6	1.1	16	LA
PX7MZ7	14.3	13.3	13.5	13.0	13.5	-0.72	1.1	0.6	13.9	-0.40	1.0	0.4	16	LH
RGFAQW	14.0	13.7	14.3	14.3	14.1	-0.10	1.0	0.3	14.4	0.48	1.1	0.4	16	LH
RYDL8K	15.0	14.6 H	14.2	13.1	14.2	0.04	1.4	0.8	14.2	0.08	1.5	0.7	16	LA
TFL26Y	15.8	15.1	14.2	15.0	15.0	0.90	1.1	0.6	14.7	1.06	1.1	0.6	16	XX
UWKE3E	12.7	13.1	13.4	13.4	13.2	-1.13	1.0	0.3	13.8	-0.73	1.3	0.6	16	TX
V6GF7Y	14.3	13.6	14.1	13.4	13.8	-0.40	1.1	0.4	13.9	-0.48	1.1	0.4	13	LU
VFR4RG	16.3	16.1 L	16.1 *	16.3 *	16.2	2.20 *	0.9	0.1	16.1	3.70 X	0.9	0.3	8	XX
XRMWPY	14.3	14.1	13.6	13.2	13.8	-0.43	1.0	0.5	13.9	-0.42	1.1	0.7	16	LU
YX4R6T	No DATA	12.5	12.6	12.4	12.5	-1.88	1.3	0.1	14.0	-0.28	1.4	3.3 H	13	XX
ZNNPLC	13.9	14.2	14.2	13.8 H	14.0	-0.19	1.5	0.2	14.4	0.50	0.9	0.4	16	LH

Consensus (All Labs) Results														
Wk Mean	14.51	14.23	14.08	14.13	Month Mean	14.18			Grand Mean	14.14				
Avg SDr	1.18	1.08	1.13	1.07	Avg SD	1.11			Avg SD	1.22				
SD btwn Labs	1.07	0.98	0.88	1.03	SD btwn Labs	0.91			SD btwn Labs	0.52				
Labs Incl	22	23	23	24	SD btwn Wks	0.51			SD btwn Wks	0.89				
Labs Excl	0	0	0	0	Labs Incl	24			Labs Incl	23				
Labs not Rcvd	2	1	1	0										



Containerboard Interlaboratory Testing Program
Analysis 261
STFI, 26 lb Corrugating Medium - CM12
TAPPI Official Test Method T826

Report #647
August 2023

Key to Instrument Codes Reported by Participants

LA	L&W Autoline	LH	L&W 282
LU	L&W 52 without moisture correction (was 53)	LZ	L&W (model not specified)
TX	TMI (model not specified)	XX	Instrument make/model not specified by lab