

Containerboard Interlaboratory Testing Program

Participant Summary Report #592 (A) - January 2019

[Introduction to the Containerboard Program](#)

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

Analysis	Sample	Analysis Name
<u>201</u>	<u>BX13</u>	<u>Box Compression Strength, Corrugated Boxes</u>
<u>202</u>	<u>EC11</u>	<u>Edgewise Compressive Strength, Wax (T811), Corrugated Board</u>
<u>203</u>	<u>EC11</u>	<u>Edgewise Compressive Strength by Clamp (T839), Corrugated Board</u>
<u>205</u>	<u>42F1</u>	<u>Mullen Burst of Linerboard, 42 lb Linerboard</u>
<u>206</u>	<u>56A2</u>	<u>Mullen Burst of Linerboard, 56 lb Linerboard</u>
<u>215</u>	<u>42F1</u>	<u>Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard</u>
<u>216</u>	<u>56A2</u>	<u>Ring Crush of Linerboard, Rigid Platen Type, 56 lb Linerboard</u>
<u>223</u>	<u>42F1</u>	<u>STFI of Linerboard, 42 lb Linerboard</u>
<u>224</u>	<u>56A2</u>	<u>STFI of Linerboard, 56 lb Linerboard</u>
<u>228</u>	<u>56A</u>	<u>Roughness - Stylus Method, 56 lb Linerboard</u>
<u>229</u>	<u>42D3</u>	<u>Roughness - Sheffield Method, 42 lb Linerboard</u>
<u>231</u>	<u>35E</u>	<u>Internal Bond Strength, Linerboard, 35 lb Linerboard</u>
<u>234</u>	<u>56A</u>	<u>Coefficient of Static Friction - Inclined Plane, 56 lb Linerboard</u>
<u>237</u>	<u>35E</u>	<u>Air Resistance - Gurley Method, Linerboard, 35 lb Linerboard</u>
<u>240</u>	<u>CM92</u>	<u>Flat Crush Strength (CMT) of Medium, 26 lb Corrugating Medium</u>
<u>250</u>	<u>CM92</u>	<u>Fluted Crush of Medium, 26 lb Corrugating Medium</u>
<u>255</u>	<u>CM92</u>	<u>Ring Crush of Medium, 26 lb Corrugating Medium</u>
<u>261</u>	<u>CM92</u>	<u>STFI of Medium, 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; 36 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 lb Corrugating Medium	CM92	January 2018-Current
	CM91	October 2016-December 2017
35 lb Linerboard	35E1	June 2017-Current
42 lb Linerboard	42F1	January 2019-Current
	42D3	November 2017-December 2018
56 lb Linerboard	56A2	January 2018-Current
	56A1	July 2016-November 2017

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, 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 80 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>
-------------	--------------------

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 #592 (A)
January 2019

Top to Bottom Box Compression Strength, Corrugated Boxes - BX13

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
64RNSWA	919.4	0.65	71.36	919.4	0.65	0.00	1	LG
6Q6CRQ	910.2	0.52	76.03	910.2	0.52	0.00	1	LL
7HTDXF	877.4	0.08	59.51	877.4	0.08	0.00	1	ER
83B9KJ	841.8	-0.41	42.22	841.8	-0.41	0.00	1	LS
AEYRDF	962.9	1.24	26.77	962.9	1.24	0.00	1	TC
AWRVQA	714.2	-2.14 *	19.36	714.2	-2.14 *	0.00	1	LS
AYJU69	735.5	-1.85	43.22	735.5	-1.85	0.00	1	LS
BYGLFL	902.4	0.42	16.41	902.4	0.42	0.00	1	ET
C24FWM	773.8	-1.33	63.30	773.8	-1.33	0.00	1	EX
CAEHHM	841.0	-0.42	49.70	841.0	-0.42	0.00	1	ER
ENNAUJ	964.3	1.26	77.27	964.3	1.26	0.00	1	LG
F4B6MK	879.4	0.10	50.79	879.4	0.10	0.00	1	ER
HAZ4G7	816.0	-0.76	33.95	816.0	-0.76	0.00	1	LG
JP2DP6	1,009.9	1.88	102.24	1,009.9	1.88	0.00	1	LH
JUE9CU	849.0	-0.31	65.33	849.0	-0.31	0.00	1	LG
K4GVXY	961.2	1.21	11.88 L	961.2	1.21	0.00	1	TE
KVNMC9	803.4	-0.93	68.05	803.4	-0.93	0.00	1	LL
ML8PK8	931.2	0.81	111.35	931.2	0.81	0.00	1	LS
NKE9N4	847.9	-0.32	32.56	847.9	-0.32	0.00	1	ET
Q6BKQU	833.9	-0.52	54.85	833.9	-0.52	0.00	1	ER
V4J6HU	876.2	0.06	93.71	876.2	0.06	0.00	1	LS
WZMQGP	908.2	0.49	53.51	908.2	0.49	0.00	1	ES
XDGY9N	893.1	0.29	27.08	893.1	0.29	0.00	1	LM
XMQBLL	635.4	-3.21 X	36.57	635.4	-3.21 X	0.00	1	ES

Consensus (All Labs) Results

Month Mean	871.84	Grand Mean	871.84
Avg SD	60.41	Avg SD Months	0.00
SD btwn Labs	73.61	SD btwn Labs	73.61
Labs Incl	23	Labs Incl	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	857.03	80.10	14.81	6
Clip sealing	877.07	73.03	5.23	17



Containerboard Interlaboratory Testing Program
Analysis 201

Report #592 (A)
January 2019

Top to Bottom Box Compression Strength, Corrugated Boxes - BX13

TAPPI Official Test Method T804

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
LS	Lansmont Squeezer	TC	TMI Monitor/Compression Tester, Model 17-37
TE	Testometric M500 - 25 KN		



Containerboard Interlaboratory Testing Program
 Analysis 202
Edgewise Compressive Strength, by T811, Corrugated Board - EC11
 TAPPI Official Test Method T811

Report #592 (A)
January 2019

WebCode	Monthly Results			Cumulative Results					
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst	
83B9KJ	40.7	0.06	2.21	40.5	-0.27	3.60	H	4	LD
AWRVQA	30.3	-2.34 *	2.41	30.1	-3.95 X	1.91		4	EM
AYJU69	44.9	1.05	0.87	43.8	0.89	0.98		4	LC
D7RJZB	38.8	-0.37	0.79	39.9	-0.47	1.10		3	TD
GUN9HD	39.9	-0.12	2.07	41.9	0.23	1.36		4	LC
HAZ4G7	43.1	0.62	1.04	44.0	0.95	0.83		4	TH
JUE9CU	44.0	0.83	2.01	43.3	0.71	0.49		4	LE
NP8F6R	34.9	-1.29	1.38	35.5	-2.02 *	0.98		2	WK
Q6BKQU	38.3	-0.49	3.58	39.6	-0.60	1.03		4	EN
T9JTLV	39.2	-0.29	2.75	37.9	-1.20	1.40		4	XX
WBEL9P	44.2	0.88	3.12	42.7	0.53	2.30		4	LC
XCAMRM	41.5	0.25	1.88	40.5	-0.26	1.14		3	LD
XMQBLL	45.5	1.18	1.18	45.5	1.50	0.00		1	CT

Consensus (All Labs) Results			
Month Mean	40.40	Grand Mean	41.25
Avg SD	2.12	Avg SD Months	1.61
SD btwn Labs	4.31	SD btwn Labs	2.83
Labs Incd	13	Labs Incd	12

Key to Instrument Codes Reported by Participants

CT Con-Ten	EM Emerson 1200 Series
EN Emerson 2200	LC L&W Crush Tester 48
LD L&W Crush Tester 248	LE L&W Crush Tester 840
TD TMI Digital Crush Tester, Model 17-09	TH TMI Monitor/Compression Tester, Model 17-76
WK Zwick Z005 Crush Tester	XX Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 203
Edgewise Compressive Strength by T839, Corrugated Board - EC11
 TAPPI Official Test Method T839

Report #592 (A)
January 2019

WebCode	Monthly Results				Cumulative Results					
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst	
2838RL	55.1	4.96 X	0.49	L	54.7	5.50 X	0.93	4	LD	
64RNWA	46.5	0.93	1.91		44.6	0.20	1.38	4	EM	
6Q6CRQ	46.9	1.11	0.98		44.2	-0.03	1.87	4	LC	
7HTDXF	45.4	0.43	1.37		44.4	0.08	0.82	4	LD	
83B9KJ	44.9	0.17	1.61		46.4	1.17	1.62	4	LD	
8THX84	45.4	0.42	1.56		44.9	0.36	0.71	4	TD	
AR47CR	42.3	-1.02	1.99		64.7	10.72 X	25.38	H	4	LC
AWRVQA	45.0	0.24	0.67	L	42.1	-1.14	2.00	4	EM	
AYJU69	45.6	0.52	2.58		44.8	0.32	0.81	4	LC	
BYGLFL	43.3	-0.57	1.81		42.5	-0.90	0.97	4	EM	
CAEHHM	43.3	-0.55	2.45		43.3	-0.48	0.00	1	LD	
CP7G6F	44.8	0.14	1.60		45.0	0.38	0.12	L	4	LD
D7RJZB	40.2	-2.00 *	0.79		41.6	-1.36	1.29	3	TD	
DFB2QW	45.3	0.39	1.73		44.5	0.15	0.94	4	LD	
E69ZQW	44.1	-0.20	1.10		41.6	-1.36	3.43	2	TK	
ENNAUJ	46.5	0.94	2.12		44.1	-0.05	3.72	4	TJ	
F4B6MK	43.1	-0.64	0.96		42.9	-0.69	0.45	4	EM	
GUN9HD	40.9	-1.69	1.84		42.9	-0.68	1.42	4	LC	
HAZ4G7	45.2	0.34	1.12		45.1	0.48	0.31	L	4	TH
JP2DP6	48.7	1.95 *	1.21		48.8	2.42 *	0.24	2	EM	
JUE9CU	45.0	0.23	1.62		44.8	0.31	0.54	4	LY	
K4GVXY	46.6	1.00	0.67	L	46.1	0.97	0.39	4	LD	
KVNMC9	87.0	19.83 X	2.71		66.0	11.42 X	25.45	H	4	BU
KYK7GR	43.6	-0.43	1.74		42.6	-0.83	0.96	4	LD	
LYLD67	43.2	-0.61	1.31		43.5	-0.39	1.15	4	LD	
MGELUN	45.3	0.39	3.65	H	44.5	0.14	1.26	4	XX	
ML8PK8	52.1	3.55 X	1.97		46.9	1.42	4.45	H	4	TB
MZ8JX2	49.1	2.14 *	2.19		47.4	1.67	5.46	H	4	TD
NKE9N4	44.8	0.13	1.02		42.9	-0.71	1.72	4	TD	
NP8F6R	42.0	-1.17	1.58		42.2	-1.06	0.31	2	WK	
Q6BKQU	39.4	-2.40 *	2.82		41.3	-1.55	1.31	4	EN	
QG2HAK	45.2	0.31	1.37		47.2	1.55	1.64	4	TG	
QPF8CY	44.9	0.21	0.76	L	44.7	0.23	0.48	4	EM	
WBEL9P	45.0	0.22	1.55		45.8	0.85	1.12	4	LC	
WZMQGP	44.2	-0.15	1.20		44.2	0.00	1.51	4	LD	
XCAMRM	40.7	-1.75	2.00		40.2	-2.13 *	0.83	4	LD	
XDGY9N	45.2	0.34	2.47		45.8	0.85	2.38	4	EM	
YXMUFK	45.9	0.63	2.18		43.9	-0.17	1.31	4	LD	



Containerboard Interlaboratory Testing Program
Analysis 203
Edgewise Compressive Strength by T839, Corrugated Board - EC11
TAPPI Official Test Method T839

Report #592 (A)
January 2019

Consensus (All Labs) Results			
Month Mean	44.49	Grand Mean	44.23
Avg SD	1.77	Avg SD Months	1.87
SD btwn Labs	2.14	SD btwn Labs	1.91
Labs Incl	35	Labs Incl	35

Key to Instrument Codes Reported by Participants

BU	Buchel Digital Crush Tester	EM	Emerson 1200 Series
EN	Emerson 2200	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LY	L&W 830
TB	TMI Monitor/Compression Tester, Model 17-70	TD	TMI Digital Crush Tester, Model 17-09
TG	TMI Digital Crush Tester, 17-76	TH	TMI Monitor/Compression Tester, Model 17-76
TJ	TLS Compression Tester, Model CDM-5	TK	TLS Compression Tester, Model 5184
WK	Zwick Z005 Crush Tester	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 205
Bursting Strength (Mullen), 42 Ib Linerboard - 42F1
 TAPPI Official Test Method T807

Report #592 (A)
January 2019

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
2QZLBK	110.9	108.0	108.5	109.8	109.3	-0.37	8.0	1.3	109.3	-0.37	8.0	1.3	4	LC
3A6KTK	108.1	107.2	105.2	105.1	106.4	-1.00	8.7	1.5	106.4	-1.00	8.7	1.5	4	LB
4M89MY	110.7	113.0	112.7	106.5	110.7	-0.05	10.4	3.0	110.7	-0.05	10.4	3.0	4	LC
4ZA2RG	118.3	113.8	108.0	112.2	113.1	0.46	10.2	4.2	113.1	0.46	10.2	4.2	4	AX
7HTDXF	109.5	112.2	112.6	114.1	112.1	0.25	9.1	1.9	112.1	0.25	9.1	1.9	4	AH
82FL7V	113.1	113.5	111.8	110.3	112.2	0.27	9.1	1.5	112.2	0.27	9.1	1.5	4	LA
83B9KJ	100.6 *	104.4	109.5 L	106.9	105.3	-1.24	8.4	3.8	105.3	-1.24	8.4	3.8	4	LA
8GPERC	106.4	107.2	108.3	108.0	107.5	-0.77	7.3	0.9	107.5	-0.77	7.3	0.9	4	AH
8WMGEC	102.6	109.2	100.1 *	104.8	104.2	-1.50	8.5	3.8	104.2	-1.50	8.5	3.8	4	LC
9CQFWE	109.7	108.8	106.0 H	111.0	108.9	-0.46	11.2	2.1	108.9	-0.46	11.2	2.1	4	LC
9DNTEZ	117.2	119.3	115.0	121.3 *	118.2	1.59	9.7	2.7	118.2	1.59	9.7	2.7	4	LC
9ZHDXB	110.4	110.8	110.5	111.3	110.7	-0.05	9.0	0.4 L	110.7	-0.05	9.0	0.4 L	4	LC
AR47CR	116.1	108.0	114.8	111.0	112.5	0.33	10.3	3.7	112.5	0.33	10.3	3.7	4	LA
AWUHDF	106.2	103.8	105.8	104.6	105.1	-1.29	9.9	1.1	105.1	-1.29	9.9	1.1	4	LC
AYJU69	102.6	105.1	107.0	108.1	105.7	-1.16	9.3	2.4	105.7	-1.16	9.3	2.4	4	AH
C24FWM	113.0	100.0 *H	115.8 L	104.2	108.3	-0.60	16.1	7.4 H	108.3	-0.60	16.1	7.4 H	4	AH
CAEHMM	105.0	104.8	104.7	107.7	105.5	-1.20	7.7	1.4	105.5	-1.20	7.7	1.4	4	LZ
CH9MBN	120.0	113.1	115.7	112.8 H	115.4	0.98	12.6	3.3	115.4	0.98	12.6	3.3	4	LA
CHP42B	121.3	122.2 *	124.1 *	123.9 *	122.9	2.63 *	10.7	1.4	122.9	2.63 *	10.7	1.4	4	TB
CP7G6F	111.9	112.1	112.2	111.8	112.0	0.23	6.9	0.2 L	112.0	0.23	6.9	0.2 L	4	LA
CWPMY3	110.1 L	110.3	110.6	111.0	110.5	-0.10	4.6	0.4 L	110.5	-0.10	4.6	0.4 L	4	LJ
D7RJZB	133.5 X	134.0 X	130.5 X	134.0 X	133.0	4.85 X	9.2	1.7	133.0	4.85 X	9.2	1.7	4	XX
DFB2QW	117.1	116.8	95.4 XH	109.1	109.6	-0.30	17.8	10.2 H	109.6	-0.30	17.8	10.2 H	4	LC
F7ZH64	105.1	107.3	108.6	109.2	107.6	-0.75	6.6	1.8	107.6	-0.75	6.6	1.8	4	TP
FHVMHA	112.7	108.8	112.4	114.5	112.1	0.25	11.4	2.4	112.1	0.25	11.4	2.4	4	LC
FJMKQG	115.3	122.4 *	118.1	119.1	118.7	1.71	9.9	2.9	118.7	1.71	9.9	2.9	4	LC
FQPRBB	105.9	106.6	108.5 H	107.3	107.1	-0.86	11.6	1.1	107.1	-0.86	11.6	1.1	4	LC
FTVZU4	111.4	99.5 *	103.7	106.7	105.3	-1.24	8.1	5.0	105.3	-1.24	8.1	5.0	4	LJ
JTKH92	110.5 H	119.1	123.0 *	118.5	117.8	1.50	10.5	5.2	117.8	1.50	10.5	5.2	4	AH
JUE9CU	118.2	119.0	115.1	118.7	117.8	1.49	9.0	1.8	117.8	1.49	9.0	1.8	4	LZ
LYLD67	104.9	106.7	105.8	105.6	105.8	-1.15	7.6	0.7	105.8	-1.15	7.6	0.7	4	LC
N3WBMD	109.5 L	109.1 L	109.5 L	109.6	109.4	-0.34	3.4	0.2 L	109.4	-0.34	3.4	0.2 L	4	LA
N8NEEV	122.2 *	120.6	117.3	120.7 *	120.2	2.03 *	10.9	2.1	120.2	2.03 *	10.9	2.1	4	LA
NAWPBY	107.0	108.2	101.1 *	104.4	105.2	-1.27	8.6	3.1	105.2	-1.27	8.6	3.1	4	LA
PFDKQU	113.4	108.9	112.4	107.2	110.5	-0.11	8.9	2.9	110.5	-0.11	8.9	2.9	4	TB



Containerboard Interlaboratory Testing Program
 Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42F1
 TAPPI Official Test Method T807

Report #592 (A)
January 2019

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
PJDTV4	123.7 *	124.1 *	121.7 *	119.5	122.2	2.48 *	9.6	2.1	122.2	2.48 *	9.6	2.1	4	XX
PQX2BN	109.5	115.0	108.8	113.0	111.6	0.13	9.9	2.9	111.6	0.13	9.9	2.9	4	LJ
PXDDTV	108.4	110.8	109.9	109.9	109.8	-0.27	7.8	1.0	109.8	-0.27	7.8	1.0	4	LA
QTXKU2	103.8	108.4	110.5	107.2	107.5	-0.77	10.7	2.8	107.5	-0.77	10.7	2.8	4	LC
QURAYU	110.3	110.9	109.0	109.8	110.0	-0.21	8.1	0.8	110.0	-0.21	8.1	0.8	4	LC
RDJN7R	111.5	115.4	111.4	No DATA	112.8	0.39	8.4	2.3	112.8	0.39	8.4	2.3	3	LC
UNF7ZR	117.4	117.3	113.3 H	119.8	117.0	1.32	11.5	2.7	117.0	1.32	11.5	2.7	4	LZ
UPND76	114.7	105.1	107.9	116.6	111.1	0.03	9.6	5.4	111.1	0.03	9.6	5.4	4	LP
V39F23	113.6	112.3	111.1	113.1	112.5	0.34	5.8	1.1	112.5	0.34	5.8	1.1	4	LC
VBKC4N	107.4	108.6	108.2	113.1	109.4	-0.36	10.4	2.6	109.4	-0.36	10.4	2.6	4	TB
VQEYC2	116.4	111.6	113.6	110.2	113.0	0.44	6.9	2.7	113.0	0.44	6.9	2.7	4	AH
WEXGBH	107.9 L	107.0 L	107.9 L	108.5 L	107.8	-0.69	2.7	0.6	107.8	-0.69	2.7	0.6	4	LA
WZMQGP	104.0	108.6	103.4	107.0	105.8	-1.15	9.4	2.5	105.8	-1.15	9.4	2.5	4	LA
X3KQUR	103.3	108.1	110.6	112.8	108.7	-0.50	9.9	4.1	108.7	-0.50	9.9	4.1	4	LA
XCAMRM	111.3	109.1	109.1	109.4	109.7	-0.27	7.0	1.0	109.7	-0.27	7.0	1.0	4	LA
XMQBLL	108.7	109.4	112.6	111.6	110.6	-0.09	10.1	1.8	110.6	-0.09	10.1	1.8	4	XX
XPTAYY	109.2	118.9	114.3	113.0	113.9	0.64	8.7	4.0	113.9	0.64	8.7	4.0	4	AA
Y4ANDH	112.5	115.0	112.4	110.6	112.6	0.37	6.4	1.8	112.6	0.37	6.4	1.8	4	XX
YEAWGV	116.2	117.4 L	115.4	115.4	116.1	1.13	5.0	0.9	116.1	1.13	5.0	0.9	4	RE
Z23JJU	107.6	108.2	105.9	105.9	106.9	-0.90	7.3	1.2	106.9	-0.90	7.3	1.2	4	LC

Consensus (All Labs) Results									
Wk Mean	111.00	111.13	110.78	111.19	Month Mean	110.96	Grand Mean	110.96	
Avg SDr	8.80	9.48	9.27	9.05	Avg SD	9.38	Avg SD	9.38	
SD btwn Labs	5.34	5.51	4.94	4.84	SD btwn Labs	4.54	SD btwn Labs	4.54	
Labs Incl	54	54	53	53	SD btwn Wks	3.04	SD btwn Wks	3.04	
Labs Excl	1	1	2	1	Labs Incl	54	Labs Incl	54	
Labs not Rcvd	0	0	0	1					



Containerboard Interlaboratory Testing Program
Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42F1
TAPPI Official Test Method T807

Report #592 (A)
January 2019

Key to Instrument Codes Reported by Participants

AA	Perkins Model A	AH	Perkins Model AH
AX	Perkins Mullen Tester (model not specified)	LA	L&W Bursting Strength Tester
LB	L&W Burst-O-Matic	LC	L&W Autoline
LJ	L&W Bursting Strength Tester J-Type	LP	L&W Bursting Strength Tester P-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 206
Bursting Strength (Mullen), 56 lb Linerboard - 56A2
 TAPPI Official Test Method T807

Report #592 (A)
January 2019

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	
2QZLBK	114.2	114.9	115.0	114.7	114.7	0.45	11.5	0.4 L	111.3	-0.39	10.3	3.4	12	LC
3A6KTK	109.7	104.1	106.5	104.8	106.3	-1.63	9.5	2.5	109.4	-0.94	8.3	3.9	12	LB
4M89MY	106.3	119.1	108.1	110.1	110.9	-0.49	12.3	5.7	112.6	0.03	10.9	4.8	12	XX
4ZA2RG	119.3 H	115.7	119.0	117.4	117.8	1.24	15.9	1.7	115.4	0.85	12.9	3.3	12	AX
7HTDXF	118.7	115.1	115.5	115.0	116.1	0.80	11.2	1.8	117.0	1.35	11.1	3.2	12	AH
82FL7V	113.9	109.9	109.5	111.3	111.2	-0.42	12.6	2.0	111.0	-0.47	11.6	4.0	12	LA
83B9KJ	110.9	107.5	111.6	107.8	109.4	-0.85	12.0	2.1	110.0	-0.78	10.9	3.8	12	LA
8GPERC	111.6	112.2	112.2	112.5 L	112.1	-0.18	7.3	0.4 L	112.5	-0.02	7.3	1.0 L	12	AH
8WMGEC	102.8 *	112.4	125.0 *	118.4 L	114.7	0.45	7.3	9.5 H	110.2	-0.71	8.8	7.0	12	LC
9CQFWE	117.9	108.8	110.5	104.1	110.3	-0.62	12.9	5.8	109.2	-1.01	12.5	3.5	12	LC
9DNTEZ	124.0	117.4	120.3	119.6	120.3	1.86	11.9	2.7	115.8	0.98	12.0	4.4	12	LC
9ZHDXB	116.2	108.1	108.0	106.6	109.7	-0.78	12.1	4.4	112.0	-0.18	11.5	4.8	8	LC
AR47CR	110.8	109.6	115.0	112.1	111.9	-0.24	10.2	2.3	112.9	0.11	10.5	4.1	12	LA
AWUHDF	107.5	109.8	113.2	105.8	109.1	-0.94	10.0	3.2	109.3	-0.98	9.3	3.0	8	LC
AYJU69	109.9	111.0	106.7	113.5	110.3	-0.64	8.2	2.8	106.8	-1.73	9.6	4.0	12	AH
C24FWM	109.4	109.8	110.8	106.6	109.2	-0.92	10.9	1.8	108.9	-1.11	11.3	2.8	12	AH
CAEHMM	110.9	107.6	106.1	108.1	108.2	-1.17	11.5	2.0	108.6	-1.19	11.6	3.2	12	LZ
CH9MBN	123.2	111.9	108.4	111.4	113.7	0.22	12.6	6.5	114.4	0.55	12.4	5.0	12	LA
CHP42B	123.4	115.7 H	120.4 H	121.9	120.3	1.86	16.1	3.3	119.6	2.12 *	11.9	5.6	12	TB
CP7G6F	115.1	115.5	115.0	114.5	115.0	0.53	10.8	0.4 L	114.5	0.58	9.7	0.6 L	12	LA
CWPMY3	113.5 L	114.0 L	114.4 L	113.6 L	113.9	0.25	3.9	0.4 L	113.9	0.40	3.4	0.4 L	8	LJ
D7RJZB	147.5 X	145.5 X	141.5 X	143.0 X	144.4	7.83 X	9.5	2.7	123.5	3.30 X	12.3	15.9 H	12	XX
DFB2QW	126.4 *	121.4	112.3	113.4	118.4	1.37	11.6	6.7	115.6	0.91	10.6	4.7	12	LC
F7ZH64	112.7	110.9	112.8	112.1	112.1	-0.18	7.6	0.9	112.1	-0.13	8.6	1.0 L	12	TP
FHVMHA	110.7	115.7	119.5	122.2	117.0	1.04	12.1	5.0	112.7	0.03	10.9	4.6	12	LA
FJMKQG	116.8	110.1	114.2	117.1	114.5	0.41	15.4	3.3	112.7	0.03	13.2	4.5	12	LC
FQPRBB	122.1	106.1	113.9	114.4 H	114.1	0.31	14.7	6.5	114.4	0.56	13.2	4.3	12	XX
FTVZU4	114.6	100.0 *	112.8	110.1	109.4	-0.86	10.0	6.5	109.6	-0.88	12.1	5.3	8	LJ
JTKH92	117.4	123.7 *	124.0 *	124.1 *	122.3	2.35 *	13.7	3.3	118.6	1.83	12.0	4.4	12	AH
JUE9CU	112.8	111.2	116.1	108.9	112.3	-0.15	11.0	3.0	113.2	0.21	10.3	3.7	12	LZ
LYLD67	110.7	114.7	113.1	105.7	111.1	-0.45	11.4	3.9	110.6	-0.60	11.5	4.6	12	LC
N3WBMD	112.5 L	112.9 L	111.8 L	112.8	112.5	-0.09	4.9	0.5 L	112.4	-0.03	4.3	0.4 L	8	LA
N8NEEV	119.2	124.1 *	118.3	114.2	118.9	1.51	9.7	4.0	120.3	2.35 *	11.2	3.4	12	LA
NAWPBY	110.5	102.8	96.7 X	112.0	105.5	-1.83	10.6	7.1	106.5	-1.83	11.1	5.0	12	LA
PFDKQU	113.0	110.4	105.5	114.4	110.8	-0.51	12.7	3.9	111.7	-0.25	12.4	3.3	12	TB



Containerboard Interlaboratory Testing Program
 Analysis 206
Bursting Strength (Mullen), 56 lb Linerboard - 56A2
 TAPPI Official Test Method T807

Report #592 (A)
January 2019

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
PJDTV4	123.8	129.9 X	135.1 X	123.8 *	128.1	3.79 X	11.7	5.5	117.5	1.51	11.2	12.0 H	8	XX
PQX2BN	114.8	113.3	122.0	120.1	117.6	1.17	9.7	4.2	112.7	0.05	11.3	5.2	12	LJ
PXDDTV	115.9	116.8	111.9	114.6	114.8	0.48	7.7	2.1	114.8	0.67	8.0	2.1	12	LA
QTXKU2	103.1	107.8	108.9	107.7	106.8	-1.49	10.4	2.6	108.1	-1.34	12.2	3.9	12	LC
RDJN7R	110.5	115.5	114.9	No DATA	113.6	0.20	10.5	2.8	114.7	0.66	10.4	4.9	7	LC
UNF7ZR	116.4	120.8	118.6	119.7	118.9	1.50	12.6	1.9	119.1	1.98 *	12.0	2.8	12	LZ
UPND76	107.2	104.3	106.9	110.4	107.2	-1.41	11.2	2.5	110.7	-0.57	10.9	3.2	12	LP
VBKC4N	105.9	114.3	107.0	108.7	109.0	-0.96	10.5	3.7	109.0	-1.07	11.0	2.9	11	TB
VQEYC2	116.1	105.0	110.6	117.0	112.2	-0.17	11.0	5.6	112.0	-0.16	10.4	4.3	10	AH
WEXGBH	116.9 L	115.3 L	118.2 L	120.6 L	117.8	1.22	3.1	2.2	126.6	4.24 X	90.6	28.5 H	12	LA
WZMQGP	114.9	116.0	103.8	117.2	113.0	0.03	10.1	6.2	110.2	-0.72	10.0	4.8	12	LA
X3KQUR	112.9	114.4	110.0	108.9	111.6	-0.32	12.0	2.5	112.0	-0.16	11.4	2.5	12	LA
XCAMRM	108.2	112.9	112.5	111.6	111.3	-0.39	7.2	2.1	110.5	-0.62	7.0	3.2	12	LA
XPTAYY	105.8 H	110.5	111.0	111.2	109.6	-0.80	12.6	2.6	111.6	-0.30	11.9	3.4	12	XX
Y4ANDH	119.4	116.2	116.7 L	104.9	114.3	0.36	7.0	6.4	117.7	1.57	6.0	5.4	9	XX
YEAWGV	115.8 L	114.8 L	115.6 L	115.8 L	115.5	0.66	4.6	0.5 L	112.9	0.12	5.6	2.4	12	RE
Z23JJU	103.7	106.1	103.2	109.8	105.7	-1.78	11.3	3.0	108.3	-1.28	10.1	4.1	12	LC

Consensus (All Labs) Results									
Wk Mean	113.72	112.36	113.00	113.06	Month Mean	112.85		Grand Mean	112.55
Avg SDr	11.01	11.24	10.55	10.81	Avg SD	10.92		Avg SD	10.59
SD btwn Labs	5.60	5.13	5.11	5.16	SD btwn Labs	4.03		SD btwn Labs	3.31
Labs Includ	51	50	49	50	SD btwn Wks	3.93		SD btwn Wks	4.23
Labs Exclcd	1	2	3	1	Labs Includ	50		Labs Includ	50
Labs not Rcvd	0	0	0	1					

Key to Instrument Codes Reported by Participants

AH	Perkins Model AH	AX	Perkins Mullen Tester (model not specified)
LA	L&W Bursting Strength Tester	LB	L&W Burst-O-Matic
LC	L&W Autoline	LJ	L&W Bursting Strength Tester J-Type
LP	L&W Bursting Strength Tester P-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 - 42F1
 TAPPI Official Test Method T822

Report #592 (A)
January 2019

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	
2QZLBK	85.7	88.2	88.1	90.5	88.1	-0.41	3.2	2.0	88.1	-0.41	3.2	2.0	4	LD
3A6KTK	93.6	94.8	92.6	94.7	93.9	1.06	3.0	1.0	93.9	1.06	3.0	1.0	4	LC
3G63AH	90.9	91.9	89.3	90.2	90.6	0.21	3.3	1.1	90.6	0.21	3.3	1.1	4	LD
4ZA2RG	77.9 X	77.4 *	78.0 *	75.9 X	77.3	-3.16 X	4.3	1.0	77.3	-3.16 X	4.3	1.0	4	LC
7HTDXF	90.2	88.3	88.1	87.4	88.5	-0.32	2.8	1.2	88.5	-0.32	2.8	1.2	4	LD
83B9KJ	89.5	91.8	90.0	90.0	90.3	0.15	2.4	1.0	90.3	0.15	2.4	1.0	4	LD
8THX84	94.1 L	90.3 L	91.7 L	95.5 L	92.9	0.80	0.7	2.3	92.9	0.80	0.7	2.3	4	TD
8WMGEC	90.5	87.5	90.3	91.6	90.0	0.06	3.4	1.7	90.0	0.06	3.4	1.7	4	LD
9CQFWE	93.4	89.9	86.8	89.5	89.9	0.04	2.8	2.7	89.9	0.04	2.8	2.7	4	LC
AR47CR	82.7 H	79.5 *H	90.2 H	83.4 H	84.0	-1.47	7.0	4.5 H	84.0	-1.47	7.0	4.5 H	4	LC
AWUHDF	89.4	91.5	88.3	89.8	89.8	0.00	3.1	1.3	89.8	0.00	3.1	1.3	4	LD
AYJU69	91.8 L	92.4	91.7	91.4	91.8	0.52	2.1	0.4	91.8	0.52	2.1	0.4	4	LC
BZBCJE	80.3 *	78.6 *	80.4 *	77.9 X	79.3	-2.65 *	2.6	1.3	79.3	-2.65 *	2.6	1.3	4	TH
CAEHHM	88.7	90.2	90.7	89.7	89.8	0.01	2.6	0.9	89.8	0.01	2.6	0.9	4	LD
CBNTQC	93.0	92.8	91.2	92.6	92.4	0.68	3.0	0.8	92.4	0.68	3.0	0.8	4	TH
CH9MBN	97.0	100.5 *	98.0	98.9 *	98.6	2.25 *	2.9	1.5	98.6	2.25 *	2.9	1.5	4	LD
CHP42B	106.3 X	107.1 X	104.9 X	105.7 X	106.0	4.13 X	3.4	0.9	106.0	4.13 X	3.4	0.9	4	LX
CP7G6F	89.6	90.1	89.8	90.0	89.9	0.03	1.8	0.2 L	89.9	0.03	1.8	0.2 L	4	LD
CWPMY3	90.1 L	90.0 L	90.4 L	90.2 L	90.2	0.11	1.0	0.2 L	90.2	0.11	1.0	0.2 L	4	LD
DFB2QW	88.4	88.1	90.3	89.3	89.0	-0.18	2.0	1.0	89.0	-0.18	2.0	1.0	4	LD
E69ZQW	88.2	86.7	91.0	87.6	88.4	-0.35	3.9	1.9	88.4	-0.35	3.9	1.9	4	MZ
F7ZH64	85.5	88.5 H	85.5 H	90.1	87.4	-0.60	6.9	2.3	87.4	-0.60	6.9	2.3	4	TJ
FHVMHA	88.9	87.9	88.9	89.4	88.8	-0.25	2.2	0.6	88.8	-0.25	2.2	0.6	4	LD
FTVZU4	91.1	92.2	94.4	90.5	92.1	0.59	3.0	1.7	92.1	0.59	3.0	1.7	4	LD
JUE9CU	87.2	90.2	88.4	87.2	88.3	-0.38	3.3	1.4	88.3	-0.38	3.3	1.4	4	LG
K3PUX4	92.5	91.9	92.5 L	92.1	92.3	0.64	2.0	0.3 L	92.3	0.64	2.0	0.3 L	4	MB
K4GVXY	93.4	95.2	94.7	94.8	94.5	1.21	2.0	0.7	94.5	1.21	2.0	0.7	4	LD
LNZE89	74.1 X	72.0 X	74.5 X	75.3 X	74.0	-4.01 X	2.4	1.4	74.0	-4.01 X	2.4	1.4	4	RS
LYLD67	89.3	88.9	90.1	90.5	89.7	-0.01	2.5	0.7	89.7	-0.01	2.5	0.7	4	LD
N3WBMD	89.7	84.6	81.9	90.8	86.7	-0.76	3.0	4.2	86.7	-0.76	3.0	4.2	4	LZ
N8NEEV	96.0	94.0	98.0	97.4	96.3	1.67	2.9	1.8	96.3	1.67	2.9	1.8	4	LD
NAWPBY	89.0	80.2	88.4	89.7	86.8	-0.74	3.3	4.5 H	86.8	-0.74	3.3	4.5 H	4	LZ
PFDKQU	96.5	93.3	93.7	83.8	91.8	0.53	3.6	5.5 H	91.8	0.53	3.6	5.5 H	4	LD
PQX2BN	93.5	87.5	97.6	93.2	93.0	0.82	2.7	4.1	93.0	0.82	2.7	4.1	4	LD
PXDDTV	87.8	89.5	89.8	90.7	89.4	-0.08	2.1	1.2	89.4	-0.08	2.1	1.2	4	LD



Containerboard Interlaboratory Testing Program
 Analysis 215
Ring Crush, 42 lb Linerboard - 42F1
 TAPPI Official Test Method T822

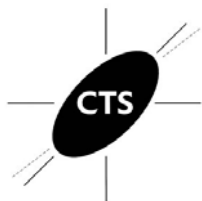
Report #592 (A)
January 2019

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
Q6BKQU	86.0	84.8	81.1	85.3	84.3	-1.38	2.7	2.2	84.3	-1.38	2.7	2.2	4	EN
QG2HAK	88.6	89.0	88.9	90.0	89.1	-0.16	2.3	0.6	89.1	-0.16	2.3	0.6	4	TH
QPF8CY	86.8	86.2	84.3	85.0	85.6	-1.06	3.1	1.1	85.6	-1.06	3.1	1.1	4	EM
QTXKU2	90.2	90.6	90.2	90.0	90.3	0.13	2.9	0.3 L	90.3	0.13	2.9	0.3 L	4	LC
QURAYU	98.6 *H	95.7 H	101.0 *	99.0 *H	98.6	2.24 *	6.3	2.2	98.6	2.24 *	6.3	2.2	4	LC
RDJN7R	92.8	93.1	93.2	No DATA	93.0	0.83	2.7	0.2 L	93.0	0.83	2.7	0.2 L	3	LD
TRX4VA	82.9	85.3	No DATA	No DATA	84.1	-1.44	3.2	1.6	84.1	-1.44	3.2	1.6	2	EX
UNF7ZR	89.4	86.2	90.6	89.8	89.0	-0.19	2.6	1.9	89.0	-0.19	2.6	1.9	4	LC
VQEYC2	92.1	94.9	96.1	96.8	95.0	1.33	3.7	2.1	95.0	1.33	3.7	2.1	4	LC
WBEL9P	87.0	86.9	86.5	86.8	86.8	-0.75	2.3	0.2 L	86.8	-0.75	2.3	0.2 L	4	LC
WEXGBH	82.5 L	82.6	83.2	83.2	82.9	-1.75	1.8	0.4	82.9	-1.75	1.8	0.4	4	TU
WWKURV	94.2	95.7	92.7	96.4	94.7	1.27	3.6	1.7	94.7	1.27	3.6	1.7	4	LD
XCAMRM	87.6	85.9	86.4	85.4 L	86.3	-0.87	2.2	0.9	86.3	-0.87	2.2	0.9	4	LD
XWRYDH	89.9	91.8	91.9	93.4	91.8	0.51	3.7	1.4	91.8	0.51	3.7	1.4	4	MB
Y4ANDH	77.0 XH	80.0	87.1	86.5	82.7	-1.80	4.1	5.0 H	82.7	-1.80	4.1	5.0 H	4	LD
YEAWGV	87.2	86.9	87.6	86.3	87.0	-0.70	3.3	0.6	87.0	-0.70	3.3	0.6	4	LZ
YYFP3U	87.6	93.5	95.1 L	92.7	92.2	0.63	3.0	3.2	92.2	0.63	3.0	3.2	4	MB

Consensus (All Labs) Results														
Wk Mean	89.81	89.07	89.93	90.41	Month Mean	89.75			Grand Mean	89.75				
Avg SDr	3.23	3.16	3.24	3.20	Avg SD	3.22			Avg SD	3.22				
SD btwn Labs	3.83	4.79	4.60	3.87	SD btwn Labs	3.94			SD btwn Labs	3.94				
Labs Incl	48	50	49	46	SD btwn Wks	2.12			SD btwn Wks	2.12				
Labs Excl	4	2	2	4	Labs Incl	49			Labs Incl	49				
Labs not Rcvd	0	0	1	2										

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
EX	Emerson (model not specified)	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	TD	TMI Digital Crush Tester, Model 17-09
TH	TMI Compression Tester, Model 17-76	TJ	TLS Compression Tester, Model CDM-5
TU	TMI Universal Crush Tester (TMI K440)		



Containerboard Interlaboratory Testing Program

Analysis 216

Report #592 (A)

January 2019

Ring Crush, 56 lb Linerboard - 56A2

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	
2QZLBK	140.3	139.9	136.6	142.0 L	139.7	0.01	3.8	2.3	138.6	-0.03	4.5	2.5	12	LD
3A6KTK	153.1	150.2	152.0	152.9	152.0	1.85	4.2	1.3	148.0	1.20	4.3	3.6	12	LC
3G63AH	141.6	140.6	136.9	142.5	140.4	0.12	4.4	2.5	142.8	0.52	4.5	2.5	12	LD
4ZA2RG	129.6	128.0	126.2	121.6 *	126.3	-1.97 *	6.6	3.5	122.3	-2.15 *	8.8	5.5	12	LC
7HTDXF	137.8	137.8	136.9	137.2	137.4	-0.32	4.7	0.5 L	135.8	-0.38	4.5	1.5	12	LD
83B9KJ	136.5	137.4	137.0	142.4	138.3	-0.19	5.1	2.8	137.0	-0.23	4.9	2.8	12	LD
8THX84	143.5 L	145.8 L	142.0 L	145.5 L	144.2	0.68	1.1	1.8	142.8	0.53	1.6	2.6	12	TD
8WMGEC	142.5	147.6	148.2	150.2	147.1	1.12	5.7	3.2	145.9	0.93	7.5	3.7	12	LD
9CQFWE	141.1	140.5	130.2	130.9	135.7	-0.58	3.5	5.9	134.5	-0.56	3.3	3.8	12	LC
AR47CR	127.5 H	133.6 H	131.0 H	130.8 H	130.7	-1.31	16.3	2.5	137.0	-0.23	13.8	9.4	12	LC
AWUHDF	143.9	141.5	142.3	137.8 L	141.4	0.27	4.4	2.6	141.6	0.37	4.4	3.0	8	LD
AYJU69	145.3	144.6	143.9	141.2	143.8	0.62	5.0	1.8	144.0	0.68	4.7	1.7	12	LC
BZBCJE	120.8 *	124.9 *	120.0 *	125.6	122.8	-2.49 *	4.8	2.8	119.7	-2.49 *	4.8	5.6	12	TH
CAEHHM	139.9	136.5	137.7	136.7	137.7	-0.28	4.7	1.6	137.8	-0.13	5.0	1.7	12	LD
CBNTQC	147.1	147.0	146.5 L	143.8	146.1	0.97	3.3	1.6	145.2	0.84	4.5	1.6	12	TH
CH9MBN	157.6 *	155.6 *	154.2	158.2 *	156.4	2.50 *	4.9	1.8	154.0	1.99 *	4.9	2.2	12	LD
CHP42B	169.1 X	168.2 X	170.2 X	172.0 X	169.9	4.50 X	5.4	1.6	165.7	3.52 X	5.6	5.2	12	LY
CP7G6F	142.8	143.7	143.7	142.6	143.2	0.54	3.6	0.6 L	143.1	0.57	3.4	0.5 L	12	LD
CWPMY3	139.6 L	139.7 L	139.2 L	139.6 L	139.5	-0.01	1.7	0.2 L	139.9	0.14	1.2	0.4 L	8	LD
DFB2QW	132.5	136.4	134.6	134.4	134.5	-0.76	3.8	1.6	134.1	-0.61	3.7	1.3 L	12	LD
E69ZQW	141.2	131.5	144.2	133.3	137.6	-0.30	4.3	6.1	127.0	-1.54	4.5	12.6 H	8	MZ
F7ZH64	134.4	138.8 H	131.2 H	137.8 H	135.5	-0.60	14.8	3.4	138.1	-0.09	10.9	3.2	12	TJ
FHVMHA	134.5	138.9	136.3	138.4	137.0	-0.38	3.8	2.0	138.7	-0.01	4.4	2.4	12	LD
FTVZU4	141.5	143.9	147.8	146.4	144.9	0.79	4.5	2.8	147.3	1.12	5.2	3.6	8	LD
JUE9CU	136.8	142.1	136.4	132.6	137.0	-0.39	4.1	3.9	137.9	-0.11	4.1	3.5	12	LY
K3PUX4	144.8	145.4	147.8	146.2	146.0	0.96	3.9	1.3	146.0	0.95	3.9	1.3 L	4	MB
K4GVXY	143.1	144.9 L	143.9 L	143.7	143.9	0.64	2.2	0.7	143.4	0.61	3.0	1.0 L	12	LD
LNZE89	117.1 *L	120.8 *	120.6 *L	119.0 *L	119.4	-3.00 X	2.3	1.7	120.3	-2.41 *	4.3	2.7	12	RS
LYLD67	138.7	138.7	141.7	136.4	138.9	-0.11	4.1	2.2	138.3	-0.06	4.4	2.3	12	LD
N3WBMD	142.3	139.2	135.5 L	145.0	140.5	0.14	3.5	4.1	142.4	0.48	3.7	3.7	8	LZ
N8NEEV	147.1 L	143.7	146.8	149.0	146.6	1.05	4.1	2.2	144.7	0.77	4.1	2.4	12	LD
NAWPBY	144.1	138.2	134.2 L	139.1	138.9	-0.10	4.2	4.1	135.4	-0.44	7.0	10.0 H	12	LZ
PFDKQU	153.9	154.7 *	151.3	132.1	148.0	1.25	5.4	10.7 H	146.2	0.98	5.0	7.4	12	LD
PQX2BN	146.7	143.2	152.1	146.7	147.2	1.13	4.0	3.7	146.8	1.05	5.1	3.5	12	LD
PXDDTV	135.3	139.1	No DATA	140.8	138.4	-0.18	4.3	2.8	138.0	-0.10	4.3	2.3	11	LD



Containerboard Interlaboratory Testing Program
 Analysis 216
Ring Crush, 56 lb Linerboard - 56A2
 TAPPI Official Test Method T822

Report #592 (A)
January 2019

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	
Q6BKQU	130.7	131.5	127.9	128.4	129.6	-1.48	4.8	1.7	129.5	-1.21	4.1	1.5	12	EN
QG2HAK	146.3	145.3	145.8	145.9	145.8	0.93	3.8	0.4 L	143.3	0.60	4.2	3.2	12	TH
QPF8CY	130.7	130.4	131.6	128.4	130.3	-1.38	5.8	1.3	127.9	-1.42	5.4	2.5	12	EM
QTXKU2	139.3	132.6 H	136.7	137.8	136.6	-0.44	6.4	2.9	140.8	0.27	5.2	3.7	12	LC
RDJN7R	148.1	148.2	147.3	No DATA	147.9	1.23	5.3	0.5 L	145.0	0.81	5.0	2.7	8	LD
TRX4VA	140.1	135.0	No DATA	No DATA	137.6	-0.30	6.2	3.6	137.9	-0.11	6.0	3.3	6	EX
UNF7ZR	136.6	131.3	136.2	138.5	135.6	-0.59	5.0	3.1	135.7	-0.40	4.6	2.8	12	LC
VQEYC2	126.7 H	144.5	140.1	145.9	139.3	-0.04	8.7	8.8 H	140.9	0.29	6.9	5.3	10	LC
WBEL9P	137.6	135.9	136.8	136.7	136.7	-0.42	4.1	0.7	137.4	-0.18	3.7	0.9 L	12	LC
WEXGBH	133.9	132.6 L	133.3	132.7	133.1	-0.96	2.8	0.6	132.5	-0.82	2.7	1.7	12	TU
WWKURV	144.3	142.1	145.6	148.5	145.1	0.83	5.0	2.7	147.0	1.07	4.5	3.2	12	LD
XCAMRM	132.2	134.6	130.1 L	133.6	132.6	-1.03	3.3	2.0	133.9	-0.64	3.7	2.1	12	LD
XWRYDH	143.7	148.2	141.7	143.2 H	144.2	0.69	6.5	2.8	138.1	-0.08	7.3	10.7 H	12	MB
Y4ANDH	119.7 *	126.7	138.3	133.1	129.5	-1.50	4.1	8.0 H	125.6	-1.72	4.4	7.5	12	LD
YEAWGV	130.7	131.4	131.7	130.7	131.1	-1.25	3.7	0.5 L	133.2	-0.73	3.6	5.8	12	LZ
YYFP3U	No DATA	145.5	150.7	143.5	146.6	1.04	4.5	3.7	154.8	2.10 * 5.4	16.0 H	9	MB	

Consensus (All Labs) Results														
Wk Mean	138.88	139.39	139.22	138.95	Month Mean	139.58			Grand Mean	138.75				
Avg SDr	5.44	5.42	5.66	5.28	Avg SD	5.50			Avg SD	5.30				
SD btwn Labs	8.32	7.30	8.02	7.90	SD btwn Labs	6.74			SD btwn Labs	7.65				
Labs Incl	49	50	48	48	SD btwn Wks	3.46			SD btwn Wks	4.94				
Labs Excl	1	1	1	1	Labs Incl	49			Labs Incl	50				
Labs not Rcvd	1	0	2	2										

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
EX	Emerson (model not specified)	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
TD	TMI Digital Crush Tester, Model 17-09	TH	TMI Compression Tester, Model 17-76
TJ	TLS Compression Tester, Model CDM-5	TU	TMI Universal Crush Tester (TMI K440)



Containerboard Interlaboratory Testing Program

Analysis 223

STFI, 42 lb Linerboard - 42F1

TAPPI Official Test Method T826

Report #592 (A)

January 2019

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
3A6KTK	23.4	24.3	24.0	24.0	23.9	0.94	1.8	0.4	23.9	0.94	1.8	0.4	4	LW
3G63AH	22.6	23.8	23.0	23.3	23.1	-0.07	1.6	0.5	23.1	-0.07	1.6	0.5	4	LY
4M89MY	23.9	24.8	24.2	24.0	24.2	1.30	1.9	0.4	24.2	1.30	1.9	0.4	4	XX
4ZA2RG	22.6	23.2	23.4	23.8 L	23.3	0.08	1.4	0.5	23.3	0.08	1.4	0.5	4	LZ
7HTDXF	22.8	22.6	23.2	22.3	22.7	-0.58	1.9	0.4	22.7	-0.58	1.9	0.4	4	LU
82FL7V	23.9	24.2	23.3	34.1 XH	26.4	3.99 X	2.1	5.1 H	26.4	3.99 X	2.1	5.1 H	4	LU
83B9KJ	23.6	23.7	24.1	24.4	24.0	0.96	2.0	0.4	24.0	0.96	2.0	0.4	4	LZ
8GPERC	22.8 L	22.8	22.5	22.6	22.7	-0.63	1.1	0.2	22.7	-0.63	1.1	0.2	4	TT
8WMGEC	23.8	24.7	21.6	23.0	23.3	0.13	1.6	1.3	23.3	0.13	1.6	1.3	4	LA
9CQFWE	24.1	22.0	22.7	22.1	22.7	-0.58	1.6	1.0	22.7	-0.58	1.6	1.0	4	LA
9DNTEZ	23.5	22.6	23.5	22.5	23.0	-0.25	1.5	0.5	23.0	-0.25	1.5	0.5	4	LA
9ZHDXB	21.8 L	22.3 L	21.6 L	21.5 L	21.8	-1.74	0.3	0.3	21.8	-1.74	0.3	0.3	4	LA
AG2VYB	19.5 X	20.6 X	20.2 X	19.2 XH	19.9	-4.18 X	2.2	0.6	19.9	-4.18 X	2.2	0.6	4	TS
AR47CR	23.9	24.8	24.2	24.0	24.2	1.30	1.9	0.4	24.2	1.30	1.9	0.4	4	LU
AWUHDF	23.3	23.8	23.9	24.1	23.8	0.75	1.7	0.3	23.8	0.75	1.7	0.3	4	LA
AYJU69	23.3	23.2	23.2	22.7	23.1	-0.12	1.6	0.3	23.1	-0.12	1.6	0.3	4	LU
BZBCJE	23.8	23.4	23.6 L	23.1	23.5	0.38	1.4	0.3	23.5	0.38	1.4	0.3	4	LH
CAEHHM	23.7	22.8 L	23.8	23.0	23.3	0.20	1.6	0.5	23.3	0.20	1.6	0.5	4	LY
CBNTQC	22.9	23.4	21.5	21.7	22.4	-1.02	2.0	0.9	22.4	-1.02	2.0	0.9	4	LH
CP7G6F	23.2	23.1	23.4	23.0	23.2	-0.03	1.4	0.2	23.2	-0.03	1.4	0.2	4	LA
DFB2QW	22.9 L	23.7 L	23.3	24.0	23.5	0.36	1.2	0.5	23.5	0.36	1.2	0.5	4	LA
F7ZH64	22.6 L	22.4	22.7 L	22.9 L	22.7	-0.67	1.0	0.2	22.7	-0.67	1.0	0.2	4	TT
FHVMHA	25.5 *	24.3	24.1	23.9	24.5	1.60	2.2	0.7	24.5	1.60	2.2	0.7	4	LA
FJMKQG	23.8	22.2	22.9	22.8	22.9	-0.34	1.6	0.7	22.9	-0.34	1.6	0.7	4	LA
FTVZU4	21.1 *	22.4	22.4	21.7	21.9	-1.60	1.8	0.6	21.9	-1.60	1.8	0.6	4	LY
GAKKWA	23.3	22.7	23.3	22.6	23.0	-0.27	1.5	0.4	23.0	-0.27	1.5	0.4	4	LW
JTKH92	23.9	23.4	24.4 L	24.4	24.0	1.08	1.8	0.5	24.0	1.08	1.8	0.5	4	LU
JUE9CU	22.9	22.8	23.7	23.5	23.2	0.05	1.5	0.5	23.2	0.05	1.5	0.5	4	LU
K3PUX4	21.4 *L	22.1 L	22.5 L	24.5 L	22.6	-0.73	0.0	1.4	22.6	-0.73	0.0	1.4	4	BK
K4GVXY	23.8	23.6	23.6	23.1	23.5	0.45	1.8	0.3	23.5	0.45	1.8	0.3	4	LY
LRZP49	23.6 L	22.6 L	23.2	24.0	23.4	0.20	1.4	0.6	23.4	0.20	1.4	0.6	4	LA
LYLD67	23.1	23.4	23.6	23.4	23.4	0.21	1.9	0.2	23.4	0.21	1.9	0.2	4	LA
N8NEEV	23.0	22.4	23.2	22.9	22.9	-0.37	1.9	0.3	22.9	-0.37	1.9	0.3	4	LW
NAWPBY	22.4	21.9	21.1 *	21.4 *	21.7	-1.88	1.7	0.6	21.7	-1.88	1.7	0.6	4	LA
PFDKQU	24.5	23.1	23.9	24.3	23.9	0.94	2.2	0.6	23.9	0.94	2.2	0.6	4	LW



Containerboard Interlaboratory Testing Program

Analysis 223

Report #592 (A)

January 2019

STFI, 42 lb Linerboard - 42F1

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	
PQX2BN	23.1	22.5	22.6	22.7	22.7	-0.59	1.6	0.3	22.7	-0.59	1.6	0.3	4	LA
PXDDTV	23.7	23.1	23.0	22.7	23.1	-0.08	1.7	0.4	23.1	-0.08	1.7	0.4	4	LA
Q6BKQU	21.8	21.8	21.6	22.1	21.8	-1.72	1.5	0.2	21.8	-1.72	1.5	0.2	4	LY
QTXKU2	23.1 H	23.4 H	21.7 H	19.9 XH	22.0	-1.46	5.3	1.6 H	22.0	-1.46	5.3	1.6 H	4	LA
QURAYU	23.4 L	26.0 X	25.9 *	26.0 X	25.3	2.69 *	1.5	1.3	25.3	2.69 *	1.5	1.3	4	LA
RDJN7R	23.2	24.6	23.3	No DATA	23.7	0.63	1.7	0.8	23.7	0.63	1.7	0.8	3	LZ
T4N3DY	23.0	23.2	23.1	18.5 X	22.0	-1.52	1.5	2.3 H	22.0	-1.52	1.5	2.3 H	4	LY
TRX4VA	23.7 L	22.5 L	No DATA	No DATA	23.1	-0.16	0.0	0.8	23.1	-0.16	0.0	0.8	2	TT
UNF7ZR	22.7	21.7	21.4	22.8	22.2	-1.30	1.9	0.7	22.2	-1.30	1.9	0.7	4	LW
UPND76	24.4	23.6	24.6	24.5	24.3	1.37	1.6	0.5	24.3	1.37	1.6	0.5	4	LZ
V39F23	23.4	22.2	25.7 *	24.5	23.9	0.94	1.9	1.5 H	23.9	0.94	1.9	1.5 H	4	LA
VBKC4N	22.4	22.1	22.3	22.6	22.3	-1.07	1.8	0.2	22.3	-1.07	1.8	0.2	4	LZ
VQEYC2	21.3 *	24.1 H	22.9 H	23.9 H	23.0	-0.19	3.2	1.3	23.0	-0.19	3.2	1.3	4	LH
WWKURV	24.6	22.8	23.7	24.6	23.9	0.91	1.5	0.8	23.9	0.91	1.5	0.8	4	LH
X3KQUR	23.9	23.6	22.7	22.7	23.2	0.03	1.5	0.6	23.2	0.03	1.5	0.6	4	LY
XCAMRM	22.2 L	22.8	22.2 L	22.8 L	22.5	-0.87	1.0	0.4	22.5	-0.87	1.0	0.4	4	BK
XPTAYY	22.6	23.1	22.5	22.6	22.7	-0.63	1.7	0.3	22.7	-0.63	1.7	0.3	4	LH
XWRYDH	22.5	24.4	56.7 X	24.6	32.0	11.14 X	2.1	16.5 H	32.0	11.14 X	2.1	16.5 H	4	LA
YXMUFK	25.1 *H	24.3	24.0	23.8	24.3	1.41	2.3	0.6	24.3	1.41	2.3	0.6	4	LH
YYFP3U	36.4 X	23.2	23.4	23.0	26.5	4.17 X	1.9	6.6 H	26.5	4.17 X	1.9	6.6 H	4	LA
Z23JJU	23.8	24.4	24.6	24.9	24.4	1.56	2.1	0.5	24.4	1.56	2.1	0.5	4	LA

Consensus (All Labs) Results												
Wk Mean	23.23	23.18	23.20	23.26	Month Mean	23.19		Grand Mean	23.19			
Avg SDr	1.96	1.87	1.85	1.71	Avg SD	1.87		Avg SD	1.87			
SD btwn Labs	0.88	0.84	1.00	0.91	SD btwn Labs	0.79		SD btwn Labs	0.79			
Labs Incl	54	54	53	49	SD btwn Wks	0.74		SD btwn Wks	0.74			
Labs Excl	2	2	2	5	Labs Incl	52		Labs Incl	52			
Labs not Rcvd	0	0	1	2								

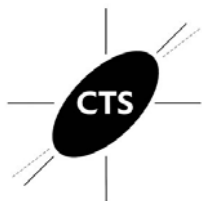


Containerboard Interlaboratory Testing Program
Analysis 223
STFI, 42 lb Linerboard - 42F1
TAPPI Official Test Method T826

Report #592 (A)
January 2019

Key to Instrument Codes Reported by Participants

BK	Buchel Strip Compression Tester BK-155	LA	L&W Autoline
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)	TS	TMI Monitor/STFI Compression Tester, 17-33
TT	TMI Short Span Compression, 17-34 (MB K455)	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 224

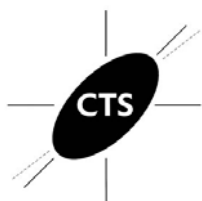
Report #592 (A)

January 2019

STFI, 56 lb Linerboard - 56A2

TAPPI Official Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
3A6KTK	35.0	35.7	35.6	35.7	35.5	0.49	2.7	0.4	35.4	0.70	2.4	0.4	12	ID
3G63AH	34.4	35.2	34.7 L	35.2	34.9	0.11	2.6	0.4	34.7	0.26	2.8	0.7	12	LY
4M89MY	38.3 *	36.5	37.9	37.2	37.5	1.64	2.8	0.8	37.1	1.84	3.1	0.9	12	LU
4ZA2RG	37.2	35.6	36.4	34.8	36.0	0.78	2.7	1.0	35.6	0.87	2.5	1.4	12	XX
7HTDXF	34.4	33.1	33.0	33.4	33.5	-0.71	3.0	0.6	33.0	-0.93	2.8	0.7	12	LU
82FL7V	35.1	37.9 *	34.5	37.2	36.2	0.87	2.8	1.6	36.8	1.62	3.0	1.3	12	LU
83B9KJ	36.2	34.2	33.6	35.9	35.0	0.17	2.7	1.3	35.1	0.48	3.1	1.1	12	LZ
8GPERC	33.7 L	34.2 L	33.8 L	33.2 L	33.7	-0.57	1.2	0.4	33.7	-0.44	1.5	0.4	12	TT
8WMGEC	35.3	36.9	36.3	36.2	36.2	0.87	3.5	0.6	35.8	1.01	3.1	1.1	12	LA
9CQFWE	36.8 L	34.6 L	34.4	33.5	34.8	0.08	1.8	1.4	34.3	-0.05	1.7	1.5	12	LA
9DNTEZ	35.0	34.6	35.0	34.8	34.8	0.09	2.8	0.2 L	34.6	0.17	2.8	1.3	12	LA
9ZHDXB	30.1 *L	30.9 *L	31.5 L	31.6 L	31.0	-2.16 *	0.4	0.7	32.3	-1.37	1.7	1.5	8	XX
AG2VYB	29.9 *	29.3 X	29.6 *	29.6 X	29.6	-2.99 X	3.0	0.2 L	29.6	-3.21 X	3.0	0.2 L	4	TS
AR47CR	38.3 *	36.5	37.9	37.2	37.5	1.64	2.8	0.8	37.0	1.77	3.1	1.1	12	LU
AWUHDF	34.8	35.2	35.2	35.7	35.2	0.32	3.3	0.3	34.8	0.28	2.9	0.9	8	LA
AYJU69	34.1	34.8	35.6	34.1	34.6	-0.03	2.7	0.7	34.3	-0.05	2.6	0.7	12	LU
BZBCJE	33.7	33.5	34.6	34.8	34.1	-0.33	2.6	0.6	33.0	-0.89	2.6	1.4	12	LH
CAEHHM	34.5 L	35.9 L	34.5	34.6	34.9	0.10	1.7	0.7	34.4	0.01	2.1	0.9	12	LZ
CBNTQC	31.4	32.9	31.7	33.2	32.3	-1.41	2.4	0.9	31.1	-2.20 *	2.5	1.5	12	LU
CP7G6F	34.3	34.6 L	34.6 L	34.1	34.4	-0.18	2.1	0.2 L	34.3	-0.01	2.3	0.2 L	12	LA
DFB2QW	33.5 L	36.2	33.4 L	35.6	34.7	-0.01	2.8	1.4	34.0	-0.26	2.5	1.5	12	LA
F7ZH64	33.9 L	33.5 L	33.8 L	33.4 L	33.7	-0.61	1.4	0.2 L	33.6	-0.54	1.7	0.3 L	12	TT
FHVMHA	34.4	34.2	35.2	36.9	35.2	0.28	3.0	1.2	34.9	0.35	3.1	1.2	12	LW
FJMKQG	34.3	33.5	33.8	34.8	34.1	-0.36	2.7	0.6	34.3	-0.05	2.8	0.9	12	LA
FTVZU4	33.2	33.4	31.6 L	33.5	32.9	-1.06	2.5	0.9	34.3	-0.05	2.9	1.6	8	LZ
GAKKWA	34.3	33.9	34.6	33.2 L	34.0	-0.40	2.7	0.6	33.5	-0.59	2.8	0.7	12	LW
JTKH92	36.3	35.9	37.1	38.1 *L	36.8	1.25	3.2	1.0	36.4	1.39	3.2	1.0	12	LU
JUE9CU	33.7 L	34.2 L	33.3 L	33.3 L	33.6	-0.63	1.6	0.4	33.5	-0.55	1.9	1.0	12	LU
K3PUX4	32.2 L	32.5 L	33.4 L	36.2 L	33.6	-0.66	0.0	1.8	33.6	-0.53	0.0	1.8	4	BK
K4GVXY	35.8	35.3	36.5	36.0	35.9	0.71	2.7	0.5	34.0	-0.27	2.4	2.3	12	LY
LRZP49	33.9 L	36.6 L	34.4	33.3 L	34.6	-0.08	2.2	1.5	34.1	-0.20	2.6	1.3	12	LA
LYLD67	35.7	33.6	35.1	34.0	34.6	-0.07	2.5	1.0	34.5	0.12	2.4	0.8	12	LA
N8NEEV	34.5	33.0	32.9	34.0	33.6	-0.64	2.8	0.8	34.0	-0.25	2.7	0.7	12	LW
NAWPBY	32.8	31.0 *	33.1	32.0	32.2	-1.46	2.5	0.9	32.2	-1.44	2.6	1.0	12	LA
PFDKQU	36.3	36.2	38.7 *	36.5	36.9	1.32	2.8	1.2	35.9	1.05	2.7	1.2	12	LW



Containerboard Interlaboratory Testing Program

Analysis 224

Report #592 (A)

January 2019

STFI, 56 lb Linerboard - 56A2

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	
PQX2BN	34.8	35.3	34.1	36.1	35.1	0.22	3.0	0.8	35.3	0.61	3.0	0.9	12	LU
PXDDTV	34.8	34.1	34.1	33.2 L	34.1	-0.38	2.9	0.7	34.0	-0.24	2.6	0.9	12	LA
Q6BKQU	32.9	33.2	31.9	32.7	32.7	-1.19	2.6	0.5	32.2	-1.48	2.6	0.8	12	LY
QTXKU2	33.6 H	34.8 H	33.8 H	33.9 H	34.0	-0.39	11.4	0.6	33.1	-0.85	6.9	1.0	12	LA
RDJN7R	32.7	33.3	32.3	No DATA	32.8	-1.14	2.9	0.5	32.3	-1.38	2.7	1.1	8	LZ
T4N3DY	33.4	33.1	33.6	28.2 X	32.1	-1.55	2.5	2.6	31.4	-2.02 *	2.6	4.2 H	12	XX
TRX4VA	34.1 L	33.4 L	No DATA	No DATA	33.8	-0.55	0.0	0.5	33.6	-0.50	0.0	0.9	6	LZ
UNF7ZR	34.5	31.6	32.2	33.1	32.8	-1.10	2.8	1.3	33.1	-0.85	2.9	1.3	12	LW
UPND76	37.4	38.1 *	37.1	37.9	37.6	1.73	3.0	0.4	38.0	2.44 *	3.3	1.0	12	LZ
V39F23	33.4 L	31.6	33.1	37.0	33.8	-0.54	2.9	2.3	34.8	0.32	2.6	2.1	12	LA
VBKC4N	33.5	33.4	33.6	32.9	33.4	-0.79	2.4	0.3	33.1	-0.86	2.6	0.7	11	LZ
WWKURV	36.5	36.5	36.0	36.5	36.4	1.01	2.4	0.3	36.0	1.11	2.4	0.7	12	LH
X3KQUR	34.7 H	33.7 H	35.0 H	33.1 H	34.1	-0.33	7.9	0.9	34.5	0.13	5.0	1.0	12	LU
XCAMRM	32.6 L	32.3	34.0	33.3 L	33.1	-0.97	1.9	0.8	32.5	-1.26	1.8	0.7	12	BK
XPTAYY	34.2	35.1	35.8	33.4	34.6	-0.05	2.8	1.0	34.5	0.11	2.8	1.2	12	LH
XWRYDH	33.3	38.7 *	47.0 X	36.7	38.9	2.50 *	2.9	5.8 H	36.0	1.14	2.9	3.8 H	12	LA
YXMUFK	36.9	34.0	37.4	36.3	36.2	0.87	3.0	1.5	36.1	1.16	3.1	0.8	12	LH
YYFP3U	49.4 X	35.7	35.3	36.3	39.2	2.64 *	3.6	6.8 H	38.7	2.97 X	3.6	7.2 H	11	LA
Z23JJU	34.4 L	36.5	36.7 L	35.7	35.8	0.67	2.3	1.0	36.0	1.13	3.0	0.9	12	LA

Consensus (All Labs) Results													
Wk Mean	34.43	34.53	34.49	34.83	Month Mean	34.69			Grand Mean	34.35			
Avg SDr	3.15	3.28	3.21	3.27	Avg SD	3.24			Avg SD	2.88			
SD btwn Labs	1.72	1.74	1.83	1.65	SD btwn Labs	1.70			SD btwn Labs	1.48			
Labs Incl	53	53	52	50	SD btwn Wks	1.57			SD btwn Wks	1.36			
Labs Excl	1	1	1	2	Labs Incl	53			Labs Incl	52			
Labs not Rcvd	0	0	1	2									

Key to Instrument Codes Reported by Participants

BK	Buchel Strip Compression Tester BK-155	ID	IDM Compression Tester
LA	L&W Autoline	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)
TS	TMI Monitor/STFI Compression Tester, 17-33	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, 56 lb Linerboard - 56A
 TAPPI Official Test Method T575

Report #592 (A)
January 2019

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
7HTDXF	173.1	0.68	8.99	172.6	0.75	2.48	4	EV
82FL7V	142.4	-0.82	11.17	145.2	-1.18	5.67	4	EV
8WMGEC	153.6	-0.28	19.83	154.3	-0.55	2.98	4	LA
9DNTEZ	168.5	0.45	21.25	168.1	0.43	5.53	4	LA
AR47CR	144.4	-0.72	17.53	139.2	-1.61	5.11	4	EV
CAEHHM	174.4	0.74	13.67	177.5	1.10	4.23	4	EV
CH9MBN	122.8	-1.78	20.19	141.0	-1.48	15.78	H 3	EV
CP7G6F	162.6	0.16	17.18	163.5	0.10	1.01	L 4	XX
J38JNB	136.5	-1.11	7.89	L 143.7	-1.29	6.27	3	EV
K3PUX4	244.6	4.16	X 45.63	H 231.7	4.91	X 18.34	H 3	EV
N8NEEV	161.6	0.11	7.73	L 162.9	0.07	3.36	4	EV
NAWPBY	172.2	0.63	11.93	170.4	0.59	9.40	4	EV
Q6BKQU	184.9	1.25	19.56	175.6	0.96	9.04	4	EV
QTXKU2	189.2	1.46	23.39	186.8	1.75	6.11	3	LA
QURAYU	136.8	-1.09	23.64	138.5	-1.66	5.01	3	LA
UNF7ZR	158.7	-0.03	13.22	166.6	0.32	5.49	4	XX
UPND76	176.3	0.83	21.51	169.2	0.51	6.00	4	LS
VBKC4N	166.7	0.36	9.36	163.5	0.11	4.23	4	LA
VQEYC2	110.2	-2.39	* 14.97	111.7	-3.54	X 2.12	2	EV
XWRYDH	179.3	0.98	27.39	175.1	0.93	2.97	4	LA
Z23JJU	159.3	0.00	27.17	155.2	-0.48	6.42	4	LA
ZH8QXW	170.8	0.56	20.95	170.8	0.62	0.00	1	XX

Consensus (All Labs) Results			
Month Mean	159.25	Grand Mean	161.99
Avg SD	18.10	Avg SD Months	6.44
SD btwn Labs	20.51	SD btwn Labs	14.20
Labs Incd	21	Labs Incd	20

Key to Instrument Codes Reported by Participants

- | | |
|--|--|
| EV Emveco Microgag Model 210-R
LS L&W 263 | LA L&W Autoline
XX Instrument make/model not specified by lab |
|--|--|



Containerboard Interlaboratory Testing Program
 Analysis 229
Roughness - Sheffield Method, 42 lb Linerboard - 42D3
 TAPPI Official Test Method T538

Report #592 (A)
January 2019

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
83B9KJ	375.5	1.40	8.71	374.4	0.82	1.50	4	XX
AWUHDF	399.2	5.36 X	10.66	381.7	1.83 *	15.32 H	3	LA
AYJU69	368.3	0.20	10.56	370.7	0.32	1.70	4	XX
DFB2QW	372.2	0.85	7.15	372.2	0.52	0.00	1	LA
FQPRBB	357.9	-1.53	8.26	356.7	-1.61	1.95	4	LA
FTVZU4	370.2	0.52	7.84	370.2	0.25	0.00	1	SH
LYLD67	357.9	-1.53	8.26	359.2	-1.28	1.31	4	LA
PXDDTV	368.1	0.17	6.94	367.9	-0.08	0.95 L	4	LA
V39F23	369.1	0.33	7.71	366.6	-0.25	3.15	4	XX
ZH8QXW	364.7	-0.40	8.15	364.7	-0.51	0.00	1	XX

Consensus (All Labs) Results			
Month Mean	367.11	Grand Mean	368.42
Avg SD	8.24	Avg SD Months	6.05
SD btwn Labs	5.99	SD btwn Labs	7.26
Labs Incd	9	Labs Incd	10

Key to Instrument Codes Reported by Participants

- LA L & W Roughness Sheffield - Autoline
- SH Sheffield (Bendix Precisionaire)
- XX Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 231
Internal Bond, 35 lb Linerboard - 35E
 TAPPI Official Test Method T569

Report #592 (A)
January 2019

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2QZLBK	172.0	-0.21	9.83	180.8	0.21	10.12	4	SC
4ZA2RG	149.2	-1.18	6.93	145.7	-1.40	2.89	4	SC
7HTDXF	171.0	-0.25	7.91	162.8	-0.62	6.54	4	TM
82FL7V	135.2	-1.78	13.07	137.6	-1.77	7.76	4	TM
9CQFWE	176.2	-0.03	10.52	163.8	-0.57	10.94	4	TM
AR47CR	155.4	-0.92	12.70	157.9	-0.84	6.64	4	TM
AWUHDF	54.5	-5.23 X	2.26 L	55.0	-5.55 X	0.61 L	3	LZ
AYJU69	192.5	0.67	22.93 H	198.0	0.99	6.29	4	HY
CAEHHM	171.8	-0.22	5.63	182.1	0.27	8.54	4	XX
CH9MBN	190.8	0.60	7.95	196.1	0.91	7.57	3	HY
DFB2QW	155.4	-0.92	9.96	164.0	-0.56	10.08	4	TM
DN8WT2	142.6	-1.46	11.46	144.3	-1.46	30.87 H	3	SC
FHVMHA	223.6	2.00 *	16.74	207.6	1.43	12.71	4	HY
FTVZU4	197.0	0.86	9.57	198.5	1.02	6.83	3	HY
NAWPBY	181.0	0.18	8.92	173.7	-0.12	7.00	4	TM
PQX2BN	187.2	0.44	7.19	188.6	0.56	5.20	4	HZ
PXDDTV	178.9	0.09	6.71	176.7	0.02	4.21	4	SC
QTXKU2	207.2	1.30	15.77	210.3	1.56	15.34	3	SC
QURAYU	206.0	1.25	11.94	192.5	0.74	19.09	2	SC
UPND76	178.8	0.08	13.14	178.8	0.11	5.10	4	TM
V39F23	146.0	-1.32	8.57	146.2	-1.38	11.74	4	SC
ZH8QXW	196.0	0.82	9.19	196.0	0.90	0.00	1	XX

Consensus (All Labs) Results			
Month Mean	176.85	Grand Mean	176.28
Avg SD	11.49	Avg SD Months	11.55
SD btwn Labs	23.37	SD btwn Labs	21.86
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	172.10	22.00	4.76	17
Modified Scott Bond Mechanics	208.07	21.97	31.21	2



Containerboard Interlaboratory Testing Program
Analysis 231
Internal Bond, 35 lb Linerboard - 35E
TAPPI Official Test Method T569

Report #592 (A)
January 2019

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), 56 lb Linerboard - 56A
 TAPPI Official Test Method T815

Report #592 (A)
January 2019

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SD	Mean	CPV	SD Months	Months
4M89MY	26.3	-0.40	4.42	25.5	-0.56	1.91	4
7HTDXF	32.2	1.61	2.49	28.5	0.56	2.92	4
82FL7V	29.7	0.76	4.15	26.1	-0.34	2.98	4
83B9KJ	31.4	1.33	1.56	32.6	2.12 *	1.12	4
9DNTEZ	28.4	0.31	2.65	28.8	0.67	0.83	4
AR47CR	24.6	-0.97	2.95	25.8	-0.46	1.42	4
AWUHDF	32.6	1.74	0.89	30.5	1.32	1.86	3
AYJU69	26.5	-0.31	1.78	25.8	-0.45	0.78	4
BZBCJE	30.7	1.10	1.44	30.7	1.41	0.00	1
CAEHHM	25.4	-0.70	1.52	24.8	-0.84	2.79	4
CP7G6F	26.0	-0.50	0.71	26.1	-0.36	0.10 L	4
DFB2QW	21.6	-1.98 *	4.28	25.0	-0.75	2.54	4
DN8WT2	24.2	-1.11	3.11	25.0	-0.76	1.06	3
FHVMHA	24.6	-0.97	3.65	24.2	-1.08	1.59	4
FJMKQG	30.2	0.93	1.48	30.3	1.24	0.34	4
FTVZU4	26.3	-0.40	2.82	26.7	-0.11	0.96	3
N8NEEV	28.2	0.25	0.84	24.5	-0.97	3.68 H	4
NAWPBY	31.4	1.33	3.85	30.6	1.35	0.70	4
PFDKQU	27.2	-0.09	2.17	28.0	0.36	1.37	4
Q6BKQU	28.8	0.46	2.75	26.7	-0.11	2.72	4
QTXKU2	30.3	0.95	3.37	30.8	1.46	0.56	3
QURAYU	22.6	-1.65	1.82	21.9	-1.93 *	0.61	3
UNF7ZR	25.8	-0.57	2.95	25.2	-0.70	1.19	4
UPND76	26.0	-0.51	0.27 L	25.3	-0.64	0.72	4
V39F23	27.8	0.11	1.64	27.9	0.34	0.26 L	4
VBKC4N	24.2	-1.11	0.84	23.8	-1.22	2.33	4
XPTAYY	28.6	0.38	0.89	28.2	0.44	1.48	4

Consensus (All Labs) Results			
Month Mean	27.47	Grand Mean	27.00
Avg SD	2.56	Avg SD Months	1.77
SD btwn Labs	2.95	SD btwn Labs	2.63
Labs Incl	27	Labs Incl	27

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program
Analysis 237

Report #592 (A)
January 2019

Air Resistance, 35 lb Linerboard - 35E

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
4M89MY	29.7	0.39	3.16	28.8	0.07	1.04	4	LA
82FL7V	29.8	0.43	1.28	29.5	0.46	0.48	4	LA
83B9KJ	33.1	2.24 *	3.69	30.2	0.83	2.06	4	GA
8WMGEC	27.8	-0.70	1.51	28.4	-0.12	0.69	4	LA
AR47CR	28.8	-0.12	1.52	29.5	0.47	1.22	4	LA
AWUHDF	30.0	0.51	1.49	30.4	0.95	1.37	3	LA
AYJU69	26.9	-1.16	3.52	28.4	-0.13	1.18	4	TP
CAEHHM	29.3	0.12	2.52	29.5	0.47	1.18	4	LP
CP7G6F	30.5	0.82	2.01	29.4	0.43	0.75	4	LA
DFB2QW	28.3	-0.43	1.67	28.5	-0.07	0.86	4	LA
FHVMHA	30.8	0.97	1.55	31.9	1.72	0.99	4	LP
FTVZU4	30.1	0.56	4.95 H	30.1	0.76	0.00	1	LA
HAZ4G7	30.3	0.68	3.65	29.7	0.59	0.78	4	TL
JGRYRA	33.4	2.42 *	2.72	26.2	-1.29	10.53 H	4	GA
K3PUX4	29.4	0.22	1.85	37.0	4.45 X	13.01 H	3	XX
K4GVXY	27.3	-0.96	1.49	27.0	-0.86	0.24 L	4	LP
LYLD67	27.5	-0.87	2.14	27.5	-0.62	0.00	1	LA
N3WBMD	28.8	-0.13	1.62	28.9	0.15	1.22	4	XX
N8NEEV	28.7	-0.19	2.36	25.8	-1.49	2.37	4	XX
NAWPBY	30.4	0.74	1.59	29.6	0.52	0.78	4	LP
NDV27Y	27.5	-0.84	2.36	27.7	-0.48	0.69	4	LP
PFDKQU	29.6	0.31	2.84	27.7	-0.49	1.53	4	LP
PXDDTV	30.1	0.59	1.23	29.4	0.42	0.50	4	LA
QTXKU2	28.7	-0.17	1.63	28.2	-0.25	0.52	3	LA
QURAYU	25.2	-2.13 *	2.49	24.6	-2.16 *	0.55	3	LA
UP4WP3	28.9	-0.08	2.49	29.1	0.26	0.63	4	LP
UPND76	27.4	-0.93	2.83	24.6	-2.16 *	3.91	4	TD
VBKC4N	28.1	-0.52	1.74	33.0	2.35 *	6.86 H	4	LP
Y4ANDH	25.5	-1.96 *	3.10	27.2	-0.74	1.63	4	GG
ZH8QXW	29.4	0.19	1.87	29.4	0.40	0.00	1	LP

Consensus (All Labs) Results

Month Mean	29.04	Grand Mean	28.62
Avg SD	2.45	Avg SD Months	2.79
SD btwn Labs	1.81	SD btwn Labs	1.88
Labs Incl	30	Labs Incl	29



Containerboard Interlaboratory Testing Program
Analysis 237

Report #592 (A)
January 2019

Air Resistance, 35 lb Linerboard - 35E

TAPPI Official Test Method T460

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	GG	Gurley Precision #4320 Densometer
LA	L&W Autoline	LP	L&W Air Permeance Tester SE 166
TD	TMI Gurley Densometer	TL	Teledyne Gurley Densometer #4110, Oil Flotation
TP	Technidyne Profile/ plus Roughness & Porosity	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
Analysis 240

Report #592 (A)
January 2019

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM92

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							
3A6KTK	59.9	59.7	60.9	60.8	60.3	0.19	2.5	0.6	63.3	1.16	2.3	4.5	H	16	LD					
3G63AH	62.7	59.3	61.9	61.0	L	61.2	0.63	2.9	1.4	60.4	0.13	2.9	1.6	16	LD					
4DL87P	50.1	X	47.2	X	50.0	X	50.3	*	49.4	-4.82	X	2.8	1.5	50.2	-3.51	X	4.0	2.1	8	TC
4ZA2RG	55.9	53.8	*	55.5	53.1	54.6	-2.44	*	2.6	1.3	55.4	-1.66	3.0	1.6	16	LC				
69HZWC	50.4	X	50.9	X	50.5	X	49.7	*	50.4	-4.37	X	2.5	0.5	58.5	-0.57	3.1	4.9	H	16	LC
7HTDXF	61.6	60.6	60.4	61.7	61.1	0.55	2.9	0.6	60.0	-0.02	2.7	1.4	16	LD						
82FL7V	57.2	56.9	57.5	57.8	57.4	-1.16	2.5	0.4	60.9	0.31	3.1	2.3	16	XX						
83B9KJ	57.6	56.3	59.5	58.4	57.9	-0.89	2.7	1.3	59.3	-0.27	2.4	1.5	16	LZ						
87AKFJ	60.9	60.6	60.2	59.6	60.3	0.20	1.8	0.6	59.3	-0.27	2.4	1.3	12	TH						
8EZ2BF	60.0	61.0	60.7	59.9	60.4	0.24	3.1	0.5	60.3	0.08	3.1	0.6	16	LD						
8GPERC	59.1	57.5	58.0	H	58.3	H	58.2	-0.77	4.9	0.7	58.3	-0.62	5.2	1.0	16	TG				
8THX84	60.8	L	63.4	L	62.5	L	64.9	L	62.9	1.39	1.1	1.7	63.6	1.26	1.1	2.1	16	TD		
9CQFWE	61.2	64.3	61.8	61.6	62.2	1.08	3.1	1.4	60.1	0.01	3.0	2.2	16	LC						
9ZHDXB	61.9	L	60.2	L	59.4	L	63.7	61.3	0.66	1.1	1.9	65.2	1.83	3.8	3.7	12	XX			
AR47CR	57.2	56.9	57.5	57.8	57.4	-1.16	2.5	0.4	60.2	0.04	3.0	2.3	16	LC						
AWUHDF	58.9	52.8	*	53.9	*	52.5	54.5	-2.46	*	3.4	3.0	H	54.4	-2.01	*	3.1	1.8	12	LD	
AYJU69	63.1	60.4	60.6	63.6	61.9	0.94	3.2	1.6	62.2	0.76	3.2	1.6	15	LC						
BZBCJE	57.6	55.7	55.9	54.9	56.0	-1.78	3.7	1.1	54.4	-2.02	*	2.9	1.7	16	TH					
C3VEAK	60.3	L	60.3	L	60.1	L	60.3	L	60.2	0.16	1.2	0.1	L	60.4	0.13	1.4	0.2	L	16	LD
CAEHHM	59.3	62.9	62.4	59.3	61.0	0.50	4.0	1.9	59.6	-0.15	3.5	1.7	14	LZ						
CBNTQC	58.9	59.3	59.0	59.0	59.0	-0.39	1.8	0.2	L	57.9	-0.79	2.7	1.6	16	TH					
CHP42B	63.1	62.0	57.7	57.7	60.1	0.11	3.4	2.8	H	60.3	0.07	3.8	2.6	16	LD					
CP7G6F	60.9	60.7	60.9	60.7	60.8	0.43	1.7	0.1	L	61.1	0.35	2.0	0.4	L	16	LD				
CWPMY3	60.2	L	60.6	L	60.2	L	60.2	L	60.3	0.19	1.2	0.2	L	60.5	0.16	0.9	0.6	16	LD	
DN8WT2	55.8	56.0	57.1	56.4	56.3	-1.63	3.3	0.6	56.7	-1.21	3.3	1.0	12	LD						
F7ZH64	61.6	60.4	60.0	58.3	60.1	0.10	2.8	1.4	60.3	0.10	3.3	2.2	12	TJ						
FHVMHA	58.0	57.5	59.7	57.1	58.1	-0.83	3.1	1.2	58.2	-0.68	2.7	1.3	16	LD						
FJMKQG	60.2	62.7	60.1	63.1	61.5	0.76	3.1	1.6	62.7	0.96	2.7	1.5	16	LD						
FTVZU4	62.4	60.1	H	62.8	63.3	62.1	1.04	4.6	1.4	62.3	0.79	4.2	1.5	10	LD					
G6L7AJ	66.0	*L	64.2	64.5	L	63.9	64.6	2.19	*	1.9	0.9	66.2	2.20	*	2.9	1.2	16	LC		
JUE9CU	61.0	59.9	59.8	60.8	60.4	0.22	2.8	0.6	58.6	-0.53	2.7	1.5	16	LZ						
K3PUX4	61.1	60.3	60.1	58.6	60.0	0.06	3.5	1.0	57.8	-0.82	4.3	3.6	12	MB						
KHHJX7	59.8	61.3	60.9	61.1	60.7	0.40	2.3	0.7	60.6	0.20	2.7	0.8	16	EM						
MWR8YY	60.2	59.3	60.9	60.5	60.2	0.16	3.0	0.7	60.3	0.10	2.9	0.7	16	LC						
N7UUK6	62.8	62.5	65.5	*	62.1	63.2	1.53	3.2	1.5	63.5	1.22	3.3	1.1	8	LD					



Containerboard Interlaboratory Testing Program

Analysis 240

Report #592 (A)

January 2019

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM92

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	
NDV27Y	58.6	60.7	59.7	58.9	59.5	-0.18	2.5	0.9	59.9	-0.05	2.8	1.5	16	LD
PFDKQU	67.7 X	66.8 *	66.3 *	65.7	66.6	3.10 X	3.2	0.8	66.1	2.16 *	3.7	1.7	16	LD
PQX2BN	62.4	62.3	63.1	63.7	62.9	1.38	4.0	0.6	63.6	1.25	4.5	1.7	16	LC
Q6BKQU	57.8	60.2	58.2	58.9	58.8	-0.51	3.3	1.0	59.2	-0.29	3.0	1.2	16	EN
RDJN7R	56.6 H	54.9	59.3	No DATA	57.0	-1.34	5.2	2.2	57.0	-1.09	4.0	1.9	13	LD
TRX4VA	60.0	58.9	No DATA	No DATA	59.4	-0.20	3.2	0.8	57.7	-0.83	2.9	1.2	10	EM
UP4WP3	60.2	59.3	58.5	59.0	59.3	-0.28	2.5	0.7	59.4	-0.25	2.8	1.2	15	LD
VBKC4N	57.4	66.7 *	59.2	58.6	60.5	0.27	3.7	4.2 H	60.9	0.31	3.7	3.5	16	LZ
WEXGBH	62.2	61.3	62.0	61.9	61.9	0.91	2.2	0.4	61.9	0.64	2.1	0.5 L	16	TU
WWKURV	63.4	61.7	58.8	61.5	61.4	0.68	3.1	1.9	61.6	0.54	3.3	1.7	16	LD
X3KQUR	60.0	58.7	62.0	61.6	60.6	0.32	3.6	1.5	61.2	0.40	4.2	1.5	16	LD
XWRYDH	57.9	58.3	59.4	56.3	58.0	-0.88	2.7	1.3	57.8	-0.80	3.2	1.3	16	MB
YXMUFK	59.2	59.7	58.5	58.9	59.1	-0.38	3.6	0.5	61.1	0.37	3.4	2.0	16	LD
YYFP3U	35.1 X	55.3 H	49.1 X	54.7	48.6	-5.19 X	3.6	9.4 H	49.8	-3.65 X	3.3	10.5 H	11	MB
ZH8QXW	No DATA	No DATA	No DATA	52.8	52.8	-3.25 X	4.5	0.0	52.8	-2.59 *	4.5	0.0	1	XX

Consensus (All Labs) Results									
Wk Mean	60.06	59.87	60.06	59.26	Month Mean	59.88	Grand Mean	60.06	
Avg SDr	3.07	3.08	2.99	2.99	Avg SD	3.03	Avg SD	3.19	
SD btwn Labs	2.20	2.97	2.41	3.59	SD btwn Labs	2.18	SD btwn Labs	2.80	
Labs Incl	45	47	45	48	SD btwn Wks	1.41	SD btwn Wks	1.96	
Labs Excl	4	2	3	0	Labs Incl	45	Labs Incl	48	
Labs not Rcvd	1	1	2	2					

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
TC	TMI Monitor/Compression Tester, 17-37	TD	TMI Digital Crush Tester, Model 17-09
TG	TMI Compression Tester, Model 17-10	TH	TMI Compression Tester, Model 17-76
TJ	TLS Compression Tester, Model CDM-5	TU	TMI Universal Crush Tester (TMI K440)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program
Analysis 250

Report #592 (A)
January 2019

Fluted Edge Crush Strength (FCF), 26 lb Corrugating Medium - CM92

TAPPI Official Test Method T843

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
3A6KTK	69.7	70.6	70.0	70.3	70.2	-0.98	1.6	0.4	68.3	-1.54	1.9	4.7	H 16	LD
8THX84	72.7 L	71.0 L	74.1	73.0 L	72.7	-0.18	1.1	1.3	72.7	-0.19	1.1	1.3	16	TD
AR47CR	61.2 XH	64.6 *H	64.8 *H	70.6 H	65.3	-2.51 *	7.4	3.9 H	65.3	-2.47 *	7.3	2.3	16	XX
AWUHDF	73.8	72.5	72.8	72.7	73.0	-0.10	2.5	0.6	73.5	0.04	2.5	0.9	12	LD
AYJU69	77.7	78.3	76.6	76.3 L	77.2	1.24	1.6	0.9	77.1	1.15	2.4	0.8	15	LC
C3VEAK	73.7	73.8 L	73.6 L	73.7	73.7	0.13	1.0	0.1 L	73.4	0.02	1.2	0.2	L 16	LD
CP7G6F	73.0	73.1	72.7	73.0	73.0	-0.10	1.9	0.2 L	73.2	-0.03	2.1	0.5	L 16	LD
FHVMHA	78.3	79.3	78.6	79.0 *	78.8	1.74	2.0	0.4	79.2	1.82	2.5	0.7	16	LD
FTVZU4	76.6	73.3	74.0	75.6	74.9	0.50	2.7	1.5	74.9	0.48	2.4	1.6	10	LD
JUE9CU	72.0	75.3	75.5	75.3	74.5	0.39	1.8	1.7	72.9	-0.13	2.7	1.4	16	LZ
MWR8YY	72.7 H	72.0	73.2	73.0	72.7	-0.17	3.4	0.5	73.0	-0.10	3.4	0.5	16	LD
N3WBMD	71.0	68.9	67.4	73.5 L	70.2	-0.98	2.1	2.7	71.8	-0.48	1.8	1.9	16	LZ
NDV27Y	74.2	77.1	77.5	75.6	76.1	0.89	2.6	1.5	75.5	0.65	2.5	1.2	16	LD
PFDKQU	76.5	79.6	76.0	75.6	76.9	1.15	3.1	1.8	77.7	1.36	3.2	1.5	16	LD
UP4WP3	73.1	73.7	71.7	73.5	73.0	-0.09	1.7	0.9	72.5	-0.24	2.3	1.0	15	LD
VBKC4N	64.0 XH	71.6	73.9	73.6	70.8	-0.78	4.2	4.6 H	72.9	-0.14	3.2	2.5	16	LZ
XCAMRM	72.7	72.2	72.1	74.3	72.8	-0.15	2.2	1.0	72.7	-0.20	2.4	1.0	16	LD

Consensus (All Labs) Results														
Wk Mean	73.84	73.34	73.21	74.03	Month Mean	73.27			Grand Mean	73.33				
Avg SDr	2.23	3.04	2.67	2.58	Avg SD	2.92			Avg SD	2.95				
SD btwn Labs	2.45	3.82	3.47	2.09	SD btwn Labs	3.18			SD btwn Labs	3.26				
Labs Incd	15	17	17	17	SD btwn Wks	1.87			SD btwn Wks	1.74				
Labs Excld	2	0	0	0	Labs Incd	17			Labs Incd	17				
Labs not Rcvd	0	0	0	0										

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) | TD | TMI Digital Crush Tester, Model 17-09 |
| XX | Instrument make/model not specified by lab | | |



Containerboard Interlaboratory Testing Program
 Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM92
 TAPPI Official Test Method T822

Report #592 (A)
January 2019

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	
2W3UFT	37.9 XH	38.2 *H	37.3 *H	38.5 *H	38.0	-3.34 X	7.4	0.5	41.8	-1.31	5.4	3.0	12	TX
4DL87P	25.7 XH	33.5 XH	38.8 *	38.0 *H	34.0	-5.27 X	4.9	6.0 H	36.6	-3.59 X	5.6	4.9 H	8	TC
69HZWC	58.9 X	57.5 X	62.1 X	58.6 X	59.3	6.99 X	2.9	2.0	49.8	2.14 *	2.7	5.8 H	16	LC
83B9KJ	44.2	44.6 L	44.0	44.5	44.3	-0.26	1.7	0.3	43.9	-0.43	2.4	1.1	16	LD
87AKFJ	40.5 *	40.7	41.4	41.1	40.9	-1.92 *	1.9	0.4	40.5	-1.89	2.2	1.0	12	TH
AWUHDF	45.9	46.4	47.3	46.0	46.4	0.73	2.6	0.7	46.2	0.59	2.9	0.9	12	LD
AYJU69	44.3	45.2	46.7	44.0	45.0	0.08	3.0	1.2	45.4	0.23	2.9	1.3	16	LC
CHP42B	53.0 X	51.1 *	47.4	48.3	50.0	2.47 *	3.3	2.6 H	49.9	2.19 *	3.0	2.2	16	LZ
CP7G6F	44.3	44.9	44.5	44.4	44.5	-0.17	2.7	0.3	44.2	-0.28	3.1	0.5 L	16	LD
CWPMY3	45.4 L	45.8 L	45.7 L	45.8 L	45.7	0.39	1.0	0.2 L	45.1	0.12	0.8	0.7	16	LD
FTVZU4	46.9	46.4	47.8	46.5	46.9	0.99	2.3	0.7	46.9	0.89	2.5	1.7	10	LD
G6L7AJ	33.0 X	32.4 X	33.7 X	31.3 XL	32.6	-5.95 X	1.8	1.0	33.9	-4.76 X	2.7	1.7	16	XX
KHHJX7	46.1 L	46.1 L	45.8	46.3 L	46.1	0.59	1.1	0.2	45.6	0.33	1.6	0.4 L	16	LC
M7YQGA	43.4	43.6	45.0	45.3	44.3	-0.27	2.1	1.0	43.0	-0.80	2.6	3.7	16	LZ
N7UUK6	45.3 H	44.2	44.0	44.2	44.4	-0.21	2.7	0.6	44.7	-0.07	2.7	0.7	8	LD
NDV27Y	41.9	44.1	44.8	45.6	44.1	-0.37	2.0	1.6	44.9	0.01	1.8	1.0	16	LD
NP8F6R	45.0 L	45.2	45.3	44.5 L	45.0	0.07	1.2	0.4	45.8	0.39	1.2	0.7	16	WK
PQX2BN	48.5 *	45.0	43.8	43.4	45.2	0.15	2.0	2.3	45.1	0.10	2.3	1.4	16	LD
QG2HAK	43.3	43.4	43.4	43.0	43.3	-0.76	1.6	0.2 L	42.8	-0.89	2.2	1.1	16	TH
RDJN7R	43.4	46.5	45.7	NO DATA	45.2	0.15	2.9	1.6	44.9	0.02	2.8	1.6	13	LD
TRX4VA	43.7	41.1	NO DATA	NO DATA	42.4	-1.21	2.5	1.8	43.0	-0.83	2.7	1.0	10	EM
UP4WP3	42.0 H	42.6	44.5 H	43.4	43.2	-0.83	3.9	1.1	42.4	-1.08	3.9	1.2	15	LD
WEXGBH	41.4	40.7	40.5	40.5	40.8	-1.99 *	1.4	0.4	41.6	-1.40	1.6	0.7	16	TU
WWKURV	45.0	46.4	46.7	46.2 L	46.1	0.58	1.9	0.8	46.8	0.82	2.2	1.2	16	LD
Y472XP	46.9 H	48.0	48.7	45.8	47.4	1.21	2.8	1.3	46.6	0.73	2.5	1.6	16	LZ
YXMUFK	46.2	48.0	45.1	44.9	46.1	0.57	2.2	1.4	45.8	0.42	2.4	0.8	16	LD

Consensus (All Labs) Results														
Wk Mean	44.46	44.69	44.54	44.10	Month Mean	44.87			Grand Mean	44.86				
Avg SDr	2.45	2.86	2.67	2.85	Avg SD	2.33			Avg SD	2.66				
SD btwn Labs	2.01	2.81	2.81	2.57	SD btwn Labs	2.06			SD btwn Labs	2.31				
Labs Incl	21	23	23	22	SD btwn Wks	1.17			SD btwn Wks	1.87				
Labs Excl	5	3	2	2	Labs Incl	22			Labs Incl	24				
Labs not Rcvd	0	0	1	2										



Containerboard Interlaboratory Testing Program
Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM92
TAPPI Official Test Method T822

Report #592 (A)
January 2019

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)
TC	TMI Monitor/Compression Tester, 17-37	TH	TMI Compression Tester, Model 17-76
TU	TMI Universal Crush Tester (TMI K440)	TX	TMI Digital Crush Tester (model not specified)
WK	Zwick Z005 Crush Tester	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 261
STFI, 26 lb Corrugating Medium - CM92
 TAPPI Official Test Method T826

Report #592 (A)
January 2019

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
2W3UFT	13.8	13.6	13.7	14.0	13.8	-1.33	0.9	0.1	13.9	-1.46	0.9	0.2	12	TT
4DL87P	13.0 *	13.7	13.9 H	13.4	13.5	-1.78	1.3	0.4	14.2	-0.82	1.2	0.9	8	TS
7HTDXF	14.3	13.9	14.2	13.9	14.1	-0.84	1.0	0.2	14.1	-1.15	1.1	0.3	16	LU
83B9KJ	15.7	14.0	15.2	15.7	15.2	0.87	1.0	0.8	14.7	0.48	0.9	0.8	16	LZ
8EZ2BF	14.8	14.3	15.0	13.9	14.5	-0.13	1.0	0.5	14.6	0.07	0.9	0.4	16	LB
9ZHDXB	29.6 X	26.8 X	24.9 XL	23.4 XL	26.2	18.38 X	0.7	2.7 H	18.6	9.93 X	0.7	5.8 H	12	LA
AWUHDF	15.0	15.6	15.4	14.9	15.2	0.95	0.9	0.3	21.5	17.12 X	1.7	9.4 H	12	LA
AYJU69	14.4	14.7	14.5	14.5	14.5	-0.14	0.9	0.1	14.6	0.24	0.9	0.2	16	LU
BZBCJE	14.4	14.6	14.5	14.5	14.5	-0.16	0.9	0.1	14.2	-0.75	0.9	0.6	16	LH
C3VEAK	14.4 L	14.5 L	14.6	14.6 L	14.5	-0.10	0.5	0.1	14.4	-0.21	1.6	0.1 L	16	LA
CAEHHM	15.2	14.6 L	15.2	14.4	14.8	0.37	0.8	0.4	14.6	0.27	1.0	0.4	16	LB
CBNTQC	14.0	14.1	14.0	14.1	14.1	-0.88	0.7	0.0 L	14.3	-0.57	0.9	0.6	16	LH
CP7G6F	14.9	14.9	14.8	14.8	14.8	0.38	0.9	0.1	14.8	0.65	1.0	0.1 L	16	LB
F7ZH64	14.4	15.2	14.6	14.9	14.8	0.27	0.9	0.3	14.7	0.39	0.9	0.3	16	TT
FJMKQG	14.8	14.3	14.5	14.5	14.5	-0.13	1.0	0.2	14.7	0.42	1.1	0.3	16	LA
FTVZU4	14.5 H	14.1	14.0	14.2	14.2	-0.67	1.1	0.2	14.2	-0.75	1.1	0.4	10	LB
K3PUX4	14.9 L	14.4 L	14.6 L	15.7 L	14.9	0.49	0.0	0.6	14.3	-0.50	1.1	0.6	12	BK
KHHJX7	13.6	13.5 L	12.8 X	13.4	13.3	-2.04 *	0.9	0.4	13.7	-1.94 *	0.9	0.6	16	LB
LRZP49	14.4	14.7 L	15.0 L	14.5	14.6	0.07	0.8	0.3	14.9	1.03	0.9	0.7	16	LA
LYLD67	15.3 H	15.0	14.5	15.0	14.9	0.54	1.2	0.3	14.8	0.74	1.0	0.4	16	LA
MWR8YY	14.2	14.6	14.0	15.1	14.5	-0.17	1.0	0.5	14.6	0.07	0.9	0.4	16	LB
RDJN7R	13.8	15.3	15.5	No DATA	14.8	0.38	1.1	0.9 H	14.4	-0.24	1.1	0.5	13	LZ
WWKURV	16.0 *	14.8	15.7	16.6 *	15.8	1.86	1.0	0.7	15.6	2.51 *	1.0	0.5	16	LH
XWRYDH	14.3	15.1	41.0 X	15.6	21.5	10.99 X	1.1	13.0 H	16.2	3.98 X	1.4	6.6 H	16	LA
Y472XP	15.9	15.9	15.6 H	16.5 *	16.0	2.17 *	1.2	0.4	15.1	1.50	1.2	1.0	16	LA
YYFP3U	24.2 XH	16.1 *H	14.4	15.4	17.5	4.67 X	1.2	4.5 H	24.3	24.06 X	2.5	20.6 H	10	LA

Consensus (All Labs) Results														
Wk Mean	14.58	14.62	14.67	14.75	Month Mean	14.60				Grand Mean	14.53			
Avg SDr	0.95	0.96	0.98	0.98	Avg SD	0.96				Avg SD	1.03			
SD btwn Labs	0.71	0.67	0.57	0.86	SD btwn Labs	0.63				SD btwn Labs	0.41			
Labs Incl	24	25	23	24	SD btwn Wks	0.42				SD btwn Wks	0.52			
Labs Excl	2	1	3	1	Labs Incl	23				Labs Incl	22			
Labs not Rcvd	0	0	0	1										



Containerboard Interlaboratory Testing Program
Analysis 261
STFI, 26 lb Corrugating Medium - CM92
TAPPI Official Test Method T826

Report #592 (A)
January 2019

Key to Instrument Codes Reported by Participants

BK	Buchel Strip Compression Tester BK-155	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)
TS	TMI Monitor/STFI Compression Tester, 17-33	TT	TMI Short Span Compression, 17-34 (MB K455)