



Containerboard Interlaboratory Testing Program

Participant Summary Report #646 - July 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>42H2</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.

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

EXPLANATION OF TABLES

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

Definitions of Terms Used

Weekly Results

Laboratory Data

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

Consensus Data

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

Monthly Results

Laboratory Data

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

Consensus Data

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

Cumulative Results

Laboratory Data

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

Consensus Data

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

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

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

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

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

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

Flags assigned to Weekly Means:

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

Flags assigned to Monthly SD Wks and Cumulative SD Wks:

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



Containerboard Interlaboratory Testing Program
Analysis 201

Report #646
July 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
2AKNGA	725.0	-1.60	51.54	775.7	-1.16	40.30	4	LS
4HNHP8	740.2	-1.37	47.46	758.0	-1.47	112.46	4	LL
4MQCXA	857.5	0.44	110.68	865.5	0.45	39.36	4	ER
76T6AY	824.2	-0.08	59.10	759.5	-1.45	91.57	4	LH
A24QGU	975.2	2.25 *	32.01	911.1	1.27	63.61	3	ES
AMJ689	778.8	-0.77	87.30	885.2	0.80	86.26	4	EX
AUWD9B	840.6	0.18	160.33 H	902.5	1.11	45.02	4	XX
B2YME3	749.8	-1.22	62.48	776.5	-1.14	27.11	4	ET
FBCEWN	859.3	0.46	80.21	865.3	0.45	40.38	4	ER
H7DJA7	824.1	-0.08	71.56	876.3	0.65	58.13	4	LG
J3KCWM	710.0	-1.83	53.09	815.6	-0.44	80.25	4	EX
J8ZJKM	876.4	0.73	33.05	844.2	0.07	48.23	4	LG
KU6WMQ	876.4	0.73	27.68	974.7	2.41 *	73.27	4	LS
LU2WZV	810.9	-0.28	54.93	805.8	-0.62	84.99	4	LG
MNUC3Q	875.7	0.72	81.61	848.2	0.14	19.92	4	LM
MZMVJG	913.2	1.29	34.40	869.9	0.53	89.07	4	ER
NK9W4H	795.6	-0.52	68.18	820.2	-0.36	21.86	4	EX
NW8MVG	888.2	0.91	48.84	882.0	0.75	24.79	4	LO
P77R8P	904.6	1.16	44.71	889.5	0.88	18.59	4	ER
Q7G9LF	887.4	0.90	127.57	816.7	-0.42	70.37	4	EX
QCA7JJ	828.6	-0.01	77.64	805.5	-0.62	18.78	4	ER
QMTHVW	758.8	-1.08	19.49	788.8	-0.92	49.14	4	LG
RW6DZL	799.3	-0.46	46.65	809.7	-0.55	66.72	4	LS
TNRPZR	772.3	-0.87	29.42	761.5	-1.41	14.02	4	LL
UYTHYB	882.6	0.82	63.80	916.5	1.36	53.34	4	LM
W2ALJD	869.9	0.63	56.22	906.0	1.18	54.89	3	LN
WEDUFA	769.6	-0.92	130.70	785.3	-0.98	15.15	4	EX
WETFPC	760.5	-1.06	79.41	796.3	-0.79	45.21	4	TB
Z479ND	889.2	0.93	76.31	856.8	0.30	23.39	4	EX

Consensus (All Labs) Results

Month Mean	829.10	Grand Mean	840.30
Avg SD	73.62	Avg SD Months	57.43
SD btwn Labs	64.97	SD btwn Labs	55.84
Labs Incl	29	Labs Incl	29



Containerboard Interlaboratory Testing Program
Analysis 201

Report #646
July 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	817.53	65.25	11.57	9
Clip sealing	830.60	65.49	1.51	19
Staple sealing	904.62	0.00	75.52	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 #646
July 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
6HPMU8	45.8	0.73	1.18	42.8	0.12	3.73	4	XX
AMJ689	44.7	0.40	1.88	43.5	0.46	1.20	4	LC
AUWD9B	41.9	-0.46	2.83	42.6	0.02	1.36	4	TS
FBCEWN	42.2	-0.36	3.01	41.5	-0.55	1.18	4	EN
H7DJA7	42.5	-0.27	1.58	42.7	0.07	1.06	4	EX
LDF6HJ	37.4	-1.83 *	2.34	39.7	-1.48	2.12	4	TS
NEGTTQ	49.5	1.86 *	2.05	46.8	2.14 *	2.01	4	XX
R7GJ2J	166.4	37.47 X	5.54 H	159.4	59.59 X	5.18 H	4	LD
RW6DZL	42.6	-0.24	2.41	41.0	-0.83	1.66	4	LD
WEDUFA	43.9	0.17	1.91	42.7	0.06	1.29	4	LC

Consensus (All Labs) Results				
Month Mean		43.39	Grand Mean	42.61
Avg SD		2.20	Avg SD Months	1.91
SD btwn Labs		3.28	SD btwn Labs	1.96
Labs Incd		9	Labs Incd	9

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 #646
July 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2AKNGA	43.4	-1.00	1.15	43.2	-1.23	0.98	4	EM
3ZGL8A	39.6	-2.37 *	1.07	37.3	-3.70 X	3.22	2	IX
4HNHP8	44.2	-0.72	0.70	45.4	-0.29	1.62	4	BU
4MQCXA	48.2	0.72	1.21	47.2	0.45	2.99	4	LD
6HPMU8	45.8	-0.15	1.00	42.5	-1.50	3.52	4	XX
76T6AY	41.3	-1.75	2.14	42.8	-1.38	6.02 H	4	EM
9LTTX4	48.5	0.82	0.95	48.9	1.18	0.74	4	TG
9ZD8Z3	44.6	-0.56	2.32 H	43.2	-1.22	1.27	3	TK
A24QGU	48.2	0.72	1.01	47.8	0.71	1.01	4	LD
AMJ689	48.8	0.93	1.47	47.5	0.61	0.87	4	LC
AUWD9B	45.7	-0.19	1.38	45.1	-0.39	1.63	4	TS
B2YME3	47.1	0.32	1.26	49.5	1.46	2.00	4	TD
ENXFTU	53.0	2.44 *	1.89	50.3	1.79	3.02	4	LC
FBCEWN	44.7	-0.54	0.51 L	46.5	0.18	1.52	4	EN
FDE4A6	46.7	0.18	2.31 H	46.8	0.30	0.96	4	TU
FJ3WBW	35.0	-4.02 X	2.55 H	41.7	-1.84	10.60 H	4	XX
H7DJA7	44.6	-0.58	1.26	44.4	-0.70	0.99	4	LY
J3KCWM	44.9	-0.46	1.54	45.3	-0.31	0.99	4	CT
J8ZJKM	46.5	0.12	1.52	46.0	-0.04	0.53	4	EM
KU6WMQ	52.9	2.40 *	1.66	55.3	3.87 X	1.72	4	EM
LDF6HJ	42.3	-1.41	1.12	41.9	-1.76	1.14	4	TS
LU2WZV	49.2	1.08	1.63	50.4	1.81	0.85	4	MK
MNUC3Q	47.3	0.40	1.24	46.7	0.27	1.28	4	TG
MZMVJG	48.2	0.72	1.72	46.5	0.18	1.49	4	LD
NK9W4H	45.7	-0.18	0.93	46.1	-0.01	2.13	4	TL
NW8MVG	43.9	-0.81	1.22	43.6	-1.03	1.20	4	LD
P77R8P	48.2	0.71	1.52	48.9	1.19	1.87	4	LD
QCA7JJ	46.3	0.03	1.11	46.3	0.08	0.31 L	4	EM
RJKYWL	44.9	-0.49	1.18	44.1	-0.84	0.79	4	TD
RW6DZL	44.1	-0.75	1.88	44.6	-0.61	2.94	4	LD
UYTHYB	45.4	-0.29	0.78	46.5	0.19	2.48	4	EM
W7YCEM	44.6	-0.57	2.18	44.1	-0.83	0.64	4	BU
WEDUFA	47.2	0.36	1.32	48.0	0.83	1.73	4	LC
WETFPC	47.0	0.28	0.62 L	49.0	1.24	3.96	4	LD
WRYB2M	49.9	1.32	1.25	48.8	1.14	1.66	4	TH
YFV3BE	43.6	-0.95	0.91	47.5	0.61	2.70	4	EM
Z479ND	46.8	0.22	1.21	45.4	-0.27	2.39	4	LD



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

Report #646
July 2023

Consensus (All Labs) Results			
Month Mean	46.20	Grand Mean	46.08
Avg SD	1.41	Avg SD Months	2.75
SD btwn Labs	2.79	SD btwn Labs	2.37
Labs Incl'd	36	Labs Incl'd	35

Key to Instrument Codes Reported by Participants

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



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

Report #646
July 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	
29RL2L	120.5	122.8	123.0	123.0	122.3	1.28	8.6	1.2	119.2	0.73	7.2	3.9	16	LA
2HWT7	108.1	106.7	107.3 *	113.7	109.0	-1.73	7.6	3.2	111.1	-1.22	8.0	3.4	16	LC
2PUFKE	116.5	115.4	116.0	115.5	115.9	-0.18	6.2	0.5 L	116.0	-0.06	6.1	0.5 L	16	LA
2XDQN8_AL	120.6	121.6	120.6	118.1	120.2	0.81	10.3	1.5	118.7	0.60	9.8	3.9	15	AL
4C3R3C	104.9 *	109.5	106.2 *	103.5 *	106.0	-2.39 *	9.6	2.6	110.1	-1.47	9.4	4.1	12	LC
4MQCXA	114.6	111.4	114.3	111.4	112.9	-0.83	10.6	1.7	112.0	-1.01	9.5	3.0	16	LZ
4ZQBK7	112.8	No DATA	118.8	114.4	115.3	-0.29	5.4	3.1	115.7	-0.12	5.4	2.4	9	AX
4ZQBK7_AL	118.2	No DATA	115.6	113.6	115.8	-0.19	8.5	2.3	116.5	0.07	8.2	2.0	9	AL
6HPMU8	113.2	117.2	115.8	117.6	116.0	-0.16	8.8	2.0	115.0	-0.29	7.2	1.8	16	LC
6KRL6Z_AL	119.7	120.8	119.8	119.8	120.0	0.76	8.5	0.5 L	119.6	0.83	7.5	1.9	16	AL
6NRWZZ	118.2	109.3	115.7	115.8	114.7	-0.43	10.1	3.8	116.1	-0.02	9.3	3.6	16	LZ
6T86NZ	111.2	116.2	112.5	116.1	114.0	-0.59	10.5	2.5	111.8	-1.07	10.4	2.8	16	LC
8TFAM8	116.6	110.8	120.1	116.6	116.0	-0.14	8.3	3.9	117.2	0.24	8.6	2.7	15	LC
94DJW3	113.8 L	113.7 L	114.0 L	115.5 L	114.3	-0.54	3.0	0.8	115.2	-0.25	2.6	2.3	16	LA
A24QGU	110.5	113.4	115.4	110.4	112.4	-0.95	8.4	2.4	113.5	-0.66	9.7	4.2	16	LA
A64V79_AL	112.9	106.9	107.1 *	109.9	109.2	-1.67	10.0	2.8	110.0	-1.50	10.4	4.0	16	AL
A8XP2	112.6	121.3	126.2	127.7 *	122.0	1.19	6.5	6.8	115.2	-0.24	6.4	5.5	16	AX
AYWB93	119.8	119.3	120.0	119.9	119.7	0.70	10.1	0.3 L	120.2	0.95	10.1	2.6	16	LJ
B87ZL2_AL	124.2	112.8	123.1	120.1	120.1	0.77	8.8	5.1	118.2	0.48	9.2	4.2	16	AL
E8DPUV	122.7	118.4	122.3	120.4	120.9	0.97	7.0	2.0	120.8	1.11	9.2	3.8	16	LC
E8DPUV_AL	124.9 H	125.8	122.3	125.1 H	124.5	1.77	12.9	1.6	122.6	1.55	11.2	2.4	16	AL
EDZGZ3	113.6	105.2 *	110.8	112.9	110.6	-1.35	6.9	3.8	108.4	-1.87	11.7	4.2	16	LA
EYK6YV_AL	116.9	114.6 L	120.6	120.2	118.1	0.32	6.5	2.9	117.4	0.30	7.4	2.3	16	AL
FPQTPL_AL	120.5	120.5	122.7	110.3	118.5	0.42	6.4	5.6	118.5	0.55	6.4	5.6	4	AL
H7DJA7	122.0	120.1	127.8 *	125.3	123.8	1.61	8.4	3.4	123.3	1.71	9.2	3.0	16	LA
HDTHHQ_AL	No DATA	121.3	119.9	No DATA	120.6	0.89	7.2	1.0	118.1	0.45	8.1	2.8	10	AL
HGTTDQ	124.4	123.1	124.2	123.8	123.9	1.63	7.1	0.6 L	117.9	0.40	8.8	4.5	16	RE
HH67HM	118.4	No DATA	120.4	120.4	119.7	0.70	4.7	1.2	119.3	0.74	5.3	1.5	10	AH
HT39KV	117.7	114.8	115.3	116.2	116.0	-0.15	5.4	1.3	115.8	-0.09	5.4	1.0	16	LJ
J3KCWM	117.5	116.0	122.5	119.0	118.8	0.47	10.1	2.8	118.5	0.54	10.2	2.7	16	XX
J3MWT3	107.3	133.8 X	115.8	137.3 X	123.5	1.55	7.9	14.4 H	125.3	2.18 *	9.4	9.5 H	16	LB
JZYFNW	124.0 L	124.0 L	123.2 L	123.0 L	123.6	1.55	3.0	0.5 L	124.5	1.98 *	3.0	1.0	16	AH
KLD9GM_AL	133.6XH	134.1 XH	134.4 XH	134.2 XH	134.1	3.93 X	23.1	0.3 L	132.0	3.81 X	20.8	3.1	12	AL
KTCU83	113.7	106.2 L	117.0	117.1	113.5	-0.71	6.7	5.1	111.6	-1.11	7.8	3.7	16	ME
LM9BLH	121.7	121.6	116.9	118.9	119.8	0.70	8.5	2.3	119.6	0.82	9.7	2.4	16	LA



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

Report #646
July 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
LM9BLH_AL	119.3	114.7	113.9	119.8	116.9	0.06	6.1	3.1	118.0	0.43	7.1	2.6	16	AL
LU7Z3M	115.4	112.2	115.8	115.1	114.6	-0.45	8.7	1.6	114.3	-0.46	9.2	2.9	16	LA
MZMVJG	113.6	114.2	118.8	112.0	114.7	-0.45	6.8	2.9	114.8	-0.33	9.0	3.0	16	AH
NVM4NP	121.4	118.8	121.8	118.5	120.1	0.78	10.2	1.7	120.8	1.11	10.5	3.4	16	LC
P4FTUR	113.6	113.8	119.8	112.5 H	114.9	-0.39	11.2	3.3	114.2	-0.50	9.3	3.3	16	XX
PXA67H	126.1	119.7	115.7	117.2	119.7	0.68	9.1	4.6	118.1	0.46	8.6	5.6	15	TB
QBWGAE_AI	118.3	116.0	114.8	113.6	115.7	-0.22	7.8	2.0	115.9	-0.07	9.2	1.8	16	AL
R7GJ2J	108.9	110.5	110.9	111.6	110.5	-1.39	8.1	1.1	106.3	-2.38 *	8.5	3.7	16	LA
RW6DZL	110.8	109.6 H	108.5	117.5	111.6	-1.13	10.6	4.0	115.1	-0.26	9.4	3.5	16	LA
RWBQNH	115.8	115.6	116.0	117.1	116.1	-0.12	5.6	0.7	115.5	-0.17	5.8	1.2	16	TP
VGH8GH	114.8	115.7	117.0	117.2	116.2	-0.11	5.8	1.1	116.4	0.06	6.4	0.9 L	16	AH
VTWDHC_AI	110.8	117.0	117.3	112.5	114.4	-0.50	10.2	3.3	114.6	-0.40	10.7	3.2	16	AL
VXCL7B_AL	130.8 *H	121.5	122.6	116.9	123.0	1.42	11.1	5.8	122.5	1.50	10.6	4.3	15	AL
WEDUFA	118.7	112.0	115.5	111.9	114.5	-0.47	7.6	3.2	113.8	-0.58	8.5	3.0	16	AH
WETFPC	115.6 H	112.2	118.1	113.3	114.8	-0.42	11.3	2.6	110.7	-1.31	8.4	3.8	16	XX
X93D6C_AL	111.7	114.2	114.5	105.5 *	111.5	-1.16	7.0	4.2	110.1	-1.47	6.5	3.1	16	XX
XQ7QZ9_AL	112.1	113.9	120.2	121.1	116.8	0.04	10.1	4.5	115.9	-0.08	9.1	4.1	16	AL
Z479ND	109.6	117.2	114.0	118.0	114.7	-0.44	10.7	3.8	114.7	-0.36	9.0	2.8	16	AH
Z8J9L6	118.6	119.1	120.3	116.8	118.7	0.47	8.7	1.5	118.4	0.54	8.9	3.1	16	LA
ZBJEBH	113.6	113.1	105.8 * NO DATA		110.8	-1.31	8.6	4.4	110.8	-1.30	6.8	2.1	13	XX
ZCZGA6_AL	119.7	113.9 L	114.7 L	113.4 L	115.4	-0.28	2.9	2.9	116.3	0.03	2.8	4.0	16	XX
ZNNGZ8	104.0 *	109.2	107.3 *	110.1 H	107.7	-2.02 *	9.5	2.7	110.0	-1.49	8.2	6.0	13	LA
ZNNGZ8_AL	122.9	129.5 *	120.1	122.3	123.7	1.59	9.9	4.0	123.8	1.82	10.3	3.6	13	AL

Consensus (All Labs) Results														
Wk Mean	116.44	115.74	117.13	116.46	Month Mean	116.64			Grand Mean	116.21				
Avg SDr	8.98	8.39	8.32	8.22	Avg SD	8.45			Avg SD	8.49				
SD btwn Labs	5.48	5.25	5.04	4.80	SD btwn Labs	4.44			SD btwn Labs	4.16				
Labs Incl	56	53	57	54	SD btwn Wks	3.59			SD btwn Wks	3.53				
Labs Excl	1	2	1	2	Labs Incl	57			Labs Incl	57				
Labs not Rcvd	1	3	0	2										



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

Report #646
July 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 #646
July 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	
29RL2L	118.6	120.3	113.9	119.7	118.1	0.65	8.4	2.9	118.2	0.74	8.0	2.2	12	LA
2HWTH7	108.8	113.6	106.8	112.9	110.5	-1.07	11.4	3.3	113.4	-0.51	11.5	3.7	12	LA
2PUFKE	117.0	116.0	116.4	116.7	116.5	0.29	5.8	0.4 L	115.9	0.15	6.3	0.7 L	12	LA
2XDQN8_AL	106.9	116.9	108.6	108.0	110.1	-1.17	7.2	4.6	113.8	-0.41	9.8	5.5	11	AL
4C3R3C	116.5	120.0	115.1	113.9	116.4	0.26	9.8	2.7	109.5	-1.52	9.3	6.0	12	LC
4MQCXA	105.0 *	111.2	108.4	112.1	109.2	-1.38	9.8	3.2	112.1	-0.84	10.9	3.7	12	LZ
4ZQBK7	113.0	No DATA	118.8	112.0	114.6	-0.15	6.9	3.7	115.9	0.14	6.3	3.7	6	AH
4ZQBK7_AL	119.2	No DATA	107.7	113.4	113.4	-0.41	10.5	5.8	114.1	-0.32	10.1	3.8	6	AL
6KRL6Z_AL	120.2	121.2	120.3	118.5	120.0	1.09	10.6	1.1	118.7	0.87	9.9	3.8	12	AL
6NRWZZ	116.0	118.1	119.2	124.6 H	119.5	0.96	13.5	3.7	117.6	0.61	12.4	3.6	12	LZ
6T86NZ	107.8	111.8	117.2	115.2	113.0	-0.51	11.4	4.1	113.8	-0.40	10.5	4.3	12	LC
8TFAM8	118.4	116.1	122.0	122.4	119.7	1.02	8.8	3.0	122.3	1.82	11.7	5.8	12	XX
94DJW3	121.7 L	122.7 L	124.0 L	123.7 L	123.0	1.77	2.8	1.0	122.0	1.73	2.7	1.4	12	LA
A24QGU	114.3	113.1	119.7	117.7	116.2	0.22	9.7	3.0	113.4	-0.49	9.6	3.7	12	LA
A64V79_AL	115.7	103.9 *	111.0	115.2	111.4	-0.87	8.6	5.4	109.9	-1.42	10.2	4.1	12	AL
A8PXP2	124.5	125.8 *	126.7 *	127.7 L	126.2	2.48 *	7.4	1.4	121.9	1.71	8.9	6.2	12	XX
AYWB93	118.4	117.6 H	118.2	116.1	117.6	0.53	13.0	1.1	119.0	0.96	11.6	3.0	12	LZ
B87ZL2_AL	116.6	112.9	121.4	118.2	117.3	0.46	9.5	3.5	117.6	0.60	10.2	2.6	12	AL
E8DPUV	119.8	112.6	111.8	121.8	116.5	0.28	11.8	5.1	119.7	1.13	10.8	7.1	8	LC
E8DPUV_AL	112.5	125.1	111.8	124.7	118.5	0.75	13.3	7.4	121.0	1.48	11.3	6.2	8	XX
EDZGZ3	108.4	113.3	112.7	103.6 *	109.5	-1.31	9.8	4.5	111.1	-1.10	9.8	4.4	12	LA
EYK6YV_AL	112.5	111.5	116.9	112.0	113.2	-0.46	8.2	2.5	114.3	-0.26	9.4	4.1	12	AL
FPQTPL_AL	117.0	117.1	110.3	113.3	114.4	-0.19	11.9	3.2	114.4	-0.24	11.9	3.2	4	AL
H7DJA7	124.0	123.8	123.0	124.8	123.9	1.97 *	9.7	0.8	124.2	2.32 *	9.5	2.4	12	LA
HDTHHQ_AL	No DATA	113.5	112.8	No DATA	113.2	-0.47	10.8	0.5	113.6	-0.44	11.7	3.9	7	AL
HGTTDQ	117.4	118.2	116.8	119.6	118.0	0.63	9.0	1.2	110.4	-1.30	8.7	6.1	12	RE
HH67HM	117.4	No DATA	114.8	120.6	117.6	0.53	6.0	2.9	118.0	0.70	5.7	2.1	6	AH
HT39KV	116.3	116.8	117.6	116.9	116.9	0.38	5.9	0.5 L	116.0	0.16	6.4	1.4	12	LJ
J3KCWM	122.5	114.0	116.0	121.0	118.4	0.71	14.6	4.0	115.7	0.10	12.4	4.3	12	XX
J3MWT3	106.9 H	137.1 X	111.7 L	129.5 *H	121.3	1.38	13.3	14.3 H	118.0	0.69	11.9	9.7 H	12	LB
JZYFNW	133.2 XL	133.5 XL	133.2 XL	132.7 *L	133.2	4.07 X	2.6	0.3 L	136.5	5.53 X	3.1	3.1	12	AH
KLD9GM_AL	127.1 *H	131.8 XH	136.5 XH	120.6 H	129.0	3.13 X	23.9	6.8	129.5	3.70 X	21.3	5.0	12	XX
KTCU83	119.0	No DATA	111.0	105.6	111.9	-0.77	11.8	6.7	113.6	-0.46	9.7	4.8	10	LA
LM9BLH	118.1	117.0 H	118.6	116.0	117.4	0.49	13.0	1.2	120.3	1.29	10.3	2.8	12	LA
LM9BLH_AL	118.9	119.0	121.3	122.7	120.5	1.18	10.3	1.8	118.0	0.70	8.8	3.4	12	XX



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

Report #646
July 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	
LU7Z3M	115.1	111.9	117.1	105.8	112.5	-0.63	10.6	5.0	114.1	-0.32	12.4	4.7	12	LA
MZMVJG	120.1	119.3	119.7	123.0	120.5	1.20	8.3	1.7	117.9	0.68	9.1	4.0	12	AH
NVM4NP	124.6	116.6	121.1	116.7	119.7	1.02	10.6	3.9	120.2	1.28	10.8	3.7	12	LC
P4FTUR	115.6	107.3	113.0 H	112.2	112.0	-0.74	13.5	3.5	112.7	-0.68	11.7	3.8	12	XX
PXA67H	116.9	113.0	116.7 L	124.5	117.8	0.58	9.8	4.8	118.6	0.84	11.3	3.8	11	TB
QBWGAE_AI	112.0	117.9	113.0	123.2	116.5	0.29	10.5	5.2	117.6	0.60	11.1	4.3	12	AL
R7GJ2J	106.1	103.0 *	112.0	102.2 *	105.8	-2.14 *	9.5	4.5	107.6	-2.02 *	10.4	4.3	12	LA
RW6DZL	110.6	109.8 L	102.6 *	116.9	110.0	-1.19	9.3	5.8	114.9	-0.10	8.7	6.1	12	LA
RWBQNH	114.2	115.0	115.6 L	116.4	115.3	0.01	5.5	0.9	115.4	0.01	6.5	0.8 L	12	TP
VGH8GH	114.2	114.5	115.2	113.9	114.5	-0.18	6.2	0.6 L	114.8	-0.13	6.1	1.0 L	12	AH
VTWDHC_AI	115.1	103.9 *	114.5	121.2	113.7	-0.36	12.3	7.2	115.4	0.03	10.8	5.3	12	AL
VXCL7B_AL	113.4	122.1	116.0	122.3 L	118.5	0.73	11.0	4.5	116.1	0.20	10.9	3.8	12	AL
WEDUFA	122.0	117.2	115.9	111.1	116.6	0.30	10.4	4.5	114.4	-0.25	10.6	3.5	12	AH
WETFPC	112.7	113.7	115.0	111.6	113.2	-0.46	7.9	1.4	111.3	-1.06	8.4	3.2	12	XX
X93D6C_AL	110.2	109.4	113.3	111.0	111.0	-0.97	11.6	1.7	111.4	-1.03	9.1	1.7	12	XX
XQ7QZ9_AL	120.4	117.9	111.1	113.6	115.8	0.11	11.1	4.2	114.2	-0.31	10.8	4.0	12	XX
Z479ND	107.2	106.8	110.4	112.0	109.1	-1.40	9.3	2.5	112.8	-0.67	9.9	3.9	12	AH
Z8J9L6	115.0	116.2	116.8	114.0	115.5	0.06	10.2	1.3	117.0	0.44	10.5	3.2	12	LA
ZBJEBH	110.0	106.5	108.0	NO DATA	108.2	-1.61	7.2	1.8	107.6	-2.02 *	10.1	2.7	6	XX
ZCZGA6_AL	114.6 L	109.2 L	110.6 L	111.8 L	111.6	-0.84	2.8	2.3	112.5	-0.74	3.4	2.9	8	XX
ZNNGZ8	87.4 X	109.3 H	112.8	112.7	105.6	-2.20 *	12.0	12.2 H	107.7	-2.00 *	10.8	7.2	12	LA
ZNNGZ8_AL	111.9	117.7	104.4 *	111.8	111.5	-0.86	9.2	5.4	111.6	-0.97	10.2	3.3	12	AL

Consensus (All Labs) Results														
Wk Mean	115.52	114.83	114.87	116.75	Month Mean	115.25			Grand Mean	115.33				
Avg SDr	10.53	10.21	9.85	10.31	Avg SD	10.03			Avg SD	9.90				
SD btwn Labs	5.13	5.34	4.92	6.36	SD btwn Labs	4.40			SD btwn Labs	3.83				
Labs Incl	54	50	55	55	SD btwn Wks	4.41			SD btwn Wks	4.25				
Labs Excl	2	3	2	0	Labs Incl	55			Labs Incl	55				
Labs not Rcvd	1	4	0	2										



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

Report #646
July 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 #646
July 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	
29RL2L	96.3	95.7	92.0	94.7	94.7	-0.16	3.5	1.9	93.7	-0.61	3.1	1.9	16	LC
2HWT7	92.6	93.8	92.9	93.7	93.2	-0.63	2.6	0.6	94.1	-0.46	2.7	1.3	16	LD
4C3R3C	94.8	95.2 L	96.0	96.9	95.7	0.18	2.6	0.9	95.2	-0.09	2.6	1.6	12	LZ
4MQCXA	94.8	95.6	93.1	95.7	94.8	-0.12	3.0	1.2	94.4	-0.37	2.9	1.7	16	LD
67CMYZ	100.9 *	96.8	98.9	97.1	98.4	1.08	3.6	1.9	97.1	0.53	6.4	9.7 H	16	TU
6NRWZZ	89.1 *	91.8	88.1	86.2 *L	88.8	-2.08 *	2.9	2.3	87.5	-2.68 *	3.3	5.9	16	LC
6T86NZ	94.5	95.2 L	96.1	97.2	95.7	0.20	3.0	1.1	97.2	0.57	3.4	2.3	16	LD
7KMH39	94.3 L	93.7 L	95.6 L	96.1 L	94.9	-0.07	0.4	1.1	94.5	-0.33	0.7	0.9 L	16	TH
7VNXUY	96.0	98.7	97.5	98.6	97.7	0.84	3.2	1.3	98.8	1.09	4.2	3.7	16	MB
8TFAM8	97.3	98.3	100.9 L	96.5	98.2	1.01	2.6	1.9	99.5	1.33	4.2	2.0	16	MB
94DJW3	93.7 L	93.8 L	93.6 L	94.1 L	93.8	-0.44	0.9	0.2 L	97.3	0.60	1.0	3.4	16	TU
9LTTX4	92.8	93.5	95.0	94.0	93.8	-0.43	3.0	1.0	97.1	0.52	2.9	4.3	16	TH
9ZD8Z3	93.5 L	93.7 L	93.2 L	93.9 L	93.6	-0.52	1.7	0.3 L	94.2	-0.42	1.6	0.5 L	16	MB
A8XP2	96.0	95.4 L	92.5 L	92.2	94.0	-0.37	2.5	2.0	93.0	-0.84	3.3	1.9	16	LD
E8DPUV	87.2 X	89.4	86.4 *	87.6 *	87.7	-2.46 *	2.5	1.3	88.9	-2.19 *	3.0	6.2	16	LD
ENXFTU	95.1 L	96.0	96.1	95.4	95.6	0.16	2.7	0.5	92.4	-1.03	2.8	3.1	16	LC
EPX89P	100.6	100.4	99.5 L	103.2 *	100.9	1.90	3.1	1.6	97.3	0.60	3.8	4.0	16	LD
FBCEWN	94.4	92.2	94.0	92.1	93.2	-0.66	3.3	1.2	92.6	-0.96	2.9	1.7	16	EN
H7DJA7	95.5	96.2	97.1	94.3	95.8	0.21	3.2	1.2	94.6	-0.30	2.6	1.6	16	LG
HDTHHQ	97.4	97.1	99.0	100.5	98.5	1.10	5.1	1.6	98.0	0.83	4.6	1.8	16	LC
HGTTDQ	84.3 XH	83.4 XH	86.9 *H	86.8 *H	85.3	-3.22 X	9.7	1.8	84.7	-3.59 X	10.3	2.8	16	EM
HT39KV	96.1	95.7 L	96.2	95.9	96.0	0.27	3.2	0.2 L	95.8	0.09	2.5	0.7 L	16	LD
J3MWT3	104.7 X	92.1	100.7	98.7	99.1	1.28	3.8	5.3	95.7	0.06	4.2	5.3	16	LD
JZYFNW	95.4	94.1	93.8	95.1	94.6	-0.18	2.3	0.8	96.1	0.19	2.5	1.2	16	LD
KLD9GM	65.2 XH	68.2 X	64.9 X	61.6 X	65.0	-9.90 X	6.3	2.7	80.8	-4.89 X	5.3	15.1 H	12	LC
KTAABL	98.2	97.7	96.6	97.3	97.5	0.76	5.6	0.7	98.7	1.06	4.6	3.6	16	LD
KTCU83	95.8	102.4 *	105.9 X	99.4	100.9	1.88	3.2	4.3	101.2	1.90	3.4	2.9	16	LX
LM9BLH	101.5 *	96.8	93.0	100.8	98.0	0.94	3.4	3.9	96.4	0.30	3.6	2.9	16	LD
MZMVJG	95.2	95.6	94.5 L	94.7	95.0	-0.05	2.7	0.5	96.6	0.37	2.9	1.7	16	LD
NUBLER	93.1	95.4	94.0	94.5	94.2	-0.30	4.3	0.9	96.3	0.25	4.1	1.7	16	RS
NVM4NP	94.6	94.4 L	93.7	95.3	94.5	-0.22	2.0	0.6	96.0	0.15	2.9	3.0	16	LD
PXA67H	90.7	90.0	86.0 *	93.0	89.9	-1.72	3.4	2.9	97.1	0.54	3.7	6.2	14	LD
QBWGAE	65.1 XH	65.9 XH	66.3 XH	67.6 XH	66.2	-9.49 X	9.4	1.0	67.7	-9.25 X	7.5	2.2	16	LD
QNWHMF	84.1 X	85.1 *	82.2 X	83.4 X	83.7	-3.76 X	4.5	1.2	87.5	-2.65 *	4.0	4.6	16	EM
R7GJ2J	96.9 H	94.1 H	90.0 H	95.7 H	94.2	-0.32	17.4	3.0	108.2	4.23 X	18.0	20.8 H	16	LB



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

Report #646
July 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	
RAXQPH	98.9 L	100.5	98.0	98.4	99.0	1.25	2.4	1.1	101.8	2.11 *	2.3	3.1	16	LD
RW6DZL	99.6	100.5	97.2	97.3	98.6	1.15	3.3	1.6	96.9	0.48	2.8	1.5	16	LD
RWBQNH	94.2	94.3	95.8	93.3	94.4	-0.24	3.4	1.1	95.5	0.01	3.1	1.3	16	TH
TWPG9L	93.9 L	93.8 L	94.9 L	96.0 L	94.6	-0.17	0.5	1.0	94.2	-0.44	0.7	1.0 L	16	TH
VTWDHC	93.0	88.4	90.6	98.8	92.7	-0.80	3.3	4.5	92.7	-0.95	3.5	2.5	16	LD
VXCL7B	75.4 XH	97.3	99.3	99.3	92.8	-0.76	5.2	11.6 H	95.4	-0.04	4.3	7.7 H	16	LZ
WEDUFA	95.9 L	95.6	96.9	95.7	96.0	0.28	2.9	0.6	96.6	0.38	3.0	1.2	13	LC
X93D6C	97.5	96.0	96.1 L	96.9	96.6	0.48	2.5	0.7	97.0	0.51	2.7	0.8 L	16	LD
XQ7QZ9	99.0	99.0	100.0	98.8 L	99.2	1.32	2.4	0.6	98.8	1.10	2.5	1.8	16	LD
YFV3BE	90.3	88.5 L	91.4	88.1 *	89.6	-1.84	2.9	1.6	93.9	-0.55	2.7	3.3	16	EM
Z8J9L6	94.4	95.5	94.4	94.6	94.7	-0.14	3.9	0.5	96.4	0.29	3.4	1.5	16	LD
ZBJEBH	96.4	86.4 *H	88.1	NO DATA	90.3	-1.60	6.6	5.3	92.7	-0.93	5.9	9.5 H	13	TU

Consensus (All Labs) Results									
Wk Mean	95.50	94.81	94.54	95.44	Month Mean	95.15		Grand Mean	95.51
Avg SDr	4.09	4.44	4.43	4.06	Avg SD	4.19		Avg SD	3.38
SD btwn Labs	2.73	3.63	3.79	3.57	SD btwn Labs	3.05		SD btwn Labs	3.01
Labs Incd	40	44	43	43	SD btwn Wks	2.70		SD btwn Wks	3.71
Labs Excl	7	3	4	3	Labs Incd	43		Labs Incd	43
Labs not Rcvd	0	0	0	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	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 #646
July 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	
29RL2L	135.0	136.0	139.3	138.3	137.2	0.59	3.6	2.0	137.4	0.50	4.0	2.6	12	LC
2HWTH7	131.0	130.6	133.3	135.7	132.7	-0.15	3.8	2.4	134.6	0.04	3.6	2.3	12	LD
4C3R3C	135.8	139.2	141.9	138.3	138.8	0.86	4.1	2.5	137.1	0.46	4.2	2.3	12	LZ
4MQCXA	134.2	135.3	128.9	135.9	133.6	0.00	4.2	3.2	133.1	-0.21	4.1	2.7	12	LD
67CMYZ	148.3 *	137.5	139.5	139.9	141.3	1.28	4.6	4.8	143.3	1.47	6.8	4.0	12	TU
6NRWZZ	119.7 X	133.1	121.7	118.7 *H	123.3	-1.70	5.9	6.6	125.1	-1.54	6.6	7.3	12	LC
6T86NZ	135.3	139.2	137.6	146.0	139.5	0.99	4.0	4.6	138.4	0.66	6.0	6.8	12	LD
7KMH39	134.0 L	133.8 L	135.1 L	136.1 L	134.7	0.20	0.6	1.0	136.8	0.41	0.8	2.4	12	TH
7VNXUY	137.2	136.4	137.1	139.1	137.5	0.65	3.9	1.1	142.9	1.41	4.7	5.2	12	MB
8TFAM8	136.5	139.6	140.7	139.3	139.0	0.91	4.3	1.8	140.0	0.93	3.7	1.4 L	12	MB
94DJW3	135.0 L	134.7 L	134.8 L	134.8 L	134.8	0.21	0.7	0.1 L	139.7	0.88	1.0	3.7	12	TU
9LTTX4	132.0	132.6	132.5	135.5	133.1	-0.07	3.9	1.6	133.3	-0.17	4.1	2.7	12	TH
9ZD8Z3	137.9 L	137.7 L	137.4 L	137.9 L	137.7	0.69	1.6	0.3 L	136.6	0.37	1.7	1.2 L	8	MB
A8XPX2	134.0	133.9	137.3	134.2	134.8	0.21	4.5	1.6	134.3	-0.01	5.3	1.8	12	LD
E8DPUV	115.1 X	124.1 *	122.1	122.1	120.9	-2.11 *	4.8	3.9	119.9	-2.40 *	4.3	9.8	8	LD
ENXFTU	138.5	135.8	136.1	136.2	136.6	0.51	3.9	1.2	133.3	-0.18	3.8	4.5	12	LC
EPX89P	139.7	132.8	135.6	139.7	137.0	0.56	4.0	3.4	133.6	-0.12	3.9	4.0	12	LD
FBCEWN	130.8	128.6	130.5	128.7	129.7	-0.65	4.4	1.2	130.6	-0.63	4.3	2.1	12	EN
H7DJA7	135.6	134.6	133.9	134.2	134.6	0.17	2.6	0.8 L	134.1	-0.04	3.1	2.3	12	LY
HDTHHQ	137.7	136.5	139.0	138.3	137.9	0.71	4.6	1.1	137.4	0.50	4.6	2.0	12	LC
HGTTDQ	114.3 XH	116.9 XH	121.2 H	121.2 *H	118.4	-2.51 *	13.2	3.4	119.5	-2.46 *	15.0	5.3	12	EX
HT39KV	138.8	138.4	139.1	139.2	138.9	0.88	3.2	0.4 L	138.4	0.66	3.3	0.5 L	12	LD
J3MWT3	144.3	127.3	140.6	127.4	134.9	0.22	5.2	8.8	134.6	0.03	4.3	5.9	12	LD
JZYFNW	124.3 *	123.6 *	123.9	123.4	123.8	-1.62	2.6	0.4 L	126.5	-1.31	2.4	2.4	12	LD
KLD9GM	84.3 XH	83.4 XH	87.6 XH	100.7 XH	89.0	-7.38 X	9.8	8.0	106.6	-4.60 X	8.2	20.3 H	12	LC
KTAABL	131.8	132.2	137.3	136.4 H	134.4	0.14	5.3	2.8	132.7	-0.28	4.9	3.0	12	LD
KTCU83	136.5 H	151.9 X	150.7 *	150.5 *	147.4	2.29 *	5.6	7.3	147.1	2.11 *	4.8	4.0	12	LY
LM9BLH	135.5	131.9	130.3	135.0	133.2	-0.06	3.9	2.5	133.5	-0.15	4.1	1.7 L	12	LD
MZMVJG	133.1	133.3	131.9	132.9	132.8	-0.13	3.3	0.6 L	135.2	0.13	3.2	3.7	12	LD
NUBLER	134.9	132.7	132.8	130.0	132.6	-0.16	4.3	2.0	132.2	-0.35	4.7	2.4	8	RS
NVM4NP	136.1	133.9	134.7	137.3	135.5	0.32	3.2	1.5	136.2	0.31	3.4	3.7	12	LD
PXA67H	126.1	129.3	125.5	131.9	128.2	-0.89	2.6	3.0	143.2	1.47	4.0	12.8 H	11	LD
QBWGAE	88.3 XH	89.3 XH	87.9 XH	88.0 XH	88.4	-7.49 X	10.0	0.6 L	91.6	-7.07 X	8.9	2.7	12	LD
QNWHMF	123.3 *	125.1 *	123.3	123.3	123.7	-1.63	3.3	0.9	124.3	-1.67	3.6	1.3 L	8	EM
R7GJ2J	111.4 XH	112.0 XH	109.6 XH	101.1 XH	108.5	-4.15 X	22.4	5.1	125.4	-1.48	18.5	25.4 H	12	LB



Containerboard Interlaboratory Testing Program
 Analysis 216
Ring Crush, 56 lb Linerboard - 56G3
 TAPPI Official Test Method T822

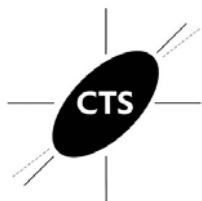
Report #646
July 2023

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
RAXQPH	142.3	143.3 *	142.2	141.5	142.3	1.45	4.3	0.7 L	143.9	1.58	3.7	3.8	12	LD
RW6DZL	137.9	136.7	134.7	135.1	136.1	0.42	3.9	1.5	134.9	0.08	3.8	1.9	12	LD
RWBQNH	136.8	134.9	134.5	135.3	135.4	0.30	3.7	1.0	134.9	0.09	4.6	1.0 L	12	TH
TWPG9L	135.7 L	133.7 L	135.7 L	136.5 L	135.4	0.31	0.6	1.2	136.6	0.38	1.0	1.8	12	TH
VTWDHC	134.4	132.4	132.1	140.3	134.8	0.20	3.7	3.8	134.3	-0.02	4.0	2.4	12	LD
VXCL7B	101.0 XH	139.1	144.3	144.7	132.3	-0.22	11.0	21.0 H	138.1	0.62	7.3	12.4	12	LZ
WEDUFA	136.8	137.4	138.2	137.1 L	137.4	0.63	3.5	0.6 L	138.0	0.61	3.7	1.8	12	LC
X93D6C	133.8	133.8	132.5	134.9	133.7	0.03	3.7	1.0	134.9	0.09	4.3	1.4 L	12	LD
XQ7QZ9	135.2	135.1	134.9	136.0	135.3	0.29	3.2	0.5 L	136.6	0.37	3.0	1.5 L	12	LD
YFV3BE	124.3 *	124.9 *	124.5	122.3	124.0	-1.59	3.1	1.2	130.3	-0.67	3.6	4.9	12	EM
Z8J9L6	129.9	132.2	127.1	132.7	130.5	-0.51	4.5	2.5	131.1	-0.55	3.9	1.7	11	LD
ZBJEBH	139.6	107.9 XH	116.1 *H	NO DATA	121.2	-2.04 *	12.3	16.5 H	122.8	-1.92	10.7	17.7 H	6	TU

Consensus (All Labs) Results									
Wk Mean	135.00	133.72	133.69	134.74	Month Mean	133.56		Grand Mean	134.37
Avg SDr	3.87	3.61	4.48	4.48	Avg SD	4.90		Avg SD	5.61
SD btwn Labs	4.97	4.41	6.93	6.69	SD btwn Labs	6.04		SD btwn Labs	6.04
Labs Incd	40	41	44	43	SD btwn Wks	4.94		SD btwn Wks	6.35
Labs Exclcd	7	6	3	3	Labs Incd	44		Labs Incd	45
Labs not Rcvd	0	0	0	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	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

Report #646

July 2023

STFI, 42 lb Linerboard - 42H2

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	
29RL2L	23.7	24.1	24.4	24.2	L	24.1	0.52	1.4	0.3	23.9	0.17	1.7	0.3	L 16	LA
2HWT7	25.3	25.2	H 24.6	25.0		25.0	1.40	2.5	0.3	24.2	0.48	1.9	1.0	16	LA
2PUFKE	24.4	24.1	24.5	24.2		24.3	0.72	1.9	0.2	24.5	0.70	1.9	0.3	L 16	LZ
4C3R3C	24.5	H 23.7	24.6	L 24.7		24.3	0.76	1.8	0.4	22.5	-1.11	1.9	1.4	12	LA
4MQCXA	23.4	23.1	23.7	L 22.7	L	23.3	-0.31	1.6	0.4	23.1	-0.59	1.8	0.4	16	LY
4ZQBK7	23.8	No DATA	22.4	24.3		23.5	-0.11	1.7	1.0	23.5	-0.20	1.7	0.5	9	LU
4ZQBK7_AL	23.0	No DATA	22.5	23.6		23.0	-0.53	1.6	0.6	23.4	-0.31	1.6	0.5	9	AL
67CMYZ	25.6	* 24.4	24.7	24.9		24.9	1.31	1.9	0.5	25.4	1.61	1.9	1.0	16	LA
6HPMU8	22.2	L 22.6	23.3	L 23.7		23.0	-0.61	1.6	0.7	23.3	-0.36	1.9	1.1	16	LA
6KRL6Z_AL	23.9	24.2	23.0	23.3		23.6	0.03	1.8	0.5	23.7	0.01	1.7	0.7	16	AL
6NRWZZ	20.2	X 21.7	23.9	18.9	XL	21.2	-2.34	* 1.6	2.2	H 21.2	-2.37	* 1.6	1.9	16	LY
6T86NZ	22.4	21.0	* 21.1	* 22.0		21.6	-1.92	2.1	0.7	23.9	0.14	2.1	1.7	16	LA
7JVJNB	24.1	22.8	23.4	23.2		23.4	-0.19	1.8	0.5	23.7	0.01	2.2	0.7	12	XX
7KMH39	23.6	L 24.5	L 24.0	L 24.7	L	24.2	0.60	0.3	0.5	24.6	0.78	0.5	0.6	16	LZ
7VNXUY	23.8	23.6	23.9	22.6		23.5	-0.09	2.1	0.6	24.4	0.65	1.9	1.3	16	LA
8TFAM8	24.8	L 24.6	25.1	24.6	L	24.8	1.19	1.6	0.2	24.5	0.72	1.5	0.8	16	LA
94DJW3	22.2	21.5	20.9	* 20.5	X	21.3	-2.26	* 1.8	0.7	21.3	-2.22	* 1.6	0.7	16	XX
9AJ4U8	25.4	25.1	25.2	25.0		25.2	1.58	1.4	0.2	25.2	1.41	1.4	0.5	16	LH
9M4LMB	21.9	22.5	22.7	H 22.6		22.4	-1.13	2.3	0.3	22.5	-1.10	2.0	0.3	L 12	LU
A64V79_AL	24.8	24.2	24.5	22.9		24.1	0.52	1.8	0.8	24.5	0.69	2.0	1.0	16	AL
A8PXP2	24.1	L 24.2	L 24.4	L 23.8	L	24.1	0.55	0.8	0.2	24.3	0.59	0.8	0.4	16	LH
AYWB93	23.3	H 24.2	H 23.6	24.1		23.8	0.21	2.8	0.4	25.5	1.66	2.3	1.7	16	LH
B87ZL2_AL	23.6	25.4	25.0	25.1		24.8	1.17	1.8	0.8	25.5	1.63	1.9	0.6	16	AL
E8DPUV	21.4	* 17.8	X 17.9	X 20.2	X	19.3	-4.18	X 1.5	1.7	20.5	-2.98	X 1.7	2.0	16	LZ
ED7K3U	22.8	22.0	23.6	22.8		22.8	-0.75	1.5	0.7	22.9	-0.71	1.5	0.7	16	LW
EDZGZ3	24.5	23.4	23.6	23.6		23.8	0.19	2.0	0.5	24.1	0.40	2.0	0.6	16	LH
EHVBX4	29.2	XL 22.3	L 20.3	XH 20.5	XL	23.1	-0.50	3.3	4.2	H 23.1	-0.60	3.3	4.2	H 4	LH
EYK6YV	23.1	H 22.3	21.9	23.1		22.6	-0.97	1.9	0.6	22.4	-1.20	1.7	1.1	15	LU
FBCEWN	21.5	* 22.0	21.6	22.7		21.9	-1.60	1.6	0.5	21.9	-1.73	1.6	0.3	L 16	LY
FJ3WBW	21.1	* 22.4	22.1	22.1		21.9	-1.62	1.5	0.6	22.6	-1.03	1.6	0.6	16	XX
FPQTPL_AL	27.5	X 30.0	X 29.6	X 29.6	X	29.2	5.49	X 2.1	1.1	29.2	5.07	X 2.1	1.1	4	AL
H7DJA7	24.2	24.7	24.2	24.0		24.3	0.67	1.8	0.3	24.3	0.58	1.9	0.5	16	BK
HDTHHQ	No DATA	20.1	X 24.0	No DATA		22.0	-1.52	2.0	2.8	23.4	-0.25	1.9	1.3	10	LU
HH67HM	24.8	No DATA	24.3	24.6		24.6	0.98	1.7	0.3	25.0	1.21	1.7	0.6	10	LU
J3MWT3	24.2	25.0	24.2	23.2		24.1	0.56	1.9	0.7	23.3	-0.35	1.7	1.0	16	LU



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

Report #646
July 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
KLD9GM_AL	43.0 XH	45.5 XH	44.0 XH	41.6 XH	43.5	19.61 X	20.3	1.6	47.8	22.39 X	22.6	3.7 H	12	AL
KTCU83	36.0 XH	30.1 XH	48.1 X	24.0	34.5	10.77 X	3.7	10.3 H	25.7	1.84	2.7	7.1 H	16	LZ
LM9BLH_AL	23.3	23.4	24.4	23.5	23.7	0.09	1.6	0.5	23.7	0.03	1.7	0.6	16	AL
LU7Z3M	23.6	22.9	22.7	22.6	22.9	-0.61	1.7	0.5	23.2	-0.52	1.7	0.6	16	LY
MJX2GQ	23.4	23.8	24.8	24.1	24.0	0.43	1.6	0.6	24.2	0.45	1.7	0.7	16	LH
MZMVJG	22.4	23.6	23.0	22.6	22.9	-0.67	1.9	0.5	23.6	-0.13	1.7	0.7	16	LU
NVM4NP	23.6	23.5	23.3	23.6	23.5	-0.09	1.8	0.2	24.0	0.30	1.8	0.7	16	LA
NW8MVG	24.2	24.4	24.2	25.2	24.5	0.91	1.7	0.5	24.4	0.68	2.0	0.7	16	LH
P4FTUR	22.8	24.0	24.6	23.5	23.7	0.15	1.5	0.8	23.1	-0.59	1.6	0.7	16	LH
P77R8P	23.5	24.3	25.3	24.2	24.3	0.74	1.8	0.8	24.4	0.64	1.8	0.7	16	LA
PXA67H	22.9	24.2	24.4	24.2	23.9	0.34	2.0	0.7	24.6	0.82	2.3	1.2	15	LW
QBWGAE	22.8	23.2	23.1	22.5	22.9	-0.68	1.9	0.3	22.4	-1.18	1.8	0.6	16	LY
QBWGAE_AI	23.9	24.4	24.3	23.3	24.0	0.40	1.9	0.5	23.8	0.05	1.8	0.4	16	AL
R7GJ2J	23.6	23.9	25.2	23.3	24.0	0.41	1.9	0.8	23.9	0.19	1.7	0.9	16	LH
RAXQPH	25.8 *	26.2 *	25.9 *	26.2 *	26.0	2.41 *	1.8	0.2	25.8	1.91	1.7	0.5	16	LH
RW6DZL	23.2	22.7	23.4	22.4	22.9	-0.64	1.8	0.4	22.9	-0.75	2.0	0.5	16	LZ
TWPG9L	23.6 L	24.5 L	24.0 L	24.7 L	24.2	0.60	0.3	0.5	24.7	0.88	0.4	0.7	16	LZ
VTWDHC_AI	24.3	23.1	25.4	23.9	24.2	0.60	2.0	1.0	24.3	0.55	1.8	0.6	16	AL
VXCL7B_AL	22.6	22.8 L	22.4	22.8	22.6	-0.91	1.6	0.2 L	22.9	-0.79	1.6	0.8	16	AL
WEDUFA	23.6	23.8	22.8	23.2	23.3	-0.25	1.8	0.4	23.3	-0.34	1.6	0.4	13	LU
X93D6C_AL	24.5	23.9 H	23.7	24.0	24.0	0.43	2.4	0.3	23.7	0.00	1.9	0.4	16	XX
XQ7QZ9_AL	23.8	23.7	22.4	23.9	23.4	-0.14	1.5	0.7	23.8	0.11	1.6	1.0	16	AL
XVDBYD	23.1 H	23.0	22.5 H	22.6	22.8	-0.73	2.6	0.3	23.4	-0.34	2.8	0.6	16	LY
Z8J9L6	22.3	22.0	22.3	22.1	22.2	-1.38	1.9	0.2	22.3	-1.36	1.8	0.3 L	16	LU
ZBJEBH	23.7	23.0 H	24.0 H	No DATA	23.6	-0.02	2.9	0.5	23.9	0.19	2.4	1.1	13	TT
ZCZGA6_AL	24.9	27.9 XL	26.0 *	25.0	25.9	2.32 *	1.9	1.4	25.4	1.54	1.9	0.9	16	XX
ZNNGZ8	23.4	23.5	23.4	24.5	23.7	0.11	2.1	0.5	21.7	-1.88	2.0	2.8 H	13	LY
ZNNGZ8_AL	22.3	22.7	24.0	23.7 H	23.2	-0.39	1.9	0.8	22.0	-1.61	1.7	1.7	13	AL

Consensus (All Labs) Results												
Wk Mean	23.55	23.54	23.73	23.69	Month Mean	23.57	Grand Mean	23.71				
Avg SDr	1.75	1.90	1.92	1.79	Avg SD	1.87	Avg SD	1.85				
SD btwn Labs	1.03	1.06	1.13	0.93	SD btwn Labs	1.02	SD btwn Labs	1.07				
Labs Incl	57	54	58	55	SD btwn Wks	0.91	SD btwn Wks	1.41				
Labs Excl	5	6	5	6	Labs Incl	59	Labs Incl	60				
Labs not Rcvd	1	3	0	2								



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

Report #646
July 2023

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	BK	Buchel Strip Compression Tester BK-155
LA	L&W Autoline (223 Enrollment)	LH	L&W 282
LU	L&W 52 without moisture correction(was 53)	LW	L&W 53 with moisture correction (was 53M)
LY	L&W 152 without moisture correction	LZ	L&W (model not specified)
TT	TMI Short Span Compression, 17-34 (MB K455)	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 224

Report #646

July 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	
29RL2L	35.0	33.6	34.7	34.2	34.4	-0.09	2.1	0.6	34.3	-0.18	2.2	0.7	12	LA
2HWT7	35.0	33.5	35.2 L	34.6	34.6	0.04	1.8	0.8	34.5	-0.06	2.0	0.6	12	LW
2PUFKE	35.1	35.2	35.1	35.2	35.2	0.44	3.0	0.1 L	35.2	0.39	2.8	0.3 L	12	LZ
4C3R3C	36.7	38.6 *H	35.2 H	36.4	36.7	1.48	3.4	1.4	34.0	-0.39	2.7	2.7	12	LA
4MQCXA	32.5	33.5	34.5 L	35.1 L	33.9	-0.40	2.4	1.1	33.4	-0.75	2.3	1.0	12	LZ
4ZQBK7	36.7	No DATA	36.3	36.8	36.6	1.40	2.4	0.2 L	36.2	0.99	2.4	0.5 L	6	LA
4ZQBK7_AL	32.7	No DATA	34.0	35.2	34.0	-0.34	2.1	1.3	34.3	-0.20	1.9	0.9	6	AL
67CMYZ	37.5	35.5	37.2	37.3	36.9	1.60	2.6	0.9	37.1	1.56	2.0	0.7	12	LA
6HPMU8	30.9	33.9	35.8 L	35.2	34.0	-0.37	1.5	2.2	33.2	-0.88	1.6	1.6	12	LA
6KRL6Z_AL	33.0	33.4	32.8	33.5	33.2	-0.87	2.7	0.3	33.6	-0.62	2.2	0.6	12	AL
6NRWZZ	24.4 X	33.2	28.4 X	27.9 X	28.5	-4.04 X	2.5	3.6 H	29.0	-3.47 X	2.3	2.1	12	LW
6T86NZ	34.1	33.7	33.6	34.8	34.1	-0.30	2.5	0.6	35.5	0.56	2.8	1.6	12	LA
7JVJNB	35.5	35.5	35.5	35.9	35.6	0.74	2.2	0.2 L	35.6	0.62	2.4	0.4 L	8	XX
7KMH39	34.5 L	34.8 L	34.7 L	36.0 L	35.0	0.33	0.5	0.7	34.2	-0.25	0.6	1.8	12	LZ
7VNXUY	32.4	36.4	36.9	35.1 H	35.2	0.46	2.9	2.0	35.2	0.40	2.7	1.3	12	LA
8TFAM8	37.7	39.8 XH	39.0 *	45.9 XH	40.6	4.09 X	10.0	3.6 H	37.0	1.47	6.5	3.6	12	LA
94DJW3	32.9 H	32.2	34.2	36.4	33.9	-0.39	3.1	1.8	32.3	-1.43	2.6	1.6	12	XX
9AJ4U8	36.3	36.6	36.3	35.7	36.2	1.17	1.7	0.4	36.6	1.26	1.7	0.4 L	12	LH
9M4LMB	32.9 H	32.5	33.2	34.1	33.2	-0.87	2.6	0.7	33.4	-0.74	2.8	0.7	12	LU
A64V79_AL	34.2	34.3 H	35.2	34.1	34.5	-0.03	2.8	0.5	35.3	0.46	2.5	1.0	12	AL
A8XP2	35.0 L	35.8 L	35.3 L	35.6 L	35.4	0.61	0.8	0.3	35.2	0.37	0.9	0.7	12	LH
AYWB93	34.0	33.2	31.9	32.6	32.9	-1.06	2.5	0.9	37.4	1.76	2.6	3.4	12	LZ
B87ZL2_AL	37.9	38.0 *	34.7	36.7	36.8	1.54	2.7	1.5	37.1	1.57	2.6	1.5	12	AL
E8DPUV	29.7 *L	25.5 X	25.9 X	29.6 X	27.7	-4.59 X	1.8	2.3	28.2	-3.97 X	1.9	3.2	8	LZ
ED7K3U	34.0 L	32.8	32.1	33.0	33.0	-1.01	1.8	0.8	32.9	-1.06	1.8	0.6	12	LW
EDZGZ3	36.1	38.2 *	34.2	35.5	36.0	1.01	2.8	1.7	35.7	0.67	2.8	1.3	12	LH
EHVBX4	38.0 L	32.6 L	31.4 *H	30.7 *L	33.2	-0.88	3.4	3.3 H	33.2	-0.88	3.4	3.3	4	LH
EYK6YV	33.9	34.1	32.8	34.0	33.7	-0.55	2.4	0.6	34.0	-0.38	2.5	0.8	12	LU
FBCEWN	31.6	31.4	31.6 L	31.4 *	31.5	-2.03 *	1.9	0.1 L	32.0	-1.63	2.2	0.8	12	LY
FJ3WBW	30.1 *	32.1	32.2	33.3	31.9	-1.74	2.5	1.4	33.2	-0.87	2.6	1.4	12	XX
FPQTPL_AL	41.7 X	45.2 X	43.9 X	43.4 X	43.5	6.07 X	2.7	1.5	43.5	5.59 X	2.7	1.5	4	AL
H7DJA7	34.8	34.8	35.4	34.9	35.0	0.32	2.1	0.3	35.9	0.82	2.4	1.1	12	BK
HDTHHQ	No DATA	31.5	36.0	No DATA	33.7	-0.52	2.7	3.1	35.5	0.54	2.5	2.0	7	LU
HH67HM	37.8	No DATA	37.3	38.7 *	37.9	2.30 *	2.8	0.7	37.6	1.88	2.7	0.7	6	LU
J3MWT3	36.7 H	37.6	36.8	34.8	36.4	1.30	2.6	1.2	34.7	0.09	2.3	1.6	12	LU



Containerboard Interlaboratory Testing Program

Analysis 224

Report #646

July 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	
KLD9GM_AL	45.7 XH	45.2 XH	45.7 XH	45.1 XH	45.4	7.33 X	18.3	0.3	44.7	6.33 X	19.3	1.3	12	XX
KTCU83	23.9 X	55.9 XH	46.0 X	35.2	40.2	3.84 X	4.3	13.8 H	35.5	0.55	3.4	8.8 H	11	LZ
LM9BLH_AL	34.3	33.6	33.8	34.7	34.1	-0.27	2.2	0.5	34.3	-0.20	2.1	0.7	12	AL
LU7Z3M	32.3	33.3	35.1	34.0	33.7	-0.56	2.2	1.2	33.7	-0.58	2.1	1.0	12	LU
MJX2GQ	34.3	34.4	35.6	35.4	34.9	0.28	2.3	0.7	35.1	0.29	2.3	0.7	12	LH
MZMVJG	32.4	33.1	32.7	32.9	32.8	-1.16	2.3	0.3	33.6	-0.64	2.4	1.3	12	LU
NVM4NP	35.0	35.4	34.3	34.3	34.8	0.17	2.4	0.5	35.4	0.50	2.3	1.2	12	LU
NW8MVG	37.1	36.2	37.1	36.3	36.7	1.47	2.3	0.5	36.5	1.18	2.4	0.9	12	LH
P4FTUR	33.6	33.7	35.2	33.1	33.9	-0.40	1.8	0.9	33.1	-0.91	1.8	1.1	12	LH
P77R8P	36.8	38.3 *	36.9	36.1	37.0	1.68	2.5	0.9	37.5	1.83	2.8	1.0	12	LA
PXA67H	33.6	34.7	32.9	34.9	34.0	-0.34	2.8	0.9	36.2	1.02	3.1	2.9	11	LW
QBWGAE	32.1	31.7	31.9	32.3	32.0	-1.67	2.2	0.3	32.0	-1.59	2.2	0.8	12	LY
QBWGAE_AI	34.0	33.6	34.4	34.0	34.0	-0.35	2.1	0.3	33.9	-0.45	2.1	0.5	12	AL
R7GJ2J	35.6	35.0	35.0	35.1	35.2	0.45	2.4	0.3	35.1	0.31	2.9	0.8	12	LH
RAXQPH	35.2 H	35.0	35.1	34.8	35.0	0.36	2.6	0.2 L	35.4	0.52	2.3	0.7	12	LH
RW6DZL	33.7	33.3	33.0	33.2	33.3	-0.79	2.3	0.3	33.5	-0.68	2.3	0.5	12	LZ
TWPG9L	35.0 L	34.7 L	34.9 L	35.5 L	35.0	0.35	0.5	0.4	33.8	-0.52	0.7	1.7	12	LZ
VTWDHC_AI	35.2	34.6	34.3	35.5	34.9	0.27	2.1	0.5	34.8	0.11	2.1	0.7	12	AL
VXCL7B_AL	42.2 XH	33.2	34.7	32.8	35.7	0.82	2.8	4.4 H	34.4	-0.14	2.6	2.7	12	AL
WEDUFA	33.6	33.6	33.8	34.1	33.7	-0.51	2.2	0.2 L	33.8	-0.48	2.3	0.5 L	12	LU
X93D6C_AL	34.4	34.8	35.1	34.8	34.8	0.17	2.2	0.3	34.5	-0.04	2.3	0.7	12	XX
XQ7QZ9_AL	34.0	33.5	35.1	34.1 L	34.2	-0.22	1.9	0.7	34.2	-0.23	2.0	1.0	12	XX
XVDBYD	34.6 H	33.6 H	34.0 H	33.9 H	34.0	-0.33	4.6	0.4	33.9	-0.41	4.6	0.4 L	12	LY
Z8J9L6	32.2	30.9	32.3	31.3 *	31.7	-1.90	2.6	0.7	32.1	-1.54	2.4	0.6	12	LU
ZBJEBH	34.2	35.5 H	34.7 H	No DATA	34.8	0.20	3.8	0.7	35.0	0.27	5.3	0.9	6	TT
ZCZGA6_AL	37.4	37.0 L	37.4 L	37.1 L	37.2	1.82	1.4	0.2 L	37.1	1.55	1.5	0.7	8	XX
ZNNGZ8	24.4 X	34.0	35.1	36.2	32.4	-1.40	2.9	5.4 H	31.1	-2.15 *	2.6	4.6 H	12	LY
ZNNGZ8_AL	32.8	31.8	32.5	32.4	32.4	-1.43	2.3	0.4	30.3	-2.65 *	2.1	2.4	12	AL

Consensus (All Labs) Results												
Wk Mean	34.44	34.30	34.62	34.65	Month Mean	34.50	Grand Mean	34.59				
Avg SDr	2.52	2.41	2.32	2.40	Avg SD	2.46	Avg SD	2.61				
SD btwn Labs	1.95	1.81	1.65	1.56	SD btwn Labs	1.49	SD btwn Labs	1.60				
Labs Incl	56	55	58	56	SD btwn Wks	1.39	SD btwn Wks	1.92				
Labs Excl	6	5	5	5	Labs Incl	57	Labs Incl	59				
Labs not Rcvd	1	3	0	2								



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

Report #646
July 2023

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	BK	Buchel Strip Compression Tester BK-155
LA	L&W Autoline (224 Enrollment)	LH	L&W 282
LU	L&W 52 without moisture correction (was 53)	LW	L&W 53 with moisture correction (was 53M)
LY	L&W 152 with moisture correction	LZ	L&W (model not specified)
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 #646
July 2023

WebCode	Monthly Results				Cumulative Results				Inst
	Mean	CPV	SD		Mean	CPV	SD Months	Months	
29RL2L	141.5	0.07	4.43	L	151.5	0.66	11.79	4	EV
2HWTH7	137.6	-0.15	16.83		140.0	0.00	8.01	4	LA
2PUFKE	141.7	0.08	13.00		140.2	0.01	2.51	4	LS
4MQCXA	153.2	0.71	7.59		148.9	0.51	3.00	4	EV
4ZQBK7_AL	115.3	-1.36	14.52		114.7	-1.44	0.72	L 3	AL
67CMYZ	155.2	0.81	17.32		159.8	1.14	7.27	4	LA
6KRL6Z_AL	125.5	-0.80	25.93	H	110.7	-1.67	10.15	4	AL
6NRWZZ	127.2	-0.71	6.51	L	130.2	-0.56	4.28	4	LS
6T86NZ	117.0	-1.26	13.06		105.8	-1.95	* 17.16	4	LA
7VNXUY	147.2	0.38	17.47		158.7	1.07	9.84	4	LA
8TFAM8	158.2	0.97	28.39	H	156.5	0.95	4.81	4	LA
A64V79_AL	155.3	0.82	24.40		138.5	-0.08	18.34	4	AL
AYWB93	205.1	3.52	X 34.53	H	181.1	2.35	* 21.88	4	LS
B87ZL2_AL	114.0	-1.43	8.86		116.3	-1.34	4.74	4	AL
E8DPUV	178.0	2.05	* 20.55		44.7	-5.43	X 88.82	H 4	LA
E8DPUV_AL	180.3	2.18	* 20.17		155.1	0.87	19.10	4	AL
EDZGZ3	135.6	-0.26	15.02		138.9	-0.06	3.09	4	EV
EYK6YV	152.6	0.67	19.77		163.9	1.37	18.67	4	EV
FBCEWN	155.3	0.82	7.91		152.0	0.69	3.88	4	EV
FLUVPU	129.6	-0.58	14.10		139.8	0.00	15.53	3	LS
FPQTPL_AL	149.6	0.51	18.14		149.6	0.55	0.00	1	AL
HDTHHQ	119.4	-1.13	15.10		133.0	-0.40	17.05	3	EV
KLD9GM_AL	134.1	-0.34	11.83		131.5	-0.48	6.03	3	AL
MZMVJG	153.8	0.74	19.56		150.7	0.62	4.76	4	EV
PXA67H	129.9	-0.56	16.65		127.0	-0.74	4.06	4	XX
QBWGAE	141.6	0.07	12.86		143.7	0.22	3.81	4	XX
VXCL7B_AL	106.9	-1.81	15.91		116.2	-1.35	8.92	4	XX
Z8J9L6	138.2	-0.11	7.16		134.1	-0.33	5.10	4	EV
ZCZGA6_AL	155.8	0.84	10.04		145.6	0.32	22.66	3	XX
ZNNGZ8_AL	118.1	-1.20	10.05		123.4	-0.94	7.85	4	AL

Consensus (All Labs) Results

Month Mean	140.27	Grand Mean	139.91
Avg SD	16.02	Avg SD Months	11.47
SD btwn Labs	18.40	SD btwn Labs	17.54
Labs Incd	29	Labs Incd	29



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

Report #646
July 2023

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program
 Analysis 229
Roughness - Sheffield Method, 42 lb Linerboard - 42H2
 TAPPI Official Test Method T538

Report #646
July 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
6HPMU8	382.4	0.87	6.24	382.6	0.46	2.61	4	XX
A64V79_AL	369.3	-0.40	3.27 L	364.5	-0.80	3.45	4	AL
B87ZL2_AL	370.7	-0.27	11.54	325.9	-3.48 X	85.28 H	4	AL
E8DPUV_AL	367.4	-0.59	6.83	368.0	-0.55	0.60 L	3	AL
LM9BLH_AL	379.0	0.54	8.65	376.1	0.01	1.95	4	AL
QBWGAE_AL	369.8	-0.35	9.70	371.5	-0.31	1.81	4	AL
QNGY3J	388.2	1.44	5.43	406.6	2.13 *	25.95	2	TS
QNWDMF	363.7	-0.95	7.63	390.5	1.01	19.70 H	4	TS
R7GJ2J	355.4	-1.76	2.39 L	348.0	-1.94 *	4.90	4	LA
RW6DZL	387.5	1.37	18.63 H	381.6	0.39	9.19	4	XX
VTWDHC_AL	363.6	-0.95	6.24	363.4	-0.87	0.72 L	4	AL
WEDUFA	377.7	0.41	7.80	382.2	0.43	3.76	4	XX
X93D6C_AL	382.0	0.84	5.27	383.0	0.49	1.47 L	4	XX
XQ7QZ9_AL	385.9	1.21	8.01	387.2	0.78	2.44	4	AL
ZCZGA6_AL	373.7	0.03	5.87	376.0	0.00	4.13	3	XX
ZNNGZ8_AL	358.7	-1.43	8.56	358.5	-1.22	0.43 L	4	AL

Consensus (All Labs) Results			
Month Mean	373.44	Grand Mean	375.97
Avg SD	8.44	Avg SD Months	9.08
SD btwn Labs	10.27	SD btwn Labs	14.38
Labs Incl	16	Labs Incl	15

Key to Instrument Codes Reported by Participants

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



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

Report #646
July 2023

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
29RL2L	124.6	-0.34	6.07	123.3	-0.33	2.12	4	TM
2HWTH7	159.8	1.68	10.96	158.4	1.86	5.02	4	HY
4B8V63	104.6	-1.49	4.56	107.5	-1.31	4.10	2	XX
4MQCXA	136.1	0.32	4.72	135.7	0.45	2.53	4	HZ
6HPMU8	107.0	-1.35	4.74	108.8	-1.24	6.19	4	SC
A64V79	133.6	0.18	5.22	135.0	0.40	3.93	4	TM
EDZGZ3	147.6	0.98	11.76	143.2	0.91	3.50	4	TM
EHVBX4	149.2	1.07	2.86	149.2	1.29	0.00	1	HY
EYK6YV	133.4	0.17	10.92	120.4	-0.51	8.67	4	TM
FLUVPU	153.4	1.32	7.30	144.2	0.97	9.20	3	HY
HDTHHQ	91.6	-2.23 *	10.06	92.3	-2.26 *	4.44	3	TM
HQWQDM	147.0	0.95	9.77	144.7	1.00	2.77	4	TM
KLD9GM	148.8	1.05	17.12 H	139.9	0.70	30.98 H	3	SC
LM9BLH	126.4	-0.23	5.08	125.7	-0.18	2.83	4	TM
MZMVJG	126.4	-0.23	6.80	126.0	-0.16	4.60	4	TM
NVM4NP	123.2	-0.42	3.56	124.3	-0.27	1.37	4	HZ
QBWGAE	119.8	-0.61	3.27	123.4	-0.32	2.47	4	TM
VTWDHC	117.1	-0.77	3.41	117.4	-0.69	0.78 L	4	TM
VXCL7B	116.0	-0.83	17.13 H	110.2	-1.15	5.69	4	TM
WEDUFA	145.1	0.84	8.34	148.6	1.25	2.74	4	HY
X93D6C	147.4	0.97	9.02	138.9	0.64	5.77	4	HY
XQ7QZ9	139.4	0.51	5.41	77.9	-3.16 X	40.99 H	4	LZ
ZBJEBH	117.0	-0.78	3.15	121.5	-0.44	3.63	4	TM
ZQFFE6	117.3	-0.75	5.32	119.2	-0.58	1.67	4	SC

Consensus (All Labs) Results			
Month Mean	130.49	Grand Mean	128.58
Avg SD	8.36	Avg SD Months	7.96
SD btwn Labs	17.42	SD btwn Labs	16.04
Labs Incl	24	Labs Incl	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	129.38	16.83	1.11	19
Modified Scott Bond Mechanics	148.10	10.53	17.61	3



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

Report #646
July 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 #646
July 2023

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SD	Mean	CPV	SD Months	Months
2HWTH7	26.8	-0.38	4.09	27.4	-0.17	0.91	4
2PUFKE	27.2	-0.25	0.84	27.5	-0.11	0.26	L 4
2XDQN8	27.6	-0.12	0.89	26.4	-0.52	2.67	4
4MQCXA	23.2	-1.54	3.11	27.3	-0.20	3.13	4
4ZQBK7	33.4	1.76	1.82	34.1	2.32 *	0.61	3
6HPMU8	26.8	-0.38	1.30	26.4	-0.54	0.81	4
6KRL6Z	26.6	-0.44	3.21	24.7	-1.14	1.33	4
6NRWZZ	29.2	0.40	1.10	28.7	0.33	0.58	4
8TFAM8	28.2	0.08	0.76	27.1	-0.27	2.40	4
A64V79	31.6	1.18	3.13	31.4	1.33	0.75	4
A8XPX2	26.0	-0.64	1.87	24.9	-1.06	1.63	4
AYWB93	22.0	-1.93 *	0.71	21.0	-2.53 *	1.05	4
B87ZL2	31.8	1.24	1.01	32.1	1.58	0.99	4
EDZGZ3	31.2	1.04	0.30	L 28.6	0.29	2.07	4
EHVBX4	28.2	0.08	3.11	28.2	0.15	0.00	1
EYK6YV	28.4	0.14	1.14	30.1	0.83	1.79	4
FBCEWN	28.6	0.22	1.70	29.6	0.65	0.61	4
FLUVPU	27.8	-0.05	0.84	27.9	0.04	0.14	2
FPQTPL	27.4	-0.18	1.08	27.4	-0.15	0.00	1
HDTHHQ	26.8	-0.38	1.92	28.3	0.20	2.48	3
HH67HM	24.6	-1.09	1.82	29.1	0.49	4.24	3
KLD9GM	32.6	1.51	5.05	H 33.7	2.19 *	0.99	3
MZMVJG	32.6	1.50	2.61	27.0	-0.30	6.25	H 4
PXA67H	30.0	0.66	3.94	27.5	-0.13	1.75	4
Q7JUHV	25.8	-0.70	1.30	25.6	-0.81	0.28	2
QBWGAE	21.8	-2.00 *	2.28	25.4	-0.90	2.60	4
RW6DZL	31.1	1.02	5.22	H 30.5	1.00	3.76	4
VEGFBQ	25.4	-0.83	3.29	27.1	-0.28	1.18	4
VTWDHC	25.6	-0.77	3.44	24.0	-1.42	1.31	4
VXCL7B	32.9	1.61	2.56	31.4	1.34	1.26	4
WC6ZGP	25.8	-0.70	2.05	25.7	-0.79	1.18	4
WEDUFA	24.1	-1.26	0.52	L 25.4	-0.89	1.97	4
X93D6C	29.2	0.40	3.96	28.5	0.24	2.19	4
XQ7QZ9	30.4	0.79	1.14	27.5	-0.13	2.81	4
Z8J9L6	18.2	-3.16 X	0.45	L 26.1	-0.65	5.48	H 4



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

Report #646
July 2023

Consensus (All Labs) Results			
Month Mean	27.96	Grand Mean	27.80
Avg SD	2.52	Avg SD Months	2.34
SD btwn Labs	3.09	SD btwn Labs	2.71
Labs Incl	34	Labs Incl	35

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program
Analysis 237

Report #646
July 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
2HWTH7	33.3	0.64	2.67	34.3	1.42	1.59	4	LP
2PUFKE	32.4	-0.02	2.41	32.4	0.10	0.40	4	LP
2XDQN8_AL	33.8	0.97	1.82	33.7	1.02	0.19	L 4	AL
4MQCXA	32.9	0.37	1.94	34.0	1.24	1.97	4	LP
4ZQBK7	33.8	1.03	2.73	33.3	0.74	0.97	3	GG
4ZQBK7_AL	31.9	-0.38	1.73	32.3	0.03	0.46	3	AL
67CMYZ	32.2	-0.13	2.27	32.4	0.08	1.46	4	LA
6KRL6Z_AL	30.4	-1.47	1.70	30.3	-1.40	0.12	L 4	AL
6NRWZZ	25.8	-4.84	X 2.78	30.2	-1.44	3.06	H 4	XX
6T86NZ	30.8	-1.17	1.70	31.6	-0.44	1.36	4	LA
7VNXUY	33.1	0.46	2.32	32.5	0.20	1.70	4	LA
8TFAM8	32.0	-0.30	1.55	30.9	-0.93	0.82	4	LA
A64V79_AL	30.9	-1.13	1.24	31.8	-0.35	1.35	4	AL
AYWB93	30.6	-1.37	2.59	29.8	-1.70	4.23	H 4	TD
B87ZL2_AL	31.7	-0.57	2.68	30.9	-0.97	0.61	4	AL
BAT26U	30.7	-1.26	1.78	30.7	-1.10	0.95	4	LP
E8DPUV_AL	30.3	-1.59	1.56	30.7	-1.09	1.39	3	XX
EDZGZ3	31.6	-0.61	1.75	32.3	0.04	0.48	4	LP
EYK6YV_AL	32.3	-0.10	2.13	32.9	0.47	0.85	4	AL
FLUVPU	32.5	0.03	0.59	L 32.3	0.03	0.60	3	LP
FPQTPL_AL	36.0	2.58	* 2.33	36.0	2.60	* 0.00	1	AL
HDTHHQ_AL	32.8	0.25	1.51	32.3	0.01	0.35	4	AL
HH67HM	33.6	0.87	1.58	32.9	0.45	0.62	3	GG
KLD9GM_AL	31.8	-0.47	1.54	32.1	-0.14	0.40	3	AL
KTAABL	24.3	-5.94	X 2.91	29.0	-2.29	* 3.20	H 4	GG
LM9BLH_AL	32.3	-0.11	1.85	32.5	0.16	0.32	4	AL
MZMVJG	33.3	0.66	3.06	33.8	1.11	1.40	4	GA
P77R8P	34.4	1.43	1.43	32.9	0.43	1.24	4	LP
PXA67H	35.7	2.39	* 3.37	34.0	1.26	1.19	4	LP
QBWGAE	33.5	0.79	2.74	32.7	0.29	0.86	4	LP
QBWGAE_AL	34.1	1.20	3.02	34.6	1.62	0.88	4	AL
R7GJ2J	29.5	-2.13	* 2.04	29.6	-1.83	2.44	4	LA
RAXQPH	31.2	-0.89	2.49	31.3	-0.69	1.12	4	XX
RW6DZL	33.8	0.99	3.78	H 34.1	1.28	0.88	4	GA
UGRV8C	32.7	0.18	2.60	32.7	0.33	0.48	4	LP
VTWDHC_AL	31.4	-0.74	2.16	31.1	-0.81	0.87	4	AL
WC6ZGP	32.8	0.28	4.46	H 32.0	-0.19	1.06	4	TD
WEDUFA	31.4	-0.72	2.97	32.0	-0.19	1.01	4	TP
X93D6C	30.9	-1.15	1.97	31.9	-0.25	2.06	4	TP



Containerboard Interlaboratory Testing Program
Analysis 237

Report #646
July 2023

Air Resistance, 42 lb Linerboard - 42H2

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
X93D6C_AL	32.6	0.14	1.35	32.0	-0.20	0.95	4	XX
XQ7QZ9_AL	33.0	0.45	1.78	33.1	0.60	1.47	4	AL
Z8J9L6	32.7	0.22	1.77	32.7	0.35	1.48	4	LP
ZBJEBH	32.8	0.28	3.41	30.6	-1.15	1.72	4	GA
ZCZGA6_AL	31.9	-0.37	1.86	32.9	0.43	0.84	3	XX
ZNNGZ8_AL	33.1	0.47	2.42	33.5	0.88	0.65	4	AL

Consensus (All Labs) Results			
Month Mean	32.42	Grand Mean	32.25
Avg SD	2.32	Avg SD Months	1.44
SD btwn Labs	1.37	SD btwn Labs	1.42
Labs Incd	43	Labs Incd	45

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 #646
July 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						
29RL2L	58.1	60.8	56.0	59.8	L	58.7	0.16	2.8	2.1	58.7	0.23	3.1	1.3	16	LC				
2HWH7	58.8	60.3	59.9	59.5	H	59.6	0.49	4.4	0.6	58.4	0.13	3.7	0.9	16	XX				
2PUFKE	58.2	L	58.4	58.6	58.0	58.3	0.03	2.0	0.3	L	58.1	0.00	2.2	0.3	L	16	LD		
328YGF	60.6	61.6	65.3	*H	63.7	62.8	1.60	4.5	2.1	61.6	1.34	4.4	2.2	16	TX				
3RWWVE	59.0	56.5	H	58.7	54.0	57.0	-0.41	4.8	2.3	56.9	-0.45	4.1	4.3	H	16	LD			
4MQCXA	58.5	56.7	60.5	58.9	58.6	0.15	4.4	1.6	58.2	0.03	3.9	1.2	16	LZ					
67CMYZ	59.2	57.3	58.5	61.4	59.1	0.31	3.2	1.7	59.6	0.60	4.0	1.9	16	TU					
6KRL6Z	61.3	58.9	54.4	H	54.7	57.3	-0.31	4.8	3.4	58.0	-0.01	4.3	2.4	16	LZ				
7JVJNB	57.9	60.9	59.0	59.8	59.4	0.41	3.2	1.2	61.7	1.38	3.9	2.5	12	LD					
7VNXUY	53.6	54.5	54.8	53.2	54.0	-1.47	4.1	0.8	54.5	-1.34	3.9	2.9	16	MB					
8TFAM8	57.6	57.5	55.3	58.0	H	57.1	-0.39	3.5	1.2	57.1	-0.38	3.8	1.5	16	MB				
94DJW3	58.9	L	58.7	L	59.0	L	58.9	L	58.9	0.23	0.6	0.1	L	57.8	-0.09	0.6	1.4	16	TU
9AJ4U8	54.4	54.9	52.3	53.2	53.7	-1.57	2.2	1.1	53.8	-1.60	3.0	1.4	16	LD					
9ZD8Z3	59.0	59.3	59.2	59.4	59.2	0.36	1.7	0.2	L	58.0	-0.02	1.7	1.3	16	MB				
A64V79	58.1	57.0	55.7	60.2	57.8	-0.16	4.2	1.9	56.1	-0.75	3.6	2.1	16	LD					
A8XP2	60.1	58.5	60.2	65.0	61.0	0.97	3.7	2.8	62.2	1.56	4.0	2.1	16	LD					
BAT26U	54.4	60.0	59.9	58.7	58.3	0.02	4.0	2.6	58.5	0.16	4.0	1.8	16	LD					
E8DPUV	54.0	57.3	57.3	54.6	55.8	-0.83	4.0	1.7	56.6	-0.54	3.5	1.6	16	LD					
FBCEWN	57.0	59.2	55.9	57.5	57.4	-0.28	2.9	1.4	59.6	0.56	4.1	2.0	16	EN					
FJ3WBW	59.1	L	60.4	L	62.9	L	58.0	60.1	0.66	1.2	2.1	60.7	1.00	1.4	1.6	16	XX		
FLUVPU	No DATA	No DATA	No DATA	56.8	56.8	-0.49	2.7	0.0	57.5	-0.22	3.7	1.3	3	LD					
H7DJA7	58.9	57.7	55.5	57.9	57.5	-0.25	2.8	1.4	57.6	-0.19	3.5	1.3	16	LZ					
HDTHHQ	64.2	*	59.2	63.7	64.5	62.9	1.64	3.4	2.5	60.7	1.00	3.8	2.2	15	LC				
HGTTDQ	54.9	53.9	55.7	54.7	54.8	-1.18	2.6	0.7	55.0	-1.16	2.6	2.4	16	EM					
HT39KV	59.1	58.9	58.4	57.4	58.5	0.09	2.7	0.8	58.9	0.30	3.3	0.7	16	LD					
HY93EQ	60.8	60.7	L	60.5	L	60.4	L	60.6	0.84	1.5	0.2	L	60.8	1.05	1.9	1.0	16	LC	
J3MWT3	50.9	*H	52.0	*	57.4	H	56.6	54.2	-1.39	5.8	3.2	54.8	-1.23	5.4	3.7	16	LD		
KKG7ZX	60.5	65.7	*H	66.3	*	67.2	*	64.9	2.33	*	4.6	3.0	64.9	2.59	*	4.6	3.0	4	LD
KKLA4P	63.1	L	63.8	62.5	64.1	L	63.4	1.81	1.8	0.7	62.4	1.65	3.2	1.5	16	TB			
KTCU83	60.7	58.8	60.6	59.8	60.0	0.62	3.7	0.9	59.5	0.55	4.0	1.5	14	LD					
LU7Z3M	56.9	H	57.3	H	60.3	57.9	58.1	-0.04	7.2	1.5	57.4	-0.25	6.2	2.3	16	LD			
MJX2GQ	63.4	61.6	64.3	62.9	63.0	1.69	3.3	1.1	61.3	1.24	4.0	2.4	16	LD					
MZMVJG	53.2	55.7	56.2	54.3	54.9	-1.17	3.2	1.4	53.9	-1.60	3.2	1.4	16	LD					
NVM4NP	56.8	54.7	56.1	56.9	56.1	-0.72	3.3	1.0	55.8	-0.88	3.2	0.9	16	LD					
NW8MVG	61.7	60.7	60.6	61.4	61.1	1.01	4.0	0.5	60.8	1.03	4.2	2.4	16	LD					



Containerboard Interlaboratory Testing Program
Analysis 240

Report #646
July 2023

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

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
P4FTUR	57.8	60.6	L 56.9	L 58.1	58.4	0.05	2.2	1.6	57.8	-0.08	2.7	1.0	16	EM
PXA67H	58.7	62.3	57.0	60.5	59.6	0.50	3.7	2.3	62.5	1.68	3.4	3.1	13	LD
QBWGAE	52.4 *	55.4	54.0	53.3	53.7	-1.55	3.6	1.3	53.0	-1.92	3.2	1.1	16	LD
R67GFK	63.7 *	64.3 *	65.7 *	64.9	64.6	2.24 *	4.0	0.8	60.8	1.03	3.6	2.7	16	LD
R7GJ2J	56.6	53.3	50.7 *	53.0	53.4	-1.67	4.0	2.4	53.5	-1.72	4.3	1.5	16	LD
RAXQPH	53.7	56.1	48.7 *	50.3 *	52.2	-2.08 *	2.8	3.3	55.0	-1.16	3.1	2.7	16	LD
RW6DZL	57.5	56.5	59.4	57.0	57.6	-0.22	3.2	1.2	58.5	0.16	3.2	1.5	16	LZ
RZ6PWL	56.1	56.9	56.9	56.6	56.6	-0.55	2.7	0.4	56.7	-0.53	2.8	0.6	16	TH
TWPG9L	59.2 L	59.1 L	58.7 L	59.8 L	59.2	0.35	0.7	0.5	59.3	0.49	1.0	1.5	16	TH
UGRV8C	58.3	57.3	58.9	58.6	58.3	0.02	3.4	0.7	57.8	-0.09	3.5	1.1	16	LD
VCCMJC	58.0	58.4	58.9	58.8	58.5	0.11	4.2	0.4	56.9	-0.46	3.3	1.5	16	LD
WC6ZGP	57.9	54.8	54.0	56.7	55.8	-0.82	3.1	1.7	55.6	-0.92	4.0	1.5	16	LZ
WEDUFA	59.5	60.5	58.5	61.1	59.9	0.59	3.4	1.1	57.9	-0.06	3.3	2.1	13	LC
X93D6C	60.7	57.3	57.0	60.8	58.9	0.26	4.3	2.1	58.4	0.12	4.0	1.8	16	LD
XQ7QZ9	53.6	53.8	54.5	56.4	54.6	-1.26	2.9	1.3	54.1	-1.51	2.6	1.0	16	LD
ZPJDXF	58.4 L	58.6 L	58.4 L	58.6 L	58.5	0.10	0.7	0.1 L	58.5	0.15	0.6	0.1 L	16	LD
ZQFFE6	56.2	53.8	58.1	55.6	55.9	-0.80	3.9	1.7	55.8	-0.88	3.8	2.4	16	LC

Consensus (All Labs) Results														
Wk Mean	58.06	58.20	58.19	58.44	Month Mean	58.20			Grand Mean	58.07				
Avg SDr	3.61	3.67	3.56	3.30	Avg SD	3.53			Avg SD	3.55				
SD btwn Labs	2.93	2.91	3.55	3.48	SD btwn Labs	2.87			SD btwn Labs	2.64				
Labs Incld	51	51	51	52	SD btwn Wks	1.68			SD btwn Wks	1.95				
Labs Excld	0	0	0	0	Labs Incld	52			Labs Incld	52				
Labs not Rcvd	1	1	1	0										

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program
Analysis 250

Report #646
July 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	
2HWTH7	71.2 H	72.7	71.2	68.9	71.0	0.93	4.2	1.6	70.2	0.51	3.8	1.8	16	XX
2PUFKE	68.4	67.6	68.0	68.7	68.2	0.06	2.3	0.5	68.2	-0.24	2.3	0.4 L	16	LD
6KRL6Z	67.0	65.8	60.9 H	66.0	64.9	-0.94	5.0	2.8	64.7	-1.61	4.6	2.6	16	LZ
9ZD8Z3	65.2 L	65.0 L	65.2 L	65.5	65.2	-0.85	1.6	0.2 L	67.2	-0.67	1.7	1.5	16	MB
A64V79	71.6	67.4	65.3	68.5	68.2	0.07	4.0	2.6	68.6	-0.11	4.1	2.0	16	LD
BAT26U	71.2	72.2	70.1	72.4	71.5	1.07	3.3	1.0	72.4	1.39	3.6	1.8	16	LD
E8DPUV	66.4	63.5	65.1	67.1	65.5	-0.75	3.4	1.6	65.4	-1.34	3.7	1.6	16	XX
FJ3WBW	72.7 L	68.0 L	68.2 L	71.0 L	70.0	0.61	1.2	2.3	70.6	0.67	1.4	1.5	16	XX
H7DJA7	68.5	63.7	64.5	66.7	65.9	-0.65	3.3	2.2	66.3	-1.01	3.3	1.6	16	LZ
HDTHHQ	70.9	73.4	72.9	72.4	72.4	1.35	3.4	1.1	72.2	1.30	3.5	2.2	15	LC
J3MWT3	63.0	67.0	71.9	69.2	67.8	-0.05	4.3	3.8	68.8	-0.05	3.7	3.7	16	LD
PXA67H	65.3	68.0	68.6	65.1	66.7	-0.38	4.3	1.8	67.7	-0.45	3.9	2.8	13	LD
QBWGAE	61.0 *	60.2 H	59.9	58.4 XH	59.9	-2.47 *	6.0	1.1	56.3	-4.91 X	4.0	3.4	16	LD
R7GJ2J	56.0 XH	57.6 *H	57.4 *H	55.8 XH	56.7	-3.44 X	8.6	0.9	59.2	-3.78 X	7.6	5.5 H	16	LD
TWPG9L	64.4 L	64.3 L	65.4 L	65.2 L	64.8	-0.97	0.4	0.6	64.6	-1.65	0.8	1.1	16	TH
UGRV8C	65.4	70.9	NO DATA	NO DATA	68.1	0.04	3.7	3.9	70.3	0.54	3.7	2.4	14	LD
WEDUFA	71.5	68.8	73.9	71.1	71.3	1.02	2.9	2.1	70.8	0.76	3.1	1.8	13	LC
X93D6C	68.9	70.5	71.5	70.4	70.3	0.71	3.9	1.0	71.5	1.04	3.8	1.4	16	LD
XQ7QZ9	71.8	71.5	74.0	70.5	72.0	1.21	3.5	1.5	71.2	0.92	3.0	1.8	16	LD

Consensus (All Labs) Results														
Wk Mean	68.02	67.26	67.43	68.66	Month Mean	67.98			Grand Mean	68.88				
Avg SDr	4.11	4.16	3.80	2.93	Avg SD	3.61			Avg SD	3.33				
SD btwn Labs	3.47	4.24	4.87	2.50	SD btwn Labs	3.28			SD btwn Labs	2.57				
Labs Incl	18	19	18	16	SD btwn Wks	2.02			SD btwn Wks	2.01				
Labs Excl	1	0	0	2	Labs Incl	18			Labs Incl	17				
Labs not Rcvd	0	0	1	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
TH	TMI Compression Tester, Model 17-76	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 #646
July 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	
2HWTH7	45.4	43.6	45.5	42.5	44.2	0.41	3.1	1.4	44.7	0.45	3.2	1.5	16	XX
328YGF	38.6	34.7 X	35.5 *	38.3	36.8	-2.39 *	2.7	2.0	41.2	-1.63	3.3	4.2 H	16	LZ
3RWWVE	41.2	43.2	36.8 *	38.3	39.9	-1.23	3.7	2.9	42.8	-0.68	4.4	2.9	16	LD
8TFAM8	47.3	47.0	45.5	44.2	46.0	1.10	2.8	1.4	47.3	2.00 *	3.5	3.2	16	MB
94DJW3	46.8 L	46.7 L	46.9 L	46.8 L	46.8	1.40	0.5	0.1 L	45.2	0.76	0.7	1.1	16	TU
9LTTX4	45.1 L	42.9	40.9	42.0	42.7	-0.15	1.4	1.8	43.4	-0.32	2.6	1.8	16	TH
9ZD8Z3	42.5	42.1	42.5	42.3	42.4	-0.29	1.5	0.2 L	43.1	-0.49	1.6	0.7	16	MB
BAT26U	41.9	44.5	43.1	47.2	44.2	0.39	3.2	2.3	44.2	0.15	3.0	1.4	16	LD
E8DPUV	39.8	38.6 *	39.4	37.1 *	38.7	-1.66	2.7	1.2	40.6	-2.00 *	3.7	2.9	16	LD
HGTTDQ	37.1 *	37.9 *	39.5 H	40.3 H	38.7	-1.68	5.2	1.5	37.2	-4.03 X	5.9	2.8	16	EM
HT39KV	43.8	43.6	42.9	43.4	43.4	0.11	3.0	0.4	44.0	0.03	2.9	0.6	16	LD
HY93EQ	41.0	41.8	41.7	42.5	41.7	-0.52	2.2	0.6	40.8	-1.87	2.4	1.1	16	XX
KKG7ZX	43.4	43.5	43.0	41.9 H	43.0	-0.06	3.3	0.7	43.0	-0.56	3.3	0.7	4	LD
KKLA4P	43.9	43.0	42.9	42.3	43.0	-0.04	2.7	0.7	42.2	-1.03	2.9	1.5	16	XX
KTCU83	47.8	48.8	43.6	46.9	46.8	1.38	3.7	2.3	46.5	1.55	3.8	1.9	14	LZ
NVM4NP	42.1	47.2	45.7	42.8	44.4	0.50	2.4	2.4	43.9	-0.01	2.6	1.8	16	LD
NW8MVG	46.1	42.9	41.7	42.7	43.4	0.09	3.7	1.9	44.4	0.32	3.1	1.6	16	LD
P77R8P	41.4	45.3	43.2 H	39.8	42.4	-0.27	3.9	2.4	42.7	-0.74	3.1	1.7	16	LD
R67GFK	46.0	46.1 H	47.8	46.1	46.5	1.28	3.6	0.9	45.3	0.86	3.3	3.0	16	EM
RAXQPH	45.7	45.2	46.7	46.0	45.9	1.05	2.9	0.6	46.9	1.79	2.8	1.8	16	LD
RW6DZL	42.7 H	44.7	43.3	41.2	43.0	-0.06	3.4	1.5	43.5	-0.21	3.2	1.7	16	LD
RZ6PWL	37.2 *	38.7 *	37.8	37.6	37.8	-2.00 *	2.0	0.6	37.0	-4.11 X	2.3	1.0	16	TH
TWPG9L	43.7 L	43.6 L	44.0 L	45.1 L	44.1	0.36	0.4	0.7	44.1	0.09	1.0	0.9	16	TH
UGRV8C	42.3 H	41.0	43.6	43.7	42.6	-0.19	3.8	1.3	42.8	-0.68	3.6	1.6	16	LD
VCCMJC	43.2	44.3	45.0	44.5	44.3	0.43	2.2	0.7	45.3	0.81	2.9	0.9	16	LC
WEDUFA	40.3 H	44.6	43.2	41.7	42.4	-0.26	3.2	1.8	44.0	0.07	3.8	2.2	13	LC
X93D6C	46.2	48.2	44.1	45.4	46.0	1.07	2.4	1.7	45.0	0.67	2.9	1.6	16	LD
XQ7QZ9	45.2	45.0	44.9	44.5	44.9	0.67	3.1	0.3	44.3	0.23	3.0	0.9	16	LD
ZPJDXF	44.8 L	44.7 L	44.6 L	44.5 L	44.6	0.57	0.5	0.1 L	44.6	0.43	0.5	0.1 L	16	LD

Consensus (All Labs) Results									
Wk Mean	43.19	43.87	42.93	42.81	Month Mean	43.12	Grand Mean	43.90	
Avg SDr	2.96	2.82	2.87	3.08	Avg SD	2.94	Avg SD	2.99	
SD btwn Labs	2.87	2.69	2.93	2.79	SD btwn Labs	2.65	SD btwn Labs	1.67	
Labs Incl	29	28	29	29	SD btwn Wks	1.47	SD btwn Wks	1.90	
Labs Excl	0	1	0	0	Labs Incl	29	Labs Incl	27	
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 #646
July 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 #646
July 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
2PUFKE	14.5 L	14.6	14.3	14.2	14.4	0.83	1.2	0.2	14.5	0.83	1.2	0.2 L	16	LA
4C3R3C	14.4	15.3	14.8	14.6 L	14.8	1.42	1.4	0.4	13.7	-0.43	1.3	0.8	12	LA
67CMYZ	15.6	13.1	13.5 L	13.7	14.0	0.04	1.1	1.1 H	14.9	1.42	1.9	1.3	16	LA
7VNXUY	15.2 L	14.2	14.0 L	14.4	14.5	0.91	0.9	0.5	14.1	0.17	2.0	0.8	16	LA
8TFAM8	16.3 *H	15.9 *H	15.8 *H	16.0 XH	16.0	3.60 X	3.4	0.2	15.0	1.60	2.0	0.8	16	LA
9M4LMB	13.9	13.9	13.6	14.2 H	13.9	-0.07	1.5	0.2	13.7	-0.40	1.4	0.4	8	LU
A64V79	13.5 L	14.8	14.1 H	13.3	13.9	-0.03	2.0	0.7	14.1	0.14	1.4	0.6	16	LA
A8XP2	14.6 L	14.4 L	14.3 L	14.6	14.5	0.90	0.6	0.2	14.5	0.71	0.6	0.4	16	LH
E8DPUV	13.1	10.6 X	10.6 X	12.6	11.7	-3.92 X	1.2	1.3 H	12.4	-2.50 *	1.1	1.2	16	LZ
FJ3WBW	12.5 *	13.1	12.6	12.5	12.7	-2.21 *	0.9	0.3	13.1	-1.42	1.2	0.8	16	XX
FLUVPU	No DATA	No DATA	No DATA	13.2	13.2	-1.24	1.1	0.0	13.1	-1.35	1.0	0.1 L	3	LH
KTCU83	21.3 XH	12.4 *	21.4 X	12.5	16.9	5.19 X	1.7	5.1 H	14.5	0.69	1.4	3.7 H	10	XX
L2YKXM	14.3	14.2	14.0	13.8	14.1	0.22	1.5	0.2	14.1	0.12	1.3	0.5	16	TX
MZMVJG	13.5	13.0	13.1	13.0	13.1	-1.41	1.1	0.2	14.0	-0.05	1.1	0.7	16	LU
NW8MVG	15.5	14.5	14.5	13.9	14.6	1.16	1.2	0.7	14.6	0.92	1.1	0.5	16	XX
P4FTUR	14.5	13.9	13.7	14.3	14.1	0.28	0.9	0.4	13.9	-0.19	1.0	0.4	16	LH
P77R8P	14.2	14.0	14.7	14.2 L	14.3	0.63	1.0	0.3	14.5	0.80	1.1	0.7	16	LH
QBWGAE	13.3 L	13.3	13.3	13.2	13.3	-1.15	1.2	0.0 L	12.9	-1.67	1.3	0.5	12	LB
RW6DZL	13.6	13.6	13.4	13.7	13.6	-0.66	0.9	0.1	13.6	-0.65	1.1	0.5	16	LZ
RWBQNH	13.2 L	13.2	12.8	13.6	13.2	-1.36	1.1	0.3	13.6	-0.63	1.1	0.5	16	TX
TWPG9L	14.1 L	14.2 L	14.3 L	14.0 L	14.2	0.37	0.3	0.1	14.4	0.54	0.4	0.6	16	LZ
VCCMJC	14.9	15.0	14.4	14.3	14.6	1.23	1.1	0.4	14.4	0.56	1.1	0.4	16	LH
VTWDHC	13.9 L	13.8	14.1	14.6	14.1	0.29	1.1	0.4	14.5	0.73	1.1	0.4	16	LA
WEDUFA	14.0	13.9	14.1	13.4	13.9	-0.14	1.1	0.3	14.1	0.08	1.0	0.4	13	LU

Consensus (All Labs) Results													
Wk Mean	14.20	14.01	13.97	13.73	Month Mean	13.94		Grand Mean	14.00				
Avg SDr	1.53	1.20	1.47	1.08	Avg SD	1.15		Avg SD	1.26				
SD btwn Labs	0.91	0.83	0.72	0.67	SD btwn Labs	0.57		SD btwn Labs	0.65				
Labs Incl	22	22	21	23	SD btwn Wks	0.42		SD btwn Wks	0.98				
Labs Excl	1	1	2	1	Labs Incl	21		Labs Incl	24				
Labs not Rcvd	1	1	1	0									



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

Report #646
July 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		