



## Containerboard Interlaboratory Testing Program

Participant Summary Report #580 (A) - January 2018

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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.

<b>Material</b>	<b>Lot Code</b>	<b>Dates in Use</b>
26 lb Corrugating Medium	CM92	January 2018-Current
	CM91	October 2016-December 2017
35 lb Linerboard	35E1	June 2017-Current
42 lb Linerboard	42D3	November 2017-Current
	42D2	August 2016-October 2017
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.

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## EXPLANATION OF TABLES

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

### Definitions of Terms Used

#### Weekly Results

##### Laboratory Data

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

##### Consensus Data

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

#### Monthly Results

##### Laboratory Data

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

##### Consensus Data

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

## Cumulative Results

### Laboratory Data

Mean	- For each lab, the average of all the monthly Means reported for the weeks shown.
CPV	- <b>Comparative Performance Value</b> , 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'.

**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 #580 (A)  
January 2018

Top to Bottom Box Compression Strength, Corrugated Boxes - BX12

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2YVXN4	552.8	-0.60	24.56	552.8	-0.60	0.00	1	LL
3MXGC8	572.0	-0.06	27.51	572.0	-0.06	0.00	1	ER
3ZKNA9	565.2	-0.25	13.68	565.2	-0.25	0.00	1	LM
46E6Y8	629.4	1.55	26.05	629.4	1.55	0.00	1	ER
723WYL	624.3	1.41	37.44	624.3	1.41	0.00	1	LH
82XWDC	533.6	-1.14	14.15	533.6	-1.14	0.00	1	EX
98LZJL	555.2	-0.53	7.05	555.2	-0.53	0.00	1	LL
A3NR2W	560.4	-0.39	15.58	560.4	-0.39	0.00	1	LG
DLC6B7	537.6	-1.03	21.45	537.6	-1.03	0.00	1	LM
DWR4W2	598.0	0.67	45.66	598.0	0.67	0.00	1	ER
DYXPK2	551.4	-0.64	26.61	551.4	-0.64	0.00	1	ER
HKGAKY	544.3	-0.84	46.68	544.3	-0.84	0.00	1	LS
KTNTU9	657.3	2.33 *	47.58	657.3	2.33 *	0.00	1	LG
L9ATXC	601.6	0.77	21.61	601.6	0.77	0.00	1	LS
LDAVBT	590.4	0.45	15.29	590.4	0.45	0.00	1	ES
MPGZ2L	532.1	-1.18	14.43	532.1	-1.18	0.00	1	LS
MQ6LJB	527.7	-1.31	14.94	527.7	-1.31	0.00	1	LL
MY2FJU	612.2	1.07	29.39	612.2	1.07	0.00	1	ET
PB7JRL	589.0	0.42	26.77	589.0	0.42	0.00	1	LG
R6QRH7	565.0	-0.26	14.47	565.0	-0.26	0.00	1	TE
T2MDCR	550.6	-0.66	12.55	550.6	-0.66	0.00	1	LG
TRXPE6	567.4	-0.19	35.99	567.4	-0.19	0.00	1	LS
UKJ2GW	517.6	-1.59	34.22	517.6	-1.59	0.00	1	TB
XBHV2C	589.4	0.43	39.54	589.4	0.43	0.00	1	EX
XLJBZP	622.5	1.36	22.55	622.5	1.36	0.00	1	LG
YY3CWL	583.0	0.25	21.83	583.0	0.25	0.00	1	ET

Consensus (All Labs) Results

Month Mean	574.23	Grand Mean	574.23
Avg SD	27.67	Avg SD Months	0.00
SD btwn Labs	35.59	SD btwn Labs	35.59
Labs Incd	26	Labs Incd	26

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	562.71	44.94	11.52	7
Clip sealing	578.47	31.87	4.24	19



Containerboard Interlaboratory Testing Program  
Analysis 201

**Report #580 (A)**  
**January 2018**

**Top to Bottom Box Compression Strength, Corrugated Boxes - BX12**

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	TB	TMI Monitor/Compression Tester, Model 17-70
TE	Testometric M500 - 25 KN		



**Containerboard Interlaboratory Testing Program**  
 Analysis 202  
**Edgewise Compressive Strength, by T811, Corrugated Board - EC10**  
 TAPPI Official Test Method T811

**Report #580 (A)**  
**January 2018**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2DWJ3M	38.6	0.34	0.97	39.6	0.87	0.87	3	TD
3H6GVR	33.8	-1.32	1.18	32.3	-1.77	1.11	4	WK
82XWDC	36.3	-0.46	1.59	36.3	-0.33	0.00	1	LC
A3NR2W	40.3	0.93	1.30	39.5	0.85	0.66	3	TX
DYXPK2	36.2	-0.48	3.42	35.0	-0.78	1.47	4	EN
F9RW7B	40.0	0.83	1.33	39.4	0.79	1.18	4	LC
HKGAKY	37.6	-0.01	1.72	37.1	-0.05	1.03	4	EM
L9ATXC	34.3	-1.16	1.56	36.0	-0.43	1.89	3	EM
MPGZ2L	41.1	1.21	0.79	39.4	0.80	1.73	4	LC
PB7JRL	41.5	1.35	1.52	40.8	1.30	0.50	4	LE
PDVMQU	34.1	-1.22	1.92	33.7	-1.24	0.98	4	XX

Consensus (All Labs) Results			
Month Mean	37.61	Grand Mean	37.19
Avg SD	1.71	Avg SD Months	1.22
SD btwn Labs	2.88	SD btwn Labs	2.78
Labs Incl	11	Labs Incl	11

**Key to Instrument Codes Reported by Participants**

<b>EM</b>	Emerson 1200 Series	<b>EN</b>	Emerson 2200
<b>LC</b>	L&W Crush Tester 48	<b>LE</b>	L&W Crush Tester 840
<b>TD</b>	TMI Digital Crush Tester, Model 17-09	<b>TX</b>	TMI (model not specified)
<b>WK</b>	Zwick Z005 Crush Tester	<b>XX</b>	Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 203  
**Edgewise Compressive Strength by T839, Corrugated Board - EC10**  
 TAPPI Official Test Method T839

**Report #580 (A)**  
**January 2018**

WebCode	Monthly Results				Cumulative Results				Inst
	Mean	CPV	SD		Mean	CPV	SD Months	Months	
2DWJ3M	41.9	0.17	0.74		41.1	-0.01	0.85	4	TD
2YVXN4	41.3	-0.03	1.31		40.8	-0.17	0.70	4	LC
3H6GVR	37.0	-1.46	0.61	L	36.7	-2.11 *	0.31	4	WK
3ZKNA9	42.1	0.24	1.11		44.6	1.60	2.37	4	TG
46E6Y8	38.8	-0.85	0.98		38.9	-1.07	0.05	L 4	EM
4G7GME	40.5	-0.29	2.04		41.1	-0.03	0.47	4	LD
6G9JY6	41.3	-0.05	0.53	L	41.3	0.05	0.00	1	LC
723WYL	45.7	1.43	2.07		45.0	1.81	1.85	4	EM
78VZRQ	42.1	0.23	1.24		40.4	-0.36	1.78	4	LC
7AF629	42.1	0.24	0.86		41.8	0.28	0.45	4	EM
82XWDC	35.4	-1.96 *	2.99	H	35.4	-2.69 *	0.00	1	LC
9CV886	41.2	-0.07	1.38		40.1	-0.48	0.90	4	LD
A3NR2W	42.3	0.29	0.87		41.6	0.22	0.62	3	TX
A4MTAA	38.5	-0.95	1.86		38.9	-1.08	0.25	L 4	LD
CJLQ3V	40.5	-0.29	2.26		41.2	0.00	0.81	4	LD
DLC6B7	43.1	0.57	1.70		42.3	0.53	1.43	4	EM
DWR4W2	35.2	-2.03 *	1.20		37.6	-1.66	1.65	4	LD
DYXPK2	38.9	-0.83	3.04	H	38.2	-1.39	0.68	4	EN
F9RW7B	46.5	1.68	1.39		44.6	1.63	3.21	4	LC
HKGAKY	40.4	-0.32	1.44		41.6	0.21	1.48	4	EM
JWB2P3	39.3	-0.70	1.44		39.4	-0.82	1.88	4	LD
KKPC6N	42.5	0.37	1.14		42.2	0.50	0.52	3	LC
KTNTU9	40.2	-0.40	1.23		40.5	-0.29	0.75	4	EM
L9ATXC	40.4	-0.32	1.82		41.8	0.28	3.09	3	EM
LDAVBT	39.8	-0.51	2.31		39.9	-0.59	0.45	4	LD
MPGZ2L	43.6	0.72	1.09		42.3	0.56	1.24	4	LC
MQ6LJB	41.8	0.12	1.32		41.6	0.23	1.43	3	BU
MY2FJU	44.0	0.84	1.06		43.3	1.02	0.62	4	TD
PB7JRL	41.3	-0.04	2.77	H	40.8	-0.16	0.67	4	LY
QTQHN7	35.8	-1.85	1.76		41.7	0.28	4.42	H 4	CT
R6QRH7	43.1	0.55	1.19		42.7	0.72	0.31	4	LD
RL4B66	39.3	-0.69	1.47		39.6	-0.75	0.85	3	EM
T283KE	38.4	-1.00	1.01		39.8	-0.64	1.03	4	TD
T2MDCR	40.9	-0.17	1.47		39.9	-0.59	1.22	4	MK
TGNZPF	45.1	1.20	1.83		43.0	0.86	1.47	4	TD
TRXPE6	40.0	-0.46	0.82		39.5	-0.79	0.51	4	TB
UKJ2GW	48.5	2.34 *	1.06		49.1	3.75 X	1.25	4	LD
WGBPCR	48.2	2.22 *	1.86		48.5	3.46 X	1.08	4	LD
X8GRBB	45.8	1.43	1.16		44.7	1.68	2.09	4	TG





**Containerboard Interlaboratory Testing Program**  
 Analysis 203  
**Edgewise Compressive Strength by T839, Corrugated Board - EC10**  
 TAPPI Official Test Method T839

**Report #580 (A)**  
**January 2018**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
XBHV2C	40.3	-0.37	1.57	41.3	0.08	1.10	4	LD
XLJBZP	43.8	0.79	1.92	41.7	0.26	1.49	4	TJ
XMQQ8V	44.0	0.86	0.75	43.6	1.14	0.33	4	TL
YY3CWL	43.2	0.59	1.41	45.2	1.91	2.85	2	EM
ZDY639	41.5	0.02	1.09	40.9	-0.12	3.84	H 4	TK
ZLABTK	36.1	-1.74	0.66	L 34.0	-3.38	X 3.75	H 3	KS
ZZ7PTE	42.8	0.45	1.23	41.0	-0.05	2.08	4	TD

Consensus (All Labs) Results			
Month Mean	41.40	Grand Mean	41.15
Avg SD	1.55	Avg SD Months	1.66
SD btwn Labs	3.04	SD btwn Labs	2.12
Labs Incd	46	Labs Incd	43

**Key to Instrument Codes Reported by Participants**

<b>BU</b> Buchel Digital Crush Tester	<b>CT</b> Con-Ten
<b>EM</b> Emerson 1200 Series	<b>EN</b> Emerson 2200
<b>KS</b> Kyungsung KSU-05M	<b>LC</b> L&W Crush Tester 48
<b>LD</b> L&W Crush Tester 248	<b>LY</b> L&W 830
<b>MK</b> Mark-10 ESM303	<b>TB</b> TMI Monitor/Compression Tester, Model 17-70
<b>TD</b> TMI Digital Crush Tester, Model 17-09	<b>TG</b> TMI Digital Crush Tester, 17-76
<b>TJ</b> TLS Compression Tester, Model CDM-5	<b>TK</b> TLS Compression Tester, Model 5184
<b>TL</b> Tech-Lab Systems Compression	<b>TX</b> TMI (model not specified)
<b>WK</b> Zwick Z005 Crush Tester	



**Containerboard Interlaboratory Testing Program**  
 Analysis 205  
**Bursting Strength (Mullen), 42 lb Linerboard - 42D3**  
 TAPPI Official Test Method T807

**Report #580 (A)**  
**January 2018**

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	
2WTZDB	109.7	109.4	109.7 L	109.1	109.5	0.04	5.2	0.3 L	109.6	0.06	5.1	2.6	12	LA
3MXGC8	105.5	97.3 *H	94.1 XH	103.0	100.0	-2.63 *	22.2	5.2	104.4	-1.64	16.7	5.7	12	LZ
3T7TDE	108.8	110.7	115.4	112.8	111.9	0.73	12.0	2.8	113.2	1.22	12.2	3.2	12	LZ
42Z8T7	111.7	109.3	107.2	109.8	109.5	0.05	7.6	1.8	111.5	0.68	8.4	3.1	12	LA
4G7GME	110.6	111.9	111.2	112.5	111.5	0.62	10.6	0.8	112.4	0.96	10.4	1.1	12	LA
6V6V89	107.2	104.4	107.8	103.8	105.8	-0.98	8.5	2.0	106.4	-0.99	9.4	2.6	12	LC
77KAMF	109.9	112.8	107.1	107.3	109.3	-0.01	10.8	2.7	109.7	0.08	11.4	2.6	12	TB
83V7AF	106.4	117.3	110.3	109.8	110.9	0.45	13.4	4.6	113.4	1.30	13.0	6.4	12	LA
8GXQUD	106.9	109.3	102.7	110.8	107.4	-0.53	11.0	3.5	105.8	-1.17	10.2	2.4	12	LC
9MVRLQ	107.6 L	109.5	108.6	108.7 L	108.6	-0.20	5.0	0.8	105.4	-1.30	6.5	5.8	12	AH
A4MTAA	105.8	106.0	104.1	100.0 *	104.0	-1.50	9.6	2.8	105.7	-1.20	9.1	2.7	12	LA
BHFYGA	109.1	110.8	111.7	107.1	109.7	0.10	9.2	2.0	109.4	-0.01	11.0	2.5	12	LB
CJLQ3V	109.4	112.6	111.8	109.2	110.8	0.40	11.5	1.7	110.3	0.30	11.9	3.7	12	AA
CNK8C6	101.6	111.0	110.5	113.1	109.0	-0.08	11.5	5.1	108.0	-0.45	10.6	3.7	12	LC
DWR4W2	107.9	106.3	111.1	105.1	107.6	-0.48	9.1	2.6	107.9	-0.49	11.1	3.5	12	AH
E6H388	106.4	106.5	108.4	101.9	105.8	-0.99	10.6	2.8	105.9	-1.15	10.4	3.0	12	LC
ECE4Z7	106.8	106.3	104.8	105.0	105.7	-1.01	12.0	1.0	105.7	-1.22	12.4	3.0	12	LC
FAPXHU	108.7	124.5 X	116.3	109.8	114.8	1.55	9.7	7.3 H	109.4	-0.01	9.0	6.9	12	LJ
FWJ4NW	107.1	105.2	106.6	109.4	107.1	-0.63	11.0	1.7	113.0	1.16	13.1	5.9	12	AH
G693Y3	111.1	102.5	109.0	103.0	106.4	-0.82	13.5	4.3	107.6	-0.59	14.1	4.2	12	LA
HBD97T	119.6 X	108.3	112.8	114.8	113.9	1.28	14.2	4.7	113.1	1.22	12.3	3.9	12	LA
HKGAKY	108.7	111.7	111.9	106.9	109.8	0.14	9.7	2.4	107.7	-0.55	10.8	3.3	12	LA
JJ2KHX	112.2	110.8	115.8	110.0	112.2	0.81	10.6	2.6	108.0	-0.45	10.2	4.0	12	LA
JT7L2X	116.6 *	109.9	118.9 *	111.7	114.3	1.40	12.1	4.2	111.9	0.81	13.2	4.1	12	TB
JWB2P3	115.1	105.2	111.5	102.6	108.6	-0.20	11.2	5.7	107.2	-0.71	10.5	4.3	12	LC
KCK6QN	114.6	112.0	120.5 *	118.4 *	116.4	1.99 *	8.7	3.8	111.9	0.82	11.0	4.8	12	LC
LDAVBT	105.5	105.2	106.2	108.3	106.3	-0.85	9.8	1.4	105.2	-1.39	10.6	2.1	12	LA
LUBRLB	106.0 L	106.6	106.4	107.0	106.5	-0.79	5.2	0.4 L	106.0	-1.10	5.2	1.3	12	RE
MN6DEZ	108.2	104.6	112.4	106.0	107.8	-0.43	10.2	3.4	107.6	-0.60	10.2	2.7	12	XX
MPGZ2L	99.7 *	98.2 *	103.9	105.6	101.9	-2.10 *	11.6	3.5	104.1	-1.74	10.5	3.3	12	AH
N4XH8U	105.4	118.6 *	111.9 H	110.2	111.5	0.62	14.4	5.5	112.7	1.07	11.2	7.8 H	8	LC
NLVX8K	110.0	110.1	109.7	109.6	109.8	0.14	7.7	0.2 L	109.4	-0.02	8.2	0.7 L	12	LJ
PB7JRL	115.5 *	118.8 *	111.5	115.1	115.3	1.67	12.6	3.0	114.7	1.72	11.7	1.9	11	LZ
PJXWU2	102.8	109.1	110.7	114.4	109.2	-0.02	9.8	4.9	108.2	-0.40	8.3	3.7	12	AH
Q9HGDK	107.7	110.1 H	104.1	107.7 L	107.4	-0.54	12.8	2.5	108.5	-0.31	13.1	3.4	12	LZ



**Containerboard Interlaboratory Testing Program**  
 Analysis 205  
**Bursting Strength (Mullen), 42 lb Linerboard - 42D3**  
 TAPPI Official Test Method T807

**Report #580 (A)**  
**January 2018**

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
QTQHN7	121.2 X	107.7	115.6	114.0	114.6	1.49	14.0	5.6	114.3	1.61	14.1	4.6	12	XX
RVPFAJ	104.6	No DATA	106.7	110.4	107.2	-0.58	11.9	3.0	109.1	-0.11	10.9	2.9	11	LA
T7P8GP	112.5	114.3	116.3	116.3	114.8	1.56	13.0	1.9	116.8	2.41	*12.2	4.1	11	LA
TV34BB	108.8	108.5	106.9	111.4	108.9	-0.12	12.3	1.9	108.6	-0.26	11.8	1.6	12	LC
UR2HWD	105.9	104.4	103.6	104.8	104.7	-1.31	9.2	1.0	105.6	-1.25	10.3	2.3	12	LA
VAWBHB	115.2	114.0	116.0	114.8	115.0	1.60	9.8	0.8	115.0	1.82	9.8	0.8	L 4	AH
WTNTTN	107.4	115.6	113.7	110.5	111.8	0.69	9.6	3.6	110.8	0.44	8.6	3.3	12	TB
XBHV2C	102.5 H	109.5	115.0	111.5	109.6	0.09	18.7	5.3	111.5	0.67	13.9	4.0	12	AH
Y83NFX	111.9 L	111.3 L	106.9 L	106.9 L	109.3	-0.02	4.2	2.7	110.8	0.46	3.8	2.4	12	XX
YBDZVB	107.2	111.6	105.7	99.2 *	105.9	-0.96	12.5	5.1	108.7	-0.22	11.3	4.5	12	LC
YBYCUJ	110.3	113.3	115.8	109.2	112.2	0.80	11.8	3.0	109.1	-0.10	12.6	3.7	12	LC
YD6WHK	109.1	107.4	108.0	115.5	110.0	0.19	10.1	3.7	110.1	0.22	11.1	2.4	12	LA
ZAHNMP	105.4	109.4	105.3	107.9	107.0	-0.65	13.4	2.0	110.7	0.42	11.8	4.8	12	LC

Consensus (All Labs) Results									
Wk Mean	108.41	109.24	110.17	109.00	Month Mean	109.31	Grand Mean	109.42	
Avg SDr	11.07	11.78	10.83	10.94	Avg SD	11.36	Avg SD	10.99	
SD btwn Labs	3.66	4.46	4.36	4.32	SD btwn Labs	3.55	SD btwn Labs	3.07	
Labs Incd	46	46	47	48	SD btwn Wks	3.41	SD btwn Wks	3.79	
Labs Excl'd	2	1	1	0	Labs Incd	48	Labs Incd	48	
Labs not Rcvd	0	1	0	0					

**Key to Instrument Codes Reported by Participants**

AA	Perkins Model A	AH	Perkins Model AH
LA	L&W Bursting Strength Tester	LB	L&W Burst-O-Matic
LC	L&W Autoline	LJ	L&W Bursting Strength Tester J-Type
LZ	L&W (model not specified)	RE	Regmed/Mullen Tester
TB	TMI Monitor/Burst 1000	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 #580 (A)**  
**January 2018**

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	
2WTZDB	114.2	114.3 L	114.2 L	114.1 L	114.2	0.33	3.8	0.1 L	114.2	0.33	3.8	0.1 L	4	LA
3MXGC8	112.1	113.1	106.2	111.1	110.6	-0.65	9.7	3.0	110.6	-0.65	9.7	3.0	4	LZ
3T7TDE	116.6	127.6 X	122.8 *	116.5	120.9	2.17 *	11.9	5.3	120.9	2.17 *	11.9	5.3	4	LZ
42Z8T7	110.4	118.4 *	118.6	118.9	116.6	0.98	8.0	4.1	116.6	0.98	8.0	4.1	4	LA
4G7GME	117.3	116.7	117.7	117.4	117.3	1.18	10.9	0.5 L	117.3	1.18	10.9	0.5 L	4	LA
6V6V89	113.7	111.3	108.2	112.0	111.3	-0.47	11.6	2.3	111.3	-0.47	11.6	2.3	4	LC
77KAMF	109.6	107.7	108.1	108.8	108.6	-1.21	10.7	0.8	108.6	-1.21	10.7	0.8	4	TB
83V7AF	108.0	110.7 H	107.3	109.2	108.8	-1.14	15.9	1.5	108.8	-1.14	15.9	1.5	4	LA
8GXQUD	106.7	106.2	107.8	115.8	109.1	-1.06	10.2	4.5	109.1	-1.06	10.2	4.5	4	LA
9MVRLQ	112.7	112.0	112.9	113.2	112.7	-0.08	5.2	0.5 L	112.7	-0.08	5.2	0.5 L	4	AH
A4MTAA	109.6	111.4	114.8 L	114.3	112.5	-0.13	6.5	2.5	112.5	-0.13	6.5	2.5	4	LA
BHFYGA	111.4	117.0	115.8	115.3	114.9	0.52	7.5	2.4	114.9	0.52	7.5	2.4	4	LB
CJLQ3V	114.4	110.3	115.4	112.7	113.2	0.06	10.4	2.2	113.2	0.06	10.4	2.2	4	AA
CNK8C6	109.0	109.5	116.0	108.7	110.8	-0.60	10.4	3.5	110.8	-0.60	10.4	3.5	4	LC
DWR4W2	109.1	110.7	114.6	109.3	110.9	-0.56	9.5	2.6	110.9	-0.56	9.5	2.6	4	AH
E6H388	106.7	113.7	112.2	108.0	110.2	-0.78	12.4	3.3	110.2	-0.78	12.4	3.3	4	LC
ECE4Z7	109.7	107.0	244.4 XH	110.2	142.8	8.19 X	218.8	67.7 H	142.8	8.19 X	218.8	67.7 H	4	LC
FAPXHU	113.4	113.0	110.5	109.7	111.7	-0.36	13.5	1.8	111.7	-0.36	13.5	1.8	4	LJ
FWJ4NW	106.8	107.6	106.9	115.7	109.3	-1.02	13.2	4.3	109.3	-1.02	13.2	4.3	4	AH
G693Y3	112.2	105.6	111.2	110.5	109.9	-0.85	11.6	2.9	109.9	-0.85	11.6	2.9	4	LA
HBD97T	116.5 H	112.4	128.6 X	117.7	118.8	1.60	13.7	6.9	118.8	1.60	13.7	6.9	4	LA
HKGAKY	106.4	113.7	112.6	108.5	110.3	-0.73	10.6	3.4	110.3	-0.73	10.6	3.4	4	LA
JJ2KHX	106.8	112.5	117.6	113.7	112.7	-0.09	12.2	4.5	112.7	-0.09	12.2	4.5	4	LA
JT7L2X	108.4	116.7	111.4	110.7	111.8	-0.32	10.6	3.5	111.8	-0.32	10.6	3.5	4	TB
JWB2P3	124.6 *	109.3	109.7	109.1	113.2	0.05	11.3	7.6 H	113.2	0.05	11.3	7.6 H	4	LC
KCK6QN	121.9	109.0	114.7	102.3 *H	111.9	-0.28	18.9	8.3 H	111.9	-0.28	18.9	8.3 H	4	LC
LDAVBT	108.0	110.3	115.5	110.8	111.2	-0.50	11.1	3.1	111.2	-0.50	11.1	3.1	4	LA
LUBRLB	120.2	117.2	120.2	118.0	118.9	1.62	6.0	1.5	118.9	1.62	6.0	1.5	4	RE
MN6DEZ	107.5	109.8	110.1	113.4	110.2	-0.76	11.6	2.4	110.2	-0.76	11.6	2.4	4	XX
MPGZ2L	104.8	111.6	99.7 *	106.8	105.7	-1.99 *	11.3	4.9	105.7	-1.99 *	11.3	4.9	4	AH
NLVX8K	115.9	115.8	115.9	115.9	115.9	0.80	5.7	0.1 L	115.9	0.80	5.7	0.1 L	4	LJ
PB7JRL	115.3	104.7 *H	117.5	118.4	114.0	0.28	14.2	6.3	114.0	0.28	14.2	6.3	4	LZ
PJXWU2	105.7 L	109.9	116.1	120.6	113.1	0.03	8.3	6.6	113.1	0.03	8.3	6.6	4	AH
Q9HGDK	115.9	110.5	110.2	116.8	113.3	0.09	12.1	3.5	113.3	0.09	12.1	3.5	4	LZ
QTQHN7	112.3	114.8	109.0	114.2	112.6	-0.11	12.7	2.6	112.6	-0.11	12.7	2.6	4	XX



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

**Report #580 (A)**  
**January 2018**

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	
RVPFAJ	118.2	115.5	113.4	110.1	114.3	0.36	9.2	3.4	114.3	0.36	9.2	3.4	4	LA
T7P8GP	116.5	116.1	117.8	120.3	117.7	1.29	9.6	1.9	117.7	1.29	9.6	1.9	4	LA
TV34BB	114.8	112.8	33.3 <b>XL</b>	110.0	92.7	-5.56 <b>X</b>	7.6	39.7 <b>H</b>	92.7	-5.56 <b>X</b>	7.6	39.7 <b>H</b>	4	LC
UR2HWD	109.8	110.4	102.9 <b>*</b>	107.6	107.7	-1.45	11.1	3.4	107.7	-1.45	11.1	3.4	4	LA
VAWBHB	114.2	111.6	113.0	111.4	112.6	-0.12	10.8	1.3	112.6	-0.12	10.8	1.3	4	AH
WTNTTN	120.5	121.9 <b>X</b>	121.7	121.0	121.3	2.27 <b>*</b>	13.2	0.7	121.3	2.27 <b>*</b>	13.2	0.7	4	TB
XBHV2C	115.5	112.5	120.5	113.5	115.5	0.69	9.8	3.6	115.5	0.69	9.8	3.6	4	AH
Y83NFX	125.1 <b>*</b>	123.2 <b>XL</b>	119.8	118.5	121.7	2.38 <b>*</b>	5.4	3.0	121.7	2.38 <b>*</b>	5.4	3.0	4	XX
YBYCUJ	108.1	114.4	112.9	117.7	113.3	0.08	9.5	4.0	113.3	0.08	9.5	4.0	4	LC
YD6WHK	114.2	106.8	109.5	111.2	110.4	-0.70	7.7	3.1	110.4	-0.70	7.7	3.1	4	LA
ZAHNMP	104.1	109.7	109.2	117.1	110.1	-0.80	10.5	5.4	110.1	-0.80	10.5	5.4	4	LC

Consensus (All Labs) Results														
Wk Mean	112.50	111.73	113.08	113.19	Month Mean	112.98			Grand Mean	112.98				
Avg SDr	10.19	11.51	9.97	11.48	Avg SD	10.84			Avg SD	10.84				
SD btwn Labs	5.14	3.36	5.01	4.23	SD btwn Labs	3.65			SD btwn Labs	3.65				
Labs Includ	46	43	43	46	SD btwn Wks	3.78			SD btwn Wks	3.78				
Labs Exclcd	0	3	3	0	Labs Includ	44			Labs Includ	44				
Labs not Rcvd	0	0	0	0										

**Key to Instrument Codes Reported by Participants**

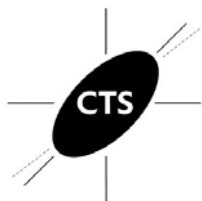
<b>AA</b>	Perkins Model A	<b>AH</b>	Perkins Model AH
<b>LA</b>	L&W Bursting Strength Tester	<b>LB</b>	L&W Burst-O-Matic
<b>LC</b>	L&W Autoline	<b>LJ</b>	L&W Bursting Strength Tester J-Type
<b>LZ</b>	L&W (model not specified)	<b>RE</b>	Regmed/Mullen Tester
<b>TB</b>	TMI Monitor/Burst 1000	<b>XX</b>	Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 215  
**Ring Crush, 42 lb Linerboard - 42D3**  
 TAPPI Official Test Method T822

**Report #580 (A)**  
**January 2018**

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	
2WTZDB	88.4	89.3	92.1	93.4	90.8	0.44	2.3	2.4	90.4	0.33	2.9	1.5	12	LZ
3MXGC8	86.9	87.3	85.5	89.5	87.3	-0.45	3.7	1.6	86.6	-0.60	4.0	1.7	12	LD
3T7TDE	84.3	90.6	86.0	85.1	86.5	-0.65	3.3	2.8	87.2	-0.46	4.0	1.7	12	LC
42Z8T7	79.7	81.9	80.6 *	80.4 *	80.7	-2.12 *	2.9	0.9	80.8	-2.05 *	2.9	1.0	12	TU
4G7GME	91.9	92.3	92.4	92.6	92.3	0.82	3.0	0.3 L	91.5	0.60	3.3	0.7 L	12	LD
6V6V89	92.2	88.5	84.4	93.4	89.6	0.13	3.5	4.0	90.2	0.29	4.3	2.9	12	LC
77KAMF	83.5	86.9	85.3	87.4	85.8	-0.83	4.2	1.8	88.4	-0.17	4.2	3.2	12	LC
7AF629	83.2	80.5 *H	80.2 *	79.1 *	80.7	-2.10 *	5.1	1.7	81.2	-1.93 *	4.2	1.7	12	EM
8DQHGL	99.5 *	86.3	91.5	90.7 L	92.0	0.74	3.5	5.5	92.8	0.94	4.3	3.4	12	EM
A4MTAA	89.5	87.5	87.8	87.4	88.1	-0.26	3.7	1.0	88.3	-0.19	3.6	1.2	12	LD
AUBQUB	92.8	91.6	91.8	94.0	92.6	0.88	4.4	1.1	92.6	0.87	4.4	1.1	4	LD
AVRW2D	90.5	89.9	93.8	88.4	90.7	0.40	4.4	2.3	90.8	0.43	3.9	1.5	12	LD
BHFYGA	87.1	84.4	87.8	84.3	85.9	-0.80	3.0	1.8	84.5	-1.12	4.1	2.0	12	LC
C8C347	82.1	85.6	86.3	70.7 X	81.2	-1.99 *	4.8	7.2 H	85.9	-0.78	4.6	5.5	11	XX
CJLQ3V	84.4	87.2	85.9	88.5	86.5	-0.65	3.3	1.7	86.6	-0.60	3.3	1.4	12	LD
CNK8C6	93.8	90.2	90.0	88.7	90.7	0.40	4.2	2.2	88.9	-0.04	4.1	2.0	12	LD
DWR4W2	83.3	85.2	87.4	87.2	85.8	-0.83	3.3	1.9	85.2	-0.95	3.5	2.6	12	LD
DYXPK2	86.1	84.5	82.8	85.5	84.7	-1.10	3.6	1.4	83.0	-1.49	4.2	2.2	12	EN
E6H388	90.4	95.7	93.9	89.8	92.5	0.85	4.8	2.8	89.8	0.18	3.6	2.6	12	LC
ECE4Z7	83.8	86.8	88.6	89.2	87.1	-0.50	3.9	2.4	89.7	0.17	4.4	2.8	12	LC
F9RW7B	87.2	88.1	90.4	88.9	88.7	-0.11	3.9	1.3	85.9	-0.78	3.7	2.6	12	LC
FAPXHU	90.1	88.1	88.2	97.6	91.0	0.48	4.3	4.5	90.4	0.33	4.1	2.7	12	LD
G3LGYZ	83.7	86.3	90.2	92.0	88.0	-0.26	3.7	3.8	89.3	0.05	3.5	2.9	12	TH
G693Y3	92.7	84.5 H	92.7 H	93.6	90.9	0.46	6.1	4.3	97.0	1.98 *	5.0	5.4	12	LC
HBD97T	97.7	95.1	95.6	96.3	96.2	1.80	4.8	1.2	97.8	2.18 *	4.4	2.7	12	LD
HKGAKY	79.3	83.9	87.0	86.6	84.2	-1.23	3.2	3.6	85.0	-1.00	3.7	3.1	12	EM
JJ2KHX	95.5	86.5	85.5	91.6	89.8	0.17	3.8	4.7	88.2	-0.21	3.9	2.8	12	LD
JT7L2X	89.9	84.4	90.5	82.6	86.9	-0.56	3.6	3.9	83.4	-1.40	3.5	4.1	12	LZ
JWB2P3	87.6	88.3	86.4	86.4	87.2	-0.48	3.1	1.0	85.7	-0.84	3.2	1.5	12	LD
KDBECA	94.3	94.6	95.9	97.0	95.5	1.61	4.5	1.2	95.5	1.59	4.5	1.2	4	TH
KTNTU9	87.1	84.2	86.2	85.6	85.8	-0.83	3.5	1.2	85.9	-0.79	3.9	3.0	12	EM
LUBRLB	95.0	95.8	93.9	93.4	94.5	1.37	3.6	1.1	92.7	0.91	3.8	1.8	12	LZ
MPGZ2L	89.2	89.1	90.4	90.0	89.7	0.16	3.8	0.7	90.8	0.43	4.0	1.5	12	LC
NLVX8K	89.1	89.1	89.9	89.8	89.5	0.10	3.7	0.4 L	88.6	-0.10	4.3	0.9 L	12	LD
PB7JRL	85.7	92.1	90.4	88.5	89.2	0.03	3.6	2.7	87.8	-0.32	4.0	2.5	11	LG



Containerboard Interlaboratory Testing Program

Analysis 215

Ring Crush, 42 lb Linerboard - 42D3

TAPPI Official Test Method T822

Report #580 (A)

January 2018

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
PJXWU2	98.7	98.9 *	98.7 *	95.4	97.9	2.23 *	4.2	1.7	98.1	2.24 *	4.3	2.0	12	LZ
QHOUT4	76.0 *H	92.3	90.6	91.8 H	87.7	-0.35	6.6	7.8 H	87.5	-0.37	6.2	6.2	12	MB
QT7TEY	87.6	89.7	88.5	89.7	88.9	-0.05	3.8	1.0	89.8	0.18	4.1	1.5	12	TH
R6QRH7	89.4 L	90.7	92.1	90.7 L	90.7	0.42	2.8	1.1	91.1	0.50	2.6	1.0	12	LD
RVPFAJ	99.7 *	95.6	100.6 *	66.2 XH	90.5	0.36	6.9	16.4 H	88.1	-0.24	7.0	14.5 H	12	LC
T283KE	92.0	93.9	94.1 L	96.2	94.0	1.25	2.4	1.7	92.7	0.90	2.4	2.1	12	TD
T7P8GP	94.5	92.0	90.9	91.7	92.3	0.81	4.6	1.6	93.3	1.05	4.3	1.9	11	LZ
UR2HWD	83.7 H	85.2	80.9 H	84.8	83.6	-1.37	6.3	1.9	84.5	-1.13	5.8	4.7	12	LZ
VAWBHB	90.8	91.2	86.9	90.0	89.7	0.17	5.0	1.9	89.7	0.17	5.0	1.9	4	LC
WTNTTN	95.4	94.1	93.5	95.5 H	94.6	1.40	4.9	1.0	96.0	1.72	5.2	2.2	12	LX
X8GRBB	87.0	88.3	86.4	87.0	87.2	-0.48	2.4	0.8	90.0	0.23	2.9	2.2	12	TH
Y83NFX	87.3	94.3	91.3	86.7	89.9	0.21	4.4	3.6	86.7	-0.59	4.3	6.3	12	LD
YBYCUJ	88.0	89.3	91.6	93.5	90.6	0.39	3.8	2.4	90.5	0.37	4.0	1.6	12	LD
YD6WHK	90.8	92.9	91.1	90.9	91.4	0.59	4.0	1.0	91.1	0.52	3.6	1.1	12	LD
ZAHNMP	91.9	96.2	95.8	99.2 *	95.8	1.69	3.2	3.0	93.7	1.15	3.6	3.7	12	LD
ZDKDCD	86.0	89.4	88.3	87.1	87.7	-0.35	5.2	1.5	87.7	-0.33	5.2	1.5	4	EX
ZDY639	80.5 H	79.5 *	81.8 H	83.0	81.2	-1.99 *	5.8	1.5	81.7	-1.83	4.8	10.8 H	12	MB

Consensus (All Labs) Results									
Wk Mean	88.78	89.14	89.43	89.75	Month Mean	89.07		Grand Mean	89.05
Avg SDr	4.29	4.09	4.25	3.71	Avg SD	4.17		Avg SD	4.17
SD btwn Labs	5.27	4.27	4.40	4.39	SD btwn Labs	3.96		SD btwn Labs	4.04
Labs Incl	52	52	52	50	SD btwn Wks	3.56		SD btwn Wks	3.69
Labs Excl	0	0	0	2	Labs Incl	52		Labs Incl	52
Labs not Rcvd	0	0	0	0					

Analysis Notes

ZDKDCD - Data appears to be switched between Analysis 215 and Analysis 216 for Week 4. Data switched by CTS.

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	TD	TMI Digital Crush Tester, Model 17-09
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 216

Report #580 (A)

January 2018

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	
2WTZDB	137.9 L	144.2	147.2	145.0	143.6	0.54	2.9	4.0	143.6	0.54	2.9	4.0	4	LZ
3MXGC8	134.3	137.6	136.3	134.9	135.8	-0.78	3.8	1.5	135.8	-0.78	3.8	1.5	4	LD
3T7TDE	134.2	138.0	131.2	135.0	134.6	-0.98	4.9	2.8	134.6	-0.98	4.9	2.8	4	LC
42Z8T7	126.6	129.7 *	127.1 *	128.0	127.9	-2.11 *	3.3	1.3	127.9	-2.11 *	3.3	1.3	4	TU
4G7GME	143.9	143.0	142.9	143.9 L	143.4	0.51	2.5	0.6 L	143.4	0.51	2.5	0.6 L	4	LD
6V6V89	143.8	147.0	140.5	144.2	143.9	0.59	5.0	2.7	143.9	0.59	5.0	2.7	4	LC
77KAMF	142.1	139.2	141.6	136.3	139.8	-0.10	5.2	2.6	139.8	-0.10	5.2	2.6	4	LC
7AF629	128.3	122.1 X	127.5 *	127.4 *	126.3	-2.37 *	4.0	2.9	126.3	-2.37 *	4.0	2.9	4	XX
8DQHGL	156.2 *	148.1	149.5	144.8	149.7	1.56	4.7	4.8	149.7	1.56	4.7	4.8	4	EM
A4MTAA	134.8	133.7	136.2	135.9	135.2	-0.88	3.9	1.1	135.2	-0.88	3.9	1.1	4	LD
AUBQUB	142.8	141.1	139.2	145.8	142.2	0.31	5.3	2.8	142.2	0.31	5.3	2.8	4	LD
AVRW2D	143.3	140.9	143.7	142.8	142.7	0.39	4.7	1.2	142.7	0.39	4.7	1.2	4	LD
BHFYGA	136.2	136.6	136.8	137.2	136.7	-0.62	3.9	0.4 L	136.7	-0.62	3.9	0.4 L	4	LC
C8C347	136.5	138.4	135.0	133.6 H	135.9	-0.76	6.9	2.1	135.9	-0.76	6.9	2.1	4	XX
CJLQ3V	131.8 L	133.0	137.5	135.6	134.5	-1.00	3.7	2.6	134.5	-1.00	3.7	2.6	4	LD
CNK8C6	140.8	137.0	139.8	138.7	139.1	-0.23	4.8	1.6	139.1	-0.23	4.8	1.6	4	LD
DWR4W2	133.2	133.2	131.8	133.6	133.0	-1.25	4.7	0.8 L	133.0	-1.25	4.7	0.8 L	4	LD
DYXPK2	134.0	133.4	132.5	134.4	133.6	-1.15	5.0	0.8 L	133.6	-1.15	5.0	0.8 L	4	EN
E6H388	142.6	145.7	142.3	148.8	144.9	0.75	4.9	3.0	144.9	0.75	4.9	3.0	4	LC
ECE4Z7	138.2	144.9	139.7	143.0	141.5	0.18	4.3	3.1	141.5	0.18	4.3	3.1	4	LC
F9RW7B	142.1	138.3	143.6	142.3	141.6	0.20	4.2	2.3	141.6	0.20	4.2	2.3	4	LC
FAPXHU	144.6	142.4	144.4	159.0 *	147.6	1.21	4.4	7.6	147.6	1.21	4.4	7.6	4	LD
G3LGYZ	138.1	145.7	136.8	140.7	140.3	-0.02	3.7	3.9	140.3	-0.02	3.7	3.9	4	TH
G693Y3	144.9	141.8	148.5	149.7	146.2	0.98	5.5	3.6	146.2	0.98	5.5	3.6	4	LC
HBD97T	151.4	147.0	152.6 *	152.2	150.8	1.75	5.3	2.6	150.8	1.75	5.3	2.6	4	LD
HKGAKY	130.4	133.7	136.8	135.6	134.1	-1.06	4.2	2.8	134.1	-1.06	4.2	2.8	4	EM
JJ2KHX	147.7	140.6	140.4	142.4	142.8	0.41	4.5	3.4	142.8	0.41	4.5	3.4	4	LD
JT7L2X	141.8	138.0	139.5	132.4 L	137.9	-0.42	3.3	4.0	137.9	-0.42	3.3	4.0	4	LZ
JWB2P3	138.7	139.8	136.1	134.8	137.3	-0.51	5.3	2.3	137.3	-0.51	5.3	2.3	4	LD
KDBECA	137.7	141.9	141.9	147.7	142.3	0.32	5.9	4.1	142.3	0.32	5.9	4.1	4	TH
KTNTU9	135.4	140.7	137.8	138.3	138.0	-0.40	4.1	2.2	138.0	-0.40	4.1	2.2	4	EM
LUBRLB	145.6	145.2	147.3	147.7	146.5	1.02	4.1	1.2	146.5	1.02	4.1	1.2	4	LZ
MPGZ2L	147.3	146.3	145.9	144.1	145.9	0.92	4.7	1.3	145.9	0.92	4.7	1.3	4	LC
NLVX8K	139.0	139.2 L	139.1	139.2	139.1	-0.21	2.6	0.1 L	139.1	-0.21	2.6	0.1 L	4	LD
PB7JRL	134.5	142.0	140.2	143.3	140.0	-0.07	4.4	3.9	140.0	-0.07	4.4	3.9	4	LY





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

**Report #580 (A)**  
**January 2018**

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
PJXWU2	154.9 *	158.5 X	153.4 *	157.9 *	156.2	2.66 *	4.9	2.4	156.2	2.66 *	4.9	2.4	4	LZ
QHOUT4	123.9 *H	144.0	142.6	138.0	137.1	-0.55	8.5	9.2	137.1	-0.55	8.5	9.2	4	MB
QT7TEY	139.3	138.3	138.8	140.5	139.2	-0.20	3.7	1.0	139.2	-0.20	3.7	1.0	4	TH
R6QRH7	147.2	144.9 L	142.7	144.6	144.8	0.75	4.0	1.9	144.8	0.75	4.0	1.9	4	LD
RVPFAJ	152.2	152.2 *	160.0 X	100.2 XH	141.1	0.12	9.0	27.5 H	141.1	0.12	9.0	27.5 H	4	LC
T283KE	139.9 L	140.7	144.1	142.4	141.8	0.23	3.5	1.9	141.8	0.23	3.5	1.9	4	TD
T7P8GP	146.4	142.2	144.2	143.7	144.1	0.63	3.2	1.7	144.1	0.63	3.2	1.7	4	LZ
UR2HWD	134.2 H	134.2	129.1	120.0 XH	129.4	-1.86	8.6	6.7	129.4	-1.86	8.6	6.7	4	LZ
VAWBHB	137.1	141.8	135.4	142.7 H	139.2	-0.19	5.8	3.6	139.2	-0.19	5.8	3.6	4	LC
WTNTTN	148.7	151.0 *	151.3	148.6	149.9	1.60	6.3	1.5	149.9	1.60	6.3	1.5	4	LY
X8GRBB	142.4	142.6	142.4	141.3	142.2	0.30	4.0	0.6 L	142.2	0.30	4.0	0.6 L	4	TH
Y83NFX	131.7	138.4	135.7	127.6 *	133.4	-1.19	5.2	4.7	133.4	-1.19	5.2	4.7	4	LD
YBYCUJ	144.3	142.1	143.2	142.6	143.1	0.45	4.5	1.0	143.1	0.45	4.5	1.0	4	LD
YD6WHK	141.2	140.4	139.1	139.7	140.1	-0.05	5.2	0.9	140.1	-0.05	5.2	0.9	4	LD
ZAHNMP	146.4	149.1	147.4	153.2	149.0	1.45	5.1	3.0	149.0	1.45	5.1	3.0	4	LD
ZDKDCD	133.1	137.2	133.8	137.5	135.4	-0.84	5.1	2.3	135.4	-0.84	5.1	2.3	4	EX
ZDY639	121.4 *	121.9 X	121.6 X	116.4 X	120.3	-3.38 X	5.5	2.6	120.3	-3.38 X	5.5	2.6	4	MB

Consensus (All Labs) Results									
Wk Mean	139.70	140.94	140.25	141.20	Month Mean	140.40		Grand Mean	140.40
Avg SDr	5.21	4.42	4.54	4.84	Avg SD	4.91		Avg SD	4.91
SD btwn Labs	7.36	4.89	6.04	6.96	SD btwn Labs	5.94		SD btwn Labs	5.94
Labs Incd	52	49	50	49	SD btwn Wks	4.96		SD btwn Wks	4.96
Labs Excl	0	3	2	3	Labs Incd	51		Labs Incd	51
Labs not Rcvd	0	0	0	0					

**Analysis Notes**

ZDKDCD - Data appears to be switched between Analysis 215 and Analysis 216 for Week 4. Data switched by CTS.

**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
TD	TMI Digital Crush Tester, Model 17-09	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 223

Report #580 (A)

January 2018

STFI, 42 lb Linerboard - 42D3

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	
3MXGC8	23.6	22.9	22.1	22.3	22.7	0.31	1.7	0.6	22.3	-0.10	1.6	0.8	12	LY
3T7TDE	23.1	23.5	22.0	23.3	23.0	0.53	2.0	0.6	22.9	0.45	2.2	0.6	12	LW
4G7GME	22.6	22.7	22.5	22.7	22.6	0.24	1.9	0.1 L	22.7	0.28	1.9	0.2 L	12	LA
6V6V89	23.3	24.3	21.3	23.5	23.1	0.63	1.8	1.2	23.1	0.67	1.9	0.8	12	LA
77KAMF	24.9	24.8 *	24.4	23.2	24.3	1.70	1.9	0.8	24.2	1.75	2.0	0.6	12	LW
83V7AF	21.9 L	22.1 L	20.8 L	20.9 L	21.4	-0.79	0.4	0.7	21.4	-0.96	1.5	0.5	12	XX
8DQHGL	22.6 L	21.6 L	22.4 L	21.6 L	22.0	-0.27	0.0	0.5	22.0	-0.38	0.0	0.5	4	TT
8GXQUD	21.8	21.9	22.0	22.8	22.2	-0.16	1.8	0.5	22.2	-0.25	1.7	0.6	12	LA
9MVRLQ	22.5 L	22.6 L	22.7 L	22.4 L	22.5	0.17	0.9	0.1 L	22.4	-0.06	0.9	0.4	12	TT
A4MTAA	21.6	21.0	20.6 L	22.1	21.3	-0.85	1.1	0.7	21.8	-0.56	1.4	0.7	12	BK
AVRW2D	22.8	23.1	22.7	22.5	22.8	0.37	1.8	0.3	22.4	0.02	2.0	0.4	12	LY
BHFYGA	21.8	22.2	21.7	22.3	22.0	-0.29	1.7	0.3	22.7	0.25	1.7	0.6	12	LU
C8C347	21.7	23.4	23.0	24.2 H	23.1	0.62	2.1	1.1	23.2	0.75	1.2	0.9	12	XX
CJLQ3V	19.4 *	20.0	19.1 *	20.3	19.7	-2.25 *	1.7	0.6	20.4	-2.00 *	2.5	1.0	12	LU
DWR4W2	20.9	21.7	22.1	21.7	21.6	-0.63	1.9	0.5	22.0	-0.45	1.8	0.8	12	LU
DYXPK2	21.3	20.5	21.5	22.1	21.3	-0.85	1.8	0.7	21.3	-1.07	1.9	0.5	12	LY
E6H388	22.3 L	21.5 L	23.0 L	23.7 L	22.6	0.24	0.0	0.9	23.2	0.75	1.1	0.9	12	LA
ECE4Z7	21.8 L	21.1 L	20.7 L	21.2 L	21.2	-0.96	0.0	0.5	20.5	-1.87	0.5	1.1	12	LA
FAPXHU	23.4 L	22.7 L	23.1 L	26.5 XL	23.9	1.34	0.0	1.8	23.9	1.43	0.0	1.1	12	LU
FWJ4NW	22.4 H	22.2 H	22.0	21.2	21.9	-0.34	2.4	0.5	22.0	-0.43	2.1	0.6	12	LU
G693Y3	22.9 L	20.1 L	26.1 *L	23.0 L	23.0	0.58	0.0	2.5 H	22.7	0.27	0.0	1.4	12	LW
HKGAKY	24.2	22.5	24.4	22.9 H	23.5	0.98	2.2	0.9	22.9	0.50	1.8	1.2	12	LZ
JJ2KHX	25.3 *	22.3	22.2	22.6	23.1	0.64	1.6	1.5	22.8	0.37	1.6	0.9	12	LA
JKW4LK	22.2	21.3	21.9 H	21.4	21.7	-0.57	1.9	0.4	22.6	0.19	1.9	1.1	12	LU
JT7L2X	22.5	22.2	21.8	21.6	22.0	-0.27	1.7	0.4	21.5	-0.93	1.8	0.7	12	LZ
JWB2P3	22.9	23.1	22.2	23.2	22.9	0.44	1.7	0.5	22.5	0.11	1.8	0.6	12	LA
K6Z3QX	23.6	24.4	23.1	23.8	23.7	1.18	1.9	0.6	23.7	1.21	2.2	0.7	12	LH
KCK6QN	22.6	21.4	22.8	23.0	22.4	0.09	1.9	0.7	22.3	-0.10	1.9	0.7	12	LA
KDBECA	20.3 L	21.6 L	20.6 L	19.8 L	20.6	-1.50	0.0	0.8	20.6	-1.79	0.0	0.8	4	LU
MN6DEZ	23.7 L	21.1 L	19.1 *L	21.0 L	21.2	-0.97	0.4	1.9 H	21.7	-0.68	1.6	1.3	12	XX
MPGZ2L	22.0	22.5	22.4	22.5	22.3	-0.01	1.8	0.2	22.4	-0.01	2.0	0.4	12	LU
N4XH8U	45.5 XH	46.6 XH	43.7 XH	47.0 XH	45.7	19.82 X	3.1	1.5	46.3	23.26 X	2.4	1.6	8	LA
PB7JRL	21.6	22.2	22.0	22.1	22.0	-0.32	2.0	0.3	21.6	-0.80	1.9	0.6	11	LU
PLQTDU	20.9 L	19.0 *L	19.4 L	19.5 *L	19.7	-2.24 *	0.0	0.8	20.9	-1.46	0.0	1.1	12	LW
Q9HGDK	25.8 *	24.4 H	24.1	24.5	24.7	2.00 *	2.2	0.7	24.6	2.11 *	2.1	0.7	12	LZ



Containerboard Interlaboratory Testing Program

Analysis 223

Report #580 (A)

January 2018

STFI, 42 lb Linerboard - 42D3

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
QHOUT4	21.8	23.5	23.6	23.1	23.0	0.56	1.5	0.8	22.5	0.11	1.7	0.7	12	LA
QT7TEY	21.9 L	22.7 L	22.4 L	22.3	22.3	-0.02	1.0	0.3	22.2	-0.21	1.0	0.4	12	TT
R6QRH7	20.6	21.5	20.8	21.1	21.0	-1.15	1.8	0.4	21.1	-1.25	1.7	0.3	12	LY
T7P8GP	20.8 H	20.4	21.3	20.8	20.8	-1.28	2.1	0.4	21.0	-1.37	1.9	0.7	11	LW
TG49P4	20.6	21.7	19.8	18.9 *	20.2	-1.79	1.6	1.2	21.3	-1.06	2.1	1.2	12	XX
TV34BB	23.9 H	23.1	22.6	22.9	23.1	0.68	2.1	0.6	22.9	0.47	1.9	0.7	12	LA
UR2HWD	21.2	23.5	21.2	19.8	21.4	-0.79	1.9	1.6	22.1	-0.34	2.0	1.5	12	LA
VAWBHB	24.4 L	23.6 L	25.1 *	26.1 X	24.8	2.06 *	1.1	1.1	24.8	2.29 *	1.1	1.1	4	LY
VB9C2N	21.6	22.8	22.5	21.9	22.2	-0.10	1.7	0.5	22.1	-0.35	1.9	0.5	12	LW
WGBPCR	23.6 H	23.7	25.2 *H	23.9 H	24.1	1.48	2.5	0.7	24.8	2.28 *	2.2	1.1	12	LH
YBDZVB	23.0	20.6	21.2	19.6 *	21.1	-1.06	1.5	1.4	22.7	0.27	2.0	1.7	12	LA
YBYCUJ	23.3	23.3 H	23.1	23.6 H	23.3	0.83	2.3	0.2	22.9	0.46	2.0	0.6	12	LA
YD6WHK	23.9	22.5 H	22.1	22.4	22.7	0.32	2.0	0.8	22.6	0.16	2.0	0.7	12	LY
ZAHNMP	24.2	24.1	22.5	23.0 H	23.4	0.92	1.9	0.8	23.1	0.70	2.0	1.0	12	LZ
ZDKDCD	24.5 L	22.4 L	23.2 L	22.0 L	23.0	0.58	0.0	1.1	23.0	0.60	0.0	1.1	4	TT

Consensus (All Labs) Results												
Wk Mean	22.55	22.31	22.21	22.13	Month Mean	22.34		Grand Mean	22.41			
Avg SDr	1.76	1.69	1.62	1.68	Avg SD	1.68		Avg SD	1.72			
SD btwn Labs	1.35	1.26	1.47	1.31	SD btwn Labs	1.18		SD btwn Labs	1.03			
Labs Incl	49	49	49	47	SD btwn Wks	0.89		SD btwn Wks	0.85			
Labs Excl	1	1	1	3	Labs Incl	49		Labs Incl	49			
Labs not Rcvd	0	0	0	0								

Analysis Notes

VB9C2N - Data appears to be switched between Analysis 223 and Analysis 224 for Week 2. Data switched by CTS.

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)	TT	TMI Short Span Compression, 17-34 (MB K455)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 224

Report #580 (A)

January 2018

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	
3MXGC8	34.7	34.0	34.3 H	35.0	34.5	0.35	2.7	0.4	34.5	0.35	2.7	0.4	4	LZ
3T7TDE	34.9	36.2 H	34.7 H	35.8	35.4	0.96	3.3	0.7	35.4	0.96	3.3	0.7	4	LW
4G7GME	33.7	33.8	33.8	33.7	33.8	-0.15	2.5	0.1 L	33.8	-0.15	2.5	0.1 L	4	LA
6V6V89	36.4	35.5	32.4	35.8	35.0	0.73	2.4	1.8	35.0	0.73	2.4	1.8	4	LA
77KAMF	36.9 H	35.7 H	36.2	36.3	36.3	1.60	3.4	0.5	36.3	1.60	3.4	0.5	4	LW
83V7AF	32.8 L	33.8 L	33.2 L	32.4 L	33.0	-0.67	1.0	0.6	33.0	-0.67	1.0	0.6	4	XX
8DQHGL	36.4 L	33.9 L	33.4 L	34.7 L	34.6	0.42	0.0	1.3	34.6	0.42	0.0	1.3	4	TT
8GXQUD	34.3 H	33.4	34.0	35.6	34.3	0.23	3.0	0.9	34.3	0.23	3.0	0.9	4	LW
9MVRLQ	34.1 L	34.0 L	33.8 L	33.7 L	33.9	-0.06	1.1	0.2 L	33.9	-0.06	1.1	0.2 L	4	TT
A4MTAA	32.0	33.8	32.3	31.2	32.3	-1.15	1.9	1.1	32.3	-1.15	1.9	1.1	4	BK
AVRW2D	35.6	34.6	34.3	35.3	35.0	0.67	2.4	0.6	35.0	0.67	2.4	0.6	4	LY
BHFYGA	35.1 H	35.1	34.8	34.5	34.9	0.62	3.0	0.3	34.9	0.62	3.0	0.3	4	LU
C8C347	34.1 L	35.6	34.3	34.8	34.7	0.50	2.3	0.7	34.7	0.50	2.3	0.7	4	XX
CJLQ3V	31.2	29.5 *	31.0 H	31.2 H	30.7	-2.26 *	2.9	0.8	30.7	-2.26 *	2.9	0.8	4	LU
DWR4W2	31.7	31.5	33.1	32.7	32.2	-1.21	2.9	0.8	32.2	-1.21	2.9	0.8	4	LU
DYXPK2	34.4	32.0	32.9	33.2	33.1	-0.60	2.5	1.0	33.1	-0.60	2.5	1.0	4	LY
E6H388	34.5 L	33.6 L	32.5 L	32.3 L	33.2	-0.53	0.0	1.0	33.2	-0.53	0.0	1.0	4	LA
ECE4Z7	33.0 L	33.9 L	33.0 L	33.7 L	33.4	-0.40	0.0	0.5	33.4	-0.40	0.0	0.5	4	LA
FAPXHU	36.0 L	36.3 L	35.2 L	36.4 L	35.9	1.37	0.0	0.6	35.9	1.37	0.0	0.6	4	LU
FWJ4NW	34.9	34.9 H	31.1	32.1	33.2	-0.52	2.9	1.9	33.2	-0.52	2.9	1.9	4	LU
G693Y3	34.2 L	32.6 L	32.8 L	33.9 L	33.4	-0.42	0.0	0.8	33.4	-0.42	0.0	0.8	4	LW
HKGAKY	37.2	36.2	36.5 *L	37.0 H	36.7	1.88	2.8	0.5	36.7	1.88	2.8	0.5	4	LZ
JJ2KHX	37.8 *H	35.9	35.6 H	35.2	36.1	1.49	3.3	1.2	36.1	1.49	3.3	1.2	4	LA
JKW4LK	32.9	33.4 L	34.2	31.7	33.1	-0.64	2.2	1.1	33.1	-0.64	2.2	1.1	4	LU
JT7L2X	34.1	33.4	34.2	33.8	33.9	-0.07	2.8	0.4	33.9	-0.07	2.8	0.4	4	LZ
JWB2P3	34.4 H	34.1	33.6	35.1	34.3	0.21	2.7	0.6	34.3	0.21	2.7	0.6	4	LA
K6Z3QX	35.1	35.9	34.5	35.0 H	35.1	0.79	3.5	0.5	35.1	0.79	3.5	0.5	4	LH
KCK6QN	33.9	33.2	34.5	33.6	33.8	-0.13	2.5	0.5	33.8	-0.13	2.5	0.5	4	LA
KDBECA	33.7 L	32.7 L	32.6 L	33.5 L	33.1	-0.60	0.0	0.6	33.1	-0.60	0.0	0.6	4	LU
MN6DEZ	35.4 L	33.7 L	31.7 L	32.6 L	33.4	-0.43	0.9	1.6	33.4	-0.43	0.9	1.6	4	XX
MPGZ2L	32.7	34.7	33.6	34.1	33.8	-0.15	2.6	0.8	33.8	-0.15	2.6	0.8	4	LU
N4XH8U	50.6 X	50.3 XH	52.2 XH	51.2 XH	51.1	11.88 X	4.0	0.9	51.1	11.88 X	4.0	0.9	4	XX
PB7JRL	33.9	33.3	33.8	34.7	33.9	-0.04	2.6	0.6	33.9	-0.04	2.6	0.6	4	LU
PLQTDU	35.1 L	30.4 *L	33.9 L	31.5 L	32.7	-0.87	0.0	2.1 H	32.7	-0.87	0.0	2.1 H	4	LW
Q9HGDK	39.6 XH	39.7 X	39.1 XH	36.0	38.6	3.19 X	3.2	1.8	38.6	3.19 X	3.2	1.8	4	LZ



Containerboard Interlaboratory Testing Program

Analysis 224

STFI, 56 lb Linerboard - 56A2

TAPPI Official Test Method T826

Report #580 (A)

January 2018

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	
QHOUT4	34.0	34.4	35.6	34.0	34.5	0.36	2.4	0.8	34.5	0.36	2.4	0.8	4	LA
QT7TEY	33.9 L	33.4 L	33.5 L	33.7 L	33.6	-0.26	1.1	0.2	33.6	-0.26	1.1	0.2	4	TT
R6QRH7	32.0	32.7	32.2	31.9	32.2	-1.26	2.1	0.4	32.2	-1.26	2.1	0.4	4	LY
T7P8GP	32.4 H	31.7	33.8	31.8	32.4	-1.09	3.0	0.9	32.4	-1.09	3.0	0.9	4	LW
TG49P4	29.9 *	32.5	31.1	29.7 *	30.8	-2.20 *	2.9	1.3	30.8	-2.20 *	2.9	1.3	4	XX
TV34BB	34.0	33.7	33.7	34.6	34.0	-0.01	2.7	0.4	34.0	-0.01	2.7	0.4	4	LA
UR2HWD	30.3 *	32.8	32.8	33.1	32.2	-1.21	2.7	1.3	32.2	-1.21	2.7	1.3	4	LA
VAWBHB	35.7	37.5 *	38.3 X	37.7 *	37.3	2.31 *	2.6	1.1	37.3	2.31 *	2.6	1.1	4	LY
VB9C2N	33.0	33.5 H	33.4 L	32.4	33.1	-0.63	2.6	0.5	33.1	-0.63	2.6	0.5	4	LW
WGBPCR	36.2	37.5 *	37.4 *	36.3	36.8	1.99 *	3.0	0.7	36.8	1.99 *	3.0	0.7	4	LH
YBDZVB	35.6 L	32.2 H	31.3 L	31.8	32.7	-0.87	2.3	2.0	32.7	-0.87	2.3	2.0	4	LA
YBYCUJ	34.7	32.6	33.1	33.7	33.5	-0.32	2.4	0.9	33.5	-0.32	2.4	0.9	4	LA
YD6WHK	35.2	33.1	34.3 L	34.7	34.3	0.23	2.4	0.9	34.3	0.23	2.4	0.9	4	LU
ZAHNMP	36.7 H	33.6	36.5 *H	34.7	35.4	0.97	3.6	1.5	35.4	0.97	3.6	1.5	4	LZ
ZDKDCD	35.1 L	39.4 XL	33.4 L	34.0 L	35.5	1.04	0.0	2.7 H	35.5	1.04	0.0	2.7 H	4	LZ

Consensus (All Labs) Results										
Wk Mean	34.28	33.87	33.70	33.92	Month Mean	33.98			Grand Mean	33.98
Avg SDr	2.44	2.55	2.47	2.33	Avg SD	2.45			Avg SD	2.45
SD btwn Labs	1.71	1.64	1.43	1.70	SD btwn Labs	1.44			SD btwn Labs	1.44
Labs Incl	48	47	47	49	SD btwn Wks	1.04			SD btwn Wks	1.04
Labs Excl	2	3	3	1	Labs Incl	48			Labs Incl	48
Labs not Rcvd	0	0	0	0						

Analysis Notes

VB9C2N - Data appears to be switched between Analysis 223 and Analysis 224 for Week 2. Data switched by CTS.

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 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, 56 lb Linerboard - 56A**  
 TAPPI Official Test Method T575

**Report #580 (A)**  
**January 2018**

WebCode	Monthly Results				Cumulative Results				
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3MXGC8	169.1	-0.03	12.61		176.9	0.19	5.49	4	EV
3T7TDE	162.7	-0.62	13.35		169.4	-0.19	7.26	4	XX
4G7GME	169.9	0.04	14.38		168.9	-0.21	2.81	4	XX
6V6V89	151.6	-1.64	11.96		161.6	-0.57	7.92	4	LA
8GXQUD	182.6	1.21	24.49		199.7	1.31	14.06	4	LA
C8C347	171.7	0.21	35.28	H	188.3	0.75	17.97	4	EV
DWR4W2	174.0	0.42	17.77		179.3	0.30	3.81	4	EV
DYXPK2	163.3	-0.56	13.51		172.2	-0.05	6.91	4	EV
ECE4Z7	171.5	0.19	29.29		197.0	1.18	18.17	4	LA
G693Y3	171.2	0.16	13.43		184.0	0.54	10.22	4	EV
HBD97T	147.6	-2.00	18.42	*	145.4	-1.37	7.36	4	EV
JT7L2X	126.7	-3.92	9.83	X	148.7	-1.21	19.39	3	EV
KCK6QN	171.4	0.18	18.91		180.6	0.36	12.07	4	LA
Q9HGDK	188.9	1.79	8.28	L	179.3	0.30	9.92	4	XX
QHQT4	250.1	7.40	31.87	X H	208.5	1.75	36.05	H 3	LA
T7P8GP	179.8	0.95	22.31		180.4	0.36	5.97	4	EV
TV34BB	157.8	-1.07	13.49		162.0	-0.56	4.66	4	LA
UR2HWD	113.6	-5.12	9.92	X	122.5	-2.51	7.64	4	LA
ZAHNMP	177.7	0.76	17.58		165.8	-0.37	8.68	4	LA

Consensus (All Labs) Results			
Month Mean	169.43	Grand Mean	173.19
Avg SD	19.08	Avg SD Months	13.25
SD btwn Labs	10.90	SD btwn Labs	20.22
Labs Incl	16	Labs Incl	19

**Key to Instrument Codes Reported by Participants**

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



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

**Report #580 (A)**  
**January 2018**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
HKGAKY	388.0	4.10 X	7.14	386.2	1.55	5.58	4	XX
JJ2KHX	364.8	0.04	6.76	363.9	-0.43	1.99	4	LA
JWB2P3	361.4	-0.56	6.36	359.8	-0.79	2.02	4	LA
MPGZ2L	368.0	0.60	4.78	369.9	0.11	2.92	4	XX
MTETL4	375.2	1.86 *	8.36	387.0	1.63	21.95 H	4	TS
N4XH8U	364.9	0.05	7.20	362.2	-0.58	3.89	2	LA
NY3QYX	357.0	-1.32	8.41	357.2	-1.01	2.64	4	LA
PJXWU2	357.0	-1.33	7.10	356.7	-1.06	2.52	4	TS
YBDZVB	365.0	0.07	5.25	366.3	-0.21	2.01	4	XX
YBYCUJ	368.0	0.60	8.16	377.5	0.78	8.33	4	XX

Consensus (All Labs) Results			
Month Mean	364.59	Grand Mean	368.67
Avg SD	7.04	Avg SD Months	7.95
SD btwn Labs	5.71	SD btwn Labs	11.29
Labs Incd	9	Labs Incd	10

**Key to Instrument Codes Reported by Participants**

- |  |                                  |
|--|----------------------------------|
| <b>LA</b> L & W Roughness Sheffield - Autoline<br><b>XX</b> Instrument make/model not specified by lab | <b>TS</b> TMI Monitor/Smoothness |
|--|----------------------------------|



Containerboard Interlaboratory Testing Program  
Analysis 231

Report #580 (A)  
January 2018

Internal Bond, 42 Ib Linerboard - 42D

TAPPI Official Test Method T569

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3MXGC8	96.9	-0.91	11.21	88.4	-1.40	6.05	4	XX
6TC4WM	124.6	0.96	3.91	109.3	-0.04	10.24	4	TM
8GXQUD	139.4	1.96 *	10.53	130.7	1.34	5.89	4	HY
CJLQ3V	113.8	0.23	5.89	114.3	0.28	2.08	4	TM
DWR4W2	81.0	-1.99 *	6.36	85.0	-1.61	4.10	4	TM
E6H388	110.2	-0.01	5.72	100.9	-0.59	6.27	4	TM
ECE4Z7	121.0	0.72	19.17	122.0	0.78	3.48	4	SC
FAPXHU	101.8	-0.58	6.30	109.3	-0.04	8.39	4	HZ
G693Y3	129.0	1.26	26.32 H	147.3	2.42 *	15.80 H	4	SC
HBD97T	119.6	0.62	13.65	119.5	0.62	2.37	4	HY
JJ2KHX	96.8	-0.92	6.06	99.0	-0.71	3.17	4	SC
LNNYCW	91.4	-1.28	11.12	96.3	-0.88	3.67	4	TM
MPGZ2L	112.4	0.14	6.62	113.0	0.20	1.39	4	HY
Q9HGDK	111.0	0.04	7.11	107.1	-0.19	4.22	4	TM
UR2HWD	109.2	-0.08	4.82	107.0	-0.19	3.93	4	TM
YBDZVB	107.8	-0.17	3.70	110.1	0.01	6.49	4	SC
YBYCUJ	61.2	-3.33 X	1.79 L	55.2	-3.54 X	4.09	4	LZ

Consensus (All Labs) Results			
Month Mean	110.37	Grand Mean	109.92
Avg SD	11.00	Avg SD Months	6.50
SD btwn Labs	14.78	SD btwn Labs	15.45
Labs Incl	16	Labs Incl	16

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	108.00	14.01	2.38	13
Modified Scott Bond Mechanics	125.92	19.06	15.55	2

Analysis Notes

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

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 #580 (A)**  
**January 2018**

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SD	Mean	CPV	SD Months	Months
3MXGC8	28.6	0.77	3.85	28.0	0.60	0.49	4
3T7TDE	24.8	-0.50	1.92	26.4	-0.05	2.36	4
4G7GME	26.2	-0.03	0.84	25.4	-0.43	0.85	4
83V7AF	29.4	1.04	3.44	28.6	0.82	1.96	4
CJLQ3V	20.1	-2.08 *	1.96	20.6	-2.34 *	0.74	4
DWR4W2	23.6	-0.90	2.51	27.1	0.22	2.51	4
DYXPK2	27.8	0.50	3.05	26.8	0.13	1.63	4
ECE4Z7	30.8	1.51	4.55	29.3	1.12	1.18	4
G693Y3	23.8	-0.83	1.79	24.8	-0.69	0.75	4
HKGAKY	31.5	1.74	2.57	30.6	1.62	1.74	4
JT7L2X	20.8	-1.83	2.95	24.7	-0.71	3.78	4
KCK6QN	29.0	0.92	4.87	30.0	1.41	0.96	4
MN6DEZ	27.2	0.30	1.92	27.6	0.44	2.19	4
MPGZ2L	25.9	-0.12	3.50	24.4	-0.85	2.95	3
NGHXCE	23.6	-0.90	3.68	21.4	-2.02 *	1.94	4
Q9HGDK	27.0	0.24	0.00 L	28.3	0.72	3.26	4
RVPFAJ	23.4	-0.97	3.44	26.4	-0.05	2.25	4
T7P8GP	26.2	-0.03	3.42	24.9	-0.65	3.56	4
UR2HWD	27.0	0.24	3.67	26.4	-0.03	2.89	4
YBDZVB	28.4	0.70	1.67	26.7	0.06	1.54	4
YBYCUJ	27.0	0.24	0.71	28.2	0.68	1.99	4

Consensus (All Labs) Results			
Month Mean	26.29	Grand Mean	26.49
Avg SD	3.03	Avg SD Months	2.19
SD btwn Labs	3.00	SD btwn Labs	2.51
Labs Incl	21	Labs Incl	21

**Key to Instrument Codes Reported by Participants**

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program  
Analysis 237

Report #580 (A)  
January 2018

**Air Resistance, 42 lb Linerboard - 42D**

TAPPI Official Test Method T460

WebCode	Monthly Results				Cumulative Results				
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2WTZDB	18.5	0.40	1.58		18.0	-0.01	0.50	4	XX
3MXGC8	17.4	-0.34	5.84	H	18.1	0.15	0.59	4	LP
4G7GME	18.0	0.07	2.15		18.0	0.05	0.47	3	LA
6V6V89	19.1	0.82	1.76		18.2	0.20	0.75	4	LA
8GXQUD	19.3	0.93	2.11		19.9	2.03 *	0.52	4	LP
A3NR2W	17.6	-0.17	0.77	L	18.1	0.12	0.42	3	TL
C8C347	16.9	-0.70	0.81	L	16.8	-1.26	0.35	4	LW
CJLQ3V	19.0	0.73	2.84		18.2	0.22	1.01	4	TP
ECE4Z7	17.3	-0.40	2.13		17.7	-0.28	0.31	4	LA
EYE3M6	15.1	-1.84	0.89	L	16.2	-1.82	0.78	4	LA
G693Y3	14.9	-2.01 *	2.56		16.5	-1.56	1.16	4	HG
G7LGKQ	15.8	-1.44	1.54		17.0	-1.05	0.93	4	LP
HKGAKY	19.1	0.81	1.53		18.9	1.00	0.57	4	XX
JJ2KHX	19.9	1.32	0.91	L	19.1	1.15	1.41	4	LA
JT7L2X	17.0	-0.60	1.28		17.1	-0.94	0.67	4	LP
KYV6YL	18.7	0.50	1.77		18.0	-0.03	0.51	4	XX
MPGZ2L	17.5	-0.28	2.31		18.6	0.60	0.87	4	TP
NGHXCE	19.5	1.06	2.81		18.4	0.41	1.00	4	GA
Q9HGDK	16.3	-1.07	1.83		17.6	-0.41	1.07	4	TD
R6QRH7	18.4	0.33	1.07		17.9	-0.07	0.46	4	LP
T7P8GP	16.0	-1.27	0.94		17.0	-1.05	1.34	4	XX
UR2HWD	19.2	0.89	1.02		18.5	0.49	0.61	4	LP
Y83NFX	19.3	0.92	2.21		17.8	-0.17	1.60	4	GG
YBYCUJ	19.9	1.32	0.75	L	20.1	2.23 *	0.45	4	LA

**Consensus (All Labs) Results**

Month Mean	17.90	Grand Mean	17.99
Avg SD	2.10	Avg SD Months	0.84
SD btwn Labs	1.50	SD btwn Labs	0.96
Labs Incl	24	Labs Incl	24



Containerboard Interlaboratory Testing Program  
Analysis 237

Report #580 (A)  
January 2018

**Air Resistance, 42 lb Linerboard - 42D**

TAPPI Official Test Method T460

**Key to Instrument Codes Reported by Participants**

<b>GA</b>	Gurley Precision #4340 Automatic Densometer	<b>GG</b>	Gurley Precision #4320 Densometer
<b>HG</b>	Technidyne - Hagerty Model #1 and Profile System	<b>LA</b>	L&W Autoline
<b>LP</b>	L&W Air Permeance Tester SE 166	<b>LW</b>	L&W Gurley Densometer, Oil Flotation
<b>TD</b>	TMI Gurley Densometer	<b>TL</b>	Teledyne Gurley Densometer #4110, Oil Flotation
<b>TP</b>	Technidyne Profile/ plus Roughness & Porosity	<b>XX</b>	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program  
Analysis 240

Report #580 (A)  
January 2018

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	
2BPED6	60.9 L	61.3 L	61.2 L	60.9 L	61.1	0.21	1.1	0.2 L	61.1	0.21	1.1	0.2 L	4	LD
3MXGC8	59.9	61.7	61.9	62.2	61.4	0.38	3.3	1.0	61.4	0.38	3.3	1.0	4	LZ
42Z8T7	62.1	62.0	64.6	61.7	62.6	0.91	2.8	1.3	62.6	0.91	2.8	1.3	4	TU
4G7GME	61.0	61.3	61.9	61.2	61.3	0.34	2.2	0.4	61.3	0.34	2.2	0.4	4	LD
4JGAQT	57.9	59.9	61.7	62.8	60.6	-0.01	3.7	2.1	60.6	-0.01	3.7	2.1	4	LC
77KAMF	61.3	62.8	60.0	62.0	61.5	0.42	3.4	1.2	61.5	0.42	3.4	1.2	4	LC
83V7AF	64.2	66.1 *	64.7	63.1	64.5	1.79	3.2	1.2	64.5	1.79	3.2	1.2	4	XX
8AY2D9	62.0	61.8	61.1	60.8	61.4	0.38	2.9	0.6	61.4	0.38	2.9	0.6	4	LC
9MVRLQ	58.7	58.0	58.2	59.4	58.6	-0.93	4.3	0.6	58.6	-0.93	4.3	0.6	4	TG
AVRW2D	63.0	64.4	62.4	61.7	62.9	1.04	3.1	1.2	62.9	1.04	3.1	1.2	4	LD
BHFYGA	60.2	61.3	62.8	62.4	61.7	0.50	2.4	1.2	61.7	0.50	2.4	1.2	4	LD
C8C347	49.5 X	50.0 XH	48.7 X	47.9 X	49.0	-5.28 X	3.9	0.9	49.0	-5.28 X	3.9	0.9	4	XX
DWR4W2	57.1	61.3	58.2	61.1	59.4	-0.54	3.2	2.1	59.4	-0.54	3.2	2.1	4	LD
DYXPK2	58.0	59.7	58.3	60.0	59.0	-0.74	3.2	1.0	59.0	-0.74	3.2	1.0	4	EN
E6H388	60.2	57.4	56.5 *	56.5	57.7	-1.35	3.0	1.8	57.7	-1.35	3.0	1.8	4	LC
EYE3M6	65.7 *	66.2 *	64.6	62.8	64.8	1.93 *	3.3	1.5	64.8	1.93 *	3.3	1.5	4	LC
FAPXHU	68.7 XH	65.2	60.1 H	63.8 H	64.5	1.76	6.9	3.6 H	64.5	1.76	6.9	3.6 H	4	LC
G3LGYZ	62.5	60.6	60.3	60.1	60.9	0.13	2.5	1.1	60.9	0.13	2.5	1.1	4	MB
G7LGKQ	59.3	62.1	58.9	61.5	60.4	-0.09	2.8	1.6	60.4	-0.09	2.8	1.6	4	LD
HKGAKY	60.7	59.9	60.0	59.2	60.0	-0.30	3.3	0.6	60.0	-0.30	3.3	0.6	4	LZ
J62J6W	60.7	61.7	62.4	61.4	61.6	0.43	3.2	0.7	61.6	0.43	3.2	0.7	4	LD
JT7L2X	57.5	58.0	58.1	61.0	58.7	-0.89	2.8	1.6	58.7	-0.89	2.8	1.6	4	LZ
K6Z3QX	61.1	61.9	62.8	60.3	61.5	0.42	3.3	1.1	61.5	0.42	3.3	1.1	4	LD
KDBECA	45.5 XH	45.3 X	46.7 XH	47.0 X	46.1	-6.62 X	5.0	0.8	46.1	-6.62 X	5.0	0.8	4	TH
KYV6YL	58.1	59.9	61.2	59.9	59.8	-0.37	2.8	1.3	59.8	-0.37	2.8	1.3	4	LD
LUBRLB	61.1	60.7	60.0	60.0	60.4	-0.07	2.3	0.5	60.4	-0.07	2.3	0.5	4	XX
MPGZ2L	59.3	61.8	61.8	63.7	61.6	0.47	3.5	1.8	61.6	0.47	3.5	1.8	4	LC
N4XH8U	64.8	59.9 H	63.5 H	65.3 *H	63.4	1.26	7.6	2.4	63.4	1.26	7.6	2.4	4	XX
NL9EFT	55.5	57.5	58.3	59.8	57.8	-1.28	2.9	1.8	57.8	-1.28	2.9	1.8	4	TH
NLVX8K	61.7	61.4	61.3	61.2	61.4	0.36	3.0	0.2 L	61.4	0.36	3.0	0.2 L	4	LD
PB7JRL	62.3	60.4	63.4	63.5 L	62.4	0.83	2.8	1.4	62.4	0.83	2.8	1.4	4	LZ
Q6J23C	47.2 X	48.2 X	47.9 X	45.0 X	47.1	-6.18 X	3.5	1.4	47.1	-6.18 X	3.5	1.4	4	TC
QHOUT4	54.4 *	63.1	58.6	59.1	58.8	-0.82	3.6	3.6 H	58.8	-0.82	3.6	3.6 H	4	MB
QT7TEY	59.9	59.2	57.9	NO DATA	59.0	-0.73	2.5	1.0	59.0	-0.73	2.5	1.0	3	TH
T283KE	64.3	63.5 L	61.9 L	60.7 L	62.6	0.90	1.2	1.6	62.6	0.90	1.2	1.6	4	TD



Containerboard Interlaboratory Testing Program  
Analysis 240

Report #580 (A)  
January 2018

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

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
WTNTTN	59.8	60.6	59.6	56.9	59.2	-0.63	2.4	1.6	59.2	-0.63	2.4	1.6	4	LD
YBYCUJ	53.7 *	53.2 X	58.0	55.0 *	55.0	-2.58 *	2.7	2.2	55.0	-2.58 *	2.7	2.2	4	LD
YD6WHK	59.7	59.4	61.7	60.1	60.2	-0.17	4.0	1.0	60.2	-0.17	4.0	1.0	4	LD
ZAHNMP	58.4	60.5	58.0	57.6	58.6	-0.92	2.5	1.3	58.6	-0.92	2.5	1.3	4	LD
ZDKDCD	55.5 H	55.5 *	59.1	54.5 *	56.2	-2.03 *	4.1	2.0	56.2	-2.03 *	4.1	2.0	4	LZ
ZDY639	80.7 XH	81.8 X	78.3 X	76.8 X	79.4	8.58 X	4.5	2.3	79.4	8.58 X	4.5	2.3	4	MB
ZX6F8C	36.4 XH	49.8 XH	42.4 XH	38.8 XH	41.8	-8.56 X	11.5	5.9 H	41.8	-8.56 X	11.5	5.9 H	4	LC

Consensus (All Labs) Results														
Wk Mean	60.06	61.05	60.68	60.64	Month Mean	60.60			Grand Mean	60.60				
Avg SDr	3.10	3.29	3.23	3.65	Avg SD	3.39			Avg SD	3.39				
SD btwn Labs	2.79	2.33	2.17	2.36	SD btwn Labs	2.19			SD btwn Labs	2.19				
Labs Incl	36	36	37	36	SD btwn Wks	1.58			SD btwn Wks	1.58				
Labs Excl	6	6	5	5	Labs Incl	37			Labs Incl	37				
Labs not Rcvd	0	0	0	1										

Key to Instrument Codes Reported by Participants

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	TU	TMI Universal Crush Tester (TMI K440)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program  
Analysis 250

Report #580 (A)  
January 2018

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
2BPED6	73.9 L	73.8 L	73.9	74.0 L	73.9	-0.13	1.1	0.1 L	73.9	-0.13	1.1	0.1 L	4	LD
2WTZDB	71.8	73.8	74.3	74.3	73.5	-0.31	1.6	1.2	73.5	-0.31	1.6	1.2	4	LZ
4G7GME	74.1	74.6	73.5	73.2	73.9	-0.14	2.4	0.6	73.9	-0.14	2.4	0.6	4	LD
77KAMF	72.7	71.4	72.6	74.5	72.8	-0.67	2.4	1.3	72.8	-0.67	2.4	1.3	4	XX
8AY2D9	76.7 H	77.4 H	77.0 H	76.5 H	76.9	1.37	5.9	0.4	76.9	1.37	5.9	0.4	4	LD
A4MTAA	73.1	70.2	72.8	72.6	72.2	-0.97	2.2	1.3	72.2	-0.97	2.2	1.3	4	XX
BHFYGA	71.8 L	71.5	72.3	72.4	72.0	-1.06	1.5	0.4	72.0	-1.06	1.5	0.4	4	LD
G7LGKQ	74.0	74.0	73.7	75.4	74.3	0.06	2.3	0.7	74.3	0.06	2.3	0.7	4	LD
JT7L2X	74.4	74.4	74.6	74.9	74.6	0.22	2.5	0.3	74.6	0.22	2.5	0.3	4	LZ
KRB87R	66.0 H	59.1 XH	57.0 XH	57.9 XH	60.0	-7.01 X	6.7	4.1 H	60.0	-7.01 X	6.7	4.1 H	4	XX
KYV6YL	72.9	72.4	72.3	72.9	72.6	-0.75	2.4	0.3	72.6	-0.75	2.4	0.3	4	XX
MPGZ2L	80.1 *	78.4 *	79.5 *	77.7	78.9	2.37 *	2.6	1.1	78.9	2.37 *	2.6	1.1	4	LC
PB7JRL	73.6	73.9	71.7	74.7	73.5	-0.33	2.8	1.3	73.5	-0.33	2.8	1.3	4	LZ
T283KE	71.3 L	71.1 L	73.6 L	73.7	72.4	-0.85	1.0	1.4	72.4	-0.85	1.0	1.4	4	TD
YBYCUJ	75.1	74.2	78.2	78.7 *	76.5	1.19	1.9	2.2 H	76.5	1.19	1.9	2.2 H	4	LD
ZDY639	63.8 *	61.5 X	61.2 X	63.9 XH	62.6	-5.73 X	3.1	1.4	62.6	-5.73 X	3.1	1.4	4	MB

Consensus (All Labs) Results									
Wk Mean	72.83	73.64	74.29	74.68	Month Mean	74.14	Grand Mean	74.14	
Avg SDr	3.18	2.34	2.61	2.61	Avg SD	2.58	Avg SD	2.58	
SD btwn Labs	3.77	2.30	2.34	1.87	SD btwn Labs	2.02	SD btwn Labs	2.02	
Labs Incl	16	14	14	14	SD btwn Wks	1.07	SD btwn Wks	1.07	
Labs Excl	0	2	2	2	Labs Incl	14	Labs Incl	14	
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)	MB	Messmer Buchel K440
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 #580 (A)**  
**January 2018**

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				
3H6GVR	42.9	42.3	42.6	43.3	L	42.8	-0.13	1.8	0.5	42.8	-0.13	1.8	0.5	4	WK		
42Z8T7	38.8	38.7	39.5	38.1		38.8	-0.98	2.4	0.6	38.8	-0.98	2.4	0.6	4	TU		
4G7GME	43.9	44.2	43.8	43.6		43.8	0.10	2.5	0.2	43.8	0.10	2.5	0.2	4	LD		
4JGAQT	49.7	50.9	48.2	47.6		49.1	1.24	2.4	1.5	49.1	1.24	2.4	1.5	4	LC		
C8C347	42.5	43.3	41.3	40.4		41.9	-0.32	2.8	1.3	41.9	-0.32	2.8	1.3	4	XX		
EYE3M6	50.3	52.0	*	50.8	51.6	51.2	1.68	1.6	0.8	51.2	1.68	1.6	0.8	4	LD		
FAPXHU	44.5	44.2	47.1	46.5		45.6	0.48	2.7	1.5	45.6	0.48	2.7	1.5	4	LD		
FG8DZ7	44.5	45.2	44.1	38.0		42.9	-0.09	2.0	3.4	H	42.9	-0.09	2.0	3.4	H	4	LZ
G7LGKQ	45.5	44.9	45.8	44.6		45.2	0.39	2.5	0.5	45.2	0.39	2.5	0.5	4	LD		
HKGAKY	39.1	41.8	41.3	40.1		40.6	-0.60	2.6	1.2	40.6	-0.60	2.6	1.2	4	EM		
K6Z3QX	46.8	45.9	46.3	45.7		46.1	0.60	2.7	0.5	46.1	0.60	2.7	0.5	4	LD		
KYV6YL	42.1	42.3	43.1	41.6		42.3	-0.23	3.0	0.7	42.3	-0.23	3.0	0.7	4	LD		
MPGZ2L	44.8	44.7	45.4	46.6		45.4	0.43	3.2	0.9	45.4	0.43	3.2	0.9	4	LC		
NL9EFT	36.0	36.0	38.5	39.8		37.6	-1.24	2.2	1.9	37.6	-1.24	2.2	1.9	4	TH		
NLVX8K	45.3	45.2	45.1	45.2		45.2	0.39	3.8	0.1	L	45.2	0.39	3.8	0.1	L	4	LD
Q6J23C	40.9	H	38.8	H	38.8	H	40.1	H		39.6	-0.80	5.6	1.0	4	TC		
RVRUWR	52.0	48.5	51.7	51.3		50.9	1.62	2.2	1.6	50.9	1.62	2.2	1.6	4	LZ		
WTNTTN	46.2	47.4	46.1	47.0		46.7	0.71	3.3	0.6	46.7	0.71	3.3	0.6	4	LZ		
X8GRBB	43.6	44.4	43.9	44.2		44.0	0.14	2.1	0.3	44.0	0.14	2.1	0.3	4	TH		
YBYCUJ	46.0	45.3	45.9	46.5		46.0	0.56	2.5	0.5	46.0	0.56	2.5	0.5	4	LD		
ZAHNMP	46.9	46.1	46.5	48.5		47.0	0.78	2.7	1.1	47.0	0.78	2.7	1.1	4	LD		
ZDKDCD	40.3	41.9	42.0	42.9		41.8	-0.34	2.5	1.0	41.8	-0.34	2.5	1.0	4	EM		
ZDY639	36.2	29.4	X	34.5	*	31.3	*	32.8	-2.26	*	2.7	3.1	H	4	MB		
ZX6F8C	33.4	*	34.4	*	33.3	*	32.8	*	33.5	-2.13	*	2.5	0.7	4	XX		

Consensus (All Labs) Results														
Wk Mean	43.43	43.83	43.57	43.21	Month Mean	43.36			Grand Mean	43.36				
Avg SDr	2.82	2.69	2.79	2.76	Avg SD	2.78			Avg SD	2.78				
SD btwn Labs	4.55	4.17	4.46	5.08	SD btwn Labs	4.64			SD btwn Labs	4.64				
Labs Incl	24	23	24	24	SD btwn Wks	1.32			SD btwn Wks	1.32				
Labs Excl	0	1	0	0	Labs Incl	24			Labs Incl	24				
Labs not Rcvd	0	0	0	0										



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

**Report #580 (A)**  
**January 2018**

**Key to Instrument Codes Reported by Participants**

<b>EM</b>	Emerson 1200 Series	<b>LC</b>	L&W Crush Tester 48
<b>LD</b>	L&W Crush Tester 248	<b>LZ</b>	L&W Crush Tester (model not specified)
<b>MB</b>	Messmer Buchel K440	<b>TC</b>	TMI Monitor/Compression Tester, 17-37
<b>TH</b>	TMI Compression Tester, Model 17-76	<b>TU</b>	TMI Universal Crush Tester (TMI K440)
<b>WK</b>	Zwick Z005 Crush Tester	<b>XX</b>	Instrument make/model not specified by lab





Containerboard Interlaboratory Testing Program

Analysis 261

Report #580 (A)

January 2018

STFI, 26 lb Corrugating Medium - CM92

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	
2BPED6	14.4 L	14.6 L	14.7 L	14.5 L	14.5	-0.29	0.4	0.1	14.5	-0.29	0.4	0.1	4	LA
3MXGC8	14.3	14.5	14.6	14.4	14.5	-0.43	0.9	0.1	14.5	-0.43	0.9	0.1	4	LB
4G7GME	14.2	14.3	14.4	14.5	14.4	-0.58	0.9	0.1	14.4	-0.58	0.9	0.1	4	LB
83V7AF	14.2 L	13.7 *L	14.2 L	13.8 L	14.0	-1.16	0.1	0.3	14.0	-1.16	0.1	0.3	4	XX
8AY2D9	15.0	14.3	14.8	14.1	14.6	-0.28	0.9	0.4	14.6	-0.28	0.9	0.4	4	LB
C8C347	16.0	14.2	14.4	14.2	14.7	-0.08	0.9	0.9 H	14.7	-0.08	0.9	0.9 H	4	XX
DWR4W2	14.2	14.2	14.4	14.3	14.3	-0.70	1.0	0.1	14.3	-0.70	1.0	0.1	4	LU
EYE3M6	15.7	16.0 X	15.7	16.9 X	16.1	2.10 *	0.9	0.6	16.1	2.10 *	0.9	0.6	4	LA
G7LGKQ	14.3	14.9	13.9	13.7	14.2	-0.82	0.9	0.5	14.2	-0.82	0.9	0.5	4	LZ
HKGAKY	15.1	14.6 H	15.5	14.8	15.0	0.43	1.1	0.4	15.0	0.43	1.1	0.4	4	LZ
J62J6W	15.1	14.7	14.2	14.9	14.7	-0.03	1.1	0.4	14.7	-0.03	1.1	0.4	4	LB
JWB2P3	14.3	14.8	14.9	14.4	14.6	-0.20	1.0	0.3	14.6	-0.20	1.0	0.3	4	LA
KDBECA	14.5 L	14.5 L	14.3 L	14.5 L	14.4	-0.46	0.0	0.1	14.4	-0.46	0.0	0.1	4	LU
MPGZ2L	14.5	14.8	14.7	14.6	14.7	-0.12	1.0	0.1	14.7	-0.12	1.0	0.1	4	LU
N4XH8U	26.0 X	24.4 XH	24.1 XH	24.7 X	24.8	15.66 X	1.8	0.8 H	24.8	15.66 X	1.8	0.8 H	4	LA
Q6J23C	14.6	14.5 H	14.6	14.7	14.6	-0.17	1.3	0.1	14.6	-0.17	1.3	0.1	4	TS
QHOUT4	14.1	12.6 X	14.6	14.1	13.8	-1.40	1.0	0.9 H	13.8	-1.40	1.0	0.9 H	4	LA
QT7TEY	14.7	14.3	14.6 L	14.1 L	14.4	-0.47	0.6	0.3	14.4	-0.47	0.6	0.3	4	TT
RVRUWR	16.3 *	16.5 XH	15.9 *	16.4 X	16.3	2.38 *	1.1	0.3	16.3	2.38 *	1.1	0.3	4	LA
YBYCUJ	15.2	15.1	15.3	15.0	15.1	0.64	0.8	0.1	15.1	0.64	0.8	0.1	4	LA
ZAHNMP	16.2 *H	15.3 *	15.9 *H	15.8 XH	15.8	1.63	1.4	0.4	15.8	1.63	1.4	0.4	4	LZ

Consensus (All Labs) Results												
Wk Mean	14.85	14.55	14.77	14.38	Month Mean	14.73		Grand Mean	14.73			
Avg SDr	0.90	0.88	0.93	0.97	Avg SD	0.94		Avg SD	0.94			
SD btwn Labs	0.70	0.38	0.58	0.35	SD btwn Labs	0.64		SD btwn Labs	0.64			
Labs Incd	20	17	20	17	SD btwn Wks	0.40		SD btwn Wks	0.40			
Labs Exclcd	1	4	1	4	Labs Incd	20		Labs Incd	20			
Labs not Rcvd	0	0	0	0								

Key to Instrument Codes Reported by Participants

LA	L&W Autoline	LB	L&W Model 152
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)
XX	Instrument make/model not specified by lab		