



## Containerboard Interlaboratory Testing Program

Participant Summary Report #607 (D) - April 2020

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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	CM11	April 2019-Current
	CM92	January 2019-March 2019
35 lb Linerboard	35E1	February 2019-Current
42 lb Linerboard	42F2	February 2020-Current
	42F1	January 2019-January 2020
56 lb Linerboard	56G1	January 2020-Current
	56A2	January 2019-November 2019

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

### Consensus Data

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

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

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

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

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

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

Flags assigned to Weekly Means:

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

Flags assigned to Monthly SD Wks and Cumulative SD Wks:

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



Containerboard Interlaboratory Testing Program  
Analysis 201

Report #607 (D)  
April 2020

Top to Bottom Box Compression Strength, Corrugated Boxes - BX14

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2DKQJ8	697.4	1.63	31.82	697.5	2.19 *	9.97	4	EX
2Q8Z7D	653.6	0.85	38.04	582.1	-0.31	61.74	4	LS
479LL6	583.3	-0.39	27.13	604.1	0.17	44.20	4	LG
4YT336	633.4	0.50	22.92	633.4	0.80	0.00	1	TC
4ZK2F4	687.2	1.45	73.59	603.5	0.15	58.58	4	TB
6ZGY46	586.8	-0.32	42.06	591.5	-0.11	19.50	4	LL
7JQBAZ	708.4	1.82	51.10	669.3	1.58	60.90	4	LS
7ZG9GM	632.4	0.48	22.96	620.3	0.52	23.88	4	LO
948ARZ	557.0	-0.85	25.47	557.0	-0.85	0.00	1	ET
9WLBY7	602.8	-0.04	27.09	622.5	0.56	16.19	4	ER
CBD67G	584.5	-0.36	7.56 L	574.9	-0.47	20.49	4	LM
CCU78X	627.8	0.40	66.19	614.2	0.39	19.31	4	ET
CJPABU	627.7	0.40	74.10	587.0	-0.20	56.67	4	LL
ERC7QT	668.0	1.11	33.53	667.7	1.54	17.15	4	LG
F2WWPQ	626.7	0.38	70.64	611.0	0.32	14.18	3	TE
FABEQC	541.9	-1.12	34.63	571.5	-0.54	48.66	4	ER
GUDQQX	556.7	-0.85	37.25	575.9	-0.44	27.36	4	ER
K4MKF8	630.8	0.45	90.57 H	598.1	0.04	32.04	4	ES
KMJVHP	563.8	-0.73	31.03	563.7	-0.71	7.10	4	LS
QHAMGL	480.2	-2.20 *	8.35 L	477.0	-2.58 *	8.63	4	LL
UMT8WX	553.9	-0.90	34.16	561.5	-0.76	5.10 L	4	ER
Y3QV98	544.5	-1.07	32.51	539.7	-1.23	18.74	3	LS
YM93HF	569.4	-0.63	37.88	593.6	-0.06	19.34	4	EX

Consensus (All Labs) Results

Month Mean	605.14	Grand Mean	596.39
Avg SD	45.18	Avg SD Months	33.62
SD btwn Labs	56.70	SD btwn Labs	46.24
Labs Incd	23	Labs Incd	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	628.08	49.83	22.95	7
Water based adhesive sealing	697.40	0.00	92.26	1
Clip sealing	588.28	53.02	16.86	15



Containerboard Interlaboratory Testing Program  
Analysis 201

Report #607 (D)  
April 2020

**Top to Bottom Box Compression Strength, Corrugated Boxes - BX14**

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	LL	Lansmont 76-5K
LM	Lansmont 122-15k	LO	Lansmont 152-30k
LS	Lansmont Squeezer	TB	TMI Monitor/Compression Tester, Model 17-70
TC	TMI Monitor/Compression Tester, Model 17-37	TE	Testometric M500 - 25 KN



**Containerboard Interlaboratory Testing Program**  
 Analysis 202  
**Edgewise Compressive Strength, by T811, Corrugated Board - EC12**  
 TAPPI Official Test Method T811

**Report #607 (D)**  
**April 2020**

WebCode	Monthly Results				Cumulative Results				
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2Q8Z7D	38.6	0.62	1.87		39.4	0.77	0.75	4	LC
3MHBY6	30.1	-0.68	0.88	L	31.7	-0.61	1.41	4	TF
46GPWB	45.4	1.66	1.58		45.3	1.82 *	2.45	4	XX
6E42TN	31.3	-0.51	4.17	H	33.3	-0.31	1.59	4	LD
FABEQC	34.4	-0.02	2.11		35.2	0.02	0.59	4	EN
FDAWKX	28.3	-0.96	0.77	L	29.5	-0.99	1.41	3	TX
KMJVHP	34.5	0.00	2.30		34.3	-0.14	0.68	4	LD
M32V2K	42.4	1.20	3.77		39.8	0.83	2.45	4	LC
Y3QV98	26.0	-1.32	2.94		27.2	-1.39	4.99	H 3	EM

Consensus (All Labs) Results				
Month Mean		34.55	Grand Mean	35.09
Avg SD		2.52	Avg SD Months	2.23
SD btwn Labs		6.50	SD btwn Labs	5.64
Labs Incd		9	Labs Incd	9

**Key to Instrument Codes Reported by Participants**

- |   |   |
|---|---|
| <b>EM</b> Emerson 1200 Series<br><b>LC</b> L&W Crush Tester 48<br><b>TF</b> TMI Digital Crush Tester, Model 17-19<br><b>XX</b> Instrument make/model not specified by lab | <b>EN</b> Emerson 2200<br><b>LD</b> L&W Crush Tester 248<br><b>TX</b> TMI (model not specified) |
|---|---|



**Containerboard Interlaboratory Testing Program**  
 Analysis 203  
**Edgewise Compressive Strength by T839, Corrugated Board - EC12**  
 TAPPI Official Test Method T839

**Report #607 (D)**  
**April 2020**

WebCode	Monthly Results				Cumulative Results				Inst
	Mean	CPV	SD		Mean	CPV	SD Months	Months	
2DKQJ8	38.7	-0.43	0.91		38.5	-0.45	0.27	3	TH
2Q8Z7D	41.8	0.90	1.35		41.3	0.70	0.53	4	LC
3MHBY6	36.1	-1.56	0.74	L	36.5	-1.26	0.43	4	TD
43RDX6	42.2	1.09	1.20		41.4	0.74	0.64	4	EM
46GPWB	44.1	1.88	1.62		45.4	2.42 *	2.93	H 4	XX
479LL6	39.2	-0.23	1.56		40.8	0.51	1.22	4	TJ
4ZK2F4	40.9	0.49	0.59	L	41.3	0.71	0.92	4	LD
6E42TN	38.1	-0.68	2.49		38.4	-0.47	1.21	4	LD
7JQBAZ	44.0	1.85	1.56		43.4	1.60	1.08	4	TB
7ZG9GM	39.4	-0.16	1.87		39.5	-0.01	0.16	L 4	LD
948ARZ	37.2	-1.10	1.93		37.2	-0.99	0.00	1	EM
9WLBY7	38.6	-0.47	1.07		38.6	-0.41	0.05	L 4	EM
C32VW3	43.3	1.53	2.05		42.5	1.22	0.63	4	LD
CBBKA2	37.0	-1.18	3.68	H	35.0	-1.91	1.66	4	XX
CBD67G	40.4	0.29	2.24		39.9	0.13	0.57	4	EM
CCU78X	42.3	1.11	0.96		43.0	1.42	1.90	4	TD
CJPABU	43.7	1.71	1.29		41.8	0.91	1.55	4	BU
ERC7QT	41.5	0.77	1.31		41.6	0.85	0.70	4	EM
F2WWPQ	40.1	0.14	1.12		40.1	0.21	0.07	L 3	LD
FABEQC	35.7	-1.75	2.89	H	36.3	-1.33	1.61	4	EN
FDAWKX	37.9	-0.79	1.84		36.7	-1.17	1.41	3	TX
GDQDEQ	41.2	0.65	1.32		41.0	0.61	0.63	3	EM
GUDQQX	40.2	0.19	2.13		37.5	-0.85	1.92	4	LD
K4MKF8	41.8	0.88	1.41		41.7	0.88	0.98	4	LD
KMJVHP	40.2	0.20	1.37		41.0	0.59	0.83	4	LD
LAQV4R	38.4	-0.56	0.92		38.2	-0.57	0.75	3	TK
M32V2K	40.0	0.10	2.08		40.7	0.47	0.97	4	LC
PDHYLP	36.3	-1.46	2.05		37.6	-0.83	0.89	4	XX
QHAMGL	36.3	-1.49	1.36		37.1	-1.02	1.12	4	LC
QKEFBK	39.8	0.04	1.49		36.3	-1.33	4.88	H 4	LC
TQQB6K	37.2	-1.07	1.91		38.2	-0.58	1.02	4	LD
TUQMZK	37.4	-1.00	2.27		36.2	-1.38	1.07	3	TD
UMT8WX	41.0	0.56	2.60		40.5	0.41	1.89	4	LD
VHAEDH	36.4	-1.45	1.42		37.3	-0.92	0.86	3	EM
VZU6CH	40.3	0.24	1.23		41.3	0.72	0.92	4	TG
Y3QV98	39.5	-0.09	0.94		38.8	-0.30	0.72	3	EM
YM93HF	40.9	0.50	1.21		38.4	-0.47	1.92	4	LD
ZKKQJA	40.5	0.35	2.14		42.4	1.16	1.34	4	TD





**Containerboard Interlaboratory Testing Program**  
 Analysis 203  
**Edgewise Compressive Strength by T839, Corrugated Board - EC12**  
 TAPPI Official Test Method T839

**Report #607 (D)**  
**April 2020**

Consensus (All Labs) Results			
Month Mean	39.72	Grand Mean	39.56
Avg SD	1.75	Avg SD Months	1.43
SD btwn Labs	2.32	SD btwn Labs	2.42
Labs Incl	38	Labs Incl	38

**Key to Instrument Codes Reported by Participants**

<b>BU</b> Buchel Digital Crush Tester <b>EN</b> Emerson 2200 <b>LD</b> L&W Crush Tester 248 <b>TD</b> TMI Digital Crush Tester, Model 17-09 <b>TH</b> TMI Monitor/Compression Tester, Model 17-76 <b>TK</b> TLS Compression Tester, Model 5184 <b>XX</b> Instrument make/model not specified by lab	<b>EM</b> Emerson 1200 Series <b>LC</b> L&W Crush Tester 48 <b>TB</b> TMI Monitor/Compression Tester, Model 17-70 <b>TG</b> TMI Digital Crush Tester, 17-76 <b>TJ</b> TLS Compression Tester, Model CDM-5 <b>TX</b> TMI (model not specified)
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**Containerboard Interlaboratory Testing Program**  
 Analysis 205  
**Bursting Strength (Mullen), 42 Ib Linerboard - 42F2**  
 TAPPI Official Test Method T807

**Report #607 (D)**  
**April 2020**

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	
2Q8Z7D	102.9	105.9	110.0	103.0	105.5	-1.34	9.6	3.3	106.8	-1.03	9.2	3.5	12	AH
2RF897	109.5	110.5	110.4	111.3	110.4	-0.02	7.0	0.7	110.1	-0.04	7.0	0.9	L 12	AH
2ZC8LD	106.9	107.1	112.1	115.8	110.5	-0.01	8.7	4.3	110.1	-0.05	9.6	2.8	12	LJ
34Q22B_AL	111.8	110.9	108.6	110.7	110.5	0.00	6.5	1.3	110.6	0.10	7.4	1.9	12	AL
3DXUCQ	107.3	106.6	110.1	112.0	109.0	-0.40	10.2	2.5	108.4	-0.54	9.1	3.5	12	LZ
3MHBY6	115.2	117.5	116.1	114.4	115.8	1.41	8.3	1.3	114.7	1.32	9.0	1.6	12	XX
46GPWB	114.5	113.2	L 115.2	117.1	115.0	1.19	4.4	1.6	114.5	1.24	5.5	1.2	12	LC
46XUDN	107.3	107.0	104.1	106.7	106.2	-1.13	6.3	1.5	106.2	-1.19	7.9	1.2	12	LC
4KQEAC	117.5	112.7	117.8	112.9	115.2	1.25	7.2	2.8	114.9	1.36	9.4	3.4	12	LA
4P8ULP	118.0	119.1	121.1	* 120.0 *	119.6	2.40	* 9.9	1.3	114.9	1.36	9.6	4.1	12	AH
6DQEBA_AL	111.7	109.9	113.0	H 110.1	111.2	0.18	10.9	1.5	113.2	0.86	13.3	4.4	12	AL
6E42TN	108.5	108.3	L 108.7	110.5	109.0	-0.40	6.6	1.0	107.6	-0.79	7.3	1.9	12	LA
7AK999	108.1	108.1	108.2	108.3	108.2	-0.62	6.7	0.1	L 108.9	-0.41	6.8	0.8	L 8	LJ
8KYPF7_AL	108.1	108.1	107.2	106.7	107.5	-0.79	8.7	0.7	106.8	-1.04	9.5	1.5	12	XX
8U23CZ	108.7	111.1	108.0	112.2	110.0	-0.13	7.5	2.0	110.5	0.06	6.9	1.8	12	TP
96ZZZZ	113.9	114.3	109.0	105.7	110.7	0.06	9.5	4.1	110.6	0.10	9.2	4.4	10	LC
96ZZZZ_AL	112.9	110.8	111.6	120.0	* 113.8	0.89	9.4	4.2	113.8	1.05	9.4	4.2	4	AL
988F77	104.3	103.2	105.1	102.1	* 103.7	-1.81	8.4	1.3	103.5	-2.01	* 7.7	1.8	12	LJ
9E68EY_AL	109.7	117.0	118.2	109.2	113.5	0.80	7.7	4.7	112.7	0.73	7.9	4.5	8	AK
ADDBQ7	108.6	108.9	108.1	108.0	108.4	-0.55	10.5	0.4	L 107.6	-0.78	11.1	2.5	12	LA
ADTRKY	101.9	* 98.7 *	100.4	* 106.8	102.0	-2.27	* 8.8	3.5	103.3	-2.06	* 10.2	4.8	12	LA
AFG4K4	110.7	111.1	L 110.7	109.7	110.6	0.01	4.4	0.6	109.9	-0.12	3.9	1.3	12	LA
AFJPFK	111.2	113.3	107.5	106.4	109.6	-0.24	10.0	3.2	109.8	-0.13	9.1	2.5	12	LA
C32VW3_AL	118.5	L 114.4	116.5	117.5	116.7	1.65	5.6	1.8	117.2	2.05	* 6.6	1.6	12	AL
CD3JNY	114.2	113.1	112.0	113.2	113.1	0.70	9.1	0.9	112.0	0.51	9.7	2.7	12	AX
CD3JNY_AL	93.3	X 92.7	XL 89.8	XL 92.0	XL 92.0	-4.92	X 3.6	1.5	87.3	-6.79	X 7.8	8.8	H 12	AL
CLYADG_AL	107.8	113.7	110.8	112.6	111.2	0.20	9.5	2.6	112.5	0.66	9.0	3.7	12	AL
DQ8YAV	102.6	99.1	* 105.5	106.2	103.4	-1.90	8.4	3.2	103.6	-1.96	* 7.6	3.3	12	AH
EHTP4D	117.2	103.9	H 111.6	114.2	111.7	0.32	18.4	5.7	112.3	0.60	13.2	4.0	12	TB
GUDQQX	109.5	113.3	110.2	109.6	110.7	0.04	7.5	1.8	107.4	-0.86	12.5	4.2	12	LZ
J2K8DN_AL	No DATA	112.2	112.1	113.7	112.6	0.57	10.7	0.9	114.5	1.24	9.9	3.6	6	XX
J69JCU	110.4	110.6	108.8	113.2	110.8	0.07	7.8	1.8	110.8	0.14	7.8	1.8	4	AH
K4MKF8	113.8	101.3	107.4	110.6	108.3	-0.59	7.2	5.3	106.9	-0.99	8.6	3.1	12	LA
KMJVHP	104.8	100.9	105.8	103.5	103.7	-1.79	8.8	2.1	104.4	-1.73	9.0	2.1	12	LA
LATGZ8	112.2	104.5	101.0	* 115.6	108.3	-0.58	8.7	6.8	H 108.2	-0.60	10.7	14.2	H 12	LB



**Containerboard Interlaboratory Testing Program**  
 Analysis 205  
**Bursting Strength (Mullen), 42 lb Linerboard - 42F2**  
 TAPPI Official Test Method T807

**Report #607 (D)**  
**April 2020**

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	
N9QPJ4	110.3	115.9	110.3	113.4	112.5	0.52	8.7	2.7	112.0	0.53	8.5	2.5	12	LA
N9QPJ4_AL	119.3 *	111.0	113.5	113.3	114.3	1.00	6.7	3.5	113.0	0.81	6.9	2.5	12	AL
NDKJG6_AL	102.8	113.8	102.4	103.2	105.5	-1.32	7.6	5.5	107.4	-0.85	7.5	4.3	8	AL
NH2R64	111.7 H	117.1	112.7	116.9	114.6	1.09	10.8	2.8	113.3	0.90	10.3	3.7	12	LA
P4BJEG	116.2	116.0 L	115.4	115.8	115.9	1.42	4.3	0.3 L	115.1	1.42	4.9	0.8 L	12	RE
QKEFBK_AL	111.8 H	113.5	111.1	115.1	112.9	0.63	10.8	1.8	114.2	1.17	9.9	2.4	12	AL
TZGWAH_AL	106.5	114.7	111.8	112.2	111.3	0.21	7.0	3.4	110.0	-0.09	8.6	3.6	12	AL
UMT8WX	109.9	103.6	109.9	115.9	109.8	-0.18	10.1	5.0	110.9	0.18	9.1	4.1	12	AH
V7JHJX	106.2	102.6	103.2	102.8	103.7	-1.80	8.7	1.7	105.2	-1.49	8.4	3.0	12	LC
W22MAD	114.4	114.2	113.2	114.5	114.1	0.95	7.5	0.6	113.7	1.02	6.8	0.7 L	12	LA
X629JV_AL	111.5	108.5	112.0	110.4	110.6	0.03	5.4	1.6	110.7	0.12	6.7	2.9	12	AL
YM93HF	113.2	113.2	119.6 *	112.4	114.6	1.09	7.9	3.4	111.6	0.40	8.7	3.9	12	AH
YQ9DEF	110.0 L	109.4 L	109.4	109.1 L	109.5	-0.27	3.8	0.4 L	109.9	-0.12	4.6	0.9 L	12	LA
YU8PAF_AL	No DATA	113.5	106.3	106.3	108.7	-0.48	10.0	4.2	108.7	-0.47	10.0	4.2	3	XX
YW29JU	110.1	111.4	109.9	107.7	109.8	-0.19	10.1	1.6	106.9	-0.98	10.1	3.9	12	LC
YZYYJD	108.2	107.7 L	107.3	109.0	108.1	-0.65	8.3	0.7	108.9	-0.41	8.7	1.4	12	LA
ZEXZWE	115.6	113.4	113.6	111.3	113.5	0.80	9.3	1.8	112.9	0.77	8.8	1.5	12	LC

Consensus (All Labs) Results									
Wk Mean	110.57	110.19	110.28	110.95	Month Mean	110.50	Grand Mean	110.27	
Avg SDr	8.03	9.33	8.53	8.56	Avg SD	8.65	Avg SD	8.81	
SD btwn Labs	4.32	4.90	4.45	4.43	SD btwn Labs	3.77	SD btwn Labs	3.38	
Labs Incl	49	51	51	51	SD btwn Wks	2.88	SD btwn Wks	3.57	
Labs Excl	1	1	1	1	Labs Incl	51	Labs Incl	51	
Labs not Rcvd	2	0	0	0					

**Key to Instrument Codes Reported by Participants**

AH	Perkins Model AH	AK	L & W Autoline 300
AL	L & W Autoline 400	AX	Perkins Mullen Tester (model not specified)
LA	L&W Bursting Strength Tester	LB	L&W Burst-O-Matic
LC	L&W Autoline (205 Enrollment)	LJ	L&W Bursting Strength Tester J-Type
LZ	L&W (model not specified)	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 207  
**Bursting Strength (Mullen), 35 lb Linerboard - 35E1**  
 TAPPI Official Test Method T807

**Report #607 (D)**  
**April 2020**

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	
2Q8Z7D	80.0 X	84.9 *	85.4	84.9 *	83.8	-3.22 X	8.6	2.5	87.4	-1.92	8.4	3.4	12	AH
2RF897	92.3	90.9	90.8	92.2	91.6	-0.36	6.4	0.8	91.1	-0.46	5.8	0.9 L	12	AH
2ZC8LD	91.6	97.3	99.8 *	95.5	96.0	1.30	9.0	3.5	95.1	1.08	8.6	2.4	12	LJ
34Q22B_AL	92.0 L	92.0	94.0	94.0	93.0	0.17	4.6	1.1	93.3	0.40	5.0	1.5	8	XX
3DXUCQ	97.7	90.9	90.2	84.8 *	90.9	-0.60	8.6	5.3 H	93.8	0.56	9.0	5.7	12	LZ
3MHB6	99.7 *	88.8	94.1	94.5	94.3	0.65	10.0	4.5	94.0	0.64	9.9	2.7	12	XX
46XUDN	90.8	91.3	88.0	95.2	91.3	-0.43	9.0	2.9	90.6	-0.67	9.2	2.7	12	LC
4KQEAC	95.2	96.3	96.5	97.5	96.4	1.42	7.8	1.0	96.8	1.72	8.6	2.6	12	LA
4P8ULP	95.6	100.3	96.9 H	96.6 H	97.4	1.78	11.3	2.0	95.1	1.09	10.2	3.2	12	AH
6DQEBA_AL	93.3	96.8	95.6	93.3	94.8	0.82	7.6	1.7	94.0	0.64	8.3	3.1	8	XX
6E42TN	87.3	88.6	84.7 *	90.7	87.8	-1.73	7.0	2.5	88.4	-1.50	6.4	2.5	12	LA
7AK999	90.2	90.1	90.1	90.1	90.1	-0.88	7.0	0.0 L	90.4	-0.73	6.6	0.3 L	12	LJ
8KYPF7_AL	87.3	87.4	89.8	87.0	87.9	-1.71	8.3	1.3	89.4	-1.12	8.8	2.9	8	XX
8U23CZ	90.7	90.7	89.9	88.3	89.9	-0.97	6.4	1.1	90.5	-0.70	5.6	1.0	12	TP
96ZZZZ	89.9	92.1	93.1	93.2	92.1	-0.16	9.1	1.5	92.4	0.02	8.4	2.9	12	LC
96ZZZZ_AL	96.7	95.1	89.5	91.7	93.3	0.27	9.2	3.3	93.3	0.36	9.2	3.3	4	AL
988F77	89.6	87.3	87.0	84.5 *	87.1	-2.00 *	8.6	2.1	87.5	-1.86	8.3	1.9	8	LJ
9E68EY_AL	97.0	98.4	93.3	94.7	95.9	1.23	9.6	2.3	95.9	1.37	9.6	2.3	4	AK
ADDBQ7	90.1	86.7	86.0	86.2	87.3	-1.94 *	8.4	1.9	88.6	-1.43	8.2	3.1	8	LA
ADTRKY	83.8 *	88.5	92.9 H	83.9 *	87.3	-1.93 *	10.1	4.4	87.4	-1.90	8.1	3.0	12	LA
AFG4K4	92.2	93.5	93.0	93.4	93.0	0.19	4.3	0.6	92.8	0.16	3.5	1.8	12	LA
AFJPFK	93.2	95.6	87.6	93.0	92.4	-0.06	6.6	3.4	93.1	0.31	6.8	2.7	12	LA
C32VW3_AL	94.9	99.7	94.4	94.6	95.9	1.25	7.4	2.5	97.0	1.82	7.2	2.6	8	XX
CD3JNY	98.1	96.3	97.0	89.8	95.3	1.02	8.2	3.7	92.9	0.21	8.6	4.6	12	AX
CD3JNY_AL	83.9 *	84.8 *	80.2 XL	79.6 X	82.1	-3.83 X	5.2	2.6	78.8	-5.23 X	6.0	5.9	8	AL
CLYADG_AL	91.5	99.2	93.5	94.9	94.8	0.84	6.5	3.3	94.3	0.76	7.3	2.5	8	AL
DQ8YAV	91.6	89.0	92.2	95.3	92.0	-0.18	7.2	2.6	91.1	-0.46	6.1	3.1	12	AH
EHTP4D	94.6	97.9	97.0	95.7	96.3	1.39	9.9	1.5	95.1	1.08	8.4	3.1	12	TB
GUDQQX	94.7	93.4	90.0	93.8	92.9	0.15	8.5	2.1	89.4	-1.11	8.5	3.1	12	LA
J2K8DN_AL	No DATA	92.7	91.9	95.3	93.3	0.29	9.4	1.8	94.5	0.85	9.3	3.8	6	XX
J69JCU	95.0	96.2	90.6	90.0	93.0	0.16	8.6	3.1	91.6	-0.28	8.5	3.2	8	AH
K4MKF8	94.6	92.4	94.8	89.2	92.8	0.08	7.5	2.6	92.3	0.00	8.1	1.6	12	LA
KMJVHP	89.9	93.3	90.1	93.0	91.6	-0.35	8.1	1.8	92.1	-0.08	8.3	2.3	12	LA
LATGZ8	89.6	92.5	83.5 *	90.8	89.1	-1.26	8.9	3.9	87.3	-1.96 *	8.1	14.8 H	12	LB
N9QPJ4	95.3	96.0	91.7	93.2	94.1	0.56	8.2	2.0	94.1	0.70	8.8	3.0	12	LA



**Containerboard Interlaboratory Testing Program**  
 Analysis 207  
**Bursting Strength (Mullen), 35 lb Linerboard - 35E1**  
 TAPPI Official Test Method T807

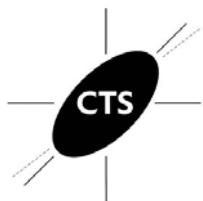
**Report #607 (D)**  
**April 2020**

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	
N9QPJ4_AL	97.4	93.1	92.2	96.1	94.7	0.80	5.7	2.4	94.6	0.87	6.2	2.5	8	AL
NDKJG6_AL	89.3	93.1	91.1	92.3	91.4	-0.40	8.1	1.6	91.4	-0.35	8.1	1.6	4	AL
NH2R64	95.5	96.5	98.2	91.9	95.5	1.11	8.9	2.6	94.9	1.00	8.4	2.3	12	LA
P4BJEG	94.6	94.6	94.8	L 94.8	94.7	0.80	4.8	0.1	L 93.1	0.31	3.6	1.2	12	RE
QKEFBK_AL	95.2	95.8	97.0	97.8	96.5	1.45	8.5	1.2	96.8	1.72	8.0	2.6	8	AL
TZGWAH_AL	93.7	90.4	93.7	L 88.1	91.5	-0.39	5.6	2.7	92.6	0.12	6.7	2.9	8	AL
UMT8WX	88.7	87.1	95.2	92.5	90.9	-0.61	8.0	3.7	91.6	-0.27	7.5	3.2	12	AH
V7JHJX	86.7	90.2	87.5	91.1	88.9	-1.34	6.2	2.1	90.0	-0.89	7.5	2.1	12	LA
W22MAD	93.1	93.4	92.7	L 93.8	L 93.3	0.27	3.4	0.5	93.2	0.33	4.1	0.6	L 12	LA
X629JV_AL	87.3	91.0	92.7	L 88.6	89.9	-0.97	5.6	2.4	90.9	-0.56	5.7	2.5	8	AL
YM93HF	95.3	96.6	87.5	92.2	92.9	0.14	9.2	4.0	91.3	-0.40	8.2	4.4	12	AH
YQ9DEF	91.0	89.2	L 88.8	L 89.9	L 89.7	-1.03	3.3	1.0	90.4	-0.76	3.8	1.4	12	LA
YU8PAF_AL	No DATA	98.4	94.4	94.1	95.7	1.15	9.2	2.4	95.7	1.29	9.2	2.4	3	XX
YW29JU	94.5	90.3	90.0	91.6	91.6	-0.34	8.7	2.1	90.3	-0.80	8.1	2.6	12	LC
YZYYJD	93.2	93.3	92.7	88.4	91.9	-0.24	7.9	2.4	91.5	-0.31	7.1	2.2	12	LA
ZEXZWE	94.2	99.9	92.2	90.3	94.1	0.60	9.5	4.1	95.2	1.12	9.1	3.8	12	LC

Consensus (All Labs) Results									
Wk Mean	92.50	92.94	91.91	91.88	Month Mean	92.52	Grand Mean	92.33	
Avg SDr	7.84	7.44	8.30	8.05	Avg SD	7.94	Avg SD	7.79	
SD btwn Labs	3.58	4.01	3.62	3.47	SD btwn Labs	2.71	SD btwn Labs	2.59	
Labs Inclcd	48	51	50	50	SD btwn Wks	2.60	SD btwn Wks	3.46	
Labs Exclcd	1	0	1	1	Labs Inclcd	49	Labs Inclcd	50	
Labs not Rcvd	2	0	0	0					

**Key to Instrument Codes Reported by Participants**

AH	Perkins Model AH	AK	L & W Autoline 300
AL	L & W Autoline 400	AX	Perkins Mullen Tester (model not specified)
LA	L&W Bursting Strength Tester	LB	L&W Burst-O-Matic
LC	L&W Autoline (207 Enrollment)	LJ	L&W Bursting Strength Tester J-Type
LZ	L&W (model not specified)	RE	Regmed/Mullen Tester
TB	TMI Monitor/Burst 1000	TP	Technidyne PROFILE/Plus
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 215

Ring Crush, 42 lb Linerboard - 42F2

TAPPI Official Test Method T822

Report #607 (D)

April 2020

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	
2Q8Z7D	89.1	91.9	89.3	90.3	90.1	-0.33	2.0	1.3	89.5	-0.33	2.5	1.2	12	LC
34Q22B	90.6	89.8 H	96.4	90.2	91.7	0.06	4.2	3.1	91.4	0.11	3.4	2.3	12	LZ
3DXUCQ	88.6	88.3	90.1	89.5	89.1	-0.58	3.0	0.9	89.1	-0.44	3.1	1.6	12	LC
43RDX6	91.0	90.8	89.5	92.0	90.8	-0.16	2.9	1.0	90.4	-0.12	3.0	1.3	12	EM
46XUDN	85.7	86.1	88.0	89.1	87.2	-1.04	2.4	1.6	87.3	-0.87	3.0	1.6	12	LD
4KQEAC	96.8	97.6	97.5	99.5 *	97.8	1.54	3.6	1.1	96.8	1.39	3.0	1.1	12	LD
6E42TN	90.1	89.9 L	88.2	93.0	90.3	-0.30	2.1	2.0	89.1	-0.44	2.3	1.7	12	LD
6URDY4	92.1 L	91.4	91.7	91.1	91.6	0.01	2.1	0.4	89.5	-0.34	2.0	2.3	8	LD
7AK999	91.7	92.4	91.8	91.1	91.7	0.06	2.2	0.5	92.6	0.40	2.7	1.0	8	LD
7CC6X3	91.9	91.6	91.2	91.7	91.6	0.03	2.4	0.3 L	94.9	0.94	2.7	3.2	12	LZ
8KYPF7	88.4	89.0 H	88.9	89.3	88.9	-0.63	3.8	0.4	88.3	-0.64	3.1	0.8 L	12	LD
8U23CZ	89.8	89.3	90.1	90.9	90.0	-0.36	3.8	0.7	90.1	-0.20	3.6	1.4	12	TJ
96ZZZZ	92.5	94.1	90.1	89.5	91.6	0.01	2.7	2.2	91.8	0.20	2.8	1.4	12	LD
988F77	92.0	91.1	92.2	91.0	91.5	0.01	2.7	0.6	88.9	-0.49	3.2	3.4	12	LD
9RU4GX	87.7	85.7	85.4	85.8	86.2	-1.30	3.6	1.1	85.6	-1.26	3.7	1.1	12	LD
ADDBQ7	102.1 *	102.5 *	101.3 *	101.9 *	101.9	2.55 *	3.2	0.5	100.8	2.34 *	3.0	1.8	12	LD
AFG4K4	83.8 L	83.1 L	84.0	84.1	83.8	-1.89	1.4	0.5	83.6	-1.74	1.8	1.3	12	TU
AFJPFK	86.3	83.3	83.6 *	88.9	85.5	-1.46	2.4	2.6	87.1	-0.92	2.7	2.5	12	LC
C32VW3	97.5	95.1	93.2	96.1	95.5	0.97	2.5	1.8	93.8	0.69	2.4	2.2	10	LD
CLYADG	89.0	91.4	94.0	91.1	91.4	-0.03	3.7	2.0	102.1	2.64 *	3.6	16.5 H	12	LC
DQ8YAV	102.3 *	98.7	103.6 X	99.8 *	101.1	2.34 *	3.6	2.2	97.2	1.48	4.3	8.4 H	12	LZ
EHTP4D	92.0	96.7	92.4	92.7	93.5	0.48	3.7	2.2	92.6	0.38	4.1	2.7	8	LD
F2WWPQ	93.5	93.9	93.3	92.6	93.3	0.44	1.5	0.6	93.5	0.61	1.5	0.5 L	8	LD
FABEQC	84.8	84.2	84.5	85.9	84.8	-1.63	2.4	0.7	84.8	-1.45	2.4	1.3	12	EN
FDBUUU	89.1	86.4	90.9	89.9	89.1	-0.59	3.6	1.9	90.7	-0.06	3.4	2.1	12	EN
GUDQQX	85.3	92.5	92.3	90.7	90.2	-0.32	2.2	3.4	91.0	0.02	2.6	2.4	12	LD
J2K8DN	90.7	92.0	95.3	91.7	92.4	0.23	3.2	2.0	92.7	0.42	3.0	2.6	12	LD
KMJVHP	90.2	89.3	92.4	89.7 L	90.4	-0.27	2.4	1.4	90.9	-0.02	2.4	1.7	12	LD
LAQV4R	88.0 L	86.4 L	86.1	86.3 L	86.7	-1.17	1.3	0.9	85.7	-1.24	1.2	1.1	12	MB
LATGZ8	96.7	96.1 L	94.7	92.5	95.0	0.85	2.7	1.9	94.4	0.82	3.0	3.1	12	LC
LFVRMR	76.9 *	76.6 X	76.6 X	77.1 X	76.8	-3.58 X	3.5	0.2 L	73.6	-4.11 X	3.7	2.5	12	EM
M32V2K	88.5	87.8	89.7	87.8	88.4	-0.75	2.7	0.9	87.8	-0.74	2.9	1.0 L	12	LC
N9QPJ4	88.6	88.1	91.0	92.5	90.1	-0.35	3.6	2.1	88.8	-0.50	3.2	1.6	12	LD
NDKJG6	104.4 *H	101.2 *H	99.2 *H	101.0 *H	101.5	2.42 *	7.4	2.2	93.5	0.60	8.3	6.1	12	LC
NH2R64	95.5	96.2	93.3	94.9	95.0	0.85	4.1	1.2	95.5	1.08	3.0	1.1	12	LZ



**Containerboard Interlaboratory Testing Program**  
 Analysis 215  
**Ring Crush, 42 lb Linerboard - 42F2**  
 TAPPI Official Test Method T822

**Report #607 (D)**  
**April 2020**

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	
P4BJEG	94.3 L	94.1	93.9	93.0 L	93.8	0.57	1.5	0.6	94.7	0.88	2.2	1.1	12	LZ
QKEFBK	83.0	87.7	87.2	87.8	86.4	-1.24	3.8	2.3	79.6	-2.70 *	4.2	5.9	12	LC
R8JN4L	80.9 H	95.2	No DATA	89.0 H	88.4	-0.76	6.8	7.2 H	86.1	-1.15	8.3	6.2	11	MB
TQTWZZ	98.0	98.8	97.6	97.7	98.0	1.60	3.2	0.6	96.0	1.20	5.4	5.0	12	TU
U4DXVX	92.9	90.7	90.0	89.6	90.8	-0.17	3.2	1.5	89.3	-0.39	3.9	1.8	12	LD
U6UYWE	94.8	94.9	94.8	94.0	94.6	0.76	2.5	0.4	90.6	-0.08	2.4	4.7	12	RS
UMT8WX	86.5	85.9	87.4	84.7	86.1	-1.31	2.8	1.1	87.5	-0.82	2.7	1.5	12	LD
V7JHJX	91.0	88.9	91.6	93.0	91.1	-0.09	2.4	1.7	90.5	-0.09	2.6	1.5	12	LD
VZU6CH	92.7	92.8	94.3	93.4	93.3	0.44	3.2	0.8	92.9	0.46	2.9	0.9 L	12	TH
W22MAD	91.5	93.0	92.6	91.9	92.3	0.18	3.8	0.7	92.5	0.37	3.4	0.8 L	12	LD
WMZBEE	90.0	90.7	89.9	89.6	90.0	-0.36	3.3	0.5	87.7	-0.77	3.7	1.9	12	EX
YQ9DEF	91.3	92.4 L	90.7	91.2	91.4	-0.03	1.7	0.7	91.8	0.20	2.0	1.6	12	LZ
ZEXZWE	95.2	96.2	95.6	90.9	94.4	0.72	2.5	2.4	93.4	0.59	2.5	1.6	12	LD

Consensus (All Labs) Results									
Wk Mean	90.94	91.60	91.49	91.48	Month Mean	91.50	Grand Mean	90.94	
Avg SDr	3.35	3.26	3.02	3.10	Avg SD	3.22	Avg SD	3.43	
SD btwn Labs	5.23	4.50	3.87	3.89	SD btwn Labs	4.11	SD btwn Labs	4.21	
Labs Incl	48	47	45	47	SD btwn Wks	1.85	SD btwn Wks	3.67	
Labs Excl	0	1	2	1	Labs Incl	47	Labs Incl	47	
Labs not Rcvd	0	0	1	0					

**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	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	RS	Regmed Digital Crush Tester CT-2000
TH	TMI Compression Tester, Model 17-76	TJ	TLS Compression Tester, Model CDM-5
TU	TMI Universal Crush Tester (TMI K440)		



**Containerboard Interlaboratory Testing Program**  
 Analysis 217  
**Ring Crush, 35 lb Linerboard - 35E1**  
 TAPPI Official Test Method T822

**Report #607 (D)**  
**April 2020**

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	
2Q8Z7D	80.6	82.4	81.7	77.4	80.5	-0.27	3.8	2.2	80.1	-0.18	3.8	1.5	12	LC
34Q22B	82.0	76.7	83.9	81.2	81.0	-0.17	2.9	3.1	80.3	-0.12	3.7	2.0	12	LZ
3DXUCQ	78.9	79.4	81.9	81.5	80.4	-0.29	3.6	1.5	78.6	-0.52	3.3	2.3	12	LC
43RDX6	81.2	79.9	80.9	81.3	80.8	-0.20	3.4	0.6	80.8	-0.01	3.2	1.0	12	EM
46XUDN	72.0 *	77.3	76.9	76.0	75.5	-1.47	4.0	2.4	75.9	-1.17	3.7	2.0	12	LD
4KQEAC	85.1	90.1 *	83.2	86.8	86.3	1.11	3.9	2.9	86.4	1.32	4.0	2.3	12	LC
6E42TN	79.8	79.4	78.5	79.9	79.4	-0.54	2.7	0.6	78.6	-0.53	3.2	1.6	12	LD
6URDY4	82.2	83.0	83.1	84.7	83.3	0.39	3.4	1.0	83.3	0.58	3.4	1.0	4	LD
7AK999	82.3	83.1	82.4	82.0	82.5	0.19	3.5	0.5	82.6	0.42	4.2	0.7 L	12	LD
7CC6X3	86.8	86.4	86.3	86.2	86.4	1.14	3.2	0.3 L	87.9	1.68	3.2	2.2	12	LZ
8KYPF7	78.8	77.9	76.2	76.8	77.4	-1.01	4.2	1.2	78.4	-0.57	3.6	1.8	12	LD
8U23CZ	80.7	81.7	77.8	80.4	80.1	-0.37	4.8	1.7	78.4	-0.57	4.5	1.6	12	TJ
96ZZZZ	81.5	81.4	78.3	78.8	80.0	-0.40	3.4	1.7	81.2	0.09	3.3	1.7	12	LD
988F77	84.8 L	85.6	82.4	80.8	83.4	0.42	3.7	2.2	80.1	-0.17	4.4	4.5	8	LD
9RU4GX	79.9	75.9	77.7	78.1	77.9	-0.91	3.4	1.7	78.2	-0.61	3.4	1.2	12	LD
ADDBQ7	90.1 *	93.5 X	92.5 *	91.3 *	91.9	2.45 *	3.8	1.5	91.3	2.48 *	3.4	1.2	8	LD
AFG4K4	74.2	74.1 L	75.4 L	75.6 L	74.8	-1.63	1.4	0.8	74.9	-1.40	1.6	0.8 L	12	TU
AFJPFK	76.3	75.2	73.6	76.4	75.4	-1.50	2.9	1.3	77.6	-0.77	3.2	3.7	12	LC
C32VW3	86.1	83.1	84.2	84.0	84.3	0.65	2.7	1.3	81.7	0.21	2.8	2.2	12	LD
CLYADG	89.0	91.4 *	94.0 *	91.1 *	91.4	2.33 *	3.7	2.0	88.4	1.81	3.9	12.2 H	12	LC
DQ8YAV	86.1 H	88.8	90.5	89.0	88.6	1.67	4.1	1.8	87.3	1.54	4.4	3.0	12	LZ
EHTP4D	No DATA	85.7	82.9	84.0	84.2	0.61	5.2	1.4	83.7	0.68	5.5	1.6	7	LC
F2WWPQ	82.3	84.0	82.5	82.6	82.8	0.28	2.2	0.8	83.2	0.58	2.1	1.0	8	LD
FABEQC	78.5	77.2	77.1	78.0	77.7	-0.95	3.4	0.7	76.4	-1.03	3.1	1.4	12	EN
FDBUUU	81.8	80.8	82.2	82.9	81.9	0.06	2.6	0.9	81.1	0.07	3.6	2.2	12	EN
GUDQQX	77.5	81.6	82.0	80.6	80.4	-0.30	4.1	2.0	81.5	0.16	3.5	1.7	12	LD
J2K8DN	78.6	80.9	81.9	84.2	81.4	-0.06	3.3	2.3	81.5	0.16	3.2	2.1	12	LD
KMJVHP	81.5	80.0	82.7	84.5	82.1	0.12	3.3	1.9	80.0	-0.20	3.5	2.8	12	LD
LAQV4R	75.4 L	78.1 L	77.0 L	75.9 L	76.6	-1.21	1.4	1.2	73.9	-1.63	1.4	3.0	8	MB
LATGZ8	88.7	87.4	87.4	86.5	87.5	1.41	4.5	0.9	85.5	1.11	4.7	3.5	12	LC
LFVRMR	67.0 X	67.4 X	68.9 *	69.1 X	68.1	-3.25 X	4.3	1.1	65.9	-3.54 X	3.9	2.8	12	EM
M32V2K	79.4	79.0	79.4	79.5	79.3	-0.56	3.5	0.2 L	79.0	-0.42	3.3	0.5 L	12	LC
N9QPJ4	80.9	79.3	78.7	81.1	80.0	-0.40	4.5	1.2	77.7	-0.73	4.5	1.9	12	LD
NDKJG6	84.7 H	82.7 H	84.2	85.3	84.2	0.62	5.7	1.1	78.7	-0.49	6.1	4.5	12	LC
NH2R64	86.1	85.0	85.7	84.0	85.2	0.85	2.9	0.9	85.3	1.05	2.9	1.0	12	LZ





Containerboard Interlaboratory Testing Program

Analysis 217

Report #607 (D)

April 2020

Ring Crush, 35 lb Linerboard - 35E1

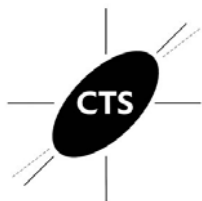
TAPPI Official Test Method T822

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	
P4BJEG	84.0	83.9	83.8 L	84.2 L	84.0	0.56	1.5	0.2 L	84.7	0.92	2.1	2.1	12	LZ
QKEFBK	68.7 X	77.2	73.7	75.9	73.9	-1.86	3.4	3.7 H	69.6	-2.67 *	4.0	4.3	12	LC
R8JN4L	72.3 *H	82.0	No DATA	74.7	76.3	-1.28	5.4	5.0 H	77.6	-0.76	5.8	5.2	10	MB
TQTWZZ	90.0	89.0	88.0	89.1	89.0	1.77	3.7	0.8	87.0	1.46	5.8	7.2 H	12	TU
U4DXVX	83.7	79.9	78.8	80.0	80.6	-0.25	4.1	2.1	77.3	-0.83	3.9	3.1	12	LD
U6UYWE	82.4	82.4	84.2	82.9	83.0	0.32	2.8	0.8	77.8	-0.70	2.3	3.8	12	RS
UMT8WX	76.0	76.9	75.9	75.4	76.1	-1.34	2.7	0.6	76.7	-0.97	3.0	1.2	12	LD
V7JHJX	82.1	81.5	83.3	81.4	82.1	0.10	2.9	0.9	80.5	-0.06	2.7	1.7	12	LD
VZU6CH	85.3	82.9	82.9	82.8	83.5	0.44	2.9	1.2	85.3	1.08	3.3	2.0	12	TH
W22MAD	81.3	82.8	82.2	81.5	82.0	0.07	4.0	0.7	81.8	0.23	3.4	0.5 L	12	LD
WMZBEE	77.2	76.5	78.0	75.8	76.8	-1.15	3.5	0.9	76.1	-1.11	3.4	1.5	12	EX
YQ9DEF	83.5	81.9	82.1	80.8	82.1	0.10	3.0	1.1	80.7	-0.02	2.9	2.6	12	LZ
ZEXZWE	85.2	82.3	83.7	82.9	83.5	0.45	2.9	1.2	83.4	0.62	3.5	0.8 L	12	LD

Consensus (All Labs) Results									
Wk Mean	81.70	81.60	81.50	81.60	Month Mean	81.65	Grand Mean	80.81	
Avg SDr	3.57	3.49	3.51	3.63	Avg SD	3.56	Avg SD	3.70	
SD btwn Labs	4.33	3.99	4.78	4.18	SD btwn Labs	4.17	SD btwn Labs	4.22	
Labs Incl	45	46	47	47	SD btwn Wks	1.70	SD btwn Wks	3.12	
Labs Excl	2	2	0	1	Labs Incl	47	Labs Incl	47	
Labs not Rcvd	1	0	1	0					

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	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	RS	Regmed Digital Crush Tester CT-2000
TH	TMI Compression Tester, Model 17-76	TJ	TLS Compression Tester, Model CDM-5
TU	TMI Universal Crush Tester (TMI K440)		



Containerboard Interlaboratory Testing Program

Analysis 223

STFI, 42 lb Linerboard - 42F2

TAPPI Official Test Method T826

Report #607 (D)

April 2020

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	
227QVR	22.5	22.2	23.5	21.8	22.5	-0.95	1.5	0.7	22.6	-0.90	1.5	0.5	12	LW
2DKQJ8	24.4	22.9	24.0	23.9	23.8	0.65	1.9	0.6	23.5	0.34	1.8	1.0	12	TT
2Q8Z7D	23.0	22.2	23.3	24.0	23.1	-0.19	1.4	0.7	23.2	-0.10	1.6	0.4	12	LU
2RF897	23.3	24.2 L	23.5	23.2	23.5	0.36	1.2	0.5	21.7	-2.00 *	1.1	5.9 H	12	TT
2ZC8LD	22.4	22.4 H	22.3	22.5	22.4	-1.09	1.9	0.1 L	23.5	0.26	2.3	1.1	12	LH
34Q22B_AL	22.1	22.1	23.7	24.0	23.0	-0.37	1.5	1.0	27.3	5.27 X	1.7	6.3 H	12	AL
3DXUCQ	24.4	24.6	24.7	24.6	24.6	1.67	1.8	0.1	24.1	1.05	1.7	0.9	12	LW
46GPWB	26.0 *	26.4 XH	25.2 *	25.1	25.7	3.04 X	1.9	0.6	24.6	1.80	1.6	1.4	12	LA
46XUDN_AL	22.3 L	21.2	21.4 *L	21.5	21.6	-2.04 *	1.2	0.5	22.3	-1.22	1.5	0.8	12	AK
4P8ULP	24.9	25.1 *	24.5	25.6 *	25.0	2.24 *	1.8	0.5	24.8	1.97 *	1.9	0.5	12	LU
6DQEBA_AL	23.6	23.4	23.7	23.7	23.6	0.46	1.6	0.1	23.5	0.32	1.7	0.4	12	AL
6E42TN	22.5 L	24.0 L	22.6	23.7	23.2	-0.05	1.3	0.8	23.3	0.11	1.3	0.6	12	BK
6QT334	22.9	22.9	23.1	23.2	23.0	-0.29	1.6	0.1	23.0	-0.39	1.6	0.5	12	LH
7CC6X3	22.4	21.6	22.5	22.1 L	22.2	-1.38	1.6	0.4	22.8	-0.62	1.7	0.7	12	LA
8KYPF7_AL	25.0	23.5	23.9	23.1	23.9	0.78	1.5	0.8	23.3	-0.01	1.4	0.8	12	XX
8U23CZ	23.8	23.6	23.6	23.6	23.6	0.50	1.3	0.1	23.6	0.45	1.2	0.2 L	12	TT
96ZZZZ	22.8	22.9	23.1	23.1	23.0	-0.36	1.8	0.2	23.2	-0.08	1.8	0.4	12	LA
96ZZZZ_AL	23.5	23.2	23.1	23.3	23.3	0.02	1.7	0.2	23.3	0.01	1.7	0.2 L	4	AL
988F77	23.0 L	20.9 *	22.5	22.4 L	22.2	-1.32	1.2	0.9	22.0	-1.64	1.6	0.6	12	LY
9E68EY_AL	23.4	23.9	22.2 H	24.8	23.6	0.41	2.2	1.1	23.5	0.26	2.0	0.8	8	AK
9RU4GX	21.9	22.0	22.5	22.2	22.2	-1.38	1.6	0.3	22.1	-1.58	1.6	0.5	12	LH
ADTRKY	23.9	22.9	25.6 *	25.3	24.4	1.49	1.9	1.3	24.5	1.59	2.0	0.9	12	LH
AFJPFK	23.8 L	23.2	23.4	23.6	23.5	0.31	1.6	0.3	22.6	-0.84	1.4	1.5	12	LA
C32VW3_AL	23.5	24.6	23.7	24.2	24.0	0.94	1.5	0.5	28.6	6.94 X	2.0	8.0 H	12	AL
CBBKA2	24.9	24.4	23.9 L	24.5	24.4	1.48	1.9	0.4	23.7	0.50	1.8	1.0	12	XX
CD3JNY	24.1	23.9	23.6	25.1	24.2	1.16	1.8	0.7	24.0	0.94	2.0	0.8	12	LU
CD3JNY_AL	44.6 X	43.0 XH	42.6 XH	42.0 X	43.1	24.86 X	2.6	1.1	40.2	21.97 X	3.8	5.2 H	12	AL
CLYADG_AL	21.6	23.6 H	37.8 XH	21.2 *L	26.1	3.52 X	2.2	7.9 H	34.2	14.25 X	2.3	7.3 H	12	AL
EHTP4D	24.1	24.0	24.6	24.7	24.4	1.38	1.9	0.3	24.3	1.34	1.9	0.3	12	LW
F2WWPQ	23.0	23.0	23.2	23.1	23.1	-0.24	1.7	0.1 L	23.2	-0.14	1.6	0.2 L	8	LY
FABEQC	21.9	22.2	22.0	22.1	22.0	-1.52	1.6	0.1	21.8	-1.89	1.5	0.5	12	LY
FDBUUU	22.5	21.4	22.6 H	22.7	22.3	-1.17	2.3	0.6	21.5	-2.27 *	2.1	0.8	12	LH
GUDQQX	21.7	22.8	22.8	21.8	22.3	-1.21	1.6	0.6	22.7	-0.74	1.7	0.8	12	LY
J2K8DN_AL	No DATA	41.3 XL	39.2 X	40.9 XL	40.5	21.60 X	1.9	1.1	40.9	22.90 X	1.9	1.3	6	XX
J69JCU	22.8	23.5	23.1	24.1	23.4	0.16	1.9	0.6	23.4	0.15	1.9	0.6	4	LH



Containerboard Interlaboratory Testing Program

Analysis 223

STFI, 42 lb Linerboard - 42F2

TAPPI Official Test Method T826

Report #607 (D)

April 2020

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	
KMJVHP	22.3	22.6	22.9	22.5	22.6	-0.85	1.6	0.2	22.8	-0.64	1.5	0.6	12	LZ
LATGZ8	24.8	23.3	22.9	22.6	23.4	0.20	1.7	1.0	23.9	0.85	2.0	0.8	12	LW
N9QPJ4_AL	24.6 L	25.1 *	24.7 L	24.7	24.8	1.91	1.6	0.2	34.8	14.95 X	2.7	7.5 H	12	AL
NDKJG6_AL	23.2 L	23.5 L	24.1 L	23.6 L	23.6	0.44	0.1	0.4	30.7	9.64 X	1.6	7.6 H	8	XX
NH2R64	22.5 L	23.0	23.2	22.7	22.9	-0.48	1.5	0.3	23.1	-0.26	1.7	0.4	12	LW
QKEFBK	21.5	21.2	24.4	22.8	22.5	-0.96	1.6	1.4 H	23.7	0.51	1.8	1.5	12	LU
R8JN4L	23.4	23.5	NO DATA	24.8	23.9	0.82	2.0	0.8	23.4	0.12	1.8	0.6	11	LA
TQTWZZ	24.6	24.2	22.7	23.1	23.6	0.47	1.5	0.9	24.4	1.48	4.7	1.7	12	LA
TZGWAH	21.1 *L	21.6	23.4	22.6	22.2	-1.31	1.3	1.0	23.3	0.10	1.6	1.4	12	LU
UMT8WX	22.8	22.8	22.4	23.5	22.9	-0.49	1.7	0.5	23.7	0.53	1.9	1.0	12	LU
V7JHJX	23.2	22.2	22.5	23.0	22.7	-0.65	1.4	0.5	22.5	-0.95	1.6	0.4	12	LA
W22MAD	23.7	23.0	23.6	23.3	23.4	0.20	1.8	0.3	23.5	0.36	1.8	0.3 L	12	LA
WMZBEE	24.0 L	21.2 L	23.9 L	24.9 L	23.5	0.31	0.0	1.6 H	23.4	0.23	0.0	1.1	12	TT
X629JV_AL	22.7	21.9	2.4 XL	22.6	17.4	-7.33 X	1.5	10.0 H	20.6	-3.45 X	1.5	5.7 H	12	AL
YM93HF	23.5 H	28.9 X	28.9 X	24.1	26.4	3.89 X	4.2	3.0 H	26.2	3.87 X	3.0	3.2 H	12	XX
YZYYJD	23.1	22.8	23.2	22.9	23.0	-0.31	1.7	0.2	23.5	0.25	1.7	0.6	12	LY
ZEXZWE	24.3	23.2	23.3	23.0	23.4	0.24	1.8	0.6	23.8	0.75	1.6	0.6	12	LA

Consensus (All Labs) Results									
Wk Mean	23.27	22.99	23.36	23.41	Month Mean	23.25	Grand Mean	23.26	
Avg SDr	2.03	1.59	1.67	1.62	Avg SD	1.65	Avg SD	1.84	
SD btwn Labs	1.05	1.04	0.86	1.05	SD btwn Labs	0.80	SD btwn Labs	0.77	
Labs Includ	50	48	46	50	SD btwn Wks	0.65	SD btwn Wks	1.21	
Labs Exclcd	1	4	5	2	Labs Includ	46	Labs Includ	43	
Labs not Rcvd	1	0	1	0					

Key to Instrument Codes Reported by Participants

AK	L & W Autoline 300	AL	L & W Autoline 400
BK	Buchel Strip Compression Tester BK-155	LA	L&W Autoline (223 Enrollment)
LH	L&W 282	LU	L&W 52 without moisture correction(was 53)
LW	L&W 53 with moisture correction (was 53M)	LY	L&W 152 without moisture correction
LZ	L&W (model not specified)	TT	TMI Short Span Compression, 17-34 (MB K455)
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 225

STFI, 35 lb Linerboard - 35E1

TAPPI Official Test Method T826

Report #607 (D)

April 2020

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	
227QVR	22.8	22.9	22.2	21.2	22.3	-0.72	1.3	0.8	22.3	-0.69	1.5	0.6	12	LW
2DKQJ8	23.3	23.3	23.5	23.3	23.3	0.49	1.9	0.1 L	23.8	1.10	2.0	0.6	8	TT
2Q8Z7D	22.8	22.8	23.1	23.2	23.0	0.07	1.8	0.2	22.9	-0.01	1.7	0.3	12	LU
2RF897	22.7	23.2 L	23.3	22.8	23.0	0.12	1.1	0.3	23.0	0.11	1.1	0.2 L	12	TT
2ZC8LD	22.2	22.7	22.8	22.0	22.4	-0.55	2.0	0.4	23.4	0.62	1.6	1.0	12	LH
34Q22B_AL	24.0	21.8	22.9	21.9	22.7	-0.30	1.4	1.0	27.6	5.63 X	2.3	5.5 H	8	XX
3DXUCQ	24.7	24.7	24.7	24.9	24.7	2.08 *	1.4	0.1 L	24.0	1.33	1.7	0.7	12	LW
46GPWB	22.3	25.1 *	24.3	25.1 *	24.2	1.48	1.5	1.3	23.8	1.13	1.4	1.1	8	LA
46XUDN_AL	20.7	21.2	21.5	20.8	21.1	-2.13 *	1.8	0.4	21.6	-1.58	1.8	0.6	8	XX
4P8ULP	23.0	22.7	22.6	23.2	22.9	-0.04	1.7	0.3	23.2	0.36	2.0	0.8	12	LU
6DQEBA_AL	23.8	23.7	23.4	23.7	23.6	0.82	1.8	0.2	23.7	0.95	1.7	0.3	8	XX
6E42TN	22.4	23.4	22.7	23.1	22.9	-0.03	1.5	0.4	22.9	0.02	1.3	0.4	12	BK
6QT334	22.7	22.3	23.1	23.0	22.8	-0.16	1.5	0.4	23.0	0.12	1.7	0.5	8	XX
7CC6X3	21.6 L	23.7	22.5	23.9	22.9	0.01	1.3	1.1	22.4	-0.55	1.6	0.8	12	LA
8KYPF7_AL	23.7	24.5	22.4	21.8	23.1	0.19	1.8	1.2	23.5	0.77	1.9	1.5	8	XX
8U23CZ	22.8	22.4	22.6	23.1	22.7	-0.22	1.2	0.3	22.7	-0.24	1.1	0.2 L	12	TT
96ZZZZ	23.2	23.2	21.7	22.0	22.5	-0.44	1.3	0.8	22.6	-0.31	1.5	0.5	12	LA
96ZZZZ_AL	22.5	22.1	22.5	22.8	22.5	-0.52	1.6	0.3	22.5	-0.51	1.6	0.3	4	AL
988F77	20.4 *	21.0	21.7	21.4	21.1	-2.07 *	1.6	0.5	21.5	-1.70	1.8	0.5	8	LY
9E68EY_AL	22.3	23.4	22.4	23.9	23.0	0.10	1.6	0.8	23.0	0.14	1.6	0.8	4	AK
9RU4GX	22.1	22.1	21.9	21.6	21.9	-1.12	1.5	0.2	21.8	-1.32	1.5	0.5	12	LH
ADTRKY	24.1	23.8	24.4	24.7 H	24.2	1.52	2.2	0.4	24.3	1.63	2.3	0.6	12	LH
AFJPFK	22.2	22.0	20.8 *L	21.4 L	21.6	-1.51	1.6	0.6	21.4	-1.77	1.5	1.1	12	LA
C32VW3_AL	23.1 H	24.0	22.8	23.6	23.4	0.53	2.0	0.5	28.0	6.00 X	2.2	4.9 H	8	XX
CBBKA2	23.9	23.8	24.7	24.5	24.2	1.52	1.7	0.5	23.3	0.43	1.7	0.9	12	XX
CD3JNY	25.6 *	25.6 *	23.5 L	23.6	24.6	1.88	1.7	1.2	23.4	0.61	1.8	1.2	12	LU
CD3JNY_AL	36.6 XH	36.2 XH	37.5 XH	35.0 XH	36.3	15.37 X	3.5	1.0	35.7	15.17 X	3.1	1.3	8	AL
CLYADG_AL	22.5	21.7	31.5 X	21.6 L	24.3	1.62	1.5	4.8 H	27.2	5.07 X	2.0	4.5 H	8	AL
EHTP4D	23.6	22.8	24.2	23.9	23.6	0.80	1.7	0.6	23.4	0.63	1.9	0.8	12	LW
F2WWPQ	22.6	22.6	22.5	22.0	22.4	-0.56	1.7	0.3	22.5	-0.41	1.6	0.3	8	LY
FABEQC	22.1	22.1	21.0	21.2	21.6	-1.52	1.7	0.6	21.6	-1.51	1.7	0.5	12	LY
FDBUUU	20.0 *	20.3 *	20.1 *	20.8 *	20.3	-3.01 X	1.6	0.3	20.7	-2.60 *	1.6	0.5	12	LH
GUDQQX	21.7	23.3	22.1	21.8	22.2	-0.82	1.3	0.7	22.5	-0.46	1.3	0.7	12	LY
J2K8DN_AL	No DATA	35.2 XL	35.0 XH	33.2 X	34.5	13.27 X	2.4	1.1	36.7	16.39 X	2.4	5.3 H	6	XX
J69JCU	22.7	23.3	23.1 H	24.1	23.3	0.45	1.9	0.6	23.7	0.92	3.1	1.9 H	8	LH



Containerboard Interlaboratory Testing Program

Analysis 225

Report #607 (D)

April 2020

STFI, 35 lb Linerboard - 35E1

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	
KMJVHP	22.3	22.6	22.4 H	22.6	22.5	-0.51	1.9	0.1 L	22.1	-0.90	1.8	0.4	12	LZ
LATGZ8	25.4 *	24.0	25.3 *	23.6	24.6	1.91	1.7	0.9	24.0	1.34	1.7	0.9	12	LW
N9QPJ4_AL	22.9	24.8	23.0	22.8	23.4	0.53	1.3	1.0	28.2	6.34 X	2.6	5.3 H	8	AL
NDKJG6_AL	23.6 L	23.6 L	23.9 L	23.8 L	23.7	0.93	0.1	0.2 L	23.7	0.99	0.1	0.2 L	4	XX
NH2R64	22.1	22.9	22.8	22.6	22.6	-0.38	1.7	0.4	22.3	-0.72	1.8	1.0	12	LW
QKEFBK	21.4	22.8	23.5 H	23.1	22.7	-0.24	2.0	0.9	22.9	0.04	1.9	0.6	12	LU
R8JN4L	22.3	22.8	NO DATA	23.6	22.9	0.00	1.6	0.6	22.6	-0.32	1.9	0.8	10	LA
TQWZZ	22.6	22.9	22.1	22.4	22.5	-0.48	1.8	0.3	23.2	0.34	3.7	1.7	12	LA
TZGWAH	21.1	21.4	NO DATA	NO DATA	21.3	-1.88	1.2	0.2	22.7	-0.22	1.8	0.9	10	LU
UMT8WX	22.5	22.8	22.8	23.5	22.9	-0.05	1.6	0.4	23.7	0.96	1.8	0.9	12	LU
V7JHJX	23.8	23.1	23.2 L	22.9	23.2	0.36	1.4	0.4	22.5	-0.42	1.6	0.7	12	LW
W22MAD	22.6	22.2	22.7	22.4	22.4	-0.54	1.7	0.2	22.6	-0.36	1.6	0.2 L	12	LA
WMZBEE	21.6 L	23.7 L	21.9 L	23.4 L	22.7	-0.30	0.0	1.0	22.8	-0.05	0.0	0.8	12	TT
X629JV_AL	21.5	21.6	23.0	22.9	22.3	-0.73	1.5	0.8	22.3	-0.72	1.5	0.6	8	XX
YM93HF	22.9	28.6 X	27.2 X	24.7	25.9	3.38 X	1.5	2.6 H	25.1	2.64 *	1.6	2.6 H	8	XX
YZYYJD	22.8	23.2	22.3	22.5 H	22.7	-0.25	1.9	0.4	22.7	-0.24	1.7	0.7	12	LU
ZEXZWE	22.9	23.8	23.6	23.7	23.5	0.65	1.6	0.4	23.3	0.44	1.6	0.7	12	LU

Consensus (All Labs) Results									
Wk Mean	22.69	22.97	22.81	22.91	Month Mean	22.92	Grand Mean	22.89	
Avg SDr	1.65	1.65	1.57	1.64	Avg SD	1.63	Avg SD	1.78	
SD btwn Labs	1.09	1.05	1.02	1.09	SD btwn Labs	0.87	SD btwn Labs	0.84	
Labs Incd	50	49	46	49	SD btwn Wks	0.93	SD btwn Wks	0.87	
Labs Excl	1	3	4	2	Labs Incd	48	Labs Incd	46	
Labs not Rcvd	1	0	2	1					

Key to Instrument Codes Reported by Participants

AK	L & W Autoline 300	AL	L & W Autoline 400
BK	Buchel Strip Compression Tester BK-155	LA	L&W Autoline (223 Enrollment)
LH	L&W 282	LU	L&W 52 without moisture correction (was 53)
LW	L&W 53 with moisture correction (was 53M)	LY	L&W 152 (was 52M)
LZ	L&W (model not specified)	TT	TMI Short Span Compression, 17-34 (MB K455)
XX	Instrument make/model not specified by lab		



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

**Report #607 (D)**  
**April 2020**

WebCode	Monthly Results				Cumulative Results				
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2ZC8LD	158.2	1.10	9.54		134.0	-0.71	18.95	4	LS
34Q22B_AL	138.3	-0.23	10.62		144.2	-0.10	6.03	4	XX
3DXUCQ	130.7	-0.74	7.51	L	140.7	-0.31	9.40	4	LS
46XUDN	121.9	-1.33	15.89		121.6	-1.45	2.04	L 4	LS
6DQEBA_AL	128.2	-0.91	12.80		157.8	0.71	58.28	H 4	AL
96ZZZZ	122.0	-1.32	19.68		127.3	-1.11	7.17	4	LA
96ZZZZ_AL	146.9	0.34	18.67		146.9	0.06	0.00	1	AL
9E68EY_AL	238.1	6.43	X 15.15		185.3	2.34	* 74.63	2	AK
ADDBQ7	176.7	2.33	* 43.41	H	172.7	1.59	4.38	3	EV
ADTRKY	118.3	-1.57	9.06		133.4	-0.75	24.23	4	EV
AFJPFK	49.1	-6.18	X 44.04	H	17.7	-7.62	X 22.76	4	EV
C32VW3	136.1	-0.38	21.07		217.5	4.25	X 95.19	H 4	EV
CD3JNY_AL	133.1	-0.58	13.12		126.2	-1.17	7.58	3	AL
CLYADG_AL	157.6	1.06	14.63		170.0	1.43	21.44	4	AL
EHTP4D	117.8	-1.60	10.68		119.6	-1.57	2.34	L 4	XX
FABEQC	152.1	0.69	9.07		148.5	0.15	4.95	4	EV
GUDQQX	149.9	0.54	16.20		152.8	0.41	4.30	4	EV
KAD2NR	145.2	0.23	22.79		139.6	-0.38	6.96	4	LS
NDKJG6_AL	126.3	-1.04	19.44		127.9	-1.07	2.30	2	AL
NH2R64	139.9	-0.12	11.33		141.5	-0.27	5.20	4	EV
QKEFBK	238.5	6.46	X 25.17		200.9	3.27	X 25.61	4	EV
R8JN4L	145.8	0.27	19.26		141.2	-0.28	4.56	4	LA
TQTWZZ	159.3	1.17	24.84		167.3	1.27	22.71	4	LA
TZGWAH	157.1	1.02	16.41		166.8	1.24	9.28	3	EV
UMT8WX	154.4	0.84	15.25		151.1	0.31	6.19	4	EV
V7JHJX	134.2	-0.51	19.47		140.6	-0.32	6.09	4	LA
W22MAD	150.3	0.57	17.20		150.0	0.24	3.48	L 4	LS
X629JV_AL	144.0	0.15	15.29		141.8	-0.25	6.26	4	AL

**Consensus (All Labs) Results**

Month Mean	141.77	Grand Mean	145.95
Avg SD	17.99	Avg SD Months	21.90
SD btwn Labs	14.98	SD btwn Labs	16.82
Labs Incl	25	Labs Incl	25



Containerboard Interlaboratory Testing Program  
Analysis 228  
**Roughness - Stylus Method, 42 lb Linerboard - 42F2**  
TAPPI Official Test Method T575

**Report #607 (D)**  
**April 2020**

**Key to Instrument Codes Reported by Participants**

<b>AK</b>	L & W Autoline 300	<b>AL</b>	L & W Autoline 400
<b>EV</b>	Emveco Microgag Model 210-R	<b>LA</b>	L&W Autoline (228 Enrollment)
<b>LS</b>	L&W 263	<b>XX</b>	Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 229  
**Roughness - Sheffield Method, 42 lb Linerboard - 42F2**  
 TAPPI Official Test Method T538

**Report #607 (D)**  
**April 2020**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2Q8Z7D	365.8	0.15	9.05	362.9	0.80	2.75	4	XX
46GPWB	360.9	-0.16	7.17	365.2	1.19	3.02	4	XX
6DQEBA_AL	355.1	-0.53	7.55	357.3	-0.14	5.82	4	AL
8HADGZ	397.9	2.19 *	7.91	380.9	3.81 X	24.04	2	TS
8KYPF7_AL	357.3	-0.39	9.97	360.6	0.41	4.82	3	XX
96ZZZZ_AL	353.6	-0.62	5.80	353.6	-0.76	0.00	1	AL
988F77	351.7	-0.74	9.67	352.2	-0.99	1.49	4	PP
9E68EY_AL	359.8	-0.23	2.94 L	351.9	-1.05	11.24	2	AK
C32VW3_AL	354.4	-0.57	5.97	356.1	-0.34	1.25	4	AL
CLYADG_AL	156.8	-13.12 X	9.49	140.7	-36.36 X	110.67 H	3	AL
DQ8YAV	350.1	-0.85	8.21	349.5	-1.45	2.00	4	XX
J2K8DN_AL	149.8	-13.57 X	31.58 H	265.2	-15.54 X	163.18	2	XX
KMJVHP	352.6	-0.69	9.75	367.0	1.47	11.00	4	XX
LFVRMR	395.0	2.00 *	7.41	394.9	6.15 X	2.19	4	TS
N9QPJ4_AL	370.4	0.44	17.88 H	363.2	0.85	7.01	3	AL

Consensus (All Labs) Results			
Month Mean	363.42	Grand Mean	358.13
Avg SD	9.03	Avg SD Months	6.15
SD btwn Labs	15.74	SD btwn Labs	5.98
Labs Incd	13	Labs Incd	11

**Key to Instrument Codes Reported by Participants**

- |   |  |
|---|--|
| <b>AK</b> L & W Autoline 300<br><b>PP</b> Technidyne Profile/Plus<br><b>XX</b> Instrument make/model not specified by lab | <b>AL</b> L & W Autoline 400<br><b>TS</b> TMI Monitor/Smoothness |
|---|--|





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

**Report #607 (D)**  
**April 2020**

WebCode	Monthly Results				Cumulative Results				
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2Q8Z7D	104.7	0.95	4.52		106.1	0.95	1.46	4	HY
34Q22B	94.4	-0.15	1.14	L	94.4	-0.14	1.18	4	TM
46GPWB	91.7	-0.44	1.97		92.7	-0.30	0.70	L 4	SC
46XUDN	104.3	0.91	6.08		102.2	0.59	4.10	4	TM
8KYPF7	43.3	-5.62	X 0.52	L	43.6	-4.89	X 0.75	L 3	LZ
96ZZZZ	99.2	0.36	5.26		92.3	-0.34	4.70	4	TM
988F77	105.2	1.01	5.02		104.4	0.79	1.43	4	HY
9E68EY	89.8	-0.65	6.52		94.9	-0.10	7.24	2	HZ
ADDBQ7	110.0	1.52	0.71	L	109.4	1.26	0.85	2	HY
AFG4K4	86.0	-1.05	2.63		96.2	0.03	13.57	H 4	TM
AFJPFK	89.0	-0.73	5.43		90.8	-0.48	4.24	4	TM
C32VW3	79.8	-1.71	4.02		83.1	-1.20	3.11	4	TM
CLYADG	100.0	0.45	7.91		102.1	0.57	10.88	4	SC
GUDQQX	85.5	-1.10	3.26		89.0	-0.65	4.41	4	XX
KAD2NR	98.0	0.23	3.16		98.3	0.22	2.66	4	HY
N9QPJ4	87.5	-0.89	5.15		87.8	-0.76	6.38	4	SC
NDKJG6	102.0	0.66	9.08		110.5	1.36	6.45	4	SC
QKEFBK	85.0	-1.16	5.24		84.3	-1.09	2.68	4	TM
TZGWAH	83.4	-1.33	8.76		69.4	-2.48	* 10.62	4	TM
UMT8WX	92.2	-0.39	1.92		83.2	-1.19	6.06	4	TM
V7JHJX	107.4	1.24	4.83		113.1	1.60	9.26	4	HY
ZEXZWE	101.6	0.62	4.16		100.6	0.44	2.42	4	HZ
ZRJFZE	111.2	1.65	4.82		106.0	0.94	4.00	4	TM

Consensus (All Labs) Results			
Month Mean	95.81	Grand Mean	95.92
Avg SD	5.11	Avg SD Months	6.04
SD btwn Labs	9.34	SD btwn Labs	10.70
Labs Incd	22	Labs Incd	22

**Consensus By Method**

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	95.09	9.31	0.72	19
Modified Scott Bond Mechanics	106.04	1.92	10.23	2

**Analysis Notes**

8KYPF7 - Method used not covered in this test. Data excluded from consensus calculation.



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

**Report #607 (D)**  
**April 2020**

**Key to Instrument Codes Reported by Participants**

<b>HY</b>	Huygen Digitized Scott Internal Bond Tester	<b>HZ</b>	Huygen Internal Bond Tester with AccuPress
<b>LZ</b>	L&W (model not specified)	<b>SC</b>	Scott Internal Bond Tester (Manual)
<b>TM</b>	TMI Monitor/Internal Bond Tester	<b>XX</b>	Instrument make/model not specified by lab



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

**Report #607 (D)**  
**April 2020**

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SD	Mean	CPV	SD Months	Months
2Q8Z7D	25.4	-0.73	0.76	25.9	-0.54	1.98	4
2ZC8LD	24.2	-1.10	1.30	24.6	-1.03	0.67	4
34Q22B	25.4	-0.74	2.30	26.5	-0.33	1.42	4
3DXUCQ	30.0	0.61	1.41	28.6	0.47	1.84	4
46GPWB	29.2	0.38	1.30	28.9	0.59	0.30	L 4
46XUDN	23.8	-1.22	2.17	24.3	-1.15	1.34	4
4KQEAC	36.4	2.50 *	2.61	29.9	0.97	4.57	H 4
6DQEBA	28.2	0.09	3.66	29.3	0.74	1.24	4
7DM3BK	24.8	-0.92	1.30	24.5	-1.07	1.31	4
8KYPF7	28.8	0.26	1.48	30.0	1.02	3.56	3
96ZZZZ	24.6	-0.98	1.82	24.8	-0.95	1.05	4
988F77	30.0	0.61	5.10	H 27.2	-0.03	2.50	4
9E68EY	31.4	1.02	3.08	30.5	1.23	1.11	4
9RU4GX	29.9	0.58	1.95	30.9	1.36	1.56	4
ADTRKY	27.0	-0.27	3.46	28.5	0.45	1.31	4
C32VW3	27.5	-0.14	3.73	28.0	0.27	0.41	4
CLYADG	31.0	0.90	4.56	30.7	1.31	1.12	4
EHTP4D	31.0	0.91	4.64	31.2	1.46	0.30	L 4
FABEQC	29.5	0.47	2.36	27.3	-0.01	2.88	4
FH6JJD	23.2	-1.39	1.48	24.1	-1.24	0.81	4
GUDQQX	27.4	-0.15	3.78	26.9	-0.16	2.72	4
KMJVHP	33.3	1.59	3.96	31.9	1.73	1.29	4
NDKJG6	24.4	-1.04	1.52	21.3	-2.30 *	2.11	4
NH2R64	28.6	0.20	1.67	27.1	-0.10	1.62	4
QKEFBK	28.8	0.26	2.77	28.2	0.32	0.85	4
QPNPK3	24.4	-1.04	0.55	L 24.4	-1.11	1.31	4
TZGWAH	29.4	0.44	1.82	26.9	-0.16	2.48	4
UMT8WX	32.4	1.32	1.52	30.0	1.01	2.35	3
V7JHJX	32.0	1.20	2.24	27.8	0.17	2.90	4
W22MAD	25.2	-0.80	1.79	25.6	-0.65	0.43	4
X629JV	22.8	-1.51	1.64	23.3	-1.52	0.74	4
YU8PAF	23.4	-1.33	1.95	25.4	-0.74	1.55	4

**Consensus (All Labs) Results**

Month Mean	27.92	Grand Mean	27.31
Avg SD	2.63	Avg SD Months	1.88
SD btwn Labs	3.39	SD btwn Labs	2.63
Labs Incl	32	Labs Incl	32



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

**Report #607 (D)**  
**April 2020**

**Key to Instrument Codes Reported by Participants**

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program  
Analysis 237

Report #607 (D)  
April 2020

Air Resistance, 42 lb Linerboard - 42F

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD	Months	Inst
2Q8Z7D	22.7	0.38	3.21	22.5	0.27	1.60	4	TP
2ZC8LD	22.9	0.51	3.08	22.9	0.55	1.73	4	TD
34Q22B_AL	23.8	1.12	1.28	23.3	0.86	0.55	4	XX
6DQEBA_AL	18.7	-2.34 *	2.90	116.1	69.03 X	194.20 H	4	AL
6URDY4	19.5	-1.78	2.05	20.1	-1.48	0.88	2	XX
8GYEK7	20.9	-0.86	1.95	20.9	-0.91	0.12 L	4	LP
8KYPF7_AL	22.2	0.06	1.10	17.7	-3.25 X	10.24 H	3	XX
96ZZZZ	23.6	0.99	2.27	24.2	1.51	0.68	4	LA
96ZZZZ_AL	23.8	1.15	1.42	23.8	1.26	0.00	1	AL
988F77	23.9	1.16	2.83	23.0	0.63	0.90	4	TP
9E68EY_AL	19.3	-1.92 *	2.47	19.5	-1.97 *	0.24	2	XX
ADTRKY	22.3	0.11	1.09	22.6	0.33	0.43	4	LP
C32VW3_AL	22.6	0.28	2.51	22.0	-0.07	0.42	4	AL
CD3JNY_AL	21.9	-0.15	1.85	22.1	-0.06	0.42	4	AL
CLYADG_AL	23.0	0.57	0.94	22.1	-0.03	1.04	4	AL
EHTP4D	22.5	0.25	1.96	22.5	0.25	0.61	4	LP
F2WWPQ	22.6	0.32	0.70 L	23.2	0.76	0.55	3	LP
GUDQQX	22.4	0.18	1.24	22.3	0.11	0.84	4	LP
KAD2NR	22.0	-0.09	1.26	22.3	0.09	0.48	4	LP
KMJVHP	23.6	1.00	1.97	23.6	1.09	0.47	4	GA
KPMQ2R	22.2	0.01	0.79 L	23.2	0.75	0.71	4	LP
M7P8ZP	19.5	-1.80	2.46	18.9	-2.38 *	0.84	4	GA
N9QPJ4_AL	22.4	0.16	1.98	21.9	-0.17	0.73	3	AL
NDKJG6_AL	21.8	-0.22	2.94	21.7	-0.36	0.21	2	AL
NH2R64	20.1	-1.36	1.23	19.3	-2.07 *	1.04	4	XX
QKEFBK_AL	25.5	2.25 *	0.87 L	23.5	0.98	1.75	3	AL
TQTWZZ	26.7	3.07 X	1.20	20.9	-0.93	10.12 H	4	LA
TZGWAH_AL	22.4	0.15	2.43	22.8	0.48	0.39	3	XX
UMT8WX	21.9	-0.17	1.96	24.7	1.89	2.35	4	GA
V7JHJX	23.0	0.59	1.63	22.0	-0.12	0.82	4	LP
W22MAD	21.6	-0.34	2.05	21.8	-0.26	0.40	4	LA
X629JV_AL	23.4	0.83	3.18	21.9	-0.15	1.04	4	AL
YQ9DEF	21.2	-0.63	1.69	21.5	-0.47	0.24 L	4	XX
YU8PAF_AL	21.5	-0.44	1.77	21.6	-0.39	0.35	3	XX



Containerboard Interlaboratory Testing Program  
Analysis 237

Report #607 (D)  
April 2020

**Air Resistance, 42 lb Linerboard - 42F2**

TAPPI Official Test Method T460

**Consensus (All Labs) Results**

Month Mean	22.13	Grand Mean	22.13
Avg SD	2.04	Avg SD Months	2.03
SD btwn Labs	1.49	SD btwn Labs	1.36
Labs Incl	33	Labs Incl	32

**Key to Instrument Codes Reported by Participants**

<b>AL</b>	L & W Autoline 400	<b>GA</b>	Gurley Precision #4340 Automatic Densometer
<b>LA</b>	L&W Autoline (237 Enrollment)	<b>LP</b>	L&W Air Permeance Tester SE 166
<b>TD</b>	TMI Gurley Densometer	<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 #607 (D)  
April 2020

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM11

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	
27XZXD	58.8	56.7	57.0	58.7	57.8	-0.13	3.3	1.1	56.1	-0.87	2.5	4.7	H 16	LC
2Q8Z7D	59.6	56.2	60.1	55.9	57.9	-0.07	4.1	2.2	58.1	0.22	4.3	2.2	16	LC
2RF897	57.5	57.5	H 58.2	56.7	57.5	-0.28	5.2	0.6	57.7	-0.02	4.7	0.8	16	TG
4F3M7P	58.2	57.7	57.2	57.0	57.5	-0.27	2.9	0.5	57.8	0.06	3.3	0.6	16	LD
6QT334	58.4	59.1	59.6	59.3	59.1	0.52	2.7	0.5	58.6	0.48	3.3	1.2	16	EM
7AK999	61.0	H 61.9	60.8	H 61.9	* 61.4	1.65	5.5	0.6	59.9	1.19	4.3	1.3	12	LD
7DM3BK	56.3	54.2	54.8	55.8	55.3	-1.38	3.1	1.0	54.7	-1.59	3.9	1.4	16	LZ
7ZG9GM	60.0	61.0	56.2	56.8	58.5	0.21	4.1	2.4	59.0	0.71	4.1	1.5	16	LD
8GYEK7	59.6	61.2	60.5	59.9	60.3	1.11	2.9	0.7	60.9	1.71	3.9	1.3	16	LD
8KYPF7	56.9	57.1	55.8	54.9	56.2	-0.93	3.9	1.0	55.5	-1.20	3.6	1.2	12	LD
8U23CZ	60.1	59.5	58.9	58.0	59.1	0.53	4.0	0.9	59.0	0.67	3.6	0.9	16	TJ
96ZZZZ	57.9	57.1	55.5	59.1	57.4	-0.33	4.0	1.5	59.5	0.96	4.2	2.8	16	LD
988F77	59.4	58.0	57.9	56.3	57.9	-0.07	3.9	1.3	56.8	-0.48	3.8	2.3	15	LD
9E68EY	54.7	54.5	55.6	54.4	54.8	-1.62	4.0	0.5	53.2	-2.40	* 4.0	2.0	16	LD
9RU4GX	55.2	55.7	56.4	55.2	55.6	-1.22	4.5	0.6	55.8	-1.01	3.5	0.9	16	LD
AFG4K4	61.1	61.1	L 61.4	L 61.0	61.2	1.54	1.7	0.2	L 61.4	2.01	* 3.5	0.8	16	TU
AFJPFK	60.9	56.7	54.4	56.6	57.2	-0.45	3.2	2.7	57.2	-0.27	3.4	2.2	16	LC
CBBKA2	59.8	62.4	L 64.0	*L 59.7	L 61.5	1.69	1.2	2.1	63.3	3.00	X 1.1	4.5	H 16	XX
EHTP4D	57.3	59.9	60.2	58.8	59.1	0.49	3.6	1.3	59.9	1.18	3.9	1.2	16	LD
FABEQC	54.8	56.3	56.0	57.7	56.2	-0.91	3.7	1.2	56.0	-0.94	3.1	2.3	16	EN
FDBUUU	57.4	57.6	56.0	55.7	56.7	-0.69	3.3	0.9	55.4	-1.23	3.3	2.2	16	EN
GUDQQX	57.5	58.1	57.0	56.5	57.3	-0.38	3.7	0.7	58.1	0.21	3.9	1.6	16	LZ
J2K8DN	56.8	61.1	59.6	58.0	58.9	0.40	3.8	1.9	56.8	-0.51	3.7	2.6	16	LD
JWUTV9	58.2	56.9	57.6	57.3	57.5	-0.28	2.9	0.5	57.9	0.09	3.0	0.7	16	LC
KAD2NR	No DATA	No DATA	No DATA	57.5	57.5	-0.27	2.1	0.0	56.9	-0.44	2.7	1.4	4	LD
KMJVHP	58.2	56.2	58.8	56.1	57.3	-0.36	3.6	1.4	58.1	0.21	3.3	1.9	16	LZ
KPMQ2R	60.6	58.2	59.3	56.6	58.7	0.30	3.7	1.7	58.1	0.20	3.4	1.5	16	LD
LAQV4R	56.9	59.0	L 56.7	L 57.0	57.4	-0.32	1.6	1.1	59.6	1.04	1.8	1.9	12	MB
LATGZ8	59.1	58.9	59.9	58.1	59.0	0.46	2.5	0.8	57.9	0.12	3.5	1.4	16	LD
M7P8ZP	59.6	59.3	64.1	* 60.9	61.0	1.45	4.0	2.2	60.6	1.54	4.1	2.2	15	LD
N296TK	60.7	60.8	L 60.7	L 60.7	60.7	1.32	1.6	0.1	L 60.5	1.49	2.0	0.3	L 16	LD
QKEFBK	77.7	X 57.8	58.0	59.5	63.3	2.57	* 3.6	9.7	H 59.5	0.98	4.0	5.0	H 16	LC
R8JN4L	53.9	* 58.0	No DATA	52.8	*H 54.9	-1.55	5.2	2.7	55.3	-1.28	4.2	1.9	15	MB
T9B24J	57.6	57.7	57.8	57.0	57.5	-0.27	3.3	0.4	57.5	-0.13	3.1	0.5	L 16	LD
TQWZZ	57.7	57.1	58.1	58.2	57.8	-0.14	4.5	0.5	56.0	-0.93	4.9	1.8	16	TU



Containerboard Interlaboratory Testing Program  
Analysis 240

Report #607 (D)  
April 2020

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM11

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	
U3248K	55.5 H	61.5 H	63.8 *	62.2 *H	60.7	1.33	6.6	3.6	65.4	4.12 X	5.3	4.0 H	16	EM
UMT8WX	51.0 X	53.4 *	56.7	56.1	54.3	-1.86	3.9	2.6	55.0	-1.43	3.4	1.9	16	LD
V7JHJX	59.4	59.3	59.2	59.6	59.4	0.65	3.7	0.2 L	58.5	0.41	3.3	1.1	16	LD
VDZ2VK	63.7 *	64.4 *	68.8 XH	67.6 X	66.1	4.00 X	5.3	2.5	65.0	3.93 X	4.6	1.8	16	LC
W22MAD	57.0	58.6	58.3	57.9	58.0	-0.06	2.5	0.7	57.9	0.09	2.5	0.6	16	LD
WMZBEE	56.7	55.1	56.2	55.4 H	55.8	-1.11	4.9	0.7	57.2	-0.28	3.9	1.6	16	EM
X629JV	62.3 *	58.9	58.3	60.9	60.1	1.02	4.0	1.8	60.2	1.32	4.0	2.0	16	LZ
YZYYJD	57.6	60.6	58.1	59.6	59.0	0.45	3.7	1.4	57.9	0.09	4.0	1.4	16	LD
Z6B27A	56.9	54.0	54.6 H	54.6	55.0	-1.51	4.4	1.3	56.2	-0.80	3.6	1.4	16	TH
ZEXZWE	57.8 L	55.3	55.5 L	55.9	56.1	-0.95	2.2	1.2	55.4	-1.21	2.8	1.6	16	LD
ZFPYBD	57.7 L	57.6 L	57.5 L	57.5 L	57.5	-0.26	1.3	0.1 L	57.8	0.05	1.3	0.4 L	16	LD

Consensus (All Labs) Results												
Wk Mean	58.28	58.21	58.19	57.67	Month Mean	58.06	Grand Mean	57.70				
Avg SDr	3.84	3.79	3.55	3.59	Avg SD	3.69	Avg SD	3.57				
SD btwn Labs	2.06	2.41	2.40	2.11	SD btwn Labs	2.02	SD btwn Labs	1.86				
Labs Includ	43	45	43	45	SD btwn Wks	2.04	SD btwn Wks	1.89				
Labs Exclcd	2	0	1	1	Labs Includ	45	Labs Includ	43				
Labs not Rcvd	1	1	2	0								

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	EN	Emerson 2200 Series
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TG	TMI Compression Tester, Model 17-10	TH	TMI Compression Tester, Model 17-76
TJ	TLS Compression Tester, Model CDM-5	TU	TMI Universal Crush Tester (TMI K440)
XX	Instrument make/model not specified by lab		





Containerboard Interlaboratory Testing Program  
Analysis 250

Report #607 (D)  
April 2020

Fluted Edge Crush Strength (FCF), 26 lb Corrugating Medium - CM11

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
2Q8Z7D	69.7	68.4	66.5	67.6	68.1	-0.06	3.3	1.4	69.1	0.41	3.3	1.6	16	LC
6E42TN	65.7	69.1	67.2	69.8	68.0	-0.09	3.9	1.9	67.0	-0.36	3.7	1.6	16	LD
8GYEK7	70.1	70.4	70.7	67.6	69.7	0.54	4.2	1.4	71.2	1.11	3.6	1.8	16	LD
8KYPF7	69.2	68.6	68.5 H	68.2	68.6	0.15	3.9	0.4	64.3	-1.29	3.7	7.0 H	12	LD
96ZZZZ	64.0	69.0	69.3	67.3	67.4	-0.28	3.9	2.4	67.6	-0.12	4.0	1.4	16	LD
988F77	66.2	70.6	69.1	67.6	68.4	0.05	3.2	1.9	69.3	0.45	3.9	1.8	15	LD
9E68EY	74.4 *	73.2	72.3	72.3	73.1	1.73	3.7	1.0	72.1	1.45	3.5	1.5	8	LD
CBBKA2	69.2 L	72.2 L	69.6 L	73.1 L	71.0	1.01	1.1	1.9	69.7	0.59	1.1	2.1	16	XX
EHTP4D	70.2	73.7	73.2	72.3	72.4	1.47	4.7	1.5	72.0	1.41	3.9	1.1	16	LD
FABEQC	64.6 H	62.3 *	64.0	62.8	63.4	-1.71	3.8	1.1	63.7	-1.51	3.1	1.9	16	XX
JWUTV9	67.4	67.9	68.1	68.6	68.0	-0.08	3.5	0.5	68.1	0.04	4.0	0.6 L	16	LD
KAD2NR	No DATA	No DATA	No DATA	66.7	66.7	-0.56	4.2	0.0	62.6	-1.90 *	3.3	2.8	4	LD
KPMQ2R	66.3	68.2	68.0	64.0	66.6	-0.57	3.3	2.0	67.2	-0.27	3.1	2.1	16	LD
LAQV4R	61.8 *	62.0 *L	62.2 *L	62.4 *L	62.1	-2.19 *	1.3	0.3 L	64.2	-1.35	1.3	1.6	12	MB
LATGZ8	70.4	69.1	67.5 L	68.5	68.9	0.24	2.0	1.2	67.5	-0.18	3.1	1.7	16	LD
QKEFBK	57.8 X	55.4 XH	73.0	71.5	64.4	-1.35	6.4	9.1 H	65.6	-0.84	6.5	6.2 H	16	XX
V7JHJX	72.5	73.8	71.7 H	74.8 *	73.2	1.76	4.6	1.4	73.3	1.85	4.2	1.9	16	LD
W22MAD	68.6	68.2	68.3	69.2	68.6	0.13	3.5	0.4	68.6	0.21	2.9	0.5 L	16	LD
X629JV	65.9	69.5 H	69.2	68.6	68.3	0.02	4.1	1.7	68.9	0.33	3.4	1.5	16	LZ
YQ9DEF	68.2	67.7	68.1 L	66.9 L	67.7	-0.18	1.7	0.6	67.5	-0.17	2.0	1.0	16	LZ
ZFPYBD	68.2	68.2	68.1	68.0	68.1	-0.04	2.2	0.1 L	68.4	0.13	1.9	0.3 L	16	LD

Consensus (All Labs) Results														
Wk Mean	68.03	69.06	68.72	68.46	Month Mean	68.21			Grand Mean	67.98				
Avg SDr	3.32	3.38	3.66	3.34	Avg SD	3.65			Avg SD	3.49				
SD btwn Labs	3.04	3.14	2.73	3.17	SD btwn Labs	2.81			SD btwn Labs	2.84				
Labs Incl	19	19	20	21	SD btwn Wks	2.44			SD btwn Wks	2.55				
Labs Excl	1	1	0	0	Labs Incl	21			Labs Incl	21				
Labs not Rcvd	1	1	1	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
- XX Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 255  
**Ring Crush (RCT), 26 lb Corrugating Medium - CM11**  
 TAPPI Official Test Method T822

**Report #607 (D)**  
**April 2020**

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
27XZXD	49.0	50.8 *	49.5 *	46.2	48.9	1.82	2.9	1.9	51.2	2.39 *	5.1	5.8 H	16	LC
2Q8Z7D	44.3	44.3	42.4	43.3	43.6	0.24	3.4	0.9	42.9	0.07	3.6	1.2	16	LC
7AK999	44.5	43.5	44.5	44.8	44.3	0.46	3.4	0.6	45.1	0.67	3.2	0.7	12	LD
7CC6X3	45.4	45.4	45.1	45.3	45.3	0.74	2.8	0.1 L	45.9	0.91	3.6	1.0	16	LZ
7ZG9GM	43.9	44.9	42.6	46.2	44.4	0.48	4.1	1.5	45.0	0.65	3.4	1.4	16	LD
8GYEK7	46.9	47.0	45.5	46.0	46.4	1.07	3.1	0.7	45.6	0.81	3.7	1.4	16	LD
8KYPF7	42.3	42.3	42.2 L	41.2	42.0	-0.23	3.2	0.5	41.1	-0.45	3.3	1.5	12	LD
988F77	47.6	46.1	44.7	44.7	45.8	0.90	2.4	1.4	43.3	0.18	3.1	2.5	15	LD
AFG4K4	40.8 L	40.8 L	41.5	40.9	41.0	-0.54	1.6	0.3	40.5	-0.61	1.7	0.7	16	TU
BMDLAZ	34.3 *H	35.3 *H	35.1 *H	35.1 XH	34.9	-2.34 *	7.5	0.5	35.8	-1.94 *	6.6	2.4	16	TX
J2K8DN	42.0	44.0	45.2 L	45.6	44.2	0.42	3.2	1.6	44.7	0.56	3.5	1.8	16	LD
KMJVHP	44.0	42.3	44.0	44.0	43.6	0.23	3.0	0.9	43.2	0.15	2.7	1.2	16	LD
KPMQ2R	42.8	38.9	43.3	42.1	41.8	-0.30	3.5	2.0	42.0	-0.19	3.3	1.2	16	LD
LAQV4R	39.1 L	38.1	41.0 L	41.6	39.9	-0.85	1.6	1.6	39.9	-0.78	1.4	1.1	12	MB
M7P8ZP	42.2	43.7	44.8	40.7 H	42.8	0.02	4.7	1.8	43.8	0.33	4.3	3.4	16	LD
N296TK	43.4	44.5	44.4	44.6	44.2	0.43	1.8	0.5	44.4	0.50	2.1	0.3 L	16	LD
QACXZH	40.0	46.5	42.3	42.0	42.7	-0.03	3.5	2.7 H	41.4	-0.35	3.5	2.0	16	LZ
T9B24J	43.3	43.2	44.0 L	43.5	43.5	0.22	1.9	0.3	42.9	0.08	2.0	0.8	16	LC
U3248K	42.9	43.7	43.7	46.4	44.2	0.42	3.8	1.5	42.6	-0.01	3.5	1.8	16	EM
V7JHJX	44.1	44.6	39.7 H	44.2	43.2	0.11	6.9	2.3	44.4	0.50	4.4	1.7	16	XX
VDZ2VK	35.0 *	34.7 *	34.6 *	36.4 X	35.2	-2.27 *	3.3	0.8	33.8	-2.48 *	3.0	3.0	16	XX
VZU6CH	42.6	43.0	43.8	45.3	43.7	0.26	2.6	1.2	44.3	0.46	3.0	1.5	16	TH
W22MAD	44.3	44.2	42.4	43.8	43.7	0.27	3.2	0.9	43.7	0.30	3.0	0.6	16	LD
WMZBEE	40.2	42.4	42.9	41.5	41.7	-0.31	3.2	1.2	40.8	-0.52	3.3	1.4	16	EM
Z6B27A	33.2 *	34.6 *	36.5 *	33.6 X	34.4	-2.49 *	2.2	1.5	35.0	-2.16 *	2.4	1.8	16	TH
ZEXZWE	45.1	43.4	46.7	45.1	45.1	0.68	3.0	1.3	44.8	0.61	3.4	1.8	16	LD
ZRJDBA	44.9	43.0	44.9	46.1	44.7	0.58	3.6	1.3	43.8	0.32	4.7	2.2	12	LZ

Consensus (All Labs) Results														
Wk Mean	42.52	42.79	42.85	43.96	Month Mean	42.78			Grand Mean	42.66				
Avg SDr	3.45	3.30	3.95	3.30	Avg SD	3.56			Avg SD	3.53				
SD btwn Labs	3.75	3.73	3.30	1.88	SD btwn Labs	3.35			SD btwn Labs	3.56				
Labs Incl	27	27	27	24	SD btwn Wks	1.34			SD btwn Wks	2.02				
Labs Excl	0	0	0	3	Labs Incl	27			Labs Incl	27				
Labs not Rcvd	0	0	0	0										



Containerboard Interlaboratory Testing Program  
Analysis 255  
**Ring Crush (RCT), 26 lb Corrugating Medium - CM11**  
TAPPI Official Test Method T822

**Report #607 (D)**  
**April 2020**

**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>TH</b>	TMI Compression Tester, Model 17-76
<b>TU</b>	TMI Universal Crush Tester (TMI K440)	<b>TX</b>	TMI Digital Crush Tester (model not specified)
<b>XX</b>	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 261

Report #607 (D)

April 2020

STFI, 26 lb Corrugating Medium - CM11

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	
2Q8Z7D	13.4	13.9	13.6	14.3	13.8	0.64	1.1	0.4	13.7	0.09	1.2	0.4	16	LU
46XUDN	12.8	13.7	12.4 *	13.1	13.0	-1.31	1.0	0.5	13.4	-0.79	1.1	0.6	16	LA
4F3M7P	14.1	13.8	13.2	13.0	13.5	-0.03	0.8	0.5	13.6	-0.19	0.9	0.4	16	LB
6QT334	14.3	14.2	14.0	14.4	14.2	1.63	1.1	0.2	14.1	1.23	1.0	0.4	16	LH
7CC6X3	13.3	13.8	13.6	13.8	13.6	0.15	1.0	0.2	13.6	-0.16	1.0	0.4	16	LA
8KYPF7	14.4	14.6 *H	14.3	13.8	14.2	1.68	1.0	0.3	14.2	1.47	1.1	0.3	12	LA
8U23CZ	13.5	13.1	13.0	13.3	13.2	-0.75	0.8	0.2	13.5	-0.47	0.7	0.3	16	TT
96ZZZZ	14.1	13.8	14.0	13.5	13.8	0.66	1.0	0.3	14.0	0.79	1.0	0.3	16	LA
988F77	14.0	13.8	13.3	12.8	13.4	-0.23	1.2	0.5	13.1	-1.56	1.1	0.4	15	LB
9E68EY	14.0	14.0	13.4	13.8	13.8	0.63	1.0	0.3	13.8	0.51	1.0	0.3	16	LA
9RU4GX	13.4	13.8	13.4	13.4	13.5	-0.09	0.9	0.2	13.3	-0.90	0.9	0.3	16	LH
BMDLAZ	12.4 *	12.6 *	12.5	12.3	12.5	-2.57 *	0.9	0.1	12.4	-3.52 X	1.0	0.2	16	TT
CBBKA2	12.9	14.1	14.0	13.3	13.6	0.11	0.9	0.6	14.0	0.92	1.2	0.6	16	XX
FDBUUU	12.6	12.6 *	12.9	12.1 *	12.5	-2.42 *	1.2	0.3	12.7	-2.46 *	1.2	0.4	16	LH
J2K8DN	13.1	23.8 XH	22.7 XH	12.3 *	18.0	10.57 X	1.6	6.1 H	16.7	8.16 X	1.4	4.8 H	16	LZ
JWUTV9	14.2	14.2	13.2	13.5	13.8	0.49	0.8	0.5	13.6	-0.10	0.9	0.4	16	LB
KMJVHP	13.1 H	13.8	13.5	13.8	13.6	0.01	1.2	0.3	13.5	-0.39	1.1	0.3	16	LZ
M7P8ZP	13.2	13.5 L	13.4	13.9	13.5	-0.13	0.9	0.3	14.2	1.51	1.1	1.0	15	LA
R8JN4L	13.0	13.4	No DATA	14.3	13.6	0.02	1.2	0.6	13.5	-0.47	1.1	0.8	15	LA
T9B24J	13.4	13.3	14.6 *H	13.8 H	13.8	0.54	1.2	0.6	13.3	-1.06	1.0	0.6	16	LH
TQTWZZ	13.5	13.3	13.7	13.4	13.5	-0.15	1.1	0.2	14.0	1.02	1.9	1.2 H	16	LA
UMT8WX	13.7	14.0	13.4	13.7	13.7	0.34	1.0	0.2	14.1	1.23	1.2	0.6	16	LU
W22MAD	13.2	13.6	13.8	13.4	13.5	-0.14	1.0	0.3	13.6	-0.24	1.0	0.2	16	LB
ZFPYBD	13.6 L	13.7 L	13.5 L	13.5 L	13.6	0.06	0.4	0.1	13.7	-0.02	0.5	0.2	16	LA
ZRJDBA	13.8	13.4	14.2	14.1	13.9	0.86	1.2	0.4	13.7	0.04	1.1	0.6	12	LA

Consensus (All Labs) Results													
Wk Mean	13.47	13.65	13.53	13.45	Month Mean	13.54			Grand Mean	13.66			
Avg SDr	1.06	1.03	0.94	0.98	Avg SD	1.01			Avg SD	1.08			
SD btwn Labs	0.53	0.46	0.54	0.61	SD btwn Labs	0.42			SD btwn Labs	0.37			
Labs Incl	25	24	23	25	SD btwn Wks	0.38			SD btwn Wks	0.54			
Labs Excl	0	1	1	0	Labs Incl	24			Labs Incl	23			
Labs not Rcvd	0	0	1	0									



Containerboard Interlaboratory Testing Program  
Analysis 261  
**STFI, 26 lb Corrugating Medium - CM11**  
TAPPI Official Test Method T826

**Report #607 (D)**  
**April 2020**

**Key to Instrument Codes Reported by Participants**

LA	L&W Autoline	LB	L&W Model 152
LH	L&W 282	LU	L&W 52 without moisture correction (was 53)
LZ	L&W (model not specified)	TT	TMI Short Span Compression, 17-34 (MB K455)
XX	Instrument make/model not specified by lab		