



## Containerboard Interlaboratory Testing Program

Participant Summary Report #574 (H) - July 2017

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[Introduction to the Containerboard Program](#)

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

<b>Analysis</b>	<b>Sample</b>	<b>Analysis Name</b>
<a href="#"><u>201</u></a>	<a href="#"><u>BX11</u></a>	<a href="#"><u>Box Compression Strength, Corrugated Boxes</u></a>
<a href="#"><u>202</u></a>	<a href="#"><u>EC10</u></a>	<a href="#"><u>Edgewise Compressive Strength, Wax (T811), Corrugated Board</u></a>
<a href="#"><u>203</u></a>	<a href="#"><u>EC10</u></a>	<a href="#"><u>Edgewise Compressive Strength by Clamp (T839), Corrugated Board</u></a>
<a href="#"><u>205</u></a>	<a href="#"><u>42D2</u></a>	<a href="#"><u>Mullen Burst of Linerboard, 42 lb Linerboard</u></a>
<a href="#"><u>206</u></a>	<a href="#"><u>56A1</u></a>	<a href="#"><u>Mullen Burst of Linerboard, 56 lb Linerboard</u></a>
<a href="#"><u>215</u></a>	<a href="#"><u>42D2</u></a>	<a href="#"><u>Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard</u></a>
<a href="#"><u>216</u></a>	<a href="#"><u>56A1</u></a>	<a href="#"><u>Ring Crush of Linerboard, Rigid Platen Type, 56 lb Linerboard</u></a>
<a href="#"><u>223</u></a>	<a href="#"><u>42D2</u></a>	<a href="#"><u>STFI of Linerboard, 42 lb Linerboard</u></a>
<a href="#"><u>224</u></a>	<a href="#"><u>56A1</u></a>	<a href="#"><u>STFI of Linerboard, 56 lb Linerboard</u></a>
<a href="#"><u>228</u></a>	<a href="#"><u>56A</u></a>	<a href="#"><u>Roughness - Stylus Method, 56 lb Linerboard</u></a>
<a href="#"><u>229</u></a>	<a href="#"><u>42D3</u></a>	<a href="#"><u>Roughness - Sheffield Method, 42 lb Linerboard</u></a>
<a href="#"><u>231</u></a>	<a href="#"><u>42D</u></a>	<a href="#"><u>Internal Bond Strength, Linerboard, 42 lb Linerboard</u></a>
<a href="#"><u>234</u></a>	<a href="#"><u>56A</u></a>	<a href="#"><u>Coefficient of Static Friction - Inclined Plane, 42 lb Linerboard</u></a>
<a href="#"><u>237</u></a>	<a href="#"><u>42D</u></a>	<a href="#"><u>Air Resistance - Gurley Method, Linerboard, 42 lb Linerboard</u></a>
<a href="#"><u>240</u></a>	<a href="#"><u>CM91</u></a>	<a href="#"><u>Flat Crush Strength (CMT) of Medium, 26 lb Corrugating Medium</u></a>
<a href="#"><u>250</u></a>	<a href="#"><u>CM91</u></a>	<a href="#"><u>Fluted Crush of Medium, 26 lb Corrugating Medium</u></a>
<a href="#"><u>255</u></a>	<a href="#"><u>CM91</u></a>	<a href="#"><u>Ring Crush of Medium, 26 lb Corrugating Medium</u></a>
<a href="#"><u>261</u></a>	<a href="#"><u>CM91</u></a>	<a href="#"><u>STFI of Medium, 26 lb Corrugating Medium</u></a>

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	CM91	October 2016-Current
	CM81	October 2015-September 2016
35 lb Linerboard	35E1	June 2017-Current
42 lb Linerboard	42D2	August 2016-Current
	42D1	April 2015-July 2016
56 lb Linerboard	56A1	July 2016-Current

### 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 #574 (H)  
July 2017

Top to Bottom Box Compression Strength, Corrugated Boxes - BX11

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results					
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst	
28VQ7Q	688.0	-1.14	18.78	826.9	1.15	94.18	H	4	TE
2KWL4J	730.0	-0.09	39.66	722.3	-0.41	13.36		4	ER
2MKVCY	757.1	0.59	41.35	757.1	0.11	0.00		1	LG
67JKWH	660.4	-1.84	15.71	673.9	-1.13	15.59		4	TB
87U7JP	725.8	-0.20	49.97	728.9	-0.31	20.05		4	LS
8E9P6A	759.1	0.64	17.68	757.8	0.12	27.81		4	LM
9PM8AL	829.0	2.39	* 21.91	854.8	1.56	23.92		4	LH
B8W3FP	715.6	-0.45	18.83	747.4	-0.04	22.98		4	LG
BAM7BH	931.4	4.96	X 45.93	857.7	1.60	132.56	H	3	LL
DNEHYC	779.0	1.14	62.23	776.5	0.40	5.27	L	3	EX
EUH44K	712.0	-0.54	28.76	740.3	-0.14	39.06		4	LS
F2VHHA	795.5	1.55	58.88	778.3	0.42	33.76		4	LG
FL4KFE	746.1	0.31	37.11	739.3	-0.16	13.78		4	ER
H24BBF	445.4	-7.23	X 28.73	577.5	-2.56	* 101.42	H	4	EX
HC9EJJ	943.8	5.27	X 26.32	909.0	2.37	* 49.24		2	LM
JEC9WU	679.2	-1.37	94.28	H 661.2	-1.32	18.02		4	LL
KFEQ8V	749.2	0.39	73.36	824.6	1.11	52.88		4	ER
MMRJDC	711.3	-0.56	22.45	780.4	0.45	48.21		4	ET
Q6XZ9Z	695.3	-0.96	16.26	716.0	-0.50	41.32		4	LH
Q7UDVR	762.0	0.71	48.43	749.2	-0.01	20.60		4	ES
U28U3Z	744.0	0.26	17.51	751.2	0.02	20.81		4	EX
V8UXT3	744.0	0.26	32.84	734.3	-0.23	18.63		4	LG
Z8F8NE	716.6	-0.43	76.64	696.4	-0.80	20.02		4	LG
ZM7A4H	707.8	-0.65	23.50	744.1	-0.09	41.83		4	ER

Consensus (All Labs) Results

Month Mean	733.66	Grand Mean	749.87
Avg SD	44.86	Avg SD Months	41.38
SD btwn Labs	39.88	SD btwn Labs	67.24
Labs Incl	21	Labs Incl	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	735.05	58.76	1.38	7
Clip sealing	732.97	29.18	0.69	14



Containerboard Interlaboratory Testing Program  
Analysis 201

Report #574 (H)  
July 2017

**Top to Bottom Box Compression Strength, Corrugated Boxes - BX11**

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

Report #574 (H)  
July 2017

Edgewise Compressive Strength, by T811, Corrugated Board - EC10

TAPPI Official Test Method T811

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
87U7JP	38.6	0.48	1.76	37.7	0.34	0.72	3	LC
9PM8AL	32.6	-1.45	1.17	33.4	-1.41	1.25	3	TC
EUH44K	38.5	0.46	2.72 H	37.7	0.34	1.52	3	EM
EVA3DC	26.2	-3.52 X	1.24	29.5	-2.96 X	4.68	2	XX
UGZMM2	32.9	-1.37	0.95	34.1	-1.11	1.35	3	WK
V8NPHU	38.0	0.29	1.83	36.3	-0.22	2.37	2	LC
V8UXT3	40.6	1.14	1.26	40.5	1.47	0.31	3	LE
Z8F8NE	38.4	0.44	1.24	38.4	0.59	0.11	2	XX

Consensus (All Labs) Results				
Month Mean		37.08	Grand Mean	36.87
Avg SD		1.66	Avg SD Months	1.31
SD btwn Labs		3.09	SD btwn Labs	2.49
Labs Incd		7	Labs Incd	7

**Key to Instrument Codes Reported by Participants**

- |    |                         |    |   |
|----|-------------------------|----|---|
| EM | Emerson 1200 Series     | LC | L&W Crush Tester 48                         |
| LE | L&W Crush Tester 840    | TC | TMI Monitor/Compression Tester, Model 17-37 |
| 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 - EC10**  
 TAPPI Official Test Method T839

**Report #574 (H)**  
**July 2017**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
28VQ7Q	43.3	1.47	1.08	42.6	0.98	0.58	3	LD
2KWL4J	38.1	-1.21	1.62	37.3	-1.66	0.72	3	EN
2MKVCY	43.0	1.33	1.71	43.0	1.17	0.00	1	XX
47BNCN	39.7	-0.40	1.23	40.1	-0.26	2.68	3	LC
4GMFEN	37.4	-1.60	1.51	41.7	0.52	3.72	3	TB
67JKWH	47.2	3.50 X	1.02	38.9	-0.90	7.24 H	3	LD
6ECTEN	39.1	-0.70	1.91	40.1	-0.27	1.00	3	LC
87U7JP	40.2	-0.16	2.76 H	41.5	0.41	1.16	3	LC
8CKFTN	43.2	1.43	0.99	44.0	1.64	1.06	2	TK
8E9P6A	42.5	1.07	1.65	42.8	1.06	1.10	3	TG
9PM8AL	39.1	-0.69	0.37 L	39.3	-0.70	0.61	3	TX
AHZTNR	41.6	0.59	0.70	41.5	0.40	1.40	3	TD
AK8A2P	39.9	-0.31	1.67	40.3	-0.19	0.46	3	LD
B8W3FP	41.1	0.32	1.50	41.9	0.64	1.52	3	TJ
BAM7BH	78.7	19.98 X	2.41	59.3	9.32 X	27.46	2	BU
CJ9RUK	40.3	-0.08	2.47 H	39.9	-0.40	0.39 L	3	LD
DDDF9A	39.1	-0.72	1.91	37.7	-1.47	2.32	3	LD
DNEHYC	42.8	1.19	0.70	42.0	0.66	0.71	3	TL
EFH3QJ	41.3	0.41	1.65	43.1	1.22	3.72	3	TD
EUH44K	43.2	1.43	0.98	44.9	2.11 *	1.62	3	EM
F2VHHA	39.9	-0.31	1.72	40.4	-0.11	0.73	3	EM
FL4KFE	38.9	-0.84	1.42	39.3	-0.69	0.51	3	TB
FTYH63	40.0	-0.24	2.00	39.1	-0.78	0.82	3	LD
H24BBF	32.9	-3.95 X	0.96	37.8	-1.41	6.14 H	3	CT
HC9EJJ	42.2	0.92	1.42	42.2	0.78	0.00	1	EM
JEC9WU	38.8	-0.87	1.41	39.0	-0.81	0.60	3	LC
K2FPT9	42.8	1.22	1.11	42.0	0.68	0.68	3	XX
KFEQ8V	41.0	0.27	1.29	40.4	-0.11	0.51	3	EM
MMRJDC	41.5	0.56	1.90	42.1	0.70	0.71	3	TD
Q6XZ9Z	37.1	-1.75	2.02	38.7	-0.96	2.28	2	EM
Q7UDVR	39.2	-0.66	1.69	38.9	-0.88	0.93	3	LD
TQUDWN	34.7	-3.03 X	2.70 H	41.5	0.40	6.15 H	3	LC
U28U3Z	38.9	-0.82	1.19	38.7	-0.97	0.76	3	LD
UGZMM2	35.6	-2.55 *	1.10	36.6	-2.02 *	1.68	3	WK
UJPUC4	41.1	0.31	1.93	42.4	0.89	1.96	2	LD
V8NPHU	42.6	1.12	0.81	40.9	0.10	2.48	2	LC
V8UXT3	40.2	-0.15	1.49	39.0	-0.81	1.32	3	LY
VHQ9X4	40.1	-0.17	1.47	41.3	0.30	1.41	3	LD
X6BZ7V	42.9	1.24	1.33	43.7	1.54	1.06	3	TG





Containerboard Interlaboratory Testing Program  
Analysis 203

Report #574 (H)  
July 2017

**Edgewise Compressive Strength by T839, Corrugated Board - EC10**

TAPPI Official Test Method T839

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
XEZLFZ	42.8	1.19	0.99	43.9	1.60	1.31	3	EM
Y37T4V	38.6	-0.98	1.30	39.8	-0.45	1.81	3	TD
Z8F8NE	38.9	-0.82	1.22	39.3	-0.67	0.61	2	XX
ZM7A4H	40.4	-0.03	1.07	38.1	-1.26	2.18	3	LD

Consensus (All Labs) Results			
Month Mean	40.47	Grand Mean	40.66
Avg SD	1.52	Avg SD Months	2.34
SD btwn Labs	1.92	SD btwn Labs	2.00
Labs Incl	39	Labs Incl	42

**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>LC</b> L&W Crush Tester 48	<b>LD</b> L&W Crush Tester 248
<b>LY</b> L&W 830	<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	<b>XX</b> Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 205  
**Bursting Strength (Mullen), 42 lb Linerboard - 42D2**  
 TAPPI Official Test Method T807

**Report #574 (H)**  
**July 2017**

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	
33U4UE	117.3	111.9	110.8	112.5	113.1	1.00	12.9	2.9	112.3	1.03	11.2	5.4	16	LA
3CYB8T	111.0 L	111.6 L	111.8 L	112.9 L	111.8	0.64	4.1	0.8	111.7	0.83	3.8	0.9 L	16	XX
48ZAQW	119.6 *	111.3	115.4	111.4	114.4	1.36	11.4	4.0	113.8	1.56	12.4	3.2	16	LZ
4CHA9X	107.2	107.5	110.5	107.8	108.2	-0.36	8.6	1.5	108.9	-0.11	8.3	3.2	16	TB
6EJXZR	112.0	108.4	108.8	114.4	110.9	0.38	8.2	2.8	113.6	1.47	9.6	2.9	16	LC
7RKX6G	104.4	110.8	110.5	109.9	108.9	-0.18	10.5	3.0	108.4	-0.30	10.7	2.4	16	TB
87U7JP	111.9	105.2	106.2	110.3	108.4	-0.31	10.4	3.2	107.3	-0.67	9.8	4.1	16	AH
892J3C	116.4	121.6 *	115.1	119.3 *	118.1	2.38 *	12.0	2.9	116.2	2.38 *	12.0	3.5	16	LA
8EQ2GN	114.0	110.8	107.0	108.0	110.0	0.12	10.1	3.1	110.2	0.34	10.8	2.2	16	LA
93PV3F	108.3	108.5 L	106.7 L	108.2	107.9	-0.45	4.5	0.8	107.8	-0.49	5.1	1.0 L	16	AH
9KU67L	113.7	123.0 *	114.2	109.1	115.0	1.52	11.7	5.8	111.0	0.59	11.4	6.2	16	LJ
9PM8AL	119.5 *	109.5	118.8 *	117.3	116.3	1.87	10.9	4.6	111.1	0.63	10.8	5.1	12	AA
9YT7L9	110.7	111.3	109.2	110.8	110.5	0.27	11.8	0.9	112.3	1.05	12.9	2.2	16	LA
A6ELP7	110.4	111.9	107.0	108.9	109.5	0.00	10.1	2.1	110.0	0.26	10.9	2.3	16	LZ
AK8A2P	106.1	108.4	103.3	102.7	105.1	-1.23	8.0	2.6	103.6	-1.91	8.8	2.6	16	LA
BGMNN9	106.0	106.9	106.5	106.2	106.4	-0.88	11.5	0.4 L	108.0	-0.41	11.8	3.8	16	LC
BJCXVP	106.9	113.8	106.6	113.0	110.1	0.15	10.4	3.9	108.8	-0.14	11.0	3.3	16	XX
BN4Y2A	108.4	121.6 *	103.3	110.5	111.0	0.40	9.9	7.7 H	107.7	-0.51	9.5	4.9	16	LA
BRKNZD	109.6	108.1	107.6	109.2	108.6	-0.25	5.6	0.9	108.2	-0.35	7.3	1.2	16	TP
CJ9RUK	116.2	109.5	110.1	107.5	110.8	0.36	10.3	3.8	110.3	0.35	10.6	3.7	16	AA
CKKH4P	110.3 L	107.9	105.7	106.8	107.7	-0.52	7.5	2.0	105.7	-1.21	8.9	5.1	16	LA
DDFA9	106.4	115.7	114.9	108.6	111.4	0.52	8.9	4.6	112.2	1.01	9.5	3.1	16	LC
DJLJKG	107.4	106.2	113.5	103.8	107.7	-0.50	10.3	4.1	109.4	0.04	9.9	4.4	16	LC
E8PU48	106.6	114.6	112.4	113.5	111.8	0.62	11.8	3.6	108.2	-0.36	11.3	4.0	16	LC
EAVFR8	109.8	107.4	108.9	109.2	108.8	-0.20	10.5	1.0	108.6	-0.21	9.7	1.7	16	LA
EH7W8K	114.1	112.5	111.4	112.0	112.5	0.83	11.4	1.1	113.0	1.28	11.9	4.0	16	AX
ET3M6L	112.4	107.5	106.5	113.9	110.1	0.15	13.1	3.6	113.7	1.50	13.3	8.1 H	16	LA
EUH44K	98.3 *	90.8 X	97.3 *	100.2 *	96.7	-3.58 X	8.8	4.1	98.3	-3.72 X	9.0	3.2	16	RE
F8H6CF	108.5	108.4	108.7	108.7	108.6	-0.26	9.8	0.1 L	108.8	-0.13	8.3	0.3 L	16	LJ
FL4KFE	105.0	104.1	107.4	104.2	105.2	-1.21	11.2	1.5	105.8	-1.16	10.6	1.9	16	LZ
GYNJL8	100.8	113.8	112.7	100.9	107.1	-0.69	11.0	7.2 H	107.2	-0.67	12.8	5.2	15	LC
H24BBF	111.0	113.7	111.0	116.6 H	113.1	0.99	13.8	2.7	114.6	1.81	13.1	3.7	16	XX
HBVPCZ	116.3	107.8	106.4	113.0	110.8	0.36	12.8	4.6	111.4	0.75	12.2	3.3	16	LC
JPACY4	105.1	No DATA	No DATA	No DATA	105.1	-1.24	13.5	0.0	107.5	-0.59	10.9	2.5	5	LC
LG8ZYC	117.5	115.9	112.7	118.1	116.0	1.80	6.4	2.4	107.6	-0.55	10.3	5.6	16	LC



**Containerboard Interlaboratory Testing Program**  
 Analysis 205  
**Bursting Strength (Mullen), 42 lb Linerboard - 42D2**  
 TAPPI Official Test Method T807

**Report #574 (H)**  
**July 2017**

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	
MBJJ3R	102.6	103.4	101.1	NO DATA	102.4	-1.99 *	10.7	1.2	107.8	-0.47	10.5	4.8	10	LC
PBU6PY	108.5	NO DATA	NO DATA	101.8 H	105.1	-1.22	16.1	4.7	106.0	-1.11	12.8	2.7	10	LC
PJP64R	110.8	108.5	112.9	106.7	109.7	0.05	7.5	2.7	107.9	-0.45	9.6	4.2	16	LA
Q7UDVR	105.4	104.3	107.7	108.5	106.5	-0.85	11.0	2.0	106.6	-0.88	11.5	3.5	16	LA
TQUDWN	104.8	114.7	108.6	113.3	110.3	0.22	11.7	4.5	109.2	-0.01	11.4	3.0	16	LA
U28U3Z	111.0	119.5	118.0 *	121.5 *	117.5	2.22 *	10.0	4.6	113.5	1.45	10.5	4.2	16	AH
U3GYFN	113.1	114.5	115.0	111.0	113.4	1.08	11.3	1.8	110.7	0.49	10.4	2.8	11	AH
UAY94K	102.7	98.2 *	106.1	107.1	103.5	-1.67	10.8	4.0	104.9	-1.46	10.6	3.3	16	LA
UDH6UW	101.8	109.4	108.4	104.3	106.0	-0.99	10.1	3.5	109.0	-0.07	8.1	11.7 H	16	AH
UUNRVX	104.2	102.2 L	105.6	105.6	104.4	-1.43	4.8	1.6	104.7	-1.53	5.3	1.6	16	RE
V8UXT3	115.7	107.4 H	108.1	115.4 H	111.7	0.59	21.8	4.5	112.1	0.99	16.0	3.2	16	LZ
VHQ9X4	111.8	113.3	113.0	111.4	112.4	0.79	10.8	0.9	113.7	1.51	9.7	1.8	16	LA
WKD3E6	108.7	109.9	114.2	110.1	110.7	0.33	10.2	2.4	108.6	-0.21	12.7	4.6	16	LB
X4H4JM	107.0	111.6	108.1	106.3	108.2	-0.36	7.8	2.3	108.4	-0.29	10.3	1.5	16	LA
XCYKDH	98.4 *	102.4	100.2 *	107.4	102.1	-2.07 *	10.2	3.9	103.2	-2.04 *	10.7	3.4	12	AH
YHH6WN	107.7	107.7	101.9	107.1	106.1	-0.96	7.8	2.8	105.1	-1.41	8.7	3.0	16	LC
YK8CGK	107.4	110.7	107.7	105.6	107.9	-0.47	8.5	2.1	106.2	-1.04	10.5	2.6	16	LC
Z9NJ6G	105.4	104.6	113.8	108.9	108.2	-0.38	10.2	4.2	110.9	0.57	9.4	3.5	16	LC
ZM7A4H	110.0	107.0	112.3	109.5	109.7	0.05	9.3	2.2	107.0	-0.77	9.7	3.6	16	AH
ZNG8HZ	109.6	108.4	109.8	104.4	108.1	-0.41	12.2	2.5	108.0	-0.42	12.2	2.5	15	TB

Consensus (All Labs) Results									
Wk Mean	109.19	110.09	109.27	109.53	Month Mean	109.53	Grand Mean	109.23	
Avg SDr	10.54	11.15	9.85	10.72	Avg SD	10.70	Avg SD	10.61	
SD btwn Labs	4.93	4.95	4.40	4.54	SD btwn Labs	3.59	SD btwn Labs	2.94	
Labs Incl	55	52	53	53	SD btwn Wks	3.33	SD btwn Wks	3.92	
Labs Excl	0	1	0	0	Labs Incl	54	Labs Incl	54	
Labs not Rcvd	0	2	2	2					



Containerboard Interlaboratory Testing Program  
Analysis 205  
**Bursting Strength (Mullen), 42 lb Linerboard - 42D2**  
TAPPI Official Test Method T807

**Report #574 (H)**  
**July 2017**

**Key to Instrument Codes Reported by Participants**

<b>AA</b>	Perkins Model A	<b>AH</b>	Perkins Model AH
<b>AX</b>	Perkins Mullen Tester (model not specified)	<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>TP</b>	Technidyne PROFILE/Plus	<b>XX</b>	Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 206  
**Bursting Strength (Mullen), 56 lb Linerboard - 56A1**  
 TAPPI Official Test Method T807

**Report #574 (H)**  
**July 2017**

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	
33U4UE	116.9	111.7	120.9	110.9	115.1	0.25	12.6	4.7	117.6	1.29	13.4	5.4	12	LA
3CYB8T	115.2	124.6 *	125.8 *	124.4 *	122.5	2.07 *	6.6	4.9	124.2	3.61 X	5.3	3.1	11	XX
48ZAQW	121.7	118.5	123.5	121.1	121.2	1.75	13.1	2.1	119.7	2.04 *	12.2	3.4	12	LZ
4CHA9X	126.0 *	121.4	124.9	118.3	122.6	2.10 *	10.1	3.5	119.1	1.84	11.6	3.6	12	TB
6EJXZR	117.9	118.7	120.3	120.1	119.2	1.27	11.9	1.1	118.8	1.71	11.4	4.6	12	LC
7RKX6G	115.8	114.6	106.6	111.4	112.1	-0.50	10.7	4.1	113.7	-0.06	10.7	3.7	12	TB
87U7JP	112.3	104.3	111.1	110.8	109.6	-1.11	9.1	3.6	111.4	-0.84	9.3	4.4	12	AH
892J3C	120.3	125.3 *	119.2	121.4	121.5	1.83	9.9	2.7	121.2	2.56 *	9.8	4.3	12	LA
8EQ2GN	116.2	117.7	112.5	112.3	114.7	0.14	10.2	2.7	116.6	0.97	9.1	3.8	8	LJ
93PV3F	112.8	113.3	114.5	113.2	113.5	-0.17	5.1	0.7	112.6	-0.43	5.3	1.3	12	AH
9KU67L	108.1	112.1	114.0	119.1 H	113.3	-0.20	12.3	4.6	112.7	-0.40	10.7	3.8	12	LJ
9PM8AL	105.5	113.8	114.8	110.5	111.1	-0.74	11.4	4.2	114.1	0.09	10.9	4.5	12	AA
9YT7L9	111.5	113.3	119.0	121.3	116.2	0.52	12.0	4.6	113.9	0.03	11.5	4.8	12	LA
A6ELP7	118.2	110.5	110.5	116.7 H	114.0	-0.04	15.1	4.0	113.4	-0.13	12.8	3.9	12	LZ
AK8A2P	107.3	104.5	109.3	113.2	108.6	-1.37	6.6	3.6	109.6	-1.46	8.2	2.9	12	LA
BGMNN9	114.5	111.3	115.7	114.4	114.0	-0.04	10.0	1.9	112.4	-0.50	9.8	3.1	12	LC
BJCXVP	110.1	120.5	115.8	107.9	113.6	-0.13	9.9	5.7	112.1	-0.58	11.6	4.6	12	XX
BN4Y2A	113.9	117.4	120.4	119.4 L	117.8	0.90	7.1	2.8	115.7	0.65	7.9	3.1	12	LA
BRKNZD	112.3	112.9	113.1	112.1	112.6	-0.37	6.2	0.5 L	112.7	-0.39	7.6	1.3	12	TP
CJ9RUK	120.5	112.4	110.7	111.6	113.8	-0.08	8.7	4.5	115.1	0.45	9.5	3.8	12	AA
CKKH4P	108.0	103.3	103.8 *	109.8	106.2	-1.95 *	11.1	3.2	110.4	-1.19	11.1	5.0	12	LA
DDDF A9	103.8	115.3	109.6	110.2	109.7	-1.08	12.6	4.7	112.7	-0.38	11.8	4.0	12	LC
DJLJKG	111.3	117.7	108.9	110.9	112.2	-0.47	11.5	3.8	113.7	-0.05	9.7	4.5	12	LC
E8PU48	118.1	108.9	115.5	115.7	114.6	0.11	11.5	3.9	112.5	-0.47	11.3	3.3	12	LC
EAVFR8	112.4	118.8	115.1	109.9	114.1	-0.02	9.1	3.8	113.0	-0.30	10.8	2.4	12	LA
EH7W8K	113.0	120.0	121.4	111.5	116.5	0.58	11.0	5.0	115.8	0.69	10.8	3.3	12	AX
ET3M6L	110.5	114.0	109.7	119.1	113.3	-0.20	11.7	4.2	110.9	-1.00	11.8	4.4	12	LA
EUH44K	100.8 *	99.9 *	101.0 *	103.7 *	101.4	-3.15 X	10.5	1.7	102.7	-3.85 X	10.7	2.8	12	RE
F8H6CF	113.4	113.4	113.2	113.5	113.4	-0.19	10.8	0.1 L	113.5	-0.09	10.1	0.3 L	12	LJ
FL4KFE	104.7	110.0	108.6	109.5	108.2	-1.46	10.4	2.4	109.8	-1.38	11.3	2.4	12	LZ
GYNJL8	112.9	104.8	109.0	112.9	109.9	-1.04	11.7	3.9	111.4	-0.85	11.7	3.9	12	LC
H24BBF	108.3	108.6	115.3	105.8	109.5	-1.14	9.8	4.1	114.9	0.36	10.5	5.4	12	XX
HBVPCZ	120.0	117.2	119.7	113.1	117.5	0.83	11.6	3.2	114.8	0.33	11.7	4.0	12	XX
JPACY4	113.7	No DATA	No DATA	No DATA	113.7	-0.12	13.3	0.0	113.7	-0.06	13.3	0.0	1	LC
LG8ZYC	121.5	115.6	114.0	114.5	116.4	0.56	9.2	3.5	111.1	-0.93	11.3	5.0	12	LC



**Containerboard Interlaboratory Testing Program**  
 Analysis 206  
**Bursting Strength (Mullen), 56 lb Linerboard - 56A1**  
 TAPPI Official Test Method T807

**Report #574 (H)**  
**July 2017**

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
MBJJ3R	113.5	110.0	114.3	NO DATA	112.6	-0.37	13.0	2.3	112.5	-0.46	13.3	2.2	9	LC
PBU6PY	NO DATA	NO DATA	NO DATA	108.0	108.0	-1.50	9.5	0.0	108.8	-1.74	10.8	1.7	9	LC
PJP64R	113.3	110.8	122.6	112.1	114.7	0.14	12.3	5.4	113.8	-0.01	12.2	4.9	12	LA
Q7UDVR	110.6	110.5	112.2	111.6	111.2	-0.71	8.6	0.8	111.4	-0.83	9.5	2.4	12	LA
TQUDWN	111.5	113.5	117.2	110.8	113.3	-0.21	9.8	2.9	115.0	0.40	11.0	3.1	12	LA
U28U3Z	123.5	127.0 *	123.5	122.0	124.0	2.44 *	9.8	2.1	118.8	1.73	10.3	4.4	12	AH
U3GYFN	116.4	116.5	NO DATA	115.7	116.2	0.51	8.3	0.4 L	116.4	0.91	8.7	2.3	8	AH
UAY94K	110.3	105.3	114.7	113.8	111.0	-0.77	10.2	4.3	109.3	-1.57	11.0	3.1	12	LA
UDH6UW	113.6	110.2	109.1	110.9	111.0	-0.78	9.7	1.9	110.9	-1.02	9.6	2.6	12	AH
UUNRVX	117.2	116.4 L	118.4	119.2	117.8	0.91	7.6	1.2	112.9	-0.31	7.5	4.3	12	RE
V8UXT3	105.8	114.1	124.5	116.7	115.3	0.29	12.0	7.7 H	117.5	1.28	12.9	4.9	12	LZ
VHQ9X4	119.0	117.8	117.8	116.9	117.9	0.92	9.4	0.9	116.5	0.93	9.7	2.5	12	LA
WKD3E6	120.8 L	117.1	117.8	121.1	119.2	1.25	5.8	2.0	115.1	0.45	10.0	5.8	12	LB
X4H4JM	114.8	116.4	114.9	113.3	114.8	0.18	10.6	1.2	114.3	0.17	10.5	1.5	11	LA
XCYKDH	107.0	104.2	106.8	107.0	106.3	-1.94 *	9.4	1.4	111.2	-0.90	10.3	5.2	11	AH
YHH6WN	109.7	112.4	111.0	108.6	110.4	-0.91	10.9	1.6	108.3	-1.92	10.7	2.2	12	LA
YK8CGK	109.4	115.6	109.5	113.5	112.0	-0.52	10.0	3.1	114.2	0.13	11.5	4.7	12	LC
ZM7A4H	118.3	112.9	114.8	118.6	116.2	0.50	8.9	2.8	116.4	0.88	9.5	4.4	12	AH
ZNG8HZ	111.5	111.4	118.8	116.1	114.4	0.08	11.1	3.7	115.0	0.39	11.9	4.1	12	TB

Consensus (All Labs) Results														
Wk Mean	113.50	113.62	114.81	113.96	Month Mean	114.12			Grand Mean	113.82				
Avg SDr	10.39	10.08	10.37	10.59	Avg SD	10.40			Avg SD	10.72				
SD btwn Labs	5.30	5.64	5.58	4.63	SD btwn Labs	4.05			SD btwn Labs	2.89				
Labs Incl	53	52	51	52	SD btwn Wks	3.47			SD btwn Wks	3.81				
Labs Excl	0	0	0	0	Labs Incl	53			Labs Incl	52				
Labs not Rcvd	1	2	3	2										

**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	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 - 42D2

TAPPI Official Test Method T822

Report #574 (H)

July 2017

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	
28VQ7Q	92.2	93.0	91.6	91.9	92.2	0.81	4.3	0.6	91.5	0.68	3.4	1.0	16	LD
2KWL4J	81.3	80.5	81.4	80.2 *	80.8	-1.66	3.4	0.6	82.2	-1.52	3.5	2.0	16	EN
33U4UE	93.3	98.8 * H	98.4 * H	97.5 * H	97.0	1.87	5.0	2.5	98.0	2.22 * H	4.3	1.6	16	LD
3CYB8T	88.5	90.7	88.5	91.1	89.7	0.27	4.3	1.4	89.4	0.19	4.7	3.7	16	LD
48ZAQW	81.9	84.5	79.3 *	84.4	82.5	-1.29	4.0	2.5	85.2	-0.79	4.0	2.8	16	LC
4CHA9X	97.6 * H	96.7 H	97.8 * H	98.9 * H	97.8	2.03 * H	4.9	0.9	98.5	2.35 * H	4.6	2.1	16	LX
4G7YLF	91.6	94.6	90.3	89.8	91.6	0.68	3.3	2.1	90.9	0.55	3.5	1.5	16	LD
6XDHVR	84.7	76.2 * H	76.7 * H	75.0 XH	78.1	-2.25 * H	4.9	4.4	81.3	-1.72	4.7	3.4	16	LC
7RKX6G	90.6	91.1	87.4	86.9	89.0	0.12	4.4	2.2	89.3	0.16	4.7	2.2	16	LC
87U7JP	91.6	90.4	89.0	92.3	90.8	0.52	4.4	1.4	90.7	0.49	3.9	1.4	16	LC
892J3C	94.9	92.8	87.1	90.0	91.2	0.60	4.2	3.4	92.1	0.84	4.4	2.5	16	LZ
8CKFTN	89.6	89.0	89.8	89.0	89.4	0.20	3.2	0.4	88.6	0.01	2.7	0.8 L	16	MB
8EQ2GN	81.5	81.4	83.6	74.7 X	80.3	-1.78	3.8	3.9	80.2	-1.98 * H	3.8	2.6	16	TU
93C72N	86.7 H	90.2	89.3	92.3	89.6	0.25	4.4	2.3	90.5	0.45	4.2	2.2	12	MB
9KU67L	87.6	87.3	87.4	86.4	87.2	-0.28	4.9	0.5	88.9	0.07	4.2	2.5	16	LD
AK8A2P	87.9	88.4	90.0	87.1	88.3	-0.03	3.5	1.2	88.8	0.06	3.4	1.1	16	LD
B8W3FP	90.3	84.0	91.7	82.4	87.1	-0.30	3.0	4.6	90.3	0.40	3.0	4.1	16	TJ
BGMNN9	85.8	88.6	89.6	89.9	88.5	0.01	3.8	1.9	88.2	-0.09	3.7	1.4	16	LD
BN4Y2A	86.5	86.6	89.4	88.3	87.7	-0.16	4.0	1.4	86.1	-0.59	3.9	2.2	16	LD
BRKNZD	89.3	88.3	89.6	89.0	89.0	0.13	3.1	0.5	89.0	0.09	3.7	1.2	16	TH
CJ9RUK	86.5	89.1	87.4	86.5	87.3	-0.24	4.3	1.3	86.8	-0.41	3.8	1.5	16	LD
CKKH4P	97.5 * H	90.7	92.2	89.2	92.4	0.86	5.1	3.6	94.3	1.34	4.2	9.0 H	16	LC
CU7NVM	87.5	89.3	94.5	88.7	90.0	0.34	4.9	3.1	86.9	-0.40	5.2	6.9	12	XX
DDFA9	84.0	87.5	88.3	89.5	87.3	-0.25	4.2	2.4	88.4	-0.05	4.0	1.7	16	LD
DLVJPN	85.0	86.1	82.5	85.8	84.8	-0.79	4.2	1.6	84.0	-1.08	5.0	5.1	16	MB
E8PU48	89.4	87.5	89.2	89.9	89.0	0.12	3.5	1.0	89.2	0.14	3.9	1.6	16	LD
EAVFR8	92.6	91.2	89.2	92.1	91.3	0.62	4.4	1.5	91.9	0.78	4.2	1.1	15	LD
EH7W8K	77.3 * H	82.8	83.6 H	79.2 * H	80.7	-1.68	5.0	3.0	81.9	-1.59	4.7	6.3	16	LC
EUH44K	95.2	94.2	93.7	95.6	94.7	1.36	3.2	0.9	89.0	0.09	3.4	5.1	16	EM
F2VHHA	87.3	87.0	84.4	86.1	86.2	-0.50	3.5	1.3	85.4	-0.75	3.9	1.6	16	EM
F8H6CF	89.4	89.5	89.8	89.5	89.5	0.23	4.2	0.2 L	88.8	0.05	5.0	1.0	16	LD
FL4KFE	83.0	87.3	87.7	82.3	85.0	-0.74	4.2	2.8	85.9	-0.64	4.0	1.6	16	LD
GYNJL8	91.0	88.7	88.1	90.7	89.6	0.26	3.8	1.5	92.4	0.89	3.9	3.1	15	LD
H6AUDG	92.6	92.9	94.0	91.8	92.8	0.96	4.6	0.9	93.0	1.05	3.4	1.6	16	LD
HC9EJJ	87.8	88.7	88.4	90.1	88.7	0.06	3.0	0.9	90.4	0.43	3.1	2.3	8	EM



**Containerboard Interlaboratory Testing Program**  
 Analysis 215  
**Ring Crush, 42 lb Linerboard - 42D2**  
 TAPPI Official Test Method T822

**Report #574 (H)**  
**July 2017**

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
JPACY4	92.1	No DATA	No DATA	No DATA	92.1	0.80	2.6	0.0	89.3	0.16	3.5	1.7	5	LC
KFEQ8V	89.1	87.8	88.4	88.1	88.3	-0.02	3.6	0.5	88.1	-0.11	3.1	0.8	L 16	EM
LG8ZYC	79.6 *	77.8 *	82.3	80.1 *	80.0	-1.85	4.5	1.9	83.7	-1.15	4.3	2.8	16	LC
PBU6PY	No DATA	No DATA	No DATA	95.1	95.1	1.45	4.3	0.0	94.0	1.29	5.6	6.1	9	LC
PJP64R	95.1	98.7 *	96.1	92.7	95.6	1.57	4.7	2.5	93.8	1.23	4.5	6.6	16	LC
PXHWL8	92.5	93.3	94.2	92.6 H	93.1	1.02	5.2	0.8	92.5	0.93	4.6	1.3	16	EM
Q6XZ9Z	61.2 XH	66.5 XH	64.0 XH	65.8 XH	64.4	-5.26 X	7.7	2.4	66.2	-5.28 X	8.5	7.7	H 16	EM
QCMDC9	85.0	77.0 *	89.7	89.7	85.4	-0.68	3.5	6.0 H	90.8	0.51	3.6	4.8	16	TH
TQUDWN	94.5	92.6	89.1 H	96.0	93.1	1.00	5.1	3.0	92.3	0.87	6.1	7.0	16	LC
UAY94K	85.4	83.9	80.6	73.5 XH	80.8	-1.66	4.0	5.3 H	82.8	-1.36	4.6	3.7	16	LZ
UDH6UW	91.0	92.1	88.9	86.2	89.5	0.24	3.7	2.6	92.5	0.92	4.2	3.1	16	LZ
UUNRVX	82.5	81.3	80.8	83.1	81.9	-1.42	3.3	1.0	86.4	-0.51	3.5	3.7	16	LZ
V8UXT3	89.2	90.0	88.5	88.9	89.2	0.15	4.2	0.6	87.4	-0.28	3.6	1.5	16	LG
VHQ9X4	91.6	91.6	89.8	90.3	90.8	0.52	4.6	0.9	90.6	0.48	3.7	1.1	16	LD
WKD3E6	86.1	87.7	86.7 L	87.7	87.1	-0.30	2.6	0.8	86.7	-0.46	3.6	1.1	16	LC
X6BZ7V	91.7	91.6	93.0	92.4 L	92.2	0.82	3.0	0.7	89.7	0.26	3.1	1.7	16	TH
XCYKDH	83.0	62.9 XH	72.0 XH	71.6 XH	72.4	-3.50 X	9.2	8.2 H	79.8	-2.07 *	6.1	7.9	H 12	LC
Y37T4V	90.9 L	89.7 L	92.3	91.7 L	91.2	0.59	1.5	1.2	91.5	0.69	2.8	1.3	16	TD
YHH6WN	81.9	84.7 L	87.4	85.8	85.0	-0.76	2.3	2.3	83.2	-1.26	3.4	2.0	12	LD
YK8CGK	91.6	89.9	91.8	92.7	91.5	0.66	3.9	1.2	92.4	0.91	4.8	2.1	16	LC
ZM7A4H	88.7	87.2	86.2	86.3	87.1	-0.30	3.4	1.1	86.5	-0.48	4.2	1.2	16	LD
ZNG8HZ	85.1	77.2 *	81.9	70.3 X	78.6	-2.15 *	5.2	6.4 H	78.8	-2.31 *	5.1	7.0	H 15	LZ

Consensus (All Labs) Results														
Wk Mean	88.47	88.29	88.46	89.08	Month Mean	88.45	Grand Mean	88.58						
Avg SDr	3.95	4.06	4.00	4.02	Avg SD	4.05	Avg SD	4.14						
SD btwn Labs	4.53	5.05	4.52	4.26	SD btwn Labs	4.58	SD btwn Labs	4.24						
Labs Incl	55	53	53	50	SD btwn Wks	2.42	SD btwn Wks	3.51						
Labs Excl	1	2	2	6	Labs Incl	55	Labs Incl	56						
Labs not Rcvd	1	2	2	1										



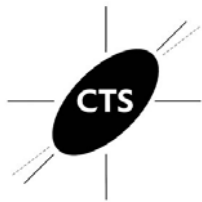


Containerboard Interlaboratory Testing Program  
Analysis 215  
**Ring Crush, 42 lb Linerboard - 42D2**  
TAPPI Official Test Method T822

**Report #574 (H)**  
**July 2017**

**Key to Instrument Codes Reported by Participants**

<b>EM</b>	Emerson 1200	<b>EN</b>	Emerson 2200
<b>LC</b>	L&W Crush Tester 48	<b>LD</b>	L&W Crush Tester 248
<b>LG</b>	L&W 753	<b>LX</b>	L&W 506
<b>LZ</b>	L&W Crush Tester (model not specified)	<b>MB</b>	Messmer Buchel K440
<b>TD</b>	TMI Digital Crush Tester, Model 17-09	<b>TH</b>	TMI Compression Tester, Model 17-76
<b>TJ</b>	TLS Compression Tester, Model CDM-5	<b>TU</b>	TMI Universal Crush Tester (TMI K440)
<b>XX</b>	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 216

Ring Crush, 56 lb Linerboard - 56A1

TAPPI Official Test Method T822

Report #574 (H)

July 2017

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	
28VQ7Q	140.3	144.2	144.8	143.5	143.2	0.78	4.4	2.0	142.5	0.90	3.7	1.6	12	LD
2KWL4J	125.6	127.7	129.4	128.0	127.7	-1.49	3.6	1.6	128.1	-1.62	4.3	2.2	12	EN
33U4UE	148.0	151.0	151.7	152.0	150.7	1.88	5.1	1.8	151.2	2.42 *	4.8	1.7	12	LD
3CYB8T	141.9	142.0	140.8	141.6	141.6	0.54	4.9	0.5 L	139.4	0.36	5.1	3.5	12	LD
48ZAQW	128.2	135.1	122.7 *	130.8	129.2	-1.27	4.2	5.2	131.1	-1.10	4.6	3.9	12	LC
4CHA9X	153.8 *	154.4 *	151.3	157.4 *	154.2	2.39 *	4.0	2.5	155.0	3.10 X	5.4	4.1	12	LY
4G7YLF	143.2	143.4	136.4	138.0	140.3	0.35	4.4	3.6	140.2	0.49	4.3	3.1	12	LD
6XDHVR	127.4	121.5 *	121.5 *	120.2 *	122.6	-2.23 *	4.6	3.2	125.3	-2.13 *	5.5	3.9	8	LC
7RKX6G	147.0	146.8	147.5	148.0	147.3	1.39	5.8	0.5 L	143.6	1.09	6.1	3.7	12	LC
87U7JP	138.7	141.1	143.7	144.0	141.9	0.59	3.6	2.5	139.9	0.44	3.8	3.7	12	LC
892J3C	146.9	136.5	134.8	135.3	138.4	0.08	5.1	5.7	139.3	0.34	4.5	3.5	12	LZ
8CKFTN	137.9	138.2	138.7	138.7	138.4	0.07	3.4	0.4 L	138.6	0.21	3.4	0.7 L	12	MB
8EQ2GN	124.6	125.6	124.4 *	121.1 *	123.9	-2.04 *	4.5	2.0	124.5	-2.26 *	4.3	3.0	8	TU
93C72N	130.6 H	146.2	144.4	133.3 H	138.6	0.11	7.7	7.8 H	141.8	0.77	6.4	5.4	12	MB
9KU67L	140.8	139.4	138.7	138.0	139.2	0.20	4.7	1.2	141.5	0.72	5.1	4.8	12	LD
AK8A2P	137.3	136.1 L	135.3	132.0	135.2	-0.39	4.1	2.3	136.3	-0.18	3.8	2.1	12	LD
B8W3FP	138.2 L	134.0	137.6	132.7	135.7	-0.32	3.3	2.7	137.9	0.09	3.4	3.9	8	TJ
BGMNN9	135.6	132.7	138.8	134.3	135.3	-0.37	3.8	2.6	133.7	-0.64	4.0	2.3	12	LD
BN4Y2A	131.4	136.9	137.7	132.9	134.7	-0.46	4.4	3.1	132.4	-0.87	3.7	2.5	12	LD
BRKNZD	136.7	138.6	136.0	137.4	137.2	-0.10	3.8	1.1	135.8	-0.29	3.8	3.3	12	TH
CJ9RUK	131.5	132.0	131.2	130.7	131.3	-0.95	3.8	0.5 L	131.6	-1.02	3.8	1.4 L	12	LD
CKKH4P	142.3 H	148.8	143.3	144.8	144.8	1.02	6.0	2.9	146.4	1.58	5.6	6.4	12	LC
CU7NVM	133.2	143.1	145.5	141.1	140.7	0.42	5.1	5.3	136.6	-0.14	7.9	9.3	8	XX
DDFA9	132.9	137.8	141.7	137.1	137.4	-0.07	4.5	3.6	137.2	-0.03	5.4	2.5	12	LD
DLVJPN	142.4	146.6 H	144.5	146.1	144.9	1.03	6.0	1.9	141.0	0.63	5.5	4.5	12	MB
E8PU48	142.4	141.8	142.3	143.5	142.5	0.68	4.1	0.7	141.8	0.77	4.1	1.6	12	LD
EAVFR8	139.2	137.9	136.7	139.6	138.4	0.07	4.7	1.3	139.7	0.40	4.2	1.6	12	LD
EH7W8K	123.0 *	128.5	138.6	128.8	129.7	-1.19	5.5	6.5	131.6	-1.01	5.0	8.9	12	LC
EUH44K	139.1	143.2	144.6	145.7	143.2	0.77	4.8	2.9	136.8	-0.11	4.9	5.6	12	EM
F2VHHA	138.4	140.4	141.1	141.4	140.3	0.36	5.1	1.3	135.5	-0.34	4.4	4.1	12	EM
F8H6CF	138.0	138.2	138.1	138.1	138.1	0.04	6.2	0.1 L	138.0	0.11	6.1	0.2 L	12	LD
FL4KFE	130.0	133.2	135.6	128.7	131.9	-0.88	5.0	3.1	134.6	-0.49	4.7	3.0	12	LD
GYNJL8	142.3	137.8	132.5	141.8	138.6	0.11	4.4	4.5	141.1	0.64	4.2	5.7	12	LD
H6AUDG	144.5	145.9	144.8	140.3	143.9	0.88	4.7	2.5	143.2	1.02	4.5	2.6	12	LD
HC9EJJ	140.3	134.2	133.7	137.5	136.4	-0.21	3.9	3.1	138.9	0.27	3.9	3.9	8	EM



**Containerboard Interlaboratory Testing Program**  
 Analysis 216  
**Ring Crush, 56 lb Linerboard - 56A1**  
 TAPPI Official Test Method T822

**Report #574 (H)**  
**July 2017**

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
JPACY4	138.0	No DATA	No DATA	No DATA	138.0	0.02	3.7	0.0	138.0	0.11	3.7	0.0	1	LC
KFEQ8V	139.1 L	136.3 L	139.2	136.5	137.8	-0.01	2.2	1.6	137.9	0.09	3.0	2.9	12	EM
LG8ZYC	127.7	132.1	131.6	128.4	130.0	-1.16	4.5	2.2	129.9	-1.32	4.0	2.3	12	LC
PBU6PY	No DATA	No DATA	No DATA	143.0	143.0	0.75	3.1	0.0	136.4	-0.18	4.8	9.0	9	LC
PJP64R	146.8	149.1	146.0	151.1	148.2	1.52	3.4	2.3	145.7	1.45	6.0	12.6 H	12	LC
PXHWL8	150.7	149.1	144.8	147.4	148.0	1.48	4.5	2.5	144.6	1.27	4.7	3.4	12	EM
Q6XZ9Z	102.2 XH	101.6 XH	101.5 XH	102.4 XH	101.9	-5.26 X	14.4	0.5 L	93.7	-7.67 X	12.5	8.9	8	EM
QCMDC9	130.5	125.4	141.0	135.8	133.2	-0.68	4.9	6.7	136.4	-0.18	4.5	4.9	12	MB
TQUDWN	134.2	146.3 H	144.9	144.5 H	142.5	0.68	7.2	5.6	140.6	0.57	9.4	8.7	12	LC
UAY94K	132.0	147.3 H	144.5 H	129.5	138.3	0.07	6.7	8.9 H	133.9	-0.62	6.4	7.7	12	LZ
UDH6UW	147.8	143.3	138.2	137.6	141.7	0.56	5.3	4.8	142.6	0.92	6.1	13.1 H	12	LZ
UUNRVX	129.2 L	132.3	132.2	133.8	131.9	-0.88	3.6	2.0	135.4	-0.35	3.7	3.4	12	LZ
V8UXT3	135.5	139.1	138.0 L	135.1	136.9	-0.14	3.2	1.9	136.2	-0.20	3.1	2.8	12	LY
VHQ9X4	145.3	144.2	144.5	144.1	144.5	0.97	3.9	0.5 L	143.3	1.05	3.9	1.6	12	LD
WKD3E6	136.4	135.1	135.7	132.7	135.0	-0.43	5.2	1.6	137.5	0.01	4.3	5.4	12	LC
X6BZ7V	141.5	142.4	141.9	142.4	142.1	0.61	5.0	0.4 L	142.2	0.85	4.5	0.7 L	12	TH
XCYKDH	122.3 *	109.7 XH	120.7 *	129.3	120.5	-2.54 *	6.8	8.1 H	125.8	-2.03 *	5.6	8.4	8	LC
Y37T4V	142.8	141.1	141.4	139.8 L	141.3	0.50	3.2	1.2	138.2	0.14	2.5	2.9	12	TD
YHH6WN	129.4	130.0	136.7	134.8	132.7	-0.75	3.3	3.6	132.2	-0.92	3.6	2.7	12	LD
YK8CGK	136.3	143.3	132.2 H	140.8	138.1	0.04	9.7	4.9	144.0	1.17	9.0	6.6	12	LC
ZM7A4H	137.3	136.4	131.9	136.1	135.4	-0.36	4.2	2.4	135.7	-0.29	4.1	3.0	12	LD
ZNG8HZ	128.4	120.8 *	127.0	120.3 *	124.1	-2.01 *	3.8	4.2	123.0	-2.53 *	5.6	5.9	12	LZ

Consensus (All Labs) Results														
Wk Mean	137.18	138.76	138.19	137.58	Month Mean	137.86			Grand Mean	137.39				
Avg SDr	4.90	4.93	4.88	4.49	Avg SD	4.82			Avg SD	4.93				
SD btwn Labs	7.23	7.41	6.98	7.60	SD btwn Labs	6.83			SD btwn Labs	5.69				
Labs Incl	55	53	54	55	SD btwn Wks	3.58			SD btwn Wks	5.05				
Labs Excl	1	2	1	1	Labs Incl	56			Labs Incl	55				
Labs not Rcvd	1	2	2	1										

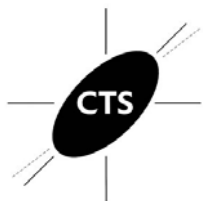


Containerboard Interlaboratory Testing Program  
Analysis 216  
**Ring Crush, 56 lb Linerboard - 56A1**  
TAPPI Official Test Method T822

**Report #574 (H)**  
**July 2017**

**Key to Instrument Codes Reported by Participants**

<b>EM</b>	Emerson 1200	<b>EN</b>	Emerson 2200
<b>LC</b>	L&W Crush Tester 48	<b>LD</b>	L&W Crush Tester 248
<b>LY</b>	L&W Crush Tester 958	<b>LZ</b>	L&W Crush Tester (model not specified)
<b>MB</b>	Messmer Buchel K440	<b>TD</b>	TMI Digital Crush Tester, Model 17-09
<b>TH</b>	TMI Compression Tester, Model 17-76	<b>TJ</b>	TLS Compression Tester, Model CDM-5
<b>TU</b>	TMI Universal Crush Tester (TMI K440)	<b>XX</b>	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 223

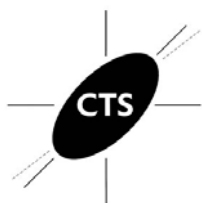
Report #574 (H)

July 2017

STFI, 42 lb Linerboard - 42D2

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	
28VQ7Q	22.1	21.8	21.0	21.3	21.6	-0.73	1.6	0.5	21.4	-0.93	1.7	0.6	16	LY
2KWL4J	21.0	20.5	20.9	21.0	20.9	-1.35	1.7	0.2	20.7	-1.67	1.8	0.5	L 16	LY
349LUY	18.5 XL	19.1 *L	20.0 L	19.9 *L	19.4	-2.67 *	0.0	0.7	19.8	-2.47 *	1.2	3.2	16	LW
48ZAQW	23.2	22.9	21.7	22.2	22.5	0.09	2.2	0.7	22.2	-0.17	2.2	0.7	16	LW
4G7YLF	21.9	22.6	22.0	22.8	22.3	-0.07	1.8	0.5	22.1	-0.27	1.8	0.5	L 16	LY
6EJXZR	25.1 *	23.4	24.7	24.3	24.4	1.77	2.0	0.7	24.5	2.20 *	2.1	1.0	16	LA
7RKX6G	24.2	23.8	23.4	24.3	23.9	1.35	1.8	0.4	23.3	0.96	1.8	0.7	16	LW
87U7JP	22.7	22.2	23.2	22.8	22.7	0.31	1.7	0.4	22.4	0.06	2.0	0.4	L 16	LU
892J3C	21.4	21.0	20.8	21.0	21.0	-1.19	1.8	0.3	21.4	-0.89	1.8	0.5	16	LW
93C72N	21.1 L	22.2 L	21.9 L	22.5 L	21.9	-0.42	0.1	0.6	26.2	3.86 X	0.2	14.9 H	12	LA
93PV3F	22.3 L	22.5 L	22.5 L	22.6	22.5	0.06	1.0	0.1	22.6	0.28	1.0	0.2	L 16	TT
9KU67L	22.9	22.8	22.5	22.9	22.8	0.35	1.8	0.2	22.6	0.26	1.9	0.9	15	LU
9YT7L9	24.1	24.6	24.3 H	23.9 H	24.2	1.61	2.4	0.3	23.6	1.24	2.1	0.6	16	LU
A6ELP7	23.8	23.1	22.3 H	24.3	23.4	0.86	2.5	0.9	23.8	1.46	2.2	0.7	16	LZ
AK8A2P	21.8	21.8	22.0	21.4	21.8	-0.56	1.7	0.3	22.0	-0.30	1.7	0.5	L 16	BK
BJCXVP	21.8	21.6	21.4	22.7	21.9	-0.48	2.0	0.6	21.7	-0.66	1.9	1.2	16	XX
BN4Y2A	22.8 L	22.4 L	22.0	22.5 L	22.4	0.03	1.0	0.3	22.1	-0.21	1.3	0.8	15	LA
BRKNZD	23.0 L	22.2 L	22.2 L	22.7 L	22.5	0.13	0.8	0.4	22.3	0.00	0.9	0.3	L 16	TT
CJ9RUK	20.1	20.7	20.0	20.4	20.3	-1.83	1.7	0.3	20.7	-1.60	1.8	0.5	16	LW
CKKH4P	21.0 L	21.6 L	19.4 *L	20.0 *L	20.5	-1.67	0.0	1.0	20.9	-1.42	0.9	0.8	16	LW
CU7NVM	23.5 L	23.2 L	21.2 L	22.2	22.5	0.11	0.9	1.1	21.9	-0.47	1.5	0.9	12	XX
DDFA9	22.2	22.1 H	22.6	22.2	22.2	-0.12	1.9	0.2	22.6	0.31	2.1	0.9	16	LA
DJLJKG	21.2	19.8 *	20.8	22.6	21.1	-1.16	1.6	1.2	21.1	-1.22	1.7	0.6	16	LA
DLVJPN	23.0 L	23.6 L	23.2 L	25.1 *L	23.7	1.17	0.5	0.9	23.0	0.66	0.4	1.0	16	BK
DVXYBM	22.2 H	21.8	22.6	25.0 *H	22.9	0.44	2.1	1.5 H	22.8	0.50	1.9	1.0	16	LH
E8PU48	23.0	23.5	22.7	21.6	22.7	0.26	1.5	0.8	22.8	0.49	1.6	0.6	16	LA
EAVFR8	22.5	22.7	22.1	22.8	22.5	0.12	2.0	0.3	22.7	0.38	1.9	0.4	L 16	LY
EH7W8K	21.9	22.6	25.6 *	24.0	23.6	1.04	1.6	1.6 H	22.5	0.16	1.7	1.8	16	XX
ET3M6L	19.8 *	20.4	21.5	71.0 XH	33.2	9.57 X	3.1	25.2 H	23.9	1.52	2.2	12.6 H	16	XX
EUH44K	24.0	23.2 H	22.6	22.8	23.2	0.68	2.2	0.6	22.7	0.33	2.1	1.0	16	LZ
FL4KFE	22.2	22.6	22.2	22.0	22.3	-0.11	1.8	0.2	22.0	-0.32	1.7	0.4	L 16	LY
GYNJL8	23.0	22.2	22.9	23.1	22.8	0.37	1.8	0.4	22.9	0.56	1.8	0.6	15	LZ
H6AUDG	23.4	23.1	23.6	23.3	23.4	0.86	1.3	0.2	23.2	0.83	1.2	0.5	L 16	LZ
HBVPCZ	22.9	22.6	24.4	23.4	23.3	0.85	1.9	0.8	24.0	1.63	2.2	0.8	16	XX
HWYD2B	21.4 H	21.0	21.0	22.1	21.3	-0.92	2.3	0.5	21.5	-0.82	2.1	0.8	16	XX



Containerboard Interlaboratory Testing Program

Analysis 223

Report #574 (H)

July 2017

STFI, 42 lb Linerboard - 42D2

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	
LG8ZYC	21.0	21.4	21.4	21.4	21.3	-0.96	1.5	0.2	20.9	-1.41	1.6	0.8	16	LA
MBJJ3R	22.9	23.6	23.1	No DATA	23.2	0.71	2.2	0.4	23.0	0.67	2.0	0.7	10	LA
MG9YQY	20.4	20.7	No DATA	20.5	20.5	-1.64	1.8	0.1	21.4	-0.91	1.8	0.7	15	LW
PBU6PY	No DATA	No DATA	21.8	L 21.9	21.8	-0.51	0.3	0.1	21.3	-0.98	0.3	0.5	10	LA
TQUDWN	21.8	24.2 H	23.3 H	23.2	23.1	0.64	2.5	1.0	23.8	1.46	2.1	0.9	16	LU
U3GYFN	25.1 *H	24.3	24.9	* No DATA	24.8	2.11 *	2.3	0.4	23.8	1.45	2.5	1.1	10	LU
UAY94K	19.6 *	19.7 *	20.8	L 20.9	20.2	-1.91	1.6	0.7	20.4	-1.87	1.8	0.8	16	LA
UJPUC4	23.0 L	22.5 L	23.9 L	22.1 L	22.9	0.43	0.0	0.8	35.3	12.89 X	2.0	13.3 H	8	LH
V8UXT3	21.4	21.6	22.5	21.5	21.7	-0.58	1.7	0.5	21.8	-0.53	2.5	0.5	L 16	LU
VHQ9X4	22.8	24.1	23.5	23.8	23.5	1.02	1.6	0.5	23.2	0.89	1.6	0.5	L 16	LA
WKD3E6	23.1	23.5	23.0	22.6	23.0	0.55	1.8	0.4	23.0	0.71	1.5	0.4	L 16	LU
X4H4JM	22.7	22.7	22.9	23.1 H	22.9	0.42	2.1	0.2	22.8	0.48	2.1	0.2	L 16	LW
XCYKDH	23.9	23.9	23.0	24.0	23.7	1.16	1.2	0.5	23.0	0.66	1.1	0.9	12	LY
YHH6WN	20.8	21.6	21.5	22.7	21.7	-0.62	1.7	0.8	22.0	-0.29	1.7	0.6	16	LA
YK8CGK	23.2	22.6	21.4	L 22.0	22.3	-0.09	1.6	0.7	22.2	-0.11	1.9	0.8	16	LA
Z3X87D	23.8 L	22.8 L	23.0 L	21.9 L	22.9	0.43	0.0	0.8	22.8	0.44	1.4	0.9	12	LU
Z9NJ6G	23.9	24.8 *	22.9 H	22.1	23.4	0.93	2.4	1.2	22.8	0.44	1.9	1.3	16	LA
ZM7A4H	22.4	21.9	22.1	21.6	22.0	-0.34	2.1	0.3	21.9	-0.47	2.0	0.5	L 16	LU
ZNG8HZ	21.7	21.0	21.7	21.1	21.4	-0.90	1.7	0.4	21.3	-1.02	1.9	0.4	L 15	LZ

Consensus (All Labs) Results									
Wk Mean	22.42	22.33	22.33	22.43	Month Mean	22.39	Grand Mean	22.33	
Avg SDr	1.72	1.68	1.82	1.65	Avg SD	1.71	Avg SD	1.78	
SD btwn Labs	1.24	1.27	1.26	1.20	SD btwn Labs	1.13	SD btwn Labs	1.00	
Labs Incl	52	53	53	51	SD btwn Wks	0.65	SD btwn Wks	1.95	
Labs Excl	1	0	0	1	Labs Incl	53	Labs Incl	52	
Labs not Rcvd	1	1	1	2					

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 #574 (H)

July 2017

STFI, 56 lb Linerboard - 56A1

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	
28VQ7Q	32.0	32.1	32.5	32.7	32.3	-0.69	3.0	0.3	32.6	-0.58	2.6	1.0	12	LY
2KWL4J	31.1	29.7 *	31.5	30.6 H	30.8	-1.57	6.1	0.8	30.9	-1.65	4.0	0.8	12	LY
349LUY	29.6 *L	30.9 L	31.4 L	30.6 L	30.6	-1.64	0.0	0.7	31.2	-1.46	0.0	1.8	12	LW
48ZAQW	35.7	35.0 H	32.0	33.7	34.1	0.29	3.3	1.6	33.2	-0.22	3.1	1.3	12	LW
4G7YLF	33.2	34.7	33.4	33.8	33.7	0.11	2.9	0.7	33.3	-0.15	3.0	0.8	12	LY
6EJXZR	35.4	36.5	39.0 *H	36.1	36.7	1.78	3.4	1.6	37.0	2.09 *	3.1	1.1	12	LA
7RKX6G	36.2	34.5	34.7 H	34.9	35.1	0.85	2.6	0.8	34.8	0.75	2.8	0.9	12	LW
87U7JP	33.4	33.6	34.1	32.3	33.4	-0.11	2.3	0.8	33.1	-0.32	2.5	0.7	12	LU
892J3C	32.2	31.4	31.3	30.9	31.4	-1.19	2.8	0.5	31.9	-1.05	2.5	0.9	12	LW
93C72N	33.2 L	32.5 L	33.0 L	32.3 L	32.7	-0.45	0.2	0.4	40.3	4.09 X	0.5	23.6 H	12	LA
93PV3F	33.7 L	33.8 L	33.2 L	33.6 L	33.6	0.01	1.2	0.3	33.7	0.07	1.1	0.3 L	12	TT
9KU67L	34.8	34.4	32.7	33.5	33.9	0.17	2.9	0.9	36.1	1.52	2.3	2.7	12	LU
9YT7L9	35.9	35.9	36.4 H	36.6 *	36.2	1.47	3.4	0.4	35.7	1.27	3.2	1.1	12	LU
A6ELP7	37.0	36.4	38.9 *	39.0 X	37.8	2.38 *	3.3	1.3	37.7	2.51 *	3.3	0.9	12	LZ
AK8A2P	35.7	33.0	31.7	32.5	33.2	-0.18	2.6	1.7	32.7	-0.53	2.3	1.3	12	BK
BJCXVP	31.9	31.9	33.2	33.0	32.5	-0.60	2.7	0.7	33.4	-0.11	2.9	2.0	12	XX
BN4Y2A	34.0	33.4	34.0	32.6	33.5	-0.03	2.4	0.7	33.2	-0.21	2.5	0.5	12	LA
BRKNZD	33.3 L	33.5 L	33.4 L	33.1 L	33.3	-0.14	1.2	0.2	33.4	-0.10	1.2	0.3 L	12	TT
CJ9RUK	30.4	30.7	31.0	31.6	31.0	-1.46	3.0	0.5	31.4	-1.35	2.9	0.9	12	LW
CKKH4P	26.9 XL	27.0 XL	29.9 L	31.6 L	28.9	-2.63 *	0.0	2.3 H	30.0	-2.20 *	0.0	3.8 H	12	LW
CU7NVM	33.1 L	33.2	35.1 L	32.9 L	33.6	0.00	1.8	1.0	33.2	-0.25	1.5	0.9	8	XX
DDFA9	34.6	34.7 H	35.8	34.2	34.8	0.70	3.6	0.7	34.4	0.53	3.1	1.3	12	LA
DJLJKG	33.1 H	31.0	30.7	33.7	32.1	-0.80	3.0	1.5	31.7	-1.14	2.7	1.1	12	LA
DLVJPN	37.3 L	35.8 L	35.8 L	38.5 XL	36.8	1.83	1.0	1.3	34.5	0.54	1.3	4.0 H	12	BK
DVXYBM	33.7	35.1	32.2	34.4	33.8	0.15	2.9	1.2	35.0	0.88	2.8	1.5	12	LH
E8PU48	34.8	34.8	34.4	34.0	34.5	0.51	2.9	0.3	34.1	0.31	2.3	0.7	12	LA
EAVFR8	34.1	33.3	31.8	32.0	32.8	-0.44	2.1	1.1	33.8	0.13	2.4	1.0	12	LU
EH7W8K	32.3	34.9	37.5	35.1	34.9	0.77	2.5	2.1 H	33.0	-0.33	2.4	2.4	12	XX
ET3M6L	30.2	31.4	30.6	30.0 *	30.6	-1.68	2.5	0.6	31.1	-1.50	2.4	1.6	12	XX
EUH44K	36.2	36.1	36.9	35.4	36.2	1.45	2.7	0.6	34.6	0.64	2.4	1.5	12	LZ
FL4KFE	31.7	34.3	32.7	32.3	32.7	-0.46	2.5	1.1	33.0	-0.33	2.4	0.9	12	LZ
GYNJL8	34.5	32.4	32.8	35.1	33.7	0.09	2.5	1.3	33.6	0.03	3.0	1.2	12	LZ
H6AUDG	34.9	34.6	35.3	35.9	35.2	0.90	2.3	0.5	34.7	0.66	2.2	0.9	12	LZ
HBVPCZ	34.9	34.9 H	35.8 H	35.8	35.4	1.00	3.6	0.5	36.3	1.65	3.4	1.0	12	LU
HWYD2B	32.0 H	31.5	32.8	33.6	32.5	-0.62	2.9	0.9	33.1	-0.30	3.1	1.1	12	XX



Containerboard Interlaboratory Testing Program

Analysis 224

Report #574 (H)

July 2017

STFI, 56 lb Linerboard - 56A1

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
LG8ZYC	32.7	32.1	31.5	33.3	32.4	-0.65	2.8	0.8	32.4	-0.71	2.7	1.3	12	LA
MBJJ3R	34.9	33.5 H	33.3	No DATA	33.9	0.18	3.1	0.9	33.5	-0.07	2.7	1.1	9	LA
MG9YQY	31.4	31.9	31.1	31.6 L	31.5	-1.15	2.6	0.3	31.9	-1.03	2.4	0.6	12	LW
PBU6PY	No DATA	No DATA	34.5 L	32.0 L	33.3	-0.16	0.9	1.8	31.5	-1.30	1.1	2.7	10	LA
TQUDWN	34.3	33.1	36.9	35.2	34.9	0.73	2.9	1.6	36.1	1.57	2.9	1.4	12	LU
U3GYFN	35.0	35.2	35.9 L	No DATA	35.4	1.03	3.1	0.5	35.0	0.85	2.8	1.2	8	LU
UAY94K	30.5	31.0	29.7	32.8	31.0	-1.44	2.3	1.3	32.0	-0.98	1.8	1.6	12	LA
UJPUC4	36.2 L	37.3 *L	35.6 L	36.3 L	36.3	1.56	0.0	0.7	36.3	1.69	0.0	0.7	4	LH
V8UXT3	33.0	31.8 L	33.0	33.0	32.7	-0.48	2.1	0.6	32.9	-0.41	2.3	0.6	12	LU
VHQ9X4	35.0	34.3	34.2	34.1	34.4	0.48	2.0	0.4	34.2	0.39	2.5	0.4	12	LA
WKD3E6	33.1	33.4	33.3	33.7 L	33.4	-0.09	1.8	0.3	34.2	0.36	2.2	0.6	12	LU
X4H4JM	33.0	33.7	33.9	33.3	33.5	-0.06	3.0	0.4	33.9	0.17	3.0	0.5	11	LW
XCYKDH	36.3	34.9	31.7	34.6	34.4	0.46	2.6	1.9	34.4	0.51	2.3	1.5	11	LY
YHH6WN	33.2	34.1	32.3	33.1	33.2	-0.21	2.8	0.7	32.4	-0.70	2.4	2.5	12	LW
YK8CGK	32.7	31.5	31.9	33.7	32.4	-0.62	2.6	1.0	33.1	-0.31	3.1	1.9	12	LA
Z3X87D	36.2 L	35.7 L	34.9 L	33.4 L	35.1	0.84	0.0	1.2	35.5	1.15	0.0	1.0	8	LU
Z9NJ6G	36.4	36.0	34.8	34.5	35.4	1.03	2.0	0.9	34.5	0.55	2.4	1.3	12	LA
ZM7A4H	33.4 H	31.9	33.0	32.2	32.6	-0.53	3.3	0.7	32.5	-0.68	3.2	0.7	12	LU
ZNG8HZ	32.7 L	31.5 L	33.0	32.3	32.4	-0.65	2.3	0.6	32.2	-0.86	2.6	0.7	12	LZ

Consensus (All Labs) Results														
Wk Mean	33.77	33.55	33.55	33.38	Month Mean	33.56			Grand Mean	33.58				
Avg SDr	2.61	2.64	2.45	2.90	Avg SD	2.64			Avg SD	2.52				
SD btwn Labs	1.86	1.79	2.13	1.53	SD btwn Labs	1.79			SD btwn Labs	1.63				
Labs Incl	52	52	54	50	SD btwn Wks	1.03			SD btwn Wks	1.47				
Labs Excl	1	1	0	2	Labs Incl	54			Labs Incl	53				
Labs not Rcvd	1	1	0	2										

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 #574 (H)**  
**July 2017**

WebCode	Monthly Results			Cumulative Results					
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst	
2KWL4J	175.2	-0.13	21.93	174.0	-0.11	1.67	L 4	EV	
33U4UE	150.7	-0.97	24.27	152.2	-1.09	8.88	4	EV	
48ZAQW	178.5	-0.01	13.62	177.8	0.06	0.64	L 4	XX	
892J3C	177.8	-0.04	15.82	162.2	-0.64	13.82	4	EV	
93C72N	143.6	-1.22	32.13	H 145.3	-1.40	7.44	3	LA	
9YT7L9	183.7	0.17	10.50	188.2	0.52	5.94	4	EV	
A6ELP7	175.4	-0.12	11.56	179.7	0.14	6.01	2	XX	
C8R3X2	160.7	-0.63	12.75	163.2	-0.59	6.57	4	EV	
CKKH4P	185.0	0.21	15.02	190.8	0.64	9.71	4	EV	
CU7NVM	208.8	1.03	14.48	196.2	0.88	11.68	3	EV	
DJLJKG	172.7	-0.21	19.84	163.8	-0.57	12.53	4	LA	
DLVJPN	208.6	1.03	30.14	205.7	1.31	9.69	4	EV	
FL4KFE	222.8	1.52	11.59	216.4	1.79	27.05	4	EV	
GYNJL8	209.6	1.06	22.38	192.1	0.70	20.35	4	LA	
JPACY4	175.9	-0.10	16.91	175.9	-0.03	0.00	1	LA	
MBJJ3R	216.3	1.29	28.96	192.5	0.72	33.66	2	LA	
TQUDWN	141.1	-1.31	11.77	145.7	-1.38	5.28	4	EV	
UAY94K	126.0	-1.83	20.58	124.8	-2.31 *	1.42	L 4	LA	
VHQ9X4	162.6	-0.56	14.37	166.5	-0.45	3.91	4	XX	
XCYKDH	130.3	-1.68	13.91	123.5	-2.37 *	14.31	3	EV	
YHH6WN	209.4	1.05	34.34	H 202.6	1.17	5.39	4	LA	
YK8CGK	224.9	1.59	23.34	187.8	0.51	27.31	4	LA	
ZM7A4H	175.5	-0.12	9.30	180.2	0.17	5.00	4	EV	

Consensus (All Labs) Results			
Month Mean	178.92	Grand Mean	176.47
Avg SD	20.02	Avg SD Months	14.23
SD btwn Labs	28.97	SD btwn Labs	22.34
Labs Incd	23	Labs Incd	22

**Key to Instrument Codes Reported by Participants**

- EV Emveco Microgag 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 #574 (H)**  
**July 2017**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
87U7JP	368.0	0.30	10.09	370.7	0.23	3.75	2	XX
9BANLR	340.9	-2.04 *	21.27 H	363.9	-0.55	32.51	2	PP
BN4Y2A	366.2	0.15	9.32	365.0	-0.43	1.70	2	LA
DDDF A9	359.5	-0.43	5.59	361.9	-0.78	3.43	2	LA
E8PU48	440.4	6.58 X	0.84 L	438.9	8.10 X	2.19	2	XX
GC9YP8	375.2	0.93	13.09	387.7	2.19 *	17.61	2	XX
Q86DU8	378.7	1.23	9.62	375.0	0.73	5.23	2	PP
UDH6UW	355.2	-0.80	6.48	358.2	-1.21	4.24	2	TS
VAXZBR	363.9	-0.05	8.93	366.6	-0.24	3.80	2	LA
Z9NJ6G	372.7	0.71	8.06	369.3	0.07	4.88	2	XX

Consensus (All Labs) Results			
Month Mean	364.48	Grand Mean	368.69
Avg SD	11.17	Avg SD Months	12.82
SD btwn Labs	11.54	SD btwn Labs	8.66
Labs Incl	9	Labs Incl	9

**Key to Instrument Codes Reported by Participants**

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



Containerboard Interlaboratory Testing Program

Analysis 231

Report #574 (H)

July 2017

Internal Bond, 42 lb Linerboard - 42D

TAPPI Official Test Method T569

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
33U4UE	118.8	0.59	3.56	126.0	1.31	6.90	4	HY
87U7JP	115.9	0.45	4.33	113.1	0.55	3.62	4	HY
9KU67L	134.0	1.32	5.48	130.5	1.57	19.64	H 4	HZ
9YT7L9	66.6	-1.91 *	2.61	62.8	-2.43 *	4.42	4	TM
A6ELP7	107.0	0.03	7.18	101.3	-0.16	5.06	4	TM
BN4Y2A	96.3	-0.48	5.16	99.0	-0.29	3.94	4	SC
CJ9RUK	115.6	0.44	1.95	L 116.5	0.74	2.62	4	TM
CKKH4P	156.0	2.37 *	20.43	H 164.3	3.57 X	9.54	4	SC
E8PU48	51.7	-2.62 X	1.44	L 56.2	-2.82 X	5.76	4	LZ
EH7W8K	81.1	-1.21	5.99	107.9	0.24	23.40	H 4	SC
FL4KFE	93.8	-0.60	5.81	91.0	-0.77	6.45	4	XX
LG8ZYC	98.2	-0.39	6.69	99.0	-0.29	3.65	4	TM
T8E26X	99.3	-0.34	5.01	97.4	-0.38	2.76	4	TM
TF9AM4	103.8	-0.13	15.79	94.9	-0.54	6.27	4	TM
TQUAWN	97.6	-0.42	1.82	L 96.0	-0.47	1.26	L 4	TM
UAY94K	112.2	0.28	13.95	111.1	0.42	3.99	4	TM
YHH6WN	129.0	1.08	16.72	129.2	1.50	5.88	4	HY
Z9NJ6G	109.8	0.16	3.77	105.1	0.07	8.92	4	SC
ZM7A4H	81.0	-1.22	8.69	86.0	-1.06	3.56	4	TM

Consensus (All Labs) Results			
Month Mean	106.45	Grand Mean	103.92
Avg SD	9.20	Avg SD Months	8.77
SD btwn Labs	20.92	SD btwn Labs	16.90
Labs Incl	18	Labs Incl	17

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	104.86	21.93	1.58	15
Modified Scott Bond Mechanics	122.44	9.28	15.99	2

Analysis Notes

E8PU48 - 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), 42 lb Linerboard - 56A**  
 TAPPI Official Test Method T815

**Report #574 (H)**  
**July 2017**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	
2KWL4J	28.9	0.85	2.67	28.9	0.85	0.00	1	
48ZAQW	24.2	-0.48	2.17	24.2	-0.48	0.00	1	
7RKX6G	25.8	-0.03	1.92	25.8	-0.03	0.00	1	
87U7JP	17.6	-2.37 *	1.52	17.6	-2.37 *	0.00	1	
892J3C	23.8	-0.60	1.79	23.8	-0.60	0.00	1	
9YT7L9	25.6	-0.08	0.89	25.6	-0.08	0.00	1	
A6ELP7	25.6	-0.08	1.34	25.6	-0.08	0.00	1	
BJCXVP	27.6	0.49	3.36	27.6	0.49	0.00	1	
CJ9RUK	18.7	-2.07 *	2.14	18.7	-2.07 *	0.00	1	
CKKH4P	27.8	0.55	2.05	27.8	0.55	0.00	1	
E8PU48	27.6	0.49	0.55	L	27.6	0.49	0.00	1
ET3M6L	31.2	1.52	2.68	31.2	1.52	0.00	1	
EUH44K	27.2	0.37	2.77	27.2	0.37	0.00	1	
FL4KFE	20.6	-1.51	0.55	L	20.6	-1.51	0.00	1
HBVPCZ	25.4	-0.14	2.41	25.4	-0.14	0.00	1	
PJP64R	26.6	0.20	1.95	26.6	0.20	0.00	1	
R8LQVP	27.4	0.43	6.73	H	27.4	0.43	0.00	1
TQUDWN	23.6	-0.65	0.89	23.6	-0.65	0.00	1	
UAY94K	31.8	1.69	9.42	H	31.8	1.69	0.00	1
VHQ9X4	27.0	0.32	1.58	27.0	0.32	0.00	1	
YHH6WN	28.8	0.83	3.27	28.8	0.83	0.00	1	
Z9NJ6G	24.0	-0.54	1.41	24.0	-0.54	0.00	1	
ZM7A4H	28.8	0.83	1.96	28.8	0.83	0.00	1	

Consensus (All Labs) Results			
Month Mean	25.89	Grand Mean	25.89
Avg SD	3.11	Avg SD Months	0.00
SD btwn Labs	3.50	SD btwn Labs	3.50
Labs Incl	23	Labs Incl	23

**Key to Instrument Codes Reported by Participants**

**ZZ** Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program  
Analysis 237

Report #574 (H)  
July 2017

**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
28VQ7Q	17.7	-0.37	1.89	18.2	-0.16	0.45	4	LP
3CYB8T	19.4	0.87	2.32	19.4	0.69	2.24	4	GG
7RXX6G	17.5	-0.52	1.65	17.8	-0.45	0.77	3	LP
87U7JP	18.3	0.09	2.39	18.5	0.05	1.31	4	TP
892J3C	16.1	-1.55	2.73	15.8	-2.00 *	1.90	4	XX
9YT7L9	15.4	-2.05 *	1.39	16.5	-1.45	0.84	4	LA
A6ELP7	17.5	-0.52	3.10 H	18.5	0.06	0.72	4	TD
BN4Y2A	19.5	0.96	1.05	20.2	1.31	0.95	4	LA
CJ9RUK	17.6	-0.45	1.80	17.6	-0.64	0.59	4	TP
CKKH4P	18.9	0.51	2.96	17.1	-0.98	1.37	4	HG
CU7NVM	16.6	-1.20	0.87	17.4	-0.80	0.79	3	LW
DLVJPN	54.8	26.90 X	2.14	29.9	8.53 X	16.61 H	4	XX
E8PU48	20.1	1.38	1.43	20.3	1.37	0.68	4	LA
EFYJG7	16.1	-1.56	1.75	16.8	-1.20	0.82	4	LA
FL4KFE	17.7	-0.39	1.08	18.5	0.01	0.52	4	LP
HBVPCZ	16.7	-1.14	1.43	16.9	-1.17	0.31	4	LA
JPACY4	20.1	1.35	2.85	19.3	0.67	1.00	2	TL
MZZFVT	19.4	0.84	1.82	19.2	0.59	0.91	4	XX
R8LQVP	20.0	1.31	2.06	21.4	2.18 *	2.94 H	4	GA
TQUDWN	18.9	0.51	1.30	19.0	0.42	1.36	4	LA
UAY94K	18.6	0.30	1.28	18.6	0.14	0.54	4	LP
UFPMTR	18.1	-0.05	1.91	18.3	-0.08	0.94	4	LP
VHQ9X4	17.4	-0.61	1.94	18.1	-0.23	0.62	4	LA
YHH6WN	20.1	1.39	2.02	20.8	1.71	0.72	4	LP
YK8CGK	19.1	0.63	1.37	18.2	-0.15	0.59	4	LA
Z8F8NE	18.6	0.27	1.72	18.6	0.11	0.02	2	TL

**Consensus (All Labs) Results**

Month Mean	18.21	Grand Mean	18.44
Avg SD	1.94	Avg SD Months	1.14
SD btwn Labs	1.36	SD btwn Labs	1.35
Labs Incl	25	Labs Incl	25



Containerboard Interlaboratory Testing Program  
Analysis 237

Report #574 (H)  
July 2017

**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 #574 (H)  
July 2017

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM91

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	
2KWL4J	57.4	56.9	55.9	56.4	56.7	-1.40	2.1	0.7	58.3	-0.80	3.2	2.1	16	EN
4CHA9X	60.2	No DATA	60.3	59.5	60.0	-0.10	3.4	0.4	59.8	-0.21	2.9	1.0	15	LD
4G7YLF	61.4	64.3	63.6	68.1 X	64.4	1.60	3.6	2.8	64.4	1.54	3.1	2.6	16	LD
6EJXZR	57.9	59.1	59.1	57.7	58.4	-0.71	3.1	0.7	58.8	-0.61	3.2	1.2	16	LD
7RKX6G	63.6	60.8	62.4	60.8	61.9	0.64	2.4	1.4	60.7	0.12	2.8	2.0	16	LC
87U7JP	61.2	61.2	62.3	60.7	61.4	0.43	3.5	0.7	61.0	0.24	3.1	1.6	16	LC
8CKFTN	60.5	59.1	60.1	60.3	60.0	-0.09	3.5	0.6	66.3	2.29 * 3.4	11.8 H	16	MB	
8EQ2GN	63.9	63.1	61.7	66.3 *	63.8	1.37	3.7	1.9	63.1	1.05	4.6	1.8	16	TU
8PAA6G	66.2	64.7	63.6	62.8	64.3	1.59	2.5	1.5	65.2	1.85	2.8	1.5	16	TM
93C72N	56.2	54.2 *	60.0	58.0	57.1	-1.23	3.3	2.5	57.5	-1.11	3.1	2.1	12	MB
93PV3F	62.4	59.3	58.2	58.2	59.5	-0.29	4.8	2.0	59.6	-0.31	5.1	1.7	16	TG
9KU67L	63.7 H	59.4	59.2	62.1	61.1	0.33	4.7	2.2	61.6	0.46	4.7	2.9	16	LC
9L48U7	61.4	61.9	61.8 L	62.2 L	61.8	0.61	1.4	0.3	61.3	0.34	1.9	0.7	16	LD
9NUBMD	58.4	58.1	59.8 L	59.4	58.9	-0.52	1.7	0.8	59.5	-0.33	3.0	1.2	16	EM
9YT7L9	56.0	56.8	57.3	56.4	56.6	-1.41	3.9	0.6	58.6	-0.69	3.9	2.1	16	XX
B68T9A	61.0	60.5	59.9	59.6	60.3	0.00	2.4	0.6	59.9	-0.18	2.5	0.6 L	16	LC
BRKNZD	60.1	60.8	60.5	58.2	59.9	-0.13	3.0	1.2	59.3	-0.42	2.9	1.0	16	TH
CU7NVM	50.8 XH	55.5	53.5 *H	55.9 H	53.9	-2.46 *	8.3	2.3	54.2	-2.37 * 6.4	2.6	12	XX	
DLVJPN	58.7	60.8	60.1	60.2	60.0	-0.11	2.3	0.9	64.7	1.67	3.0	5.2	16	MB
DVXYBM	63.2	60.7	59.1	62.0	61.2	0.39	3.4	1.7	59.9	-0.19	2.7	1.8	16	LD
E8PU48	55.9	52.6 *	55.4	53.2 X	54.3	-2.33 *	3.3	1.6	54.9	-2.09 * 2.9	1.2	16	LD	
EAVFR8	60.9	60.0	61.8	61.2	61.0	0.28	3.5	0.8	59.7	-0.25	3.4	1.4	16	LD
EFYJG7	60.9	61.6	62.0 H	62.5	61.7	0.58	4.1	0.7	63.0	1.00	3.7	1.3	16	LC
EH7W8K	55.0	60.7	58.7	55.7 *	57.5	-1.07	2.7	2.7	56.8	-1.36	3.4	2.4	16	LC
ET3M6L	65.4	65.5 *H	66.3 *	62.7	65.0	1.84	4.1	1.6	62.2	0.72	3.9	3.4	16	XX
EUH44K	58.7	59.2	57.1	60.2	58.8	-0.56	2.7	1.3	58.5	-0.71	3.2	1.3	16	LZ
F8H6CF	59.8	60.1	60.0	60.1	60.0	-0.10	2.7	0.1 L	59.7	-0.24	3.0	0.3 L	16	LD
FL4KFE	61.6	60.5	60.1	59.8	60.5	0.09	3.7	0.8	60.0	-0.13	3.1	1.2	16	LZ
GYNJL8	56.4	55.7	61.5	57.8	57.8	-0.94	3.3	2.6	57.7	-1.01	3.1	1.9	14	LD
H6AUDG	65.0	63.3	62.4	61.3	63.0	1.06	2.7	1.5	61.6	0.48	2.2	2.5	16	LC
LG8ZYC	63.1	60.9	61.5	62.8	62.1	0.71	3.7	1.0	60.9	0.22	3.0	2.4	16	LC
M8JBUB	61.3	60.5	No DATA	No DATA	60.9	0.25	2.0	0.6	60.3	-0.03	2.2	1.6	14	LC
MZXFVT	59.9	60.6	61.1	63.7	61.3	0.42	3.4	1.6	60.5	0.05	3.3	1.2	16	LD
QCMDC9	62.9	57.0	58.0	61.9	59.9	-0.12	2.8	2.9	61.7	0.50	2.8	2.0	16	MB
RBHDMT	60.7	60.0	59.7	61.2	60.4	0.06	2.7	0.7	60.1	-0.09	2.6	0.6 L	16	LD



Containerboard Interlaboratory Testing Program  
Analysis 240

Report #574 (H)  
July 2017

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM91  
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	
RUWR89	57.3	57.7	57.3	59.1	57.8	-0.93	2.5	0.8	58.3	-0.80	2.9	0.9	16	TJ
T3NRWK	48.3 X	49.0 X	47.2 X	49.9 X	48.6	-4.53 X	3.3	1.1	50.1	-3.94 X	3.1	3.7	16	TC
TQUDWN	55.5	61.7	56.9	58.3	58.1	-0.83	2.9	2.7	58.7	-0.63	3.5	3.6	16	LC
UFPMTR	62.3	63.9	64.1	62.9	63.3	1.18	2.6	0.8	62.7	0.89	3.1	1.2	16	LD
UUNRVX	59.2	59.2	58.5	58.9	58.9	-0.51	2.0	0.3	58.2	-0.83	2.3	1.6	16	XX
V8UXT3	65.6	64.0	62.6	62.6	63.7	1.34	2.7	1.4	62.6	0.87	2.6	2.0	16	LZ
VHQ9X4	60.6	60.1	61.3	60.6	60.6	0.15	2.2	0.5	61.0	0.24	2.4	1.0	16	LD
WKD3E6	61.0	59.5	60.0	59.7	60.0	-0.08	2.3	0.7	60.1	-0.12	2.3	0.9	16	LD
WMZN3L	67.3 *	64.2	67.7 *	64.2	65.9	2.19 *	4.0	1.9	66.7	2.42 *	4.4	3.3	16	LC
X4H4JM	55.6	56.6	60.6	59.7	58.1	-0.83	3.3	2.4	57.8	-0.96	2.7	1.8	16	LC
Y37T4V	64.1 L	61.0	64.9 L	61.5 L	62.9	1.02	1.2	1.9	63.6	1.23	1.8	1.7	16	TD
YHH6WN	60.7	61.9	61.7	59.3	60.9	0.24	4.2	1.2	59.9	-0.17	3.8	1.7	12	LD
ZM7A4H	59.1	57.2	57.4	56.9	57.6	-1.01	2.7	1.0	58.4	-0.75	2.9	1.3	16	LD
ZNG8HZ	57.6	56.9	61.0	58.9	58.6	-0.63	2.7	1.8	58.3	-0.79	3.0	2.0	15	LZ

Consensus (All Labs) Results									
Wk Mean	60.57	59.98	60.38	60.22	Month Mean	60.25	Grand Mean	60.36	
Avg SDr	3.05	3.02	3.31	3.35	Avg SD	3.30	Avg SD	3.27	
SD btwn Labs	3.06	2.79	2.73	2.33	SD btwn Labs	2.57	SD btwn Labs	2.60	
Labs Incl	47	47	47	45	SD btwn Wks	1.53	SD btwn Wks	2.59	
Labs Excl	2	1	1	3	Labs Incl	48	Labs Incl	48	
Labs not Rcvd	0	1	1	1					

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	EN	Emerson 2200 Series
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
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	TM	TMI/Hinde & Dauch
TU	TMI Universal Crush Tester (TMI K440)	XX	Instrument make/model not specified by lab





Containerboard Interlaboratory Testing Program  
Analysis 250

Report #574 (H)  
July 2017

Fluted Edge Crush Strength (FCF), 26 lb Corrugating Medium - CM91  
TAPPI Official Test Method T824

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	
7RKX6G	71.7	74.1	76.3	77.4	74.9	0.38	2.4	2.5 H	74.9	0.38	2.3	2.0	16	XX
87U7JP	78.1	78.3 *	76.2	79.0	77.9	1.61	2.5	1.2	77.2	1.41	2.2	1.2	16	LC
8CKFTN	72.9	73.1	73.0	73.5	73.1	-0.34	2.8	0.3	73.8	-0.08	2.9	1.0	16	MB
9L48U7	72.5	72.1	71.7	72.2	72.1	-0.73	1.6	0.3	72.3	-0.71	1.9	0.4 L	16	LD
E8PU48	75.1	73.3	76.2	74.3	74.7	0.32	2.3	1.2	75.2	0.53	2.3	0.9	16	LD
MZXFVT	72.6	73.5	73.5	71.6	72.8	-0.46	1.9	0.9	73.9	-0.03	2.3	1.1	16	XX
TQUDWN	73.2	75.5 H	75.7 H	75.7 H	75.0	0.44	4.2	1.2	73.4	-0.24	4.8	4.4 H	16	XX
UFPMTR	77.3	74.8	78.2	75.3	76.4	0.99	2.9	1.6	76.4	1.04	2.7	1.2	16	LD
V8UXT3	70.5	72.3	71.9	70.9	71.4	-1.02	2.4	0.8	73.3	-0.28	2.2	2.6	16	LZ
VHQ9X4	71.1	71.2	70.6	70.7	70.9	-1.23	2.5	0.3	71.0	-1.26	2.4	0.9	16	LD
WKD3E6	70.0	70.0	69.9	70.6	70.1	-1.55	1.7	0.3	70.2	-1.62	1.8	0.7	16	LD
Y37T4V	72.3	73.5	72.2	72.5	72.6	-0.53	1.3	0.6	72.2	-0.75	1.6	1.0	16	TD
YHH6WN	78.7	78.0	77.8	77.3	78.0	1.63	1.9	0.6	78.6	1.99 *	2.4	1.4	12	LD
ZNG8HZ	74.5	75.2	75.4	75.6	75.2	0.50	2.7	0.5	73.1	-0.38	3.9	4.2 H	15	LZ

Consensus (All Labs) Results									
Wk Mean	73.60	73.92	74.18	74.03	Month Mean	73.93	Grand Mean	73.97	
Avg SDr	2.35	2.47	2.66	2.34	Avg SD	2.46	Avg SD	2.68	
SD btwn Labs	2.78	2.34	2.68	2.75	SD btwn Labs	2.47	SD btwn Labs	2.32	
Labs Incl	14	14	14	14	SD btwn Wks	1.08	SD btwn Wks	2.03	
Labs Excl	0	0	0	0	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 - CM91**  
 TAPPI Official Test Method T822

**Report #574 (H)**  
**July 2017**

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
4CHA9X	46.0 H	45.4	46.7	46.6	46.2	0.78	2.8	0.6	45.2	0.60	2.7	1.7	16	LZ
676YKV	35.2 *	35.4	31.4 *	36.5	34.6	-2.54 *	2.7	2.2	36.5	-1.42	2.5	1.8	16	LZ
6D6FXM	43.8	44.0	43.1	45.3	44.0	0.16	2.6	0.9	45.0	0.55	2.7	1.6	16	LZ
87U7JP	45.8	46.5	45.9	45.7	46.0	0.72	3.1	0.4	44.9	0.53	3.1	1.2	16	LC
8CKFTN	42.5	42.7	43.1	42.9	42.8	-0.19	2.9	0.3	42.4	-0.05	2.7	0.6	16	MB
8EQ2GN	39.8	39.5	38.4	37.9	38.9	-1.30	2.4	0.9	38.4	-0.97	2.2	1.2	16	TU
8PAA6G	47.7	50.1	47.6	46.5	48.0	1.29	2.0	1.5	48.6	1.41	2.6	1.9	16	LD
9KU67L	45.7	45.4	42.8	45.9	44.9	0.42	2.6	1.5	45.2	0.60	2.8	1.9	16	LD
9NUBMD	44.5	44.9	44.9	44.3	44.6	0.33	1.7	0.3	43.9	0.31	2.4	0.8	16	LC
CU7NVM	46.3	46.8	48.4	46.9	47.1	1.04	2.3	0.9	45.7	0.72	3.2	3.4	12	XX
DVXYBM	44.7	44.8	44.5	45.6	44.9	0.41	2.0	0.5	44.1	0.35	2.1	1.9	16	LD
E8PU48	45.9	44.4	46.2	45.8	45.6	0.61	2.5	0.8	45.1	0.58	2.8	1.7	16	LD
EFYJG7	49.9	51.2	47.3	48.8	49.3	1.67	1.7	1.6	49.2	1.53	1.9	1.2	16	LD
EUH44K	46.4	45.0	46.2	47.0	46.2	0.77	2.7	0.8	43.9	0.30	2.5	2.1	16	EM
F8H6CF	38.3	38.4	38.5	38.4	38.4	-1.45	3.0	0.1 L	42.2	-0.09	4.2	2.8	16	LD
GYNJL8	43.4	43.0	41.9	43.0	42.8	-0.19	2.6	0.6	43.9	0.31	2.6	1.7	15	LD
H6AUDG	41.6	41.5	41.3	41.0 L	41.4	-0.61	1.8	0.3	43.2	0.13	2.0	1.9	16	LD
M8JBUB	45.0	44.6	No DATA	No DATA	44.8	0.38	2.1	0.2	42.3	-0.07	2.4	2.6	14	LC
MZXFVT	41.5	43.3	42.3 H	42.2	42.3	-0.33	3.5	0.7	42.2	-0.10	3.1	0.9	16	LD
RUWR89	38.5	36.2	36.7	35.5	36.7	-1.93 *	2.5	1.3	36.7	-1.38	2.0	1.6	16	TJ
T3NRWK	30.3 XH	30.5 *H	30.3 *L	29.3 XH	30.1	-3.83 X	4.5	0.5	31.6	-2.56 *	4.2	3.5	16	TC
UFPMTR	46.6	38.8	44.8	45.0	43.8	0.10	2.0	3.4 H	45.7	0.71	1.8	2.0	16	LD
UGZMM2	42.5	41.5	43.0	40.9 L	42.0	-0.42	1.5	0.9	42.7	0.01	1.3	1.0	16	WK
VHQ9X4	44.0	44.7	44.3	43.1	44.0	0.16	2.5	0.7	44.1	0.34	2.5	0.6	16	LD
WMZN3L	32.8 X	32.0 *	31.6 *	32.6 *	32.2	-3.21 X	2.8	0.6	32.1	-2.45 *	2.8	0.7	16	XX
X6BZ7V	44.0	44.1	44.1	43.7	43.9	0.14	1.8	0.2	43.0	0.10	2.1	1.0	16	TH

Consensus (All Labs) Results														
Wk Mean	43.73	42.48	42.21	42.96	Month Mean	43.47			Grand Mean	42.60				
Avg SDr	2.34	2.68	2.37	2.54	Avg SD	2.44			Avg SD	2.66				
SD btwn Labs	3.32	4.93	5.08	4.15	SD btwn Labs	3.49			SD btwn Labs	4.28				
Labs Inclcd	24	26	25	24	SD btwn Wks	1.17			SD btwn Wks	1.83				
Labs Exclcd	2	0	0	1	Labs Inclcd	24			Labs Inclcd	26				
Labs not Rcvd	0	0	1	1										

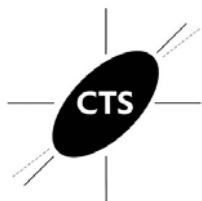


Containerboard Interlaboratory Testing Program  
Analysis 255  
**Ring Crush (RCT), 26 lb Corrugating Medium - CM91**  
TAPPI Official Test Method T822

**Report #574 (H)**  
**July 2017**

**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>TJ</b>	TLS Compression Tester, Model CDM-5
<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 #574 (H)

July 2017

STFI, 26 lb Corrugating Medium - CM91

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	
6D6FXM	14.5	13.7	13.9	14.5	14.1	-0.68	1.0	0.4	14.4	-0.25	1.1	0.4	16	LA
87U7JP	14.5	14.7	14.2	14.4	14.4	-0.21	0.9	0.2	14.3	-0.34	0.9	0.3	16	LU
8PAA6G	14.4	15.9 H	15.6	16.6 XH	15.6	1.63	1.2	0.9 H	15.0	1.11	1.1	0.8	16	LA
93C72N	13.3 L	13.9 L	13.9 L	14.4 L	13.9	-1.10	0.0	0.4	16.6	4.83 X	0.1	9.8 H	12	LA
9BANLR	14.5 L	14.8 L	15.4 L	14.6 L	14.8	0.41	0.0	0.4	14.8	0.68	0.7	0.3	12	LZ
9L48U7	14.1	14.5	14.2	14.4	14.3	-0.38	0.8	0.2	14.4	-0.21	0.6	0.3	16	LA
9NUBMD	14.5	14.2	13.8	13.9	14.1	-0.75	1.0	0.3	14.1	-0.96	1.1	0.7	16	LB
B68T9A	14.7	15.0	14.2	14.5	14.6	0.06	0.8	0.3	14.4	-0.24	0.8	0.3	16	LB
BRKNZD	14.5	14.6 L	14.4	14.1	14.4	-0.30	0.6	0.2	14.4	-0.24	0.7	0.2	16	TT
CU7NVM	14.2	14.0	14.4	14.3 L	14.2	-0.56	0.9	0.2	14.1	-0.83	1.0	0.4	12	XX
DDDA9	14.9	14.4	14.2 H	14.8 L	14.6	0.01	0.9	0.3	14.8	0.82	1.0	0.4	16	LA
DLVJPN	15.9 L	16.1 *L	14.8 L	15.8 *L	15.7	1.73	0.2	0.6	14.7	0.42	0.1	0.8	16	BK
E8PU48	15.1	15.3	14.9	15.0	15.1	0.79	1.0	0.2	14.8	0.85	0.9	0.3	16	LA
EFYJG7	15.9	15.4 H	15.5	15.7 *H	15.6	1.64	1.3	0.2	15.2	1.73	1.0	0.5	16	LA
ET3M6L	12.7 *H	13.4	12.9 *	13.4 *	13.1	-2.35 *	1.0	0.3	13.4	-2.52 *	1.0	0.7	16	XX
EUH44K	15.1 H	15.0	14.6 H	15.1	15.0	0.60	1.3	0.2	14.6	0.38	1.2	0.7	16	LZ
FL4KFE	14.3	14.9	14.5	14.2	14.5	-0.17	1.0	0.3	14.3	-0.46	1.0	0.3	16	LB
GYNJL8	14.4	13.7	14.7	14.4	14.3	-0.47	0.8	0.4	14.8	0.74	1.0	0.5	15	LZ
H6AUDG	15.0	15.4	15.3	15.2	15.2	1.03	0.8	0.2	15.2	1.68	0.8	0.2	16	LZ
M8JBUB	13.7	No DATA	No DATA	No DATA	13.7	-1.31	0.6	0.0	13.7	-1.76	0.7	0.2	13	XX
RBHDMT	14.7	14.2	15.1	14.5	14.6	0.10	0.8	0.4	14.3	-0.32	0.8	0.3	16	LB
T3NRWK	14.1	14.3	14.4	14.3 H	14.3	-0.47	1.0	0.1	14.2	-0.68	1.1	0.2	16	TS
UFPMTTR	14.5	14.2	14.2	13.7	14.1	-0.70	0.9	0.3	14.4	-0.07	0.9	0.3	16	LZ
UJPUC4	16.3 *L	15.2 L	15.9 *L	15.1 L	15.6	1.66	0.0	0.6	21.0	14.89 X	0.9	5.8 H	8	LH
VHQ9X4	14.6	14.2	14.1	14.3	14.3	-0.41	0.9	0.2	14.4	-0.19	1.0	0.2	16	LB
X4H4JM	15.1	14.9	15.5	15.2	15.2	0.95	0.9	0.3	15.0	1.27	1.0	0.2	16	LW
ZM7A4H	14.3	14.0	13.8 H	14.2	14.1	-0.77	1.1	0.2	14.2	-0.63	1.1	0.4	16	LU

Consensus (All Labs) Results														
Wk Mean	14.58	14.61	14.55	14.55	Month Mean	14.57			Grand Mean	14.48				
Avg SDr	0.85	0.89	0.93	0.85	Avg SD	0.88			Avg SD	0.92				
SD btwn Labs	0.74	0.68	0.69	0.57	SD btwn Labs	0.63			SD btwn Labs	0.44				
Labs Incl	27	26	26	25	SD btwn Wks	0.36			SD btwn Wks	0.44				
Labs Excl	0	0	0	1	Labs Incl	27			Labs Incl	25				
Labs not Rcvd	0	1	1	1										



Containerboard Interlaboratory Testing Program  
Analysis 261  
**STFI, 26 lb Corrugating Medium - CM91**  
TAPPI Official Test Method T826

**Report #574 (H)**  
**July 2017**

**Key to Instrument Codes Reported by Participants**

<b>BK</b>	Buchel Strip Compression Tester BK-155	<b>LA</b>	L&W Autoline
<b>LB</b>	L&W Model 152	<b>LH</b>	L&W 282
<b>LU</b>	L&W 52 without moisture correction (was 53)	<b>LW</b>	L&W 53 with moisture correction (was 53M)
<b>LZ</b>	L&W (model not specified)	<b>TS</b>	TMI Monitor/STFI Compression Tester, 17-33
<b>TT</b>	TMI Short Span Compression, 17-34 (MB K455)	<b>XX</b>	Instrument make/model not specified by lab