



Containerboard Interlaboratory Testing Program

Participant Summary Report #644 - May 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>206</u>	<u>56G3</u>	<u>Bursting Strength (Mullen), 56 lb Linerboard</u>
<u>215</u>	<u>42H2</u>	<u>Ring Crush, 42 lb Linerboard</u>
<u>216</u>	<u>56G3</u>	<u>Ring Crush, 56 lb Linerboard</u>
<u>223</u>	<u>42H2</u>	<u>STFI, 42 lb Linerboard</u>
<u>224</u>	<u>56G3</u>	<u>STFI, 56 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

Report #644
May 2023

Top to Bottom Box Compression Strength, Corrugated Boxes - BX17

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2NK9C7	872.7	0.45	31.97	909.7	1.02	30.37	4	ER
2U4TWX	889.0	0.65	59.29	856.7	0.13	30.65	3	LG
3KL86B	969.2	1.66	28.84	965.6	1.97 *	11.32	3	LN
7MT4KU	637.0	-2.52 *	71.85	829.3	-0.34	140.64 H	4	LL
7PHB6Q	786.7	-0.63	77.42	809.0	-0.68	35.63	4	TB
7UV9CE	746.9	-1.13	47.54	748.5	-1.70	12.69	4	LL
8CGVXU	855.2	0.23	121.00	841.7	-0.13	60.70	4	ER
8Z6ZP4	837.7	0.01	55.09	908.9	1.01	53.80	4	LG
BCKRGN	765.9	-0.90	53.82	783.3	-1.11	31.71	3	LH
CM3NBL	874.8	0.47	98.35	922.6	1.24	49.39	4	LM
CXFHBY	735.6	-1.28	27.45	812.7	-0.62	52.52	4	LG
DWHX2Y	923.8	1.09	81.34	862.3	0.22	87.92	4	LG
G7P7QM	823.2	-0.17	105.68	776.2	-1.23	35.05	4	LS
J3R4G6	803.2	-0.43	72.61	798.2	-0.86	51.33	4	ER
K4WBVH	822.9	-0.18	110.97	850.0	0.02	47.97	4	ER
KMW43B	849.1	0.15	69.02	854.9	0.10	28.36	4	LM
KT9H7E	808.1	-0.36	25.32	832.2	-0.29	37.48	4	EX
M7WB2R	720.2	-1.47	23.06	769.0	-1.36	52.15	4	EX
MKTFCB	845.4	0.10	88.13	863.5	0.24	38.48	4	LO
PG4UJL	871.8	0.44	110.70	905.6	0.95	58.82	4	EX
PGTNJ4	843.6	0.08	80.71	820.3	-0.49	35.72	4	EX
PR4GBH	905.8	0.86	91.70	822.6	-0.45	92.91	4	LS
QUMVEJ	787.5	-0.62	73.20	836.1	-0.22	59.76	4	ET
R8QLRB	1,036.0	2.50 *	13.56 L	998.7	2.53 *	52.75	2	LS
T9HYUU	948.4	1.40	112.36	888.3	0.66	54.10	4	XX
TXGFNK	853.8	0.21	85.78	893.5	0.75	28.00	4	EX
V8MZ78	848.0	0.14	50.36	880.1	0.52	40.81	3	ES
VKB2NY	833.0	-0.05	70.34	811.5	-0.64	85.72	4	ER
Y9Y8EG	780.0	-0.72	135.42	774.4	-1.26	16.32	4	EX

Consensus (All Labs) Results

Month Mean	837.05	Grand Mean	849.15
Avg SD	78.21	Avg SD Months	55.40
SD btwn Labs	79.52	SD btwn Labs	59.12
Labs Incl	29	Labs Incl	29



Containerboard Interlaboratory Testing Program
Analysis 201

Report #644
May 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	830.39	84.84	6.66	9
Clip sealing	838.33	80.89	1.28	19
Staple sealing	872.70	0.00	35.65	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	LH	L.A.B. Compression Tester Model #10610
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 #644
May 2023

WebCode	Monthly Results				Cumulative Results					
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst	
8442KD	156.1	66.19 X	5.49	H	158.5	64.85 X	3.64	H	4	LD
8Z6ZP4	41.4	-0.52	1.12		43.1	0.33	1.22		4	EX
DN4DDT	45.8	2.02 *	2.74		45.6	1.72	1.60		3	XX
K4WBVH	41.9	-0.26	2.51		42.7	0.12	1.14		3	EN
MJKCHY	41.2	-0.68	1.32		40.6	-1.04	1.23		4	TS
PG4UJL	44.4	1.18	1.11		44.2	0.92	1.26		4	LC
PR4GBH	41.9	-0.27	1.93		40.8	-0.93	2.75		4	LD
QGNTD4	41.0	-0.80	1.42		40.8	-0.97	1.88		4	XX
T9HYUU	41.7	-0.35	1.65		42.8	0.14	1.39		4	TS
Y9Y8EG	43.7	0.80	1.85		44.1	0.88	2.36		4	LC
YTLVTP	40.4	-1.12	2.16		40.4	-1.17	0.00		1	XX

Consensus (All Labs) Results			
Month Mean	42.33	Grand Mean	42.50
Avg SD	1.86	Avg SD Months	1.74
SD btwn Labs	1.72	SD btwn Labs	1.79
Labs Incl	10	Labs Incl	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

Report #644
May 2023

WebCode	Monthly Results				Cumulative Results				Inst
	Mean	CPV	SD		Mean	CPV	SD Months	Months	
2NK9C7	50.4	1.54	1.82		48.5	0.75	1.59	4	LD
2U4TWX	46.3	0.14	1.60		45.8	-0.15	0.37	L 4	EM
7MT4KU	44.1	-0.63	1.30		46.0	-0.09	1.47	4	BU
7PHB6Q	48.3	0.83	0.95		53.8	2.54 *	3.78	4	LD
8CGVXU	45.3	-0.22	2.09		46.2	0.00	0.93	4	LD
8EJXG6	48.3	0.82	4.17	H	40.0	-2.07 *	7.68	H 4	XX
8Z6ZP4	43.0	-1.04	2.30		43.9	-0.77	1.10	4	LY
BCKRGN	39.6	-2.21 *	1.10		44.5	-0.58	6.35	H 3	EM
CM3NBL	44.1	-0.64	1.06		45.4	-0.26	1.19	4	EM
DQTJ8Q	42.5	-1.20	2.11		42.5	-1.24	0.00	1	TD
DWHX2Y	50.3	1.51	3.10	H	52.0	1.91	2.47	3	MK
EE7ZTJ	47.9	0.69	1.03		50.8	1.54	3.86	4	LC
EFNPJR	48.1	0.76	1.22		48.9	0.88	0.68	3	EM
G7P7QM	41.7	-1.47	0.71	L	43.0	-1.09	0.92	4	EM
GPTMAR	49.7	1.33	1.88		49.5	1.10	0.42	L 4	TG
HD4C66	47.6	0.57	1.37		46.9	0.21	1.02	4	TU
J3R4G6	46.6	0.22	1.34		45.9	-0.12	0.68	4	EM
JERAPG	46.3	0.13	0.81		48.4	0.72	1.41	4	TH
K4WBVH	46.0	0.01	0.76	L	47.6	0.45	1.30	4	EN
KMW43B	46.1	0.04	1.78		46.7	0.15	1.13	4	TG
KT9H7E	44.9	-0.35	1.69		44.3	-0.66	0.68	4	TL
MJKCHY	42.6	-1.17	1.76		44.1	-0.71	3.70	4	TS
MKTFCB	45.1	-0.30	1.34		43.9	-0.79	1.14	4	LD
PG4UJL	47.2	0.43	1.77		48.9	0.88	2.17	4	LC
PGTNJ4	46.9	0.34	1.44		44.2	-0.69	2.30	4	LD
PR4GBH	45.8	-0.04	1.50		46.0	-0.09	1.48	4	LD
QGNTD4	40.0	-2.08 *	1.53		40.8	-1.82	2.10	4	XX
QUMVEJ	51.6	1.99 *	1.72		49.7	1.15	1.99	4	TD
R8QLRB	56.8	3.80 X	1.32		56.5	3.42 X	0.42	2	EM
T9HYUU	43.1	-0.98	1.41		46.8	0.18	4.42	4	TS
TAT2FR	43.2	-0.95	1.49		43.8	-0.83	0.77	4	BU
TT7HPC	44.6	-0.45	1.88		43.9	-0.78	1.04	2	TD
TXGFNK	45.5	-0.17	1.29		45.3	-0.32	0.69	4	CT
V8MZ78	48.9	1.02	1.33		48.3	0.69	0.62	4	LD
VKB2NY	48.4	0.86	1.50		44.1	-0.71	2.86	4	LD
Y9Y8EG	49.0	1.06	1.63		49.4	1.06	0.54	4	LC
YTLVTP	44.8	-0.38	2.55		44.8	-0.46	0.00	1	XX



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

Report #644
May 2023

Consensus (All Labs) Results			
Month Mean	45.94	Grand Mean	46.23
Avg SD	1.75	Avg SD Months	2.53
SD btwn Labs	2.86	SD btwn Labs	3.00
Labs Incl	36	Labs Incl	36

Key to Instrument Codes Reported by Participants

BU Buchel Digital Crush Tester	CT Con-Ten
EM Emerson 1200 Series	EN Emerson 2200
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	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 - 42H2
 TAPPI Official Test Method T807

Report #644
May 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	
2VRW7L	117.4	121.6	116.2	122.1	119.3	0.79	10.2	3.0	121.4	1.24	9.4	2.7	16	LJ
3CPEE4	125.9 L	125.5 *L	125.0 *L	125.3 *L	125.4	2.14 *	2.8	0.4 L	126.0	2.33 *	3.4	0.7 L	16	AH
3JRKAX	134.2 X	134.0 XH	120.2	118.0	126.6	2.40 *	11.1	8.7 H	121.4	1.23	9.7	6.4	16	LB
49HEVH	110.7	109.6	No DATA	113.4	111.2	-1.01	7.2	2.0	110.4	-1.39	6.3	1.6	10	XX
4P8PHK_AL	112.0	113.1	114.0	109.7	112.2	-0.79	5.4	1.9	111.4	-1.14	6.0	3.3	16	AL
4ZTVD3	116.9	117.9	116.6	No DATA	117.1	0.30	8.8	0.7	117.5	0.31	8.9	3.1	15	LC
6KYRJ6_AL	121.3	120.1	116.2	113.5	117.8	0.45	9.4	3.6	118.7	0.60	8.8	3.1	16	AL
7EYVZ4	109.2	114.9 L	111.6	113.3	112.3	-0.78	4.7	2.4	117.7	0.34	6.8	6.1	16	AX
7GM6CP	123.6	124.6	120.0	122.5	122.7	1.54	10.8	2.0	121.1	1.16	10.1	4.3	12	LC
7GM6CP_AL	119.4	121.9	120.0	123.5 H	121.2	1.20	12.7	1.9	120.9	1.12	10.9	2.7	12	AL
7LLHA2_AL	128.6 *H	134.5 XH	130.6 XH	131.3 XH	131.3	3.44 X	19.3	2.4	125.6	2.25 *	18.5	13.5 H	12	AL
7PHB6Q	111.0	108.9	109.5	110.3	109.9	-1.29	7.2	0.9	111.4	-1.15	7.8	3.6	16	XX
7RCXY9_AL	123.1	127.5 *	119.5	123.3	123.3	1.68	10.7	3.3	119.6	0.82	10.3	4.4	15	AL
8442KD	102.9 *	112.4	103.2 *	105.4 *	105.9	-2.18 *	7.6	4.4	105.7	-2.50 *	8.2	3.2	16	LA
84MMC4	111.2	113.5	108.9	108.5	110.5	-1.17	9.7	2.3	111.9	-1.02	10.3	2.9	16	LC
8CGVXU	115.5	115.9	111.8	115.9	114.8	-0.22	10.4	2.0	115.2	-0.23	8.6	3.4	16	AH
8X8FBX	116.0	115.9	116.9	117.2	116.5	0.16	6.0	0.6	116.5	0.07	6.6	0.9 L	16	AH
8Z6ZP4	125.5	125.1 *	115.7	125.4 *	122.9	1.59	10.3	4.8	123.7	1.78	8.9	3.0	16	AH
924JHA	115.2	115.5	108.9 H	115.9	113.9	-0.42	12.0	3.3	111.0	-1.25	8.8	2.7	16	LC
98XFK9_AL	113.9	116.8	No DATA	115.0 L	115.2	-0.12	8.4	1.5	117.1	0.21	9.2	3.5	15	AL
9H29D9_AL	119.3	119.2	118.2	115.6	118.1	0.51	7.6	1.7	117.7	0.37	7.5	2.1	16	AL
A4EM6Y_AL	118.9	117.9	112.8	112.5	115.5	-0.05	8.8	3.4	115.9	-0.07	9.6	3.0	16	AL
BZ9JUN	109.8	109.0	109.1	109.8	109.4	-1.41	8.5	0.4 L	111.7	-1.07	7.7	2.0	16	ME
CVAPAR	117.2	113.8	118.5	124.6	118.5	0.61	9.3	4.5	119.4	0.77	8.7	2.9	16	LA
D4FRVQ	116.0	116.7	115.3	117.5	116.4	0.14	6.2	0.9	115.6	-0.14	6.0	1.1	16	TP
DY2C6Y	104.4 *	98.4 XH	110.4	112.6	106.4	-2.07 *	18.1	6.4 H	110.1	-1.45	11.8	4.4	16	LA
E34AQD	127.2 *	123.5	125.0 *	122.5 H	124.5	1.95 *	10.4	2.0	121.4	1.23	11.0	3.7	16	LC
FD477Z_AL	116.7	114.0	No DATA	No DATA	115.3	-0.10	6.6	1.9	116.3	0.01	10.0	2.2	14	AL
FF8VT3_AL	120.4	No DATA	120.8	117.4	119.5	0.84	8.8	1.8	116.6	0.11	9.0	4.1	12	AL
GADMFM	114.1 L	114.9 L	114.6 L	115.6 L	114.8	-0.21	2.2	0.6	115.3	-0.22	2.5	1.7	16	LA
H39Z6X	111.1	110.4	111.5	115.2	112.1	-0.82	8.1	2.1	114.0	-0.53	9.2	3.2	16	LA
HZKN7T	119.6	No DATA	121.2	117.6	119.5	0.82	6.1	1.8	120.0	0.91	6.9	2.3	5	AH
KDHFRV	117.0	118.2	108.6	118.3	115.5	-0.06	9.9	4.6	113.5	-0.64	8.8	3.9	16	XX
LHXAHE	114.4	111.8	114.7	117.5	114.6	-0.26	6.8	2.3	117.9	0.41	6.5	3.2	16	LA
MKD4RK	115.4	117.5	114.8	113.6	115.3	-0.09	5.0	1.6	115.5	-0.17	5.7	1.2	16	LJ



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

Report #644
May 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	
P833FR	109.5	112.9	108.0	106.8	109.3	-1.44	7.0	2.6	110.6	-1.35	7.9	5.7	16	LA
P833FR_AL	124.1	129.7 X	122.6	121.1	124.4	1.91	9.9	3.8	125.9	2.31	*10.2	4.2	16	AL
PGTNJ4	117.6	113.6	110.8	114.4	114.1	-0.37	8.9	2.8	116.2	0.00	8.9	3.2	16	AH
PQUDYK_AL	110.4 L	115.5 L	110.6 L	109.7 L	111.5	-0.94	2.2	2.6	115.6	-0.15	2.7	4.8	8	XX
PR4GBH	116.8	115.7	117.3	113.7	115.9	0.03	8.7	1.6	115.4	-0.20	9.9	2.4	16	LA
QGNTD4	114.4	112.7	117.8	112.3	114.3	-0.33	7.2	2.5	114.8	-0.34	6.6	2.3	16	LC
QYD8CZ_AL	116.0	117.1	114.9	116.1	116.0	0.06	10.0	0.9	116.8	0.14	9.5	2.7	16	AL
RAK9ND	118.2	116.8	117.9	115.3	117.1	0.29	9.6	1.3	118.4	0.51	10.1	3.0	16	LA
RAK9ND_AL	114.3	116.5	116.4	120.3	116.9	0.24	7.4	2.5	116.2	0.00	7.5	3.4	16	AL
RPM7BG	116.1	115.4	115.9	116.1	115.9	0.02	6.4	0.3 L	116.4	0.05	5.3	0.5 L	16	LA
T89Q3M_AL	117.7	112.4	109.1	109.2	112.1	-0.81	9.5	4.0	115.0	-0.29	8.8	4.2	16	AL
TC3NRD_AL	117.7	122.4	118.3	115.6	118.5	0.61	7.6	2.9	121.3	1.20	7.8	2.9	16	AL
TXGFNK	118.0	119.0	117.5	118.0	118.1	0.52	10.3	0.6	117.6	0.34	10.5	2.7	16	XX
U93YNB	119.0	110.3	113.2	118.8	115.3	-0.10	8.7	4.3	116.5	0.07	9.2	3.7	16	LZ
V8MZ78	112.6	114.5	114.3	108.9	112.6	-0.71	11.3	2.6	113.8	-0.58	9.6	3.7	16	LA
VKB2NY	113.4	109.7	108.5	114.6	111.6	-0.94	8.5	3.0	112.5	-0.87	9.6	3.4	16	LZ
VW2TBN	117.8	115.6	115.8	111.4	115.2	-0.14	7.9	2.7	111.2	-1.18	8.7	4.9	16	RE
VZVNVJ_AL	115.0	115.0	112.8	109.2	113.0	-0.61	9.4	2.8	111.5	-1.13	9.1	4.1	16	AL
W2UA2N_AL	112.7	110.2	105.6 *	110.2	109.7	-1.35	6.4	3.0	110.1	-1.46	6.7	2.2	16	XX
WTZ68M	116.6 L	113.6 L	No DATA	113.0	114.4	-0.30	5.9	1.9	116.1	-0.03	6.0	2.2	6	AX
WTZ68M_AL	116.8	No DATA	117.7	116.9	117.1	0.30	8.9	0.5	116.8	0.13	8.5	1.3	6	AL
Y6PMWC	122.3	121.2	117.6	118.5	119.9	0.91	7.2	2.2	117.0	0.19	7.3	5.8	14	TB
Y9Y8EG	112.9	116.5	113.5	112.2	113.8	-0.44	8.4	1.9	112.0	-0.99	8.7	5.7	16	AH
YRZN7A	110.4	117.5	112.8	113.4	113.5	-0.50	8.6	2.9	113.4	-0.67	8.2	2.9	16	LC

Consensus (All Labs) Results														
Wk Mean	116.22	116.18	114.79	115.43	Month Mean	115.77			Grand Mean	116.20				
Avg SDr	8.75	8.06	8.79	8.37	Avg SD	8.71			Avg SD	8.71				
SD btwn Labs	5.10	4.44	4.68	4.77	SD btwn Labs	4.50			SD btwn Labs	4.20				
Labs Incl	58	52	54	56	SD btwn Wks	2.87			SD btwn Wks	3.83				
Labs Excl	1	4	1	1	Labs Incl	58			Labs Incl	59				
Labs not Rcvd	0	3	4	2										



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

Report #644
May 2023

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	RE	Regmed/Mullen Tester
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), 56 lb Linerboard - 56G3
 TAPPI Official Test Method T807

Report #644
May 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	
2VRW7L	124.4	121.1	119.9	118.3	120.9	1.34	9.7	2.6	117.2	0.47	11.6	5.1	12	LZ
3CPEE4	136.5 XL	136.0 XL	135.7 XL	136.0 XL	136.1	4.86 X	3.0	0.3 L	138.3	5.95 X	3.4	1.8	12	AH
3JRKAX	128.5 *	121.3	110.3	113.7	118.5	0.77	12.3	8.1 H	117.2	0.46	11.3	6.1	12	LB
49HEVH	111.0	106.6	NO DATA	103.5 *	107.0	-1.88	12.3	3.8	108.4	-1.81	9.5	3.5	7	XX
4P8PHK_AL	113.8	109.6	114.3	109.6	111.8	-0.77	7.6	2.6	111.6	-0.99	8.3	2.7	8	AL
4ZTVD3	129.0 *	124.7	116.0	113.0	120.7	1.29	10.4	7.4	122.5	1.84	12.8	6.7	12	XX
6KYRJ6_AL	118.6	119.7	117.8	118.7	118.7	0.83	10.3	0.8	117.2	0.47	10.2	3.4	12	AL
7EYVZ4	128.0	120.7	126.7 *	124.2	124.9	2.27 *	7.3	3.2	121.9	1.68	9.0	6.2	12	XX
7GM6CP	129.7 *	112.1	121.5	128.1 *	122.8	1.79	9.8	8.0 H	122.1	1.74	10.0	6.7	8	LC
7GM6CP_AL	127.8	126.3 *	121.5	118.1	123.4	1.92	8.8	4.5	120.6	1.36	8.8	4.7	8	XX
7LLHA2_AL	135.8 XH	136.8 XH	128.0 *H	126.3 *H	131.7	3.85 X	24.3	5.4	129.8	3.74 X	19.9	4.5	8	XX
7PHB6Q	111.2	108.4	106.7	109.7	109.0	-1.43	8.0	1.9	110.3	-1.33	8.6	3.5	8	XX
7RCXY9_AL	114.9	118.8	112.5	110.3	114.1	-0.24	9.5	3.6	115.0	-0.10	10.7	3.1	12	AL
8442KD	109.1	115.7	112.4	105.3	110.6	-1.05	11.0	4.5	107.5	-2.04 *	11.0	3.8	12	LA
84MMC4	107.1	115.9	110.1	110.1	110.8	-1.01	9.6	3.7	112.5	-0.74	8.8	4.5	12	LC
8CGVXU	119.9	112.6	120.4	110.7	115.9	0.18	9.6	5.0	117.2	0.47	10.1	3.6	12	AH
8X8FBX	115.6	115.6	114.0	113.0	114.6	-0.14	6.3	1.3	115.1	-0.07	6.5	1.1 L	12	AH
8Z6ZP4	119.7	123.0	122.9	122.5	122.0	1.60	10.6	1.6	123.1	2.00 *	9.0	3.1	12	AH
924JHA	111.5	107.2	99.9 *	108.2	106.7	-1.97 *	8.2	4.9	109.1	-1.63	9.3	5.8	12	LC
98XFK9_AL	108.4	113.6	NO DATA	120.8	114.3	-0.21	12.9	6.2	116.7	0.35	10.9	4.2	11	AL
9H29D9_AL	114.1	110.2	112.7	113.6	112.6	-0.59	8.8	1.7	114.8	-0.16	9.9	4.3	11	AL
A4EM6Y_AL	109.3	116.0	118.1	114.5	114.5	-0.16	8.8	3.8	117.1	0.45	10.6	4.0	12	AL
BZ9JUN	117.7	117.4	119.8	108.4	115.8	0.16	7.3	5.1	114.3	-0.28	8.6	3.7	11	LA
CVAPAR	115.3	120.5	112.4	118.3	116.6	0.34	10.3	3.6	117.0	0.43	10.7	3.6	12	LA
D4FRVQ	115.6	115.6	114.7 L	115.0	115.2	0.02	8.1	0.5 L	115.3	-0.03	6.7	0.7 L	12	TP
DY2C6Y	119.7	112.1	109.6	114.6	114.0	-0.27	10.3	4.3	112.8	-0.68	10.5	4.4	12	LA
E34AQD	124.0	116.5	119.3	116.2	119.0	0.89	10.3	3.6	118.7	0.85	11.1	4.3	12	LC
FD477Z_AL	123.8	110.6	NO DATA	NO DATA	117.2	0.47	12.1	9.4	115.1	-0.06	12.4	5.0	10	AL
FF8VT3_AL	111.5	NO DATA	111.2	119.2	114.0	-0.27	13.4	4.5	115.1	-0.07	11.8	6.2	9	AL
GADMFM	120.1 L	120.7 L	121.6 L	119.1 L	120.4	1.22	3.1	1.0	120.1	1.23	3.5	2.4	12	LA
H39Z6X	109.5	117.5	110.1	111.8	112.2	-0.68	13.3	3.6	114.8	-0.15	12.5	3.8	12	LA
HZKN7T	117.8	NO DATA	120.2 L	117.2	118.4	0.76	5.3	1.6	117.8	0.62	5.8	2.6	5	AH
KDHFRV	115.1	116.3	116.0	113.6	115.2	0.02	9.6	1.2	113.2	-0.56	11.1	3.8	12	LZ
LHXAHE	117.4	117.8	118.7	117.2	117.8	0.61	7.9	0.7 L	119.3	1.00	8.1	2.9	12	LA
MKD4RK	113.6	114.1	115.8	117.9	115.4	0.05	5.2	2.0	115.6	0.04	6.2	1.2	12	LJ



Containerboard Interlaboratory Testing Program
 Analysis 206
Bursting Strength (Mullen), 56 lb Linerboard - 56G3
 TAPPI Official Test Method T807

Report #644
May 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	
P833FR	109.7	106.2	106.1	110.1	108.0	-1.65	10.2	2.2	111.2	-1.09	10.1	5.0	12	LA
P833FR_AL	115.0	111.7	108.0	111.9 H	111.7	-0.81	12.4	2.9	112.6	-0.74	10.4	2.3	12	AL
PGTNJ4	112.0	113.2	114.0	115.2	113.6	-0.36	10.4	1.3	115.1	-0.08	9.7	3.2	12	AH
PQUDYK_AL	108.6 L	113.3	116.9	115.0 L	113.4	-0.40	3.8	3.5	113.4	-0.51	3.8	3.5	4	XX
PR4GBH	118.4	111.9	119.9	117.1	116.8	0.39	6.2	3.5	116.3	0.23	9.2	4.3	12	LA
QYD8CZ_AL	114.1	125.3 *	113.6	115.5	117.1	0.46	9.3	5.5	117.3	0.50	11.5	4.6	12	AL
RAK9ND	118.6	122.5	122.7	126.0 *	122.4	1.70	9.2	3.0	122.3	1.80	9.4	3.6	12	LA
RAK9ND_AL	119.2 L	110.8	116.0	120.9	116.7	0.36	7.4	4.4	117.6	0.58	7.4	3.4	12	XX
RPM7BG	115.1	116.3	116.1	115.3	115.7	0.13	7.4	0.6 L	116.0	0.15	6.5	0.8 L	12	LA
T89Q3M_AL	117.6	108.6	107.0	114.1	111.8	-0.77	11.7	4.9	112.3	-0.81	10.4	4.4	12	XX
TC3NRD_AL	125.9	115.8	110.7	116.2	117.2	0.47	7.3	6.3	119.3	1.00	9.7	4.9	12	AL
TXGFNK	121.0	115.5	110.5	113.0	115.0	-0.03	10.7	4.5	114.3	-0.30	10.8	4.0	12	XX
U93YNB	120.9	120.3	114.4	112.4 H	117.0	0.43	14.1	4.3	116.2	0.21	11.4	3.8	12	LZ
V8MZ78	110.7	112.6	109.5	112.1	111.2	-0.91	10.7	1.4	113.1	-0.60	9.4	3.1	12	LA
VKB2NY	114.3	112.2	108.9	110.4	111.5	-0.85	10.4	2.3	111.6	-0.98	11.6	4.5	12	LZ
VW2TBN	106.6	107.8	110.4	107.8	108.2	-1.62	9.0	1.6	105.4	-2.59 *	8.5	2.9	12	RE
VZVNVJ_AL	105.8	106.8	111.1	105.0	107.2	-1.86	11.7	2.7	111.6	-0.99	10.6	4.8	12	AL
W2UA2N_AL	113.4	110.7	108.0	113.2	111.3	-0.89	7.9	2.5	111.8	-0.94	7.4	2.1	12	XX
WTZ68M	119.8	No DATA	112.6	119.0	117.1	0.46	5.5	3.9	118.1	0.70	5.8	3.3	5	AH
WTZ68M_AL	116.6	No DATA	114.0	113.6	114.7	-0.10	9.6	1.6	114.4	-0.27	9.3	1.4	5	AL
Y6PMWC	123.7	115.2	121.3	120.6	120.2	1.18	11.8	3.6	120.0	1.20	11.4	5.1	11	TB
Y9Y8EG	109.2	113.5	111.8	116.1	112.6	-0.58	9.6	2.9	111.7	-0.95	10.6	5.6	12	AH
YRZN7A	112.2	112.3	112.2	113.6	112.6	-0.60	10.8	0.7	114.4	-0.27	10.5	2.7	12	LA

Consensus (All Labs) Results														
Wk Mean	116.44	115.01	114.64	114.90	Month Mean	115.14			Grand Mean	115.39				
Avg SDr	9.49	9.43	10.18	10.09	Avg SD	9.66			Avg SD	9.70				
SD btwn Labs	6.16	5.07	5.53	5.19	SD btwn Labs	4.31			SD btwn Labs	3.85				
Labs Inclcd	56	52	54	56	SD btwn Wks	3.94			SD btwn Wks	4.07				
Labs Exclcd	2	2	1	1	Labs Inclcd	56			Labs Inclcd	56				
Labs not Rcvd	0	4	3	1										



Containerboard Interlaboratory Testing Program
Analysis 206
Bursting Strength (Mullen), 56 lb Linerboard - 56G3
TAPPI Official Test Method T807

Report #644
May 2023

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)	RE	Regmed/Mullen Tester
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 #644

May 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	
3CPEE4	97.0 L	95.2	96.3	96.6 L	96.2	0.15	2.2	0.8	96.4	0.17	2.5	0.5 L	16	LD
3JRKAX	99.1	91.3	95.5	95.2	95.3	-0.06	4.4	3.2	95.5	-0.11	3.4	3.5	16	LD
49HEVH	77.7 XH	77.2 XH	NO DATA	97.7	84.2	-2.53 *	8.1	11.7 H	96.1	0.10	5.3	10.4 H	10	TU
4W4JEX	82.9 *	91.1	90.8	91.2	89.0	-1.46	4.6	4.1	73.2	-7.12 X	22.2	18.4 H	12	LZ
4ZTVD3	98.5	102.3	100.1	100.0	100.2	1.04	4.0	1.5	98.7	0.93	4.5	2.7	16	MB
6R8GPN	101.4	101.6	103.2	102.9 *	102.3	1.49	3.9	0.9	100.7	1.53	4.2	4.0	16	MB
7EYVZ4	92.8	91.2	91.2	93.1	92.1	-0.78	3.4	1.0	92.1	-1.18	3.3	1.7	16	LD
7GM6CP	89.6	92.0	68.4 X	90.2 *	85.1	-2.34 *	3.2	11.1 H	89.3	-2.06 *	3.3	7.0	12	LD
7LLHA2	92.8	97.5	93.8 L	96.7	95.2	-0.08	2.9	2.3	84.0	-3.72 X	5.9	13.0 H	12	LC
7RCXY9	95.4	94.7	98.6	98.2	96.7	0.25	3.4	2.0	96.5	0.23	4.1	5.5	16	LZ
8442KD	97.0 H	98.7 H	94.4 H	98.5 H	97.1	0.35	23.0	2.0	119.0	7.30 X	15.3	23.6 H	16	LB
84MMC4	96.6	101.1	96.0	98.2	98.0	0.53	3.2	2.3	97.4	0.51	3.8	2.2	16	LD
8CGVXU	99.6	98.6	99.5	98.2	99.0	0.76	3.8	0.7	97.2	0.43	2.9	1.9	16	LD
8Z6ZP4	95.1	95.8 L	92.6	92.9	94.1	-0.32	2.5	1.6	93.8	-0.64	2.4	1.2	16	LG
924JHA	98.0	95.2	95.5	95.0	95.9	0.08	2.8	1.4	94.3	-0.48	2.9	1.5	16	LZ
A4EM6Y	94.9	94.8 L	94.6	92.7	94.2	-0.30	3.0	1.0	92.9	-0.93	3.3	1.7	16	LD
BZ9JUN	101.1	98.4	101.0	101.4	100.5	1.09	3.7	1.4	101.6	1.82	4.0	1.7	16	LX
CRR3ZT	96.4	94.6	98.3	94.7	96.0	0.10	4.7	1.8	93.9	-0.61	3.7	3.0	16	LD
CVAPAR	96.1	96.2	97.7	97.2	96.8	0.27	2.7	0.8	96.3	0.16	3.3	1.2	11	LZ
D4FRVQ	93.9	96.4	96.9	95.2	95.6	0.00	3.3	1.3	95.4	-0.13	3.2	1.2	16	MZ
DQTJ8Q	94.4 L	94.1 L	94.5 L	95.0 L	94.5	-0.24	1.6	0.4 L	94.4	-0.46	1.7	0.3 L	12	MB
E34AQD	94.1	104.0 *	98.9	99.4	99.1	0.78	4.1	4.1	96.2	0.11	3.1	3.0	16	LD
EE7ZTJ	92.3	92.6 L	94.0	95.5	93.6	-0.44	3.2	1.5	90.6	-1.65	2.9	4.0	16	LC
EFNPJR	95.2	94.1 L	95.1	95.2	94.9	-0.15	2.6	0.6	97.5	0.53	3.0	2.0	16	EM
F4VR7K	105.4 *	102.1	95.5	97.5	100.1	1.02	4.1	4.5	96.7	0.27	7.2	9.3 H	16	TU
FD477Z	94.4 L	98.8	NO DATA	NO DATA	96.6	0.22	2.1	3.1	96.3	0.16	2.4	1.4	14	LD
FF8VT3	101.2	98.6	98.5	99.0	99.3	0.84	3.2	1.3	97.9	0.67	4.3	2.2	16	LC
GADMFM	97.3 L	96.9 L	97.3 L	97.4 L	97.2	0.37	0.9	0.2 L	98.1	0.73	1.2	2.8	16	TU
GPTMAR	105.7 *	103.6 L	104.0 *	99.2	103.1	1.68	2.6	2.8	98.0	0.68	2.6	3.5	16	TH
K4WBVH	91.0 L	95.0	93.1 L	92.7	93.0	-0.58	2.1	1.7	93.1	-0.84	2.9	1.9	16	EN
LHXAE	92.0 L	90.6	92.6	92.8	92.0	-0.79	2.6	1.0	93.2	-0.82	3.2	2.1	16	LC
LVHWJZ	83.2 *	88.4 L	93.4 L	85.2 X	87.6	-1.78	3.2	4.4	87.3	-2.68 *	3.6	6.2	12	EM
MKD4RK	95.9	96.5 L	95.3	96.2 L	96.0	0.09	2.2	0.5 L	96.3	0.15	2.4	0.4 L	16	LD
MUZ3JP	98.0	91.4	103.5 *	103.0 *	99.0	0.76	4.2	5.6	99.0	1.02	4.2	3.6	16	LD
P3NPBX	110.5 X	103.4 L	102.9 L	102.5 *	104.8	2.06 *	1.9	3.8	101.0	1.63	2.5	4.0	16	LD



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

Report #644
May 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	
P9ALYV	98.2	99.3	95.9	95.6	L	97.3	0.38	3.8	1.8	96.0	0.07	4.0	2.3	12	RS
PR4GBH	97.3	95.9	96.2	97.9	L	96.8	0.28	2.3	0.9	95.3	-0.17	2.6	2.7	16	LD
QYD8CZ	70.9 XH	69.8 X	69.4 X	70.2 X		70.1	-5.66 X	5.3	0.6	69.4	-8.34 X	6.4	2.7	16	LD
RAK9ND	92.9	97.8	96.2	96.2		95.8	0.05	4.0	2.0	95.7	-0.03	3.2	1.7	16	LD
T89Q3M	97.8 L	98.8 L	96.8	98.3		97.9	0.52	2.2	0.8	97.6	0.57	2.4	1.3	16	LD
U93YNB	88.0	90.0	89.4 *	90.1 *		89.4	-1.37	3.3	1.0	90.1	-1.82	3.1	6.7	16	LC
VKB2NY	94.6	93.9	95.6	93.2		94.3	-0.28	2.8	1.0	94.5	-0.40	2.9	1.8	16	LD
VW2TBN	86.5 H	85.4 *H	82.0 XH	81.4 XH		83.8	-2.61 *	10.4	2.5	86.0	-3.08 X	9.7	3.6	16	EM
W2UA2N	98.0 L	96.6	97.1	98.1		97.5	0.42	2.8	0.7	97.6	0.56	2.6	1.1	16	LD
Y6PMWC	105.4 *	99.8	104.4 *	97.0		101.7	1.35	3.9	3.9	103.9	2.57 *	3.7	4.1	13	LD
Y9Y8EG	97.5	96.8	98.8	96.9		97.5	0.43	2.9	0.9	97.2	0.44	2.8	1.4	16	LC
YRZN7A	95.0 L	92.7	93.2 L	92.5		93.4	-0.49	2.8	1.1	95.3	-0.16	2.7	1.5	16	LD
Z3Q6V9	94.1 L	94.6 L	93.9 L	93.9 L		94.1	-0.32	0.6	0.3 L	94.6	-0.39	1.2	1.2	16	MZ
Z428G8	93.8 L	92.8 L	93.5 L	94.3 L		93.6	-0.43	0.5	0.6	94.2	-0.49	1.4	1.2	16	MZ

Consensus (All Labs) Results										
Wk Mean	95.59	95.98	96.49	96.34	Month Mean	95.57	Grand Mean	95.81		
Avg SDR	4.86	4.90	4.83	4.49	Avg SD	4.89	Avg SD	3.34		
SD btwn Labs	4.82	4.12	3.56	3.12	SD btwn Labs	4.50	SD btwn Labs	3.17		
Labs Includ	46	47	44	45	SD btwn Wks	3.19	SD btwn Wks	3.58		
Labs Exclud	3	2	3	3	Labs Includ	48	Labs Includ	44		
Labs not Rcvd	0	0	2	1						

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 216
Ring Crush, 56 lb Linerboard - 56G3
 TAPPI Official Test Method T822

Report #644
May 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	
3CPEE4	126.2	126.0	126.3	126.5	126.3	-1.27	2.6	0.2 L	127.7	-1.29	2.3	1.4 L	12	LD
3JRKAX	138.0	130.5	132.7	127.4	132.1	-0.42	4.1	4.5	136.2	0.17	4.1	4.8	12	LD
49HEVH	98.5 XH	135.1	No DATA	139.5	124.4	-1.55	8.8	22.5 H	136.4	0.20	6.2	17.2 H	7	TU
4W4JEX	130.5	131.6	131.4	130.5	131.0	-0.59	3.4	0.6 L	109.0	-4.49 X	4.7	23.6 H	8	LZ
4ZTVD3	140.7	140.7	140.0	138.6 L	140.0	0.72	3.8	1.0	139.9	0.80	3.7	1.4 L	12	MB
6R8GPN	150.8 *	137.4	142.4	145.2	144.0	1.30	5.9	5.6	145.9	1.83	4.8	5.0	12	MB
7EYVZ4	134.9	134.9	131.9	132.4	133.5	-0.22	5.7	1.6	133.8	-0.24	5.8	1.9	12	LD
7GM6CP	127.1	128.4	97.8 XL	122.3 *	118.9	-2.35 *	3.8	14.3 H	121.0	-2.43 *	3.8	9.7	8	LD
7LLHA2	95.5 X	129.2	129.1	129.5	120.8	-2.07 *	3.6	16.9 H	115.4	-3.40 X	7.3	18.8 H	8	LC
7RCXY9	139.6	142.8	151.5 X	142.0	144.0	1.30	4.3	5.2	137.6	0.40	6.2	6.5	12	LZ
8442KD	114.3XH	113.8XH	111.0XH	98.0 XH	109.3	-3.75 X	21.6	7.6	144.3	1.56	14.7	27.1 H	12	LB
84MMC4	145.3	140.9	145.7 *	145.7	144.4	1.37	5.0	2.3	138.1	0.49	6.9	6.7	12	LD
8CGVXU	138.3	138.3	138.4	139.1	138.5	0.51	3.3	0.4 L	135.8	0.10	3.4	4.2	12	LD
8Z6ZP4	139.0	135.9	130.8	132.9	134.6	-0.06	3.5	3.6	133.7	-0.26	3.3	2.6	12	LY
924JHA	137.5	137.7	135.3	135.8	136.5	0.22	3.9	1.2	133.7	-0.26	3.9	4.2	12	LZ
A4EM6Y	134.3	136.7	135.4	133.2	134.9	-0.02	4.0	1.5	133.5	-0.29	4.0	1.6 L	12	LD
BZ9JUN	147.3	148.4 *	146.3 *	148.3 *	147.6	1.83	4.1	1.0	146.8	1.98 *	4.6	2.3	11	LY
CRR3ZT	135.1	134.6	134.9	135.4	135.0	0.00	4.7	0.4 L	132.1	-0.53	4.0	3.0	12	LD
CVAPAR	130.2	132.3	130.9	131.3	131.2	-0.56	3.5	0.9	131.4	-0.65	3.4	1.2 L	7	LZ
D4FRVQ	133.0	135.6	135.8	135.2	134.9	-0.02	4.1	1.3	134.9	-0.05	4.8	1.0 L	12	MZ
DQTJ8Q	135.1 L	135.4 L	135.9 L	135.7 L	135.5	0.07	1.7	0.3 L	135.5	0.05	1.7	0.2 L	8	MB
E34AQD	135.2 L	143.6	133.1	138.3	137.6	0.37	3.8	4.6	136.2	0.18	3.4	3.9	12	LD
EE7ZTJ	130.6	135.6	138.7	136.2	135.3	0.04	3.8	3.4	133.4	-0.31	3.8	4.5	12	LC
EFNPJR	135.4	134.0	131.2	134.0	133.6	-0.20	3.1	1.7	134.1	-0.20	3.8	1.5 L	12	EM
F4VR7K	146.0	140.7	142.9	142.2	142.9	1.15	4.0	2.2	144.4	1.58	7.9	4.2	12	TU
FD477Z	136.2	135.4	No DATA	No DATA	135.8	0.11	3.0	0.5	136.4	0.21	3.7	2.6	10	LD
FF8VT3	138.5	139.5	138.6	139.6	139.1	0.59	4.1	0.6 L	136.6	0.24	4.7	2.1	12	LC
GADMFM	141.5 L	140.6 L	141.7 L	141.7 L	141.4	0.93	1.1	0.5 L	141.9	1.14	1.6	1.1 L	12	TU
GPTMAR	134.2	135.9	136.4	130.7	134.3	-0.10	4.0	2.6	133.2	-0.34	3.8	2.7	12	TH
K4WBVH	130.7	131.4	129.2	128.6	130.0	-0.74	3.0	1.3	130.5	-0.81	3.9	2.2	12	EN
LHXAHE	137.3	137.4	139.9	138.6	138.3	0.48	3.6	1.2	135.3	0.02	4.4	4.1	12	LC
LVHWJZ	123.5	124.8 *	127.1	123.8 *	124.8	-1.49	3.9	1.6	120.6	-2.51 *	7.2	5.9	8	EM
MKD4RK	138.3	138.5	138.0	138.7	138.4	0.49	3.4	0.3 L	138.0	0.47	3.1	0.5 L	12	LD
MUZ3JP	129.1	128.1	131.8	136.5	131.4	-0.53	5.4	3.8	127.3	-1.36	4.9	7.2	12	LD
P3NPBX	154.5 *	143.8	144.5	145.7	147.1	1.76	3.5	5.0	144.0	1.51	3.4	4.3	12	LD



Containerboard Interlaboratory Testing Program

Analysis 216

Report #644

May 2023

Ring Crush, 56 lb Linerboard - 56G3

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	
P9ALYV	129.1	133.8	129.6	134.9	131.9	-0.46	5.0	2.9	131.9	-0.57	5.0	2.9	4	RS
PR4GBH	135.3	135.0	134.4	136.5	135.3	0.04	3.5	0.9 L	133.1	-0.36	3.8	2.8	12	LD
QYD8CZ	94.0 XH	91.8 X	93.2 X	92.1 X	92.8	-6.16 X	6.6	1.0	105.0	-5.18 X	7.3	17.4 H	12	LD
RAK9ND	134.9	133.8	133.0	133.6	133.8	-0.17	3.6	0.8 L	133.0	-0.37	4.1	1.5 L	12	LD
T89Q3M	139.5	135.5	136.5	138.3	137.5	0.36	3.0	1.8	136.8	0.27	3.1	1.9	12	LD
U93YNB	120.9 *	123.0 *	121.5 *	112.4 XH	119.4	-2.27 *	8.9	4.8	126.1	-1.56	6.0	6.4	12	LC
VKB2NY	132.5	136.4 L	133.3	136.4	134.7	-0.05	3.6	2.0	133.8	-0.25	3.8	2.6	12	LD
VW2TBN	122.6 H	125.5 H	125.4 H	123.0 *H	124.1	-1.59	15.3	1.5	126.7	-1.46	13.0	11.0	12	EX
W2UA2N	136.8	134.7	137.6	136.2	136.3	0.19	4.6	1.2	135.0	-0.03	4.3	1.4 L	12	LD
Y6PMWC	152.0 *	144.8	156.7 X	142.7	149.1	2.04 *	4.7	6.5	147.5	2.11 *	4.3	8.1	11	LD
Y9Y8EG	138.4	137.5	136.8	136.3	137.3	0.33	3.3	0.9	138.2	0.52	3.5	1.8	12	LC
YRZN7A	137.3	134.6	133.9	133.1	134.7	-0.04	3.8	1.8	135.3	0.01	3.5	1.8	12	LD
Z3Q6V9	136.6 L	139.8 L	135.3 L	135.4 L	136.8	0.26	0.8	2.1	136.1	0.16	1.7	3.1	12	TH
Z428G8	138.3 L	139.5 L	135.7 L	135.1 L	137.1	0.31	1.2	2.1	135.7	0.09	1.7	2.8	12	MZ

Consensus (All Labs) Results										
Wk Mean	136.17	135.65	134.98	135.61	Month Mean	135.02		Grand Mean	135.20	
Avg SDR	4.68	4.42	4.36	4.27	Avg SD	4.70		Avg SD	5.15	
SD btwn Labs	7.14	5.36	5.45	5.91	SD btwn Labs	6.87		SD btwn Labs	5.83	
Labs Incl	45	47	42	45	SD btwn Wks	5.25		SD btwn Wks	6.27	
Labs Excl	4	2	5	3	Labs Incl	47		Labs Incl	46	
Labs not Rcvd	0	0	2	1						

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
EX	Emerson (model not specified)	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 - 42H2
 TAPPI Official Test Method T826

Report #644
May 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									
269JY9	25.0	25.4	23.5	26.2	H	25.0	1.01	2.3	1.1	24.8	0.84	2.2	0.9	8	ID							
2NK9C7	25.4	25.7	24.3	24.5		25.0	0.96	1.8	0.7	24.3	0.49	1.7	0.7	16	LA							
2VRW7L	27.4	X	26.1	27.5	*	26.8	*	26.9	2.47	*	2.2	0.6	27.0	2.61	*	2.0	0.4	16	LH			
3JRKAX	23.1	24.1	23.2	22.5	L	23.2	-0.35	1.5	0.7	28.7	3.98	X	2.2	9.7	H	16	LU					
49HEVH	23.8	H	22.6	H	No DATA	24.3	H	23.6	-0.09	2.6	0.9	24.5	0.65	2.2	0.9	10	TT					
4P8PHK_AL	22.9	23.7	24.4	23.2		23.5	-0.12	1.7	0.6	24.6	0.75	1.8	0.9	16	AL							
4W4JEX	23.7	22.4	23.0	23.2		23.1	-0.46	2.1	0.5	38.4	11.81	X	3.5	16.7	H	8	XX					
4ZTV3	23.9	L	24.0	24.2	25.1	24.3	0.46	1.6	0.6	24.1	0.29	1.7	0.9	16	LA							
6KYRJ6_AL	25.0	26.2	25.9	25.9		25.8	1.57	2.1	0.5	26.1	1.89	2.1	0.5	16	AL							
6R8GPN	25.7	24.6	23.5	25.0		24.7	0.76	2.0	0.9	24.0	0.21	1.8	1.6	16	LA							
7EYVZ4	23.6	L	24.7	L	23.7	L	25.1	L	24.3	0.45	0.7	0.7	24.3	0.44	0.8	0.4	16	LH				
7GM6CP	21.5	22.1	16.3	XL	21.6	20.4	-2.51	*	1.7	2.7	H	20.4	-2.64	*	1.7	2.0	H	12	LZ			
7GM6CP_AL	44.2	XL	46.0	XL	36.3	XL	41.9	XL	42.1	13.96	X	0.0	4.2	H	44.8	16.90	X	0.0	3.6	H	12	AL
7LLHA2_AL	53.4	XH	47.7	XH	50.7	XH	52.4	XH	51.1	20.76	X	25.2	2.5	H	49.6	20.76	X	25.2	2.4	H	8	AL
7RCXY9_AL	23.6	22.1	21.9	24.2		22.9	-0.58	1.5	1.1	23.4	-0.27	1.5	0.9	16	AL							
8442KD	25.2	23.6	L	24.1	L	24.0	24.2	0.42	1.3	0.7	24.0	0.24	1.9	0.9	16	LH						
84MMC4	25.2	24.5	26.2	24.9		25.2	1.13	1.9	0.7	24.8	0.92	2.0	1.0	16	LA							
8CGVXU	24.3	23.7	24.3	24.7		24.2	0.42	1.6	0.4	23.5	-0.19	1.8	0.7	16	LU							
8EJXG6	22.3	22.6	22.5	23.1		22.6	-0.81	1.8	0.3	22.9	-0.62	1.5	0.4	16	XX							
8Z6ZP4	25.3	24.2	23.9	24.0		24.3	0.50	1.8	0.6	24.3	0.48	1.8	0.5	16	BK							
924JHA	21.4	*	20.8	*	21.5	L	21.8	21.4	-1.75	1.8	0.4	22.0	-1.39	1.7	0.9	16	LA					
9H29D9	21.4	*	21.2	22.1	L	22.6	21.8	-1.42	1.3	0.6	22.9	-0.68	1.7	1.2	16	LU						
A4EM6Y_AL	24.3	24.5	24.4	24.3		24.4	0.54	1.8	0.1	L	24.2	0.37	1.8	0.6	16	AL						
ACGZP8	24.8	23.5	25.0	H	24.3	H	24.4	0.54	2.4	0.7	24.4	0.56	2.4	0.7	4	XX						
BZ9JUN	22.9	21.3	19.2	X	23.9	21.8	-1.41	1.8	2.1	H	22.6	-0.85	2.1	1.9	H	13	LZ					
CVAPAR	23.0	22.7	22.2	22.2		22.5	-0.87	1.7	0.4	22.3	-1.09	1.8	0.4	16	LU							
D4FRVQ	22.8	24.2	23.6	23.5		23.5	-0.11	1.4	0.6	23.7	-0.02	1.4	0.4	16	XX							
DY2C6Y	24.2	24.4	H	25.0	24.2	24.4	0.57	2.3	0.4	24.2	0.44	2.1	0.7	16	LH							
E34AQD	24.0	24.5	25.1	25.4		24.7	0.80	1.8	0.6	24.0	0.27	1.7	0.7	16	LA							
F4VR7K	26.3	*	26.0	H	25.8	26.9	*	26.2	1.94	*	2.2	0.5	25.0	1.05	1.8	1.3	16	LA				
FD477Z_AL	23.1	L	23.2	No DATA	No DATA	23.2	-0.41	1.4	0.1	24.5	0.61	1.9	0.8	14	AL							
FF8VT3	23.7	No DATA	23.9	23.8		23.8	0.08	2.1	0.1	L	24.3	0.45	2.0	1.0	12	LU						
G6E3JP	24.5	23.9	25.0	23.8		24.3	0.45	1.7	0.5	24.0	0.20	1.6	0.6	16	LH							
GADMFM	22.1	21.2	21.7	21.5		21.6	-1.57	1.6	0.4	21.2	-2.02	*	1.6	0.6	16	XX						
H39Z6X	23.4	23.9	23.4	24.0		23.7	-0.02	1.8	0.3	23.6	-0.09	1.8	0.5	16	LY							



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

Report #644
May 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
HC2D6X	22.4	22.2	24.3	23.0	23.0	-0.54	1.6	1.0	23.2	-0.44	1.6	0.7	16	LW
HY73JK	23.2 H	23.0 H	23.9 H	22.4 H	23.1	-0.43	3.5	0.6	23.6	-0.11	2.9	0.5	16	LY
HZKN7T	25.5	No DATA	25.9	25.4	25.6	1.45	1.7	0.3	25.4	1.38	1.6	0.5	5	LU
K4WBVH	21.6	22.2	21.8	21.7	21.8	-1.42	1.7	0.2	21.9	-1.46	1.7	0.4	16	LY
KDHFRV	22.7	22.0	22.9	22.9	22.6	-0.81	1.9	0.4	22.6	-0.87	1.6	0.4	16	LH
LHXAHE	23.3	24.5	23.8	23.9 L	23.9	0.14	1.6	0.5	23.7	0.03	1.7	0.3	16	LA
MKTFCB	25.2	25.5	25.2	23.6	24.9	0.92	2.0	0.9	24.5	0.63	2.2	0.9	16	LH
P3NPBX	26.4 *	25.6	25.7	26.0	25.9	1.70	2.0	0.3	25.7	1.61	1.8	0.5	16	LH
P833FR	23.6	20.3 *	14.8 XH	23.4	20.5	-2.41 *	2.3	4.1 H	21.0	-2.13 *	1.9	2.4 H	16	LH
P833FR_AL	23.0	19.3 XL	21.5	23.1 L	21.7	-1.49	1.2	1.8	21.0	-2.15 *	1.6	1.4	16	AL
PQUDYK_AL	25.2 L	24.0	24.8	24.4	24.6	0.69	1.5	0.5	25.1	1.11	1.8	0.8	8	XX
PR4GBH	23.6	22.5	22.9	23.0	23.0	-0.54	1.9	0.4	22.8	-0.73	1.8	0.5	16	LZ
QGNTD4	22.1	22.6 H	23.4	22.6	22.7	-0.76	1.8	0.6	23.7	-0.01	2.0	1.0	16	LA
QYD8CZ	21.9	22.3	21.1 *	21.6 L	21.7	-1.49	1.5	0.5	22.5	-0.96	1.8	0.7	16	LY
QYD8CZ_AL	23.4	24.0	23.9	23.6	23.7	0.01	1.9	0.3	23.7	-0.02	1.7	0.4	16	AL
RAK9ND_AL	23.4	24.0	22.7	23.2	23.3	-0.27	2.0	0.5	23.6	-0.09	1.7	0.6	16	AL
RPM7BG	24.7	24.6	24.8	24.5	24.7	0.73	2.0	0.1 L	24.4	0.60	1.9	0.3	16	LZ
T89Q3M_AL	23.9 L	23.3	24.7	23.6 L	23.9	0.14	1.6	0.6	23.7	0.02	1.6	0.8	16	AL
TC3NRD_AL	23.2	25.0	24.6	24.3	24.3	0.45	1.8	0.8	24.3	0.45	1.7	0.6	16	AL
U93YNB	26.2 *	20.0 *	20.6 *	23.3	22.5	-0.89	1.3	2.8 H	21.1	-2.10 *	1.6	1.6	16	LY
VKB2NY	22.8	23.3	22.9	23.1	23.0	-0.51	1.7	0.2	22.9	-0.67	1.9	0.6	16	LY
VZVNVJ_AL	24.7	23.7 H	22.4	24.8	23.9	0.16	2.3	1.1	24.6	0.74	2.1	1.0	16	AL
W2UA2N_AL	23.9	23.5	24.3	23.8	23.9	0.13	1.7	0.3	23.8	0.12	1.8	0.5	16	XX
W3XBLT	22.9	22.7	22.7	22.8	22.8	-0.70	1.9	0.1 L	22.8	-0.73	1.8	0.4	11	LU
WTZ68M	23.8	No DATA	23.4	23.8	23.7	-0.02	1.6	0.2	23.4	-0.20	1.7	0.4	6	LU
WTZ68M_AL	23.7	No DATA	23.9	22.7	23.4	-0.20	1.5	0.6	22.8	-0.71	1.4	0.9	6	AL
XKVQLJ	24.3 L	24.7	25.3	24.9	24.8	0.84	1.3	0.4	25.0	1.04	1.3	0.5	16	LH
Y6PMWC	25.3	25.4	26.0	25.4 H	25.5	1.40	2.5	0.3	25.4	1.37	2.5	1.8	14	LW
Y9Y8EG	23.4	23.9	23.5	23.4	23.5	-0.13	1.6	0.2	23.5	-0.12	1.6	0.3	16	LU
YRZN7A	23.0 L	23.8	23.1	23.3	23.3	-0.31	1.3	0.4	23.8	0.07	1.8	1.0	16	LA
Z3Q6V9	24.6 L	23.8 L	25.1 L	25.2 L	24.7	0.74	0.5	0.7	23.9	0.17	0.5	0.9	16	LZ
Z428G8	25.0 L	23.8 L	25.0 L	25.2 L	24.7	0.80	0.5	0.6	24.0	0.26	0.9	0.9	16	LZ



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

Report #644
May 2023

Consensus (All Labs) Results									
Wk Mean	23.80	23.56	23.84	23.88	Month Mean	23.69	Grand Mean	23.70	
Avg SDr	1.75	1.84	1.89	1.76	Avg SD	1.81	Avg SD	1.80	
SD btwn Labs	1.23	1.41	1.40	1.24	SD btwn Labs	1.32	SD btwn Labs	1.25	
Labs Incd	64	60	60	64	SD btwn Wks	0.96	SD btwn Wks	0.91	
Labs Excld	3	3	5	2	Labs Incd	65	Labs Incd	63	
Labs not Rcvd	0	4	2	1					

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 224

Report #644

May 2023

STFI, 56 lb Linerboard - 56G3

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	
269JY9	35.0	36.8	37.9	34.8	36.1	0.72	2.4	1.5	36.9	1.28	2.3	1.4	8	ID
2NK9C7	38.4	39.1	* 37.8	38.6 H	38.5	1.76	2.8	0.5	37.5	1.56	2.8	1.0	12	LA
2VRW7L	40.4 *	38.7	39.8 *	38.5	39.3	2.14 *	2.7	0.9	39.1	2.40 *	2.6	3.2 H	12	LZ
3JRKAX	34.0	34.3	34.6	33.1	34.0	-0.22	2.2	0.6	33.6	-0.43	2.1	1.0	12	LU
49HEVH	36.6 H	35.1 H	No DATA	34.1 H	35.3	0.34	6.4	1.2	36.0	0.82	4.7	1.1	7	TT
4P8PHK_AL	35.8	35.8	35.1	35.9	35.6	0.50	2.4	0.3	35.9	0.73	2.4	0.8	8	AL
4W4JEX	30.4	29.4	*H 32.0	30.8 *	30.6	-1.71	3.1	1.1	41.0	3.37 X	3.5	11.2 H	8	XX
4ZTV3	35.3 H	36.1 H	38.3 H	37.2	36.7	0.98	4.7	1.3	35.5	0.53	3.5	1.7	12	LA
6KYRJ6_AL	33.9	38.7	38.1	36.5	36.8	1.02	2.7	2.1	37.3	1.49	2.4	1.6	12	AL
6R8GPN	34.8 H	34.1	35.1	36.0	35.0	0.22	3.0	0.8	32.1	-1.21	2.2	4.7 H	12	LA
7EYVZ4	35.4 L	36.3 L	34.8 L	34.8 L	35.3	0.36	1.0	0.7	34.9	0.22	1.0	0.8	12	LH
7GM6CP	31.0	31.6 L	22.6 X	30.1 *	28.8	-2.52 *	1.9	4.2 H	30.5	-2.02 *	2.2	3.4 H	8	LZ
7GM6CP_AL	43.9 XL	42.4 XL	28.3 *L	38.2 L	38.2	1.63	0.0	7.0 H	40.5	3.10 X	0.0	5.3 H	8	XX
7LLHA2_AL	45.6 XH	44.7 XH	45.3 XH	44.2 XH	45.0	4.64 X	20.3	0.6	44.4	5.12 X	20.3	1.5	8	XX
7RCXY9_AL	34.3	33.9	35.8	34.8	34.7	0.08	2.6	0.8	33.9	-0.29	2.3	1.3	12	AL
8442KD	35.0	36.1	34.7	36.4 H	35.5	0.46	3.0	0.8	35.8	0.73	2.8	1.5	12	LH
84MMC4	37.7	36.0	36.9	38.3	37.2	1.21	2.7	1.0	35.2	0.42	2.6	1.9	12	LA
8CGVXU	35.3	34.4	35.6	35.6	35.2	0.32	2.2	0.6	33.7	-0.38	2.5	1.3	12	LU
8EJXG6	33.3	32.9	32.4	34.3	33.2	-0.56	2.3	0.8	33.7	-0.40	2.5	0.9	12	XX
8Z6ZP4	38.2	35.3	35.0	35.7	36.0	0.69	2.3	1.5	36.0	0.82	2.5	1.0	12	BK
924JHA	30.7	30.8	30.6 L	32.0 L	31.0	-1.54	1.7	0.7	32.7	-0.91	2.4	1.7	12	LA
9H29D9	34.0	33.4	35.5	34.2	34.3	-0.09	2.2	0.9	34.1	-0.16	2.4	1.1	12	LU
A4EM6Y_AL	34.7	35.6	34.6	35.3	35.0	0.24	2.1	0.5	34.9	0.26	2.1	0.8	12	AL
ACGZP8	35.9	36.0	34.9	35.3	35.6	0.47	2.6	0.5	35.6	0.58	2.6	0.5	4	XX
BZ9JUN	35.6	30.7	29.5 *H	36.8	33.1	-0.60	2.9	3.6 H	32.4	-1.03	3.0	2.8	11	LZ
CVAPAR	32.4	32.3	32.5	33.0	32.6	-0.86	2.4	0.3	32.2	-1.13	2.4	0.5	12	LU
D4FRVQ	34.1	34.1	34.2 L	34.5	34.3	-0.11	1.7	0.2 L	34.4	-0.01	1.7	0.5	12	XX
DY2C6Y	36.5	36.6	35.8	35.7	36.2	0.74	2.7	0.5	35.4	0.48	2.8	1.2	12	LH
E34AQD	35.3	36.0	36.7	38.3	36.6	0.92	2.2	1.3	35.5	0.56	2.2	1.1	12	LU
F4VR7K	35.9	38.2	37.2	37.3	37.2	1.18	1.9	0.9	37.3	1.49	2.1	0.8	12	LA
FD477Z_AL	33.7	34.6	No DATA	No DATA	34.2	-0.16	2.0	0.6	36.7	1.15	2.1	1.8	10	XX
FF8VT3	37.8	No DATA	36.9	35.0	36.6	0.92	2.2	1.5	35.9	0.76	2.3	1.1	8	LU
G6E3JP	35.5	36.7	34.8	35.3	35.6	0.49	2.4	0.8	35.3	0.47	2.4	1.0	12	LH
GADMFM	31.4	30.8	31.4	30.6 *	31.1	-1.53	2.3	0.4	31.5	-1.51	2.3	0.7	8	XX
H39Z6X	34.2	32.1	34.3	34.8	33.9	-0.28	2.2	1.2	34.1	-0.15	2.2	1.1	12	LU



Containerboard Interlaboratory Testing Program

Analysis 224

Report #644

May 2023

STFI, 56 lb Linerboard - 56G3

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	
HC2D6X	32.5	33.2 L	32.9	32.9	32.9	-0.73	1.7	0.3	32.9	-0.76	1.8	0.4	12	LW
HY73JK	33.7 H	34.2 H	34.2 H	33.9 H	34.0	-0.23	4.6	0.3 L	33.7	-0.37	4.4	1.2	12	LY
HZKN7T	36.6	No DATA	37.7	37.6	37.3	1.24	2.6	0.6	37.7	1.67	2.7	0.7	5	LU
K4WBVH	31.0	31.4	31.7	32.4	31.6	-1.27	2.5	0.6	32.1	-1.18	2.1	0.8	12	LZ
KDHFRV	34.4	33.3	32.2	34.0	33.5	-0.45	1.9	1.0	32.5	-0.99	1.7	1.0	12	LH
LHXAHE	33.9	33.4 L	35.1	33.3	33.9	-0.26	2.0	0.8	34.0	-0.24	2.3	1.0	12	LA
MKTFCB	36.9	36.9	36.8	36.9	36.9	1.07	2.2	0.1 L	36.2	0.90	2.5	1.1	12	LH
P3NPBX	36.2	35.1	35.2	36.3	35.7	0.53	2.1	0.6	35.4	0.50	2.3	0.7	12	LH
P833FR	30.2	29.3 *	21.9 XL	35.7	29.3	-2.31 *	2.0	5.7 H	31.5	-1.50	2.3	3.9 H	12	LH
P833FR_AL	30.5	26.9 X	28.8 *	31.5	29.4	-2.25 *	2.2	2.0	29.8	-2.37 *	2.2	2.1	12	AL
PQU DYK_AL	37.1	35.5	38.0	37.2 L	36.9	1.08	1.6	1.0	36.9	1.29	1.6	1.0	4	XX
PR4GBH	34.2	33.4	34.0	33.5	33.8	-0.33	2.1	0.4	33.7	-0.40	2.3	0.5	12	LZ
QGNTD4	31.1	33.1 L	32.1 L	32.5	32.2	-1.02	1.7	0.8	33.9	-0.27	1.8	2.0	12	LA
QYD8CZ	31.7	32.5	31.0	31.2	31.6	-1.29	2.0	0.7	32.3	-1.09	2.3	0.8	12	LU
QYD8CZ_AL	33.5 L	33.0 L	34.1	33.9	33.6	-0.39	1.9	0.5	33.9	-0.29	2.2	0.6	12	AL
RAK9ND_AL	35.0	35.8	33.1	34.6	34.6	0.05	1.9	1.1	34.2	-0.11	2.3	0.7	12	AL
RPM7BG	35.2	35.3	35.0	35.1	35.2	0.30	2.7	0.1 L	35.2	0.42	2.8	0.3 L	12	LA
T89Q3M_AL	32.8	34.3	34.6	36.6	34.6	0.03	2.2	1.5	34.0	-0.21	1.9	1.3	12	XX
TC3NRD_AL	32.9	33.6	32.9	34.3	33.4	-0.48	1.8	0.6	33.7	-0.38	2.1	0.7	12	AL
U93YNB	28.4 *	29.2 *	28.3 *	28.9 X	28.7	-2.58 *	2.2	0.4	29.3	-2.65 *	2.1	0.9	12	LW
VKB2NY	33.1	33.0 L	33.6	34.5	33.5	-0.43	2.3	0.7	33.3	-0.58	2.0	0.8	12	LZ
VZVNVJ_AL	36.1	35.0	34.5	35.5	35.3	0.34	2.4	0.7	35.6	0.59	2.4	1.3	12	AL
W2UA2N_AL	33.6	34.2	36.1	34.0	34.5	0.00	2.5	1.1	34.2	-0.13	2.3	0.8	12	XX
W3XBLT	33.1	32.9 L	34.3 H	34.6 H	33.7	-0.34	2.7	0.9	34.0	-0.22	2.7	1.0	12	LU
WTZ68M	36.0	No DATA	36.0	35.4	35.8	0.57	2.3	0.3	36.4	1.02	2.5	0.9	5	LA
WTZ68M_AL	34.4 L	No DATA	34.2	35.0 L	34.6	0.03	1.5	0.4	34.9	0.22	1.7	0.7	5	AL
XKVQLJ	37.1 L	36.9	36.7	36.2	36.7	0.99	1.8	0.4	36.8	1.23	1.8	0.4	12	LH
Y6PMWC	36.3 H	36.1	35.4	36.2	36.0	0.66	3.3	0.4	36.2	0.91	3.1	3.2 H	11	LW
Y9Y8EG	34.4	33.1	33.0	33.7	33.6	-0.42	2.6	0.6	33.9	-0.25	2.3	0.5	12	LU
YRZN7A	35.2 L	34.4	34.3	34.6	34.6	0.06	2.4	0.4	34.1	-0.19	2.1	0.8	12	LW
Z3Q6V9	35.9 L	35.5 L	35.6 L	35.9 L	35.7	0.53	0.4	0.2 L	33.0	-0.74	1.4	2.0	12	LZ
Z428G8	35.3 L	34.6 L	35.1 L	33.9 L	34.7	0.11	0.5	0.6	32.6	-0.94	1.3	1.7	12	LZ



Containerboard Interlaboratory Testing Program
 Analysis 224
STFI, 56 lb Linerboard - 56G3
 TAPPI Official Test Method T826

Report #644
May 2023

Consensus (All Labs) Results								
Wk Mean	34.47	34.35	34.48	34.91	Month Mean	34.50	Grand Mean	34.43
Avg SDr	2.62	2.67	2.29	2.33	Avg SD	2.50	Avg SD	2.41
SD btwn Labs	2.25	2.25	2.44	1.95	SD btwn Labs	2.25	SD btwn Labs	1.94
Labs Incd	65	60	62	64	SD btwn Wks	1.55	SD btwn Wks	1.54
Labs Excld	2	3	3	2	Labs Incd	66	Labs Incd	64
Labs not Rcvd	0	4	2	1				

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 (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)	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 lb Linerboard - 42H
 TAPPI Official Test Method T575

Report #644
May 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2VRW7L	152.9	1.13	16.48	173.6	1.84	14.01	4	LS
4P8PHK_AL	124.3	-0.80	12.79	130.2	-0.57	11.31	4	AL
4ZTVD3	160.1	1.62	11.24	168.6	1.56	16.28	3	LA
6KYRJ6_AL	123.3	-0.87	15.07	118.4	-1.23	3.78	4	AL
6R8GPN	153.8	1.19	10.90	166.2	1.42	8.50	4	LA
7GM6CP	0.3	-9.18 X	0.02 L	60.1	-4.47 X	103.50 H	3	LA
7GM6CP_AL	153.5	1.17	13.11	146.2	0.32	10.74	3	AL
7LLHA2_AL	135.7	-0.03	16.40	159.9	1.07	22.46	3	AL
7RCXY9_AL	125.8	-0.70	14.55	120.0	-1.14	8.27	4	AL
84MMC4	88.8	-3.20 X	13.95	95.9	-2.48 *	5.86	4	LA
8CGVXU	145.0	0.60	10.90	146.2	0.32	5.11	4	EV
9H29D9	143.6	0.50	10.98	156.2	0.87	18.48	4	EV
CVAPAR	136.3	0.01	9.82	140.0	-0.03	5.47	4	EV
DY2C6Y	137.0	0.06	11.44	135.6	-0.28	4.83	4	EV
F4VR7K	159.7	1.59	12.20	167.7	1.51	7.26	4	LA
FF8VT3	127.4	-0.59	18.19	147.2	0.37	13.48	4	EV
K4WBVH	148.7	0.85	10.86	147.0	0.36	3.85	4	EV
LHXAHE	141.5	0.36	17.03	136.1	-0.24	21.63	4	EV
P833FR_AL	118.7	-1.18	18.15	133.9	-0.37	12.89	4	AL
PQUDYK_AL	119.6	-1.12	12.63	119.6	-1.16	0.00	1	AL
PR4GBH	135.4	-0.05	18.23	143.7	0.17	9.35	4	LS
QYD8CZ	139.4	0.22	19.60	163.7	1.29	36.25 H	4	XX
QYD8CZ_AL	109.9	-1.77	14.69	136.2	-0.24	26.17	4	AL
RPM7BG	136.5	0.02	15.68	138.5	-0.11	2.22 L	4	LS
TC3NRD_AL	107.2	-1.96 *	10.49	115.8	-1.37	13.88	4	AL
U93YNB	129.4	-0.46	5.30 L	139.2	-0.07	12.98	4	LS
VKB2NY	147.9	0.80	13.22	147.4	0.38	2.08 L	4	EV
VZVNVJ_AL	149.8	0.92	24.61 H	132.0	-0.48	13.38	4	AL
WTZ68M_AL	113.9	-1.50	12.66	120.7	-1.10	9.62	2	AL
Y6PMWC	123.2	-0.88	16.53	129.6	-0.61	7.99	4	XX
YRZN7A	148.6	0.84	18.40	140.9	0.02	6.48	4	LA

Consensus (All Labs) Results			
Month Mean	136.14	Grand Mean	140.53
Avg SD	14.71	Avg SD Months	13.82
SD btwn Labs	14.80	SD btwn Labs	18.00
Labs Incl	29	Labs Incl	30



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

Report #644
May 2023

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 #644
May 2023

WebCode	Monthly Results			Cumulative Results				Inst
	Mean	CPV	SD	Mean	CPV	SD Months	Months	
6KYRJ6_AL	198.0	-12.69 X	0.00 L	328.6	-2.17 *	87.09 H	4	AL
8442KD	345.7	-2.05 *	3.83	345.6	-1.31	0.17 L	4	LA
A4EM6Y_AL	363.8	-0.75	9.98	363.0	-0.44	1.74 L	4	AL
FD477Z	377.6	0.25	8.04	368.7	-0.15	7.68	4	PP
LVHWJZ	397.7	1.69	5.85	414.7	2.17 *	19.65	3	TS
P833FR_AL	357.9	-1.17	5.38	357.7	-0.70	1.14 L	4	AL
PQUDYK_AL	373.6	-0.04	8.82	373.6	0.10	0.00	1	XX
PR4GBH	371.2	-0.22	6.89	379.9	0.42	8.37	4	XX
QGNTD4	383.9	0.70	7.19	382.9	0.57	2.74 L	3	XX
QYD8CZ_AL	371.4	-0.20	5.62	370.0	-0.08	3.59 L	4	AL
RAK9ND_AL	375.5	0.09	5.56	377.1	0.27	2.00 L	4	AL
T89Q3M_AL	390.7	1.19	8.17	387.3	0.79	3.90 L	4	AL
VZVNVJ_AL	361.2	-0.94	9.59	360.7	-0.55	7.14	4	AL
W2UA2N_AL	383.6	0.68	5.17	384.2	0.63	0.70 L	4	XX
Y9Y8EG	384.8	0.76	12.37 H	380.8	0.46	3.02 L	4	XX

Consensus (All Labs) Results			
Month Mean	374.19	Grand Mean	371.63
Avg SD	7.65	Avg SD Months	24.21
SD btwn Labs	13.88	SD btwn Labs	19.83
Labs Incd	14	Labs Incd	15

Key to Instrument Codes Reported by Participants

- | | | | |
|----|--|----|---------------------------------|
| AL | L & W Autoline 400 | LA | L & W Autoline (229 Enrollment) |
| PP | Technidyne Profile/Plus | TS | TMI Monitor/Smoothness |
| 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 #644
May 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
49HEVH	125.6	-0.09	10.53	134.2	0.37	19.35	H 3	TM
7LLHA2	105.4	-1.34	19.24	99.6	-1.77	13.10	3	SC
7RCXY9	111.8	-0.94	10.18	107.4	-1.29	3.85	4	TM
8CGVXU	120.0	-0.44	10.22	123.6	-0.29	5.13	4	TM
9H29D9	116.0	-0.68	5.61	119.3	-0.55	5.61	4	TM
A4EM6Y	116.6	-0.65	5.02	121.2	-0.43	4.41	4	TM
DY2C6Y	139.8	0.78	7.76	138.9	0.66	5.38	4	TM
E34AQD	125.8	-0.08	6.34	124.5	-0.23	1.58	4	HZ
FD477Z	152.4	1.56	7.06	148.8	1.27	2.55	4	HY
FF8VT3	88.2	-2.40 *	6.06	98.0	-1.87	7.53	4	TM
GKYJMF	120.0	-0.44	4.17	119.0	-0.57	2.43	4	SC
LHXAHE	125.6	-0.09	9.13	123.6	-0.29	2.94	4	TM
QGNTD4	114.4	-0.78	4.83	113.3	-0.92	3.79	4	SC
QYD8CZ	125.4	-0.10	7.06	128.0	-0.01	7.80	4	TM
RAK9ND	127.7	0.04	5.67	124.8	-0.21	4.08	4	TM
T89Q3M	57.7	-4.28 X	1.54	59.0	-4.28 X	1.20	4	LZ
VKB2NY	132.1	0.31	3.54	138.1	0.61	4.86	4	HZ
VZVNVJ	139.6	0.77	7.92	138.9	0.66	1.74	4	TM
W2UA2N	136.8	0.60	0.84	140.5	0.76	6.21	4	HY
XZBT7T	141.6	0.90	4.72	142.9	0.91	3.00	4	TM
Y9Y8EG	151.8	1.53	7.67	148.7	1.26	2.61	4	HY
YRZN7A	152.2	1.55	5.22	159.7	1.94 *	7.60	4	HY

Consensus (All Labs) Results			
Month Mean	127.09	Grand Mean	128.23
Avg SD	7.94	Avg SD Months	6.82
SD btwn Labs	16.20	SD btwn Labs	16.17
Labs Incd	21	Labs Incd	21

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	124.40	15.10	2.69	18
Modified Scott Bond Mechanics	152.00	0.28	24.91	2

Analysis Notes

T89Q3M - Method used is not covered in this test. Data excluded from consensus calculation.



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

Report #644
May 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		



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

Report #644
May 2023

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SD	Mean	CPV	SD Months	Months
2VRW7L	21.3	-1.92 *	3.77	21.8	-2.27 *	3.72	4
4ZTVD3	24.4	-1.04	3.76	28.1	-0.03	2.51	4
6KYRJ6	33.3	1.50	2.46	30.5	0.81	2.70	4
7EYVZ4	23.2	-1.38	0.76	24.9	-1.17	1.41	4
7LLHA2	34.5	1.85	3.82	32.9	1.66	1.53	3
7RCXY9	32.0	1.12	2.42	30.6	0.86	0.90	4
8CGVXU	30.8	0.79	1.92	28.6	0.14	2.03	4
98XFK9	24.4	-1.04	1.14	28.3	0.02	4.71 H	4
9H29D9	29.6	0.44	5.18	30.2	0.69	0.64	4
A4EM6Y	22.8	-1.50	1.48	24.2	-1.42	1.62	4
CVAPAR	26.6	-0.41	0.55 L	27.3	-0.32	2.31	4
DY2C6Y	27.6	-0.14	4.15	29.3	0.39	1.49	4
FD477Z	31.6	1.02	3.51	32.0	1.35	3.42	3
FF8VT3	31.2	0.90	0.84	28.7	0.18	3.23	4
HZKN7T	29.8	0.50	3.56	30.9	0.96	1.56	2
JKN4DN	28.0	-0.01	2.74	27.8	-0.16	0.70	4
JPHXBP	27.2	-0.24	2.59	26.4	-0.64	1.38	4
K4WBVH	29.8	0.51	0.57 L	29.6	0.48	1.08	4
PR4GBH	29.3	0.36	4.19	31.3	1.10	3.76	4
QGNTD4	27.0	-0.30	0.71	26.6	-0.58	0.91	4
QYD8CZ	25.0	-0.87	2.24	26.1	-0.74	2.08	4
RPM7BG	27.6	-0.13	1.14	27.5	-0.25	0.26 L	4
T89Q3M	23.9	-1.18	3.97	24.5	-1.32	3.11	4
TC3NRD	23.6	-1.27	3.85	24.4	-1.36	0.82	4
U93YNB	29.2	0.33	1.92	29.6	0.48	1.17	4
VKB2NY	30.0	0.56	4.74	26.2	-0.72	4.14	4
VZVNVJ	31.4	0.96	3.65	29.3	0.39	1.98	4
W2UA2N	30.0	0.56	2.24	29.2	0.34	1.06	4
WTZ68M	34.2	1.76	0.84	35.4	2.56 *	1.70	2
Y6PMWC	26.0	-0.58	4.36	27.3	-0.32	1.36	4
Y9Y8EG	23.7	-1.25	3.57	26.0	-0.78	1.73	4
YRZN7A	28.4	0.10	1.34	27.2	-0.35	1.42	4

Consensus (All Labs) Results			
Month Mean	28.04	Grand Mean	28.20
Avg SD	2.96	Avg SD Months	2.24
SD btwn Labs	3.50	SD btwn Labs	2.82
Labs Incl	32	Labs Incl	32



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

Report #644
May 2023

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program
Analysis 237

Report #644
May 2023

Air Resistance, 42 Ib Linerboard - 42H

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD	Months	Inst
2NK9C7	33.0	0.52	1.26	32.1	-0.19	1.13	4	LA
2VRW7L	24.2	-5.78 X	3.67	28.2	-3.63 X	4.82 H	4	TD
49HEVH	30.9	-0.97	3.25	29.8	-2.20 *	1.56	2	GA
4P8PHK_AL	33.4	0.80	2.18	33.7	1.17	0.25	4	AL
4ZTVD3	30.9	-0.95	2.93	30.8	-1.33	0.95	4	LA
6KYRJ6_AL	31.0	-0.88	1.73	30.1	-1.96 *	1.04	4	AL
6R8GPN	30.7	-1.14	1.67	31.7	-0.58	0.73	4	LA
7LLHA2_AL	31.9	-0.27	1.77	32.7	0.29	0.79	3	AL
7RCXY9_AL	32.5	0.19	2.34	33.0	0.60	0.53	4	AL
8442KD	32.9	0.47	3.42	28.7	-3.16 X	2.86 H	4	LA
84MMC4	31.7	-0.42	1.59	32.6	0.23	0.90	4	LA
8CGVXU	34.4	1.55	4.71 H	34.9	2.27 *	1.26	4	GA
98XFK9_AL	34.0	1.23	2.50	33.0	0.56	1.00	4	AL
9H29D9_AL	34.0	1.29	1.40	33.0	0.60	1.05	4	AL
A4EM6Y_AL	30.1	-1.58	2.31	31.4	-0.79	1.56	4	AL
C2ZU83	32.4	0.12	1.39	33.1	0.64	1.33	4	LP
CVAPAR	33.2	0.70	1.21	32.0	-0.30	1.01	4	LP
DY2C6Y	32.6	0.27	1.83	32.5	0.12	1.13	4	LP
F4VR7K	30.9	-0.99	2.41	32.2	-0.13	1.20	4	LA
FD477Z	33.6	0.95	3.50	32.2	-0.13	1.68	4	TP
FF8VT3_AL	32.1	-0.08	1.67	32.6	0.28	0.92	4	AL
HZKN7T	32.6	0.24	1.34	34.5	1.87	2.68	2	GG
JPHXBP	31.0	-0.88	3.10	31.6	-0.60	1.49	4	TD
MUZ3JP	29.7	-1.84	2.67	31.1	-1.07	1.09	4	GG
P3NPBX	29.8	-1.76	2.10	30.4	-1.70	1.56	4	XX
P833FR_AL	33.2	0.70	1.23	33.0	0.62	0.37	4	AL
PQUDYK_AL	33.2	0.71	2.19	33.2	0.79	0.00	1	XX
PR4GBH	35.3	2.22 *	4.12 H	34.6	1.98 *	1.08	4	GA
QYD8CZ	32.7	0.35	2.62	32.3	-0.02	0.77	4	LP
QYD8CZ_AL	34.2	1.38	3.65	34.3	1.69	0.17 L	4	AL
RAK9ND_AL	32.2	-0.05	1.36	32.3	-0.04	0.57	4	AL
RPM7BG	32.9	0.45	4.68 H	32.6	0.21	0.23	4	LP
T89Q3M_AL	31.5	-0.57	1.86	32.2	-0.07	0.70	4	AL
TC3NRD_AL	30.2	-1.50	1.65	30.7	-1.45	0.61	4	AL
U93YNB	31.1	-0.83	1.37	31.5	-0.71	0.52	4	XX
VKB2NY	32.4	0.10	3.19	32.6	0.23	0.91	4	LP
VZVNVJ_AL	31.3	-0.65	1.66	31.8	-0.50	0.81	4	AL
W2UA2N	31.6	-0.47	2.63	32.5	0.12	1.61	4	GG
W2UA2N_AL	32.0	-0.18	1.15	31.7	-0.57	0.72	4	XX



Containerboard Interlaboratory Testing Program
Analysis 237

Report #644
May 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
WTZ68M	32.2	-0.04	1.72	33.5	0.99	1.80	2	GG
WTZ68M_AL	32.8	0.40	2.25	32.2	-0.11	0.85	2	AL
XBYNHF	29.6	-1.92	1.53	30.7	-1.41	1.16	4	LP
Y6PMWC	34.0	1.26	2.10	32.6	0.21	1.40	4	LP
Y9Y8EG	33.4	0.84	4.08 H	32.2	-0.07	0.93	4	TP
YRZN7A	34.0	1.26	3.09	32.9	0.48	1.55	4	LP

Consensus (All Labs) Results			
Month Mean	32.25	Grand Mean	32.33
Avg SD	2.51	Avg SD Months	1.14
SD btwn Labs	1.39	SD btwn Labs	1.15
Labs Incd	44	Labs Incd	43

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

Report #644
May 2023

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM12

TAPPI Official Test Method T809

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	
269JY9	57.0	56.9	56.5	56.9	56.8	-0.43	2.5	0.2 L	56.7	-0.47	2.6	0.8	8	RS
3JRKAX	52.0	55.2 H	61.0	61.0 H	57.3	-0.24	5.4	4.5 H	55.7	-0.87	5.0	3.5	16	LD
4KCV4	55.8	56.7	57.3	56.0	56.4	-0.57	3.2	0.7	56.2	-0.67	2.9	1.2	16	TH
4ZTV3	57.6	56.8	56.3	55.0	56.4	-0.58	4.1	1.1	55.1	-1.09	4.3	1.9	16	MB
6R8GPN	51.1 *	58.0	60.0	57.0	56.5	-0.54	3.4	3.8 H	56.3	-0.62	3.7	3.5	16	MB
7EYV4	61.6	61.9	62.0	60.1	61.4	1.39	3.9	0.9	63.1	2.17 * 4.3	1.6	16	LD	
7GM6CP	58.2	59.7	57.3	58.0	58.3	0.15	4.1	1.0	57.5	-0.11	3.8	1.2	12	LD
8442KD	54.6	53.3	53.1	53.3	53.6	-1.71	3.7	0.7	53.1	-1.92	4.3	1.1	16	LD
8CGVXU	53.7	51.4 *	52.2 *	52.2	52.4	-2.18 *	3.3	1.0	54.6	-1.32	3.2	2.2	16	LD
8EJXG6	60.5	61.9	61.5 L	60.6 L	61.1	1.28	1.8	0.7	60.4	1.05	1.3	1.7	16	XX
8Z6ZP4	59.5	58.9	56.1	57.0	57.9	-0.01	3.4	1.6	57.5	-0.13	3.4	1.7	16	LZ
ACGZP8	65.1 *	63.1	65.3 X	64.1 *	64.4	2.57 *	4.1	1.0	64.4	2.68 * 4.1	1.0	4	LD	
BZ9JUN	61.7	56.0	58.2	59.3	58.8	0.35	3.8	2.4	59.4	0.64	3.7	2.3	16	LD
C2ZU83	56.6	58.3	55.5	57.6	57.0	-0.35	3.5	1.2	57.8	0.01	3.5	1.5	16	LD
D4FRVQ	55.9	58.4 H	59.2	58.4 H	58.0	0.03	5.6	1.4	58.0	0.06	5.2	1.1	16	TH
DQTJ8Q	59.1 L	59.7	59.2	59.2	59.3	0.56	1.6	0.3	57.4	-0.17	1.6	1.5	12	MB
E34AQD	55.4	54.2	56.1	55.5	55.3	-1.02	3.2	0.8	56.3	-0.62	3.2	1.4	16	LD
F4VR7K	58.5	57.8	60.0	58.9	58.8	0.36	4.5	0.9	59.7	0.75	4.2	1.3	16	TU
FD477Z	56.7	57.6	No DATA	No DATA	57.2	-0.28	3.8	0.7	57.4	-0.18	3.4	1.4	13	LD
FF8VT3	59.6	60.7	No DATA	60.1	60.1	0.89	4.3	0.6	58.8	0.40	3.8	1.8	15	LC
FWEBDA	59.9	61.8	60.9 L	61.9	61.1	1.27	2.1	0.9	60.6	1.13	2.5	1.0	16	LC
G6E3JP	65.4 *	60.9	63.8 *	62.7	63.2	2.09 *	3.8	1.9	60.3	1.02	4.0	2.4	16	LD
GADMFM	58.5 L	58.0 L	58.3 L	58.5 L	58.3	0.17	0.5	0.3 L	58.1	0.11	0.7	0.6	16	TU
GKYJMF	57.2	57.3	59.9	56.9	57.8	-0.03	3.2	1.4	55.1	-1.10	3.6	2.7	16	LC
H39Z6X	60.7	58.3	56.6 H	53.2 H	57.2	-0.27	8.5	3.2	58.3	0.19	5.7	2.2	16	LD
JPHXBP	55.5	55.9	57.3	54.3	55.7	-0.85	3.8	1.2	54.6	-1.31	4.2	2.1	16	LZ
JY9B2W	56.6	56.4	56.4	57.2	56.6	-0.50	3.1	0.4	56.4	-0.57	2.8	0.9	16	LD
K4WBVH	62.4	60.6 H	59.6	57.5	60.0	0.84	4.5	2.1	59.7	0.76	4.2	1.6	16	EN
KDHRV	57.7	56.9	57.4	59.3 L	57.8	-0.03	2.3	1.0	57.3	-0.21	2.8	0.9	16	EM
LHXAHE	59.6	60.7	59.1	58.0	59.4	0.58	2.9	1.1	58.8	0.39	3.0	1.3	16	LC
LNGHZJ	57.0	61.3	58.3	59.1	58.9	0.41	3.7	1.8	59.2	0.56	4.0	2.2	16	LD
LXBHL4	61.0	59.7	61.7	59.9 L	60.6	1.06	3.3	0.9	61.4	1.48	2.9	2.0	16	TB
MKD4RK	58.7	58.2	58.7	58.1	58.4	0.21	3.3	0.3	59.0	0.48	3.0	0.8	16	LD
MKTFCB	66.3 *H	63.9	59.5	57.2	61.7	1.51	4.7	4.2 H	60.9	1.24	4.2	2.7	16	LD
P3NPBX	58.8	55.9	56.6	58.6	57.5	-0.16	3.1	1.5	55.8	-0.80	2.8	2.1	16	LD



Containerboard Interlaboratory Testing Program
Analysis 240

Report #644
May 2023

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM12

TAPPI Official Test Method T809

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	
PR4GBH	60.3	59.2	58.1	59.2	59.2	0.53	3.3	0.9	57.9	0.02	3.5	2.0	16	LZ
QYD8CZ	51.9	52.3	52.7 *	51.6 *	52.1	-2.27 *	2.7	0.5	52.9	-2.00 *	3.1	1.4	16	LD
RPM7BG	58.0	57.8	58.3	57.9	58.0	0.04	2.3	0.2 L	58.1	0.10	2.1	0.3 L	16	LD
T89Q3M	54.1 L	53.3	53.9	51.8 *	53.3	-1.83	2.4	1.0	54.7	-1.26	2.9	1.5	16	LD
TC3NRD	57.3	55.7	56.1	57.5	56.6	-0.50	3.6	0.9	59.0	0.50	4.1	2.3	16	LZ
VKB2NY	56.5	57.9	55.7	58.9	57.2	-0.26	3.0	1.4	57.4	-0.15	3.5	1.5	16	LZ
VW2TBN	56.0	57.0	53.6	51.9 *	54.6	-1.29	2.9	2.3	53.8	-1.61	2.8	1.6	16	EM
VZVNVJ	56.4	55.2	55.7	53.2	55.1	-1.09	3.1	1.4	55.4	-0.96	3.6	1.8	16	LD
W2UA2N	58.7	58.0	55.0	58.7	57.6	-0.11	3.3	1.8	57.0	-0.35	3.8	1.2	16	LD
WCPNMD	56.1	55.9	57.9	59.1	57.3	-0.25	4.0	1.5	57.7	-0.03	4.0	2.0	12	LD
WV2BAL	58.4 L	58.5 L	58.4 L	58.4 L	58.4	0.21	0.5	0.0 L	58.4	0.23	0.6	0.2 L	16	LD
XBYNHF	59.2	58.9	56.6	62.9	59.4	0.59	3.4	2.6	59.7	0.77	3.8	2.2	16	LD
XKVQLJ	52.5	52.3 L	54.9	53.9	53.4	-1.77	3.7	1.2	54.6	-1.29	3.3	1.3	16	LD
Y6PMWC	67.4 *	66.1 *	66.0 X	62.9	65.6	3.05 X	3.6	1.9	66.3	3.44 X	3.7	2.6	12	LD
Y9Y8EG	57.2	58.3	57.1	58.2	57.7	-0.07	3.1	0.6	57.5	-0.11	3.7	2.4	16	LC
YRZN7A	58.0	58.0	58.1	58.5	58.2	0.11	3.8	0.2 L	58.5	0.26	3.4	1.0	16	XX
Z428G8	60.8 L	60.9 L	60.6 L	60.4 L	60.7	1.11	1.0	0.2 L	60.1	0.94	1.3	1.9	16	XX
ZTGTBH	61.3	62.8 H	60.4	56.3	60.2	0.91	4.1	2.8	62.7	1.97 *	4.1	2.7	16	TX

Consensus (All Labs) Results														
Wk Mean	58.22	58.11	57.72	57.76	Month Mean	57.89			Grand Mean	57.81				
Avg SDr	3.63	3.45	3.54	3.76	Avg SD	3.61			Avg SD	3.52				
SD btwn Labs	3.42	3.01	2.53	2.95	SD btwn Labs	2.53			SD btwn Labs	2.46				
Labs Incl	53	53	49	52	SD btwn Wks	1.63			SD btwn Wks	1.80				
Labs Excl	0	0	2	0	Labs Incl	52			Labs Incl	52				
Labs not Rcvd	0	0	2	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
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 #644
May 2023

Fluted Edge Crush Strength (FCF), 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	
3JRKAX	66.0	70.0 H	75.7 *	73.5	71.3	0.78	4.3	4.2 H	68.8	-0.10	3.5	3.6	16	LD
7GM6CP	65.9	65.9	66.3	66.2 H	66.1	-1.09	4.4	0.2 L	65.8	-1.30	3.8	1.6	12	XX
8442KD	69.3	67.6	65.6	70.2	68.2	-0.35	3.6	2.0	58.9	-4.06 X	7.3	5.7 H	16	LD
8EJXG6	70.8 L	70.1 L	70.4	70.5	70.4	0.47	1.7	0.3 L	71.1	0.83	1.5	1.3	16	XX
8Z6ZP4	66.5 H	63.5	66.2	66.4	65.7	-1.24	3.8	1.4	66.6	-0.95	3.4	1.7	16	LZ
C2ZU83	72.4	70.5	73.2	71.4	71.9	0.98	3.6	1.2	69.8	0.33	3.3	2.0	16	LD
DQTJ8Q	67.7 L	67.3	67.4	67.7	67.5	-0.58	1.7	0.2 L	68.7	-0.14	1.7	1.8	12	MB
FD477Z	72.4	71.4 H	No DATA	No DATA	71.9	1.00	5.7	0.7	70.6	0.64	4.0	1.5	13	LD
FF8VT3	74.3	75.7 *	No DATA	70.8	73.6	1.60	3.7	2.5	70.4	0.58	4.3	2.5	15	LC
QYD8CZ	51.5 X	51.8 X	52.9 X	51.0 X	51.8	-6.20 X	3.3	0.8	56.5	-5.02 X	4.5	3.8	16	LD
RPM7BG	68.4	68.0	67.5	68.3	68.1	-0.38	2.5	0.4	68.3	-0.27	2.2	0.5 L	16	LD
T89Q3M	72.7	72.6	70.9	67.6	71.0	0.65	2.4	2.4	70.6	0.62	2.9	1.5	16	LD
TC3NRD	64.1	60.4 *	68.0 L	66.4	64.7	-1.57	4.2	3.3	64.2	-1.92 *	4.5	3.0	16	LZ
VZVNVJ	68.0	66.7	64.9	70.2	67.5	-0.60	4.1	2.2	69.0	0.00	3.7	2.1	16	LD
W2UA2N	71.8	71.5	72.0	72.1 H	71.8	0.96	3.7	0.3 L	72.3	1.33	3.8	1.5	16	LD
XBYNHF	75.1	71.8	68.1	72.7	71.9	1.00	3.3	2.9	73.4	1.75	3.7	1.9	16	LD
Y6PMWC	67.1	63.6	64.4	66.4	65.4	-1.34	4.0	1.6	68.5	-0.20	3.8	2.8	12	LD
Y9Y8EG	73.7	70.6	71.1	68.8	71.1	0.69	3.3	2.0	69.7	0.29	3.1	2.3	16	LC
YRZN7A	72.2	71.2	67.7	69.1	70.0	0.33	3.3	2.0	70.0	0.38	3.6	1.7	16	XX
Z428G8	65.4 L	65.1 L	65.6 L	65.7 L	65.5	-1.32	0.7	0.3 L	64.3	-1.89 *	2.5	1.5	16	XX

Consensus (All Labs) Results									
Wk Mean	69.67	68.59	68.52	69.12	Month Mean	69.12	Grand Mean	69.01	
Avg SDr	3.31	3.78	3.20	3.52	Avg SD	3.55	Avg SD	3.40	
SD btwn Labs	3.38	3.76	3.18	2.42	SD btwn Labs	2.79	SD btwn Labs	2.49	
Labs Includ	19	19	17	18	SD btwn Wks	1.97	SD btwn Wks	2.05	
Labs Exclcd	1	1	1	1	Labs Includ	19	Labs Includ	18	
Labs not Rcvd	0	0	2	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 - CM12
 TAPPI Official Test Method T822

Report #644
May 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
2NK9C7	42.5	42.4	45.4	44.1	43.6	-0.39	2.5	1.4	43.1	-0.62	2.8	1.5	16	LD
4KCV4	35.6 X	36.9 X	36.5 *	35.7 X	36.2	-4.07 X	2.4	0.6	36.4	-4.32 X	2.3	1.1	16	TH
4ZTV3	44.9	47.5	48.1	46.7	46.8	1.20	3.5	1.4	47.0	1.56	4.2	3.3	16	MB
7GM6CP	42.6	43.0	32.7 X	40.2 H	39.6	-2.35 *	4.1	4.8 H	41.4	-1.52	3.7	3.1	12	LD
BZ9JUN	45.2	47.3	46.6	47.0	46.5	1.06	3.7	0.9	46.3	1.19	3.5	1.5	16	LZ
C2ZU83	42.1	40.4 *	43.3	42.4	42.1	-1.15	3.8	1.2	42.5	-0.90	3.7	1.5	16	LD
DQTJ8Q	43.0	42.8	42.1	43.0	42.7	-0.82	1.6	0.4	43.6	-0.34	1.7	0.8	12	MB
E34AQD	44.9	45.5	42.1	45.7	44.6	0.09	2.6	1.6	44.3	0.06	2.7	1.3	16	LD
FD477Z	46.4 *	45.2	NO DATA	NO DATA	45.8	0.69	4.0	0.8	45.3	0.65	3.3	1.1	14	LD
FWEBDA	39.9 X	40.0 *	39.3	42.2	40.4	-1.99 *	3.0	1.3	40.9	-1.80	2.7	1.3	16	XX
GADMFM	43.7 L	43.7 L	43.9 L	44.0 L	43.8	-0.28	0.8	0.1 L	44.4	0.13	0.9	0.6	16	TU
GPTMAR	42.3	45.9	46.7	45.8	45.1	0.38	3.0	2.0	44.0	-0.08	3.3	1.3	16	TH
JY9B2W	45.6	46.4	45.4	45.5	45.7	0.67	2.5	0.5	45.0	0.47	2.3	0.9	16	LC
LNGHZJ	48.6 X	47.7	46.8	46.5	47.4	1.48	3.2	1.0	46.8	1.45	3.1	1.3	16	EM
LXBHL4	41.7	42.7	41.0	44.9	42.6	-0.89	3.1	1.7	41.4	-1.54	2.6	1.6	16	XX
MKD4RK	45.0	44.8	44.3	43.6	44.4	0.02	3.0	0.6	44.3	0.06	2.6	0.5 L	16	LD
MKTFCB	44.6	47.4	44.1	47.0	45.8	0.69	3.0	1.6	45.0	0.44	2.9	1.4	16	LD
P3NPBX	51.4 X	46.9	50.3 *	47.7	49.1	2.32 *	2.8	2.1	47.0	1.58	3.0	1.7	16	LD
PR4GBH	45.0	44.6	46.0	43.9	44.9	0.25	3.2	0.9	42.8	-0.75	3.0	2.9	16	LD
T89Q3M	43.9 L	46.0	44.2	44.5	44.6	0.13	2.2	0.9	44.4	0.10	2.8	1.2	16	LD
VW2TBN	38.4 XH	34.6 XH	38.8	38.9 *H	37.7	-3.32 X	5.7	2.0	39.8	-2.40 *	5.3	3.3	16	EM
W2UA2N	43.4	44.1	43.8	43.9	43.8	-0.30	3.0	0.3	45.4	0.70	2.9	1.3	16	LD
WCPNMD	43.9	45.2 H	46.0	40.5	43.9	-0.24	4.3	2.4	43.6	-0.32	4.4	2.1	12	LD
WV2BAL	44.7 L	44.8 L	44.5 L	44.7 L	44.7	0.14	0.5	0.1 L	44.6	0.23	0.5	0.1 L	16	LD
XBYNHF	45.1	44.0	44.7	43.6	44.3	-0.02	3.0	0.6	44.8	0.33	3.0	1.2	16	LD
Y9Y8EG	44.5	44.5	47.2	47.5	45.9	0.77	3.9	1.6	44.9	0.42	3.5	2.0	16	LC
YRZN7A	43.1	43.9	44.5	45.0	44.1	-0.12	3.3	0.8	44.1	-0.02	3.4	1.3	16	XX
Z428G8	42.7 L	42.6 L	44.0 L	44.1	43.3	-0.52	1.2	0.8	43.9	-0.16	1.3	1.1	16	XX
ZTGTHB	43.5	42.5	41.5	43.5	42.8	-0.81	3.1	1.0	46.1	1.08	3.5	2.6	16	LZ

Consensus (All Labs) Results														
Wk Mean	43.93	44.50	44.11	44.31	Month Mean	44.38			Grand Mean	44.17				
Avg SDr	2.92	3.24	3.07	3.06	Avg SD	3.03			Avg SD	3.11				
SD btwn Labs	1.25	2.06	2.97	2.20	SD btwn Labs	2.02			SD btwn Labs	1.81				
Labs Incl	24	27	27	27	SD btwn Wks	1.52			SD btwn Wks	1.76				
Labs Excl	5	2	1	1	Labs Incl	27			Labs Incl	28				
Labs not Rcvd	0	0	1	1										



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

Report #644
May 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)	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 #644
May 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	
269JY9	16.2 *	15.7	15.6	16.1 *	15.9	2.11 *	0.9	0.3	15.1	1.51	1.0	1.0	8	XX
2NK9C7	14.6	16.1	15.1	15.3	15.3	1.37	1.3	0.6	14.5	0.66	1.1	0.7	16	LH
4ZTV D3	14.3 L	15.0	14.6	13.0 L	14.2	0.15	0.8	0.9	14.5	0.73	1.3	0.6	16	LA
6R8GPN	14.2	14.0 H	14.4	12.7 H	13.8	-0.29	2.5	0.7	14.5	0.74	1.8	2.3 H	16	LA
7EYVZ4	15.0 L	14.9 L	14.0 L	13.9 L	14.4	0.41	0.5	0.6	14.4	0.57	0.6	0.4	16	LH
7GM6CP	12.8	13.1	10.2 XL	12.9	12.2	-2.14 *	1.3	1.4 H	12.4	-2.13 *	1.1	1.3	12	LZ
8CGVXU	14.5	15.4	14.8	14.4	14.8	0.79	1.2	0.5	14.0	0.04	1.1	0.6	16	LU
8EJXG6	11.8 *H	15.1	12.8	13.0	13.2	-1.06	1.7	1.4 H	13.1	-1.23	1.2	0.8	16	XX
924JHA	13.1	13.8 H	13.1 H	13.4	13.3	-0.88	1.5	0.4	13.5	-0.74	1.2	0.6	16	LA
A4EM6Y	14.4	14.1	15.3	14.3	14.5	0.52	1.1	0.5	14.5	0.74	1.1	0.4	16	LA
BZ9JUN	12.2	12.7	12.7	12.2 *	12.4	-1.90	1.2	0.3	12.4	-2.12 *	1.2	0.3	4	XX
D4FRVQ	13.0	13.2	13.5	13.3	13.2	-0.97	1.2	0.2	13.6	-0.55	1.1	0.4	16	XX
F4VR7K	15.4 H	15.3	15.1	14.8 L	15.2	1.23	1.6	0.3	15.3	1.81	1.6	1.0	16	LA
FD477Z	13.9	13.9	No DATA	No DATA	13.9	-0.24	1.3	0.0	13.6	-0.60	1.1	0.4	14	LB
JY9B2W	14.8	14.9 L	14.5	14.2	14.6	0.61	1.0	0.3	14.5	0.64	1.1	0.5	16	LH
KDHFRV	13.9 L	13.7	13.9	14.2 L	13.9	-0.18	0.9	0.2	13.5	-0.70	0.9	0.4	16	LH
MKTFCB	14.6	14.8	14.3 H	14.7	14.6	0.62	1.2	0.2	14.5	0.72	1.1	0.2	16	XX
PAG4V6	13.9	14.6	14.7	14.2	14.4	0.31	1.2	0.4	14.5	0.66	1.0	0.3	16	TX
PR4GBH	14.2	13.6	13.5	13.7	13.7	-0.39	1.0	0.3	13.3	-0.99	1.0	0.6	16	LZ
QYD8CZ	13.5	12.0 *	12.5 *	13.4	12.8	-1.43	1.2	0.7	13.3	-0.90	1.4	0.6	12	LB
RPM7BG	14.4	14.7	14.7	14.5	14.6	0.57	1.1	0.1	14.5	0.70	1.2	0.2	16	LA
T89Q3M	13.6	13.8	14.2	14.2 L	14.0	-0.14	0.9	0.3	14.1	0.15	0.9	0.7	16	LA
VZVNVJ	15.0	14.8	13.5	15.0	14.6	0.57	1.1	0.7	14.2	0.25	1.1	0.6	16	LA
Y9Y8EG	13.8	14.7	14.1	13.7 L	14.1	-0.02	0.9	0.4	14.2	0.26	1.0	0.3	16	LU
Z428G8	14.4 L	14.3 L	14.2 L	14.9 L	14.4	0.39	0.3	0.3	13.8	-0.22	0.4	0.9	16	LZ

Consensus (All Labs) Results										
Wk Mean	14.04	14.33	14.13	14.01	Month Mean	14.08	Grand Mean	13.99		
Avg SDr	1.30	1.07	1.15	1.39	Avg SD	1.23	Avg SD	1.13		
SD btwn Labs	0.97	0.96	0.85	0.92	SD btwn Labs	0.86	SD btwn Labs	0.73		
Labs Incl	25	25	23	24	SD btwn Wks	0.58	SD btwn Wks	0.78		
Labs Excl	0	0	1	0	Labs Incl	25	Labs Incl	25		
Labs not Rcvd	0	0	1	1						



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

Report #644
May 2023

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)	TX	TMI (model not specified)
XX	Instrument make/model not specified by lab		