



## Containerboard Interlaboratory Testing Program

Participant Summary Report #638 (M) - November 2022

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<a href="#"><u>201</u></a>	<a href="#"><u>BX16</u></a>	<a href="#"><u>Top to Bottom Box Compression Strength, Corrugated Boxes</u></a>
<a href="#"><u>202</u></a>	<a href="#"><u>EC14</u></a>	<a href="#"><u>Edgewise Compressive Strength, by T811, Corrugated Board</u></a>
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<a href="#"><u>206</u></a>	<a href="#"><u>56G3</u></a>	<a href="#"><u>Bursting Strength (Mullen), 56 lb Linerboard</u></a>
<a href="#"><u>215</u></a>	<a href="#"><u>42H1</u></a>	<a href="#"><u>Ring Crush, 42 lb Linerboard</u></a>
<a href="#"><u>216</u></a>	<a href="#"><u>56G3</u></a>	<a href="#"><u>Ring Crush, 56 lb Linerboard</u></a>
<a href="#"><u>223</u></a>	<a href="#"><u>42H1</u></a>	<a href="#"><u>STFI, 42 lb Linerboard</u></a>
<a href="#"><u>224</u></a>	<a href="#"><u>56G3</u></a>	<a href="#"><u>STFI, 56 lb Linerboard</u></a>
<a href="#"><u>228</u></a>	<a href="#"><u>42H</u></a>	<a href="#"><u>Roughness - Stylus Method, 42 lb Linerboard</u></a>
<a href="#"><u>229</u></a>	<a href="#"><u>42H1</u></a>	<a href="#"><u>Roughness - Sheffield Method, 42 lb Linerboard</u></a>
<a href="#"><u>231</u></a>	<a href="#"><u>42H</u></a>	<a href="#"><u>Internal Bond, 42 lb Linerboard</u></a>
<a href="#"><u>234</u></a>	<a href="#"><u>42H</u></a>	<a href="#"><u>COF Inclined Plane (Slide Angle), 42 lb Linerboard</u></a>
<a href="#"><u>237</u></a>	<a href="#"><u>42H1</u></a>	<a href="#"><u>Air Resistance, 42 lb Linerboard</u></a>
<a href="#"><u>240</u></a>	<a href="#"><u>CM12</u></a>	<a href="#"><u>Flat Crush Strength (CMT), 26 lb Corrugating Medium</u></a>
<a href="#"><u>250</u></a>	<a href="#"><u>CM12</u></a>	<a href="#"><u>Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium</u></a>
<a href="#"><u>255</u></a>	<a href="#"><u>CM12</u></a>	<a href="#"><u>Ring Crush (RCT), 26 lb Corrugating Medium</u></a>
<a href="#"><u>261</u></a>	<a href="#"><u>CM12</u></a>	<a href="#"><u>STFI, 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; 35 lb. and 56 lb. - alternate months. The participants return their test results for analysis and receive a monthly report.

Please refer to the section, "EXPLANATION OF TABLES", for definitions of terms and guidelines to interpreting the results.

USE OF AVERAGE MEAN AS A COLLABORATIVE REFERENCE VALUE

The samples of linerboard and corrugating medium, which have been randomized and placed in sealed packages for distribution in this program, may be used as collaborative reference materials. The values most representative of each material are the Cumulative Grand Means in the latest reports, given at the bottom right of each table. Comparisons can only be made within one lot of material; therefore check your measurements against the Cumulative Grand Means with the same lot code as on the packages being tested.

<b>Material</b>	<b>Lot Code</b>	<b>Dates in Use</b>
26# Corrugating Medium	CM12	July 2021 - Current
	CM11	April 2019 - June 2021
35# Corrugating Medium	35E3	June 2022 - Current
	35E2	June 2020 - April 2022
42# Corrugating Medium	42H1	April 2022 - Current
	42F4	August 2021 - March 2022
56# Corrugating Medium	56G3	July 2022 - Current
	56G2	May 2021 - May 2022

**ABOUT CTS**

Founded in 1971, Collaborative Testing Services, Inc. (CTS) is a privately-owned company that specializes in interlaboratory tests for a wide variety of industries, including rubber, plastics, fasteners and metals, containerboard, paper, color, agriculture, hemp, and wine, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality control objectives. Labs from the U.S., as well as more than 100 countries, currently participate in the CTS programs.

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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 #638 (M)  
November 2022

Top to Bottom Box Compression Strength, Corrugated Boxes - BX16

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2UK2VZ	666.0	-0.16	58.55	671.6	0.13	6.83	4	LG
6YJEE3	717.8	0.76	59.71	703.3	1.33	35.63	4	EX
9KVJGU	625.6	-0.88	32.07	638.5	-1.12	10.89	4	LG
B74JW6	664.2	-0.19	50.53	691.5	0.89	26.99	4	LO
E4LP97	637.0	-0.68	26.92	652.6	-0.58	20.18	4	ES
ECFV28	625.9	-0.88	54.84	642.6	-0.96	26.28	4	ER
F2UZDR	621.4	-0.96	19.74	647.3	-0.79	26.91	4	EX
FMD622	741.5	1.18	30.64	722.3	2.05 *	37.30	4	ER
GJ4JKF	652.0	-0.41	33.01	651.9	-0.61	72.49	4	LL
GLW7JX	788.8	2.02 *	40.61	776.8	4.11 X	23.29	3	LH
GN6LQ4	701.7	0.47	59.09	696.4	1.07	12.69	4	LS
GXQM9Y	796.7	2.16 *	93.08 H	663.3	-0.18	99.91 H	4	ET
JDG73R	635.9	-0.70	26.50	642.0	-0.99	9.13	4	LS
JYUY7Q	626.8	-0.86	7.21 L	646.1	-0.83	41.41	4	LL
LD7EYZ	682.4	0.13	65.77	680.7	0.48	17.11	4	EX
LWFE82	681.9	0.12	26.60	682.6	0.55	24.22	4	LG
NGFBJT	666.6	-0.15	17.09	671.2	0.12	53.58	4	LS
P3FUAK	722.2	0.84	46.66	635.4	-1.23	72.93	4	LS
P8MMYA	639.2	-0.64	98.77 H	636.6	-1.19	23.37	4	ER
PEPMKX	709.4	0.61	34.35	689.0	0.79	32.74	4	ER
QCXXPJ	666.4	-0.16	34.84	652.4	-0.59	24.15	4	ER
QMG8HJ	693.2	0.32	22.21	668.3	0.01	41.44	4	EX
QVTNPJ	655.9	-0.34	37.28	664.8	-0.12	37.11	4	TE
RJB46M	679.8	0.08	84.86	725.1	2.16 *	32.17	4	TB
RKLDP8	791.4	2.07 *	24.82	814.1	5.53 X	37.90	4	EM
RP2F34	532.8	-2.53 *	36.02	531.5	-5.16 X	10.70	4	LL
VUFMQD	628.7	-0.83	24.98	629.7	-1.45	22.66	4	LM
XJEUKJ	642.1	-0.59	61.98	660.2	-0.30	13.36	4	LM
XXDLHG	693.2	0.32	25.87	670.9	0.11	29.34	4	LG
XYPHP8	667.7	-0.13	28.40	700.6	1.23	29.71	4	EX

Consensus (All Labs) Results

Month Mean	675.14	Grand Mean	668.02
Avg SD	47.57	Avg SD Months	38.69
SD btwn Labs	56.18	SD btwn Labs	26.43
Labs Incd	30	Labs Incd	27



Containerboard Interlaboratory Testing Program  
Analysis 201

Report #638 (M)  
November 2022

**Top to Bottom Box Compression Strength, Corrugated Boxes - BX16**

TAPPI Official Test Method T804

**Consensus By Method**

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	673.83	30.02	1.31	8
Water based adhesive sealing	791.40	0.00	116.26	1
Clip sealing	666.53	58.84	8.61	20
Staple sealing	741.50	0.00	66.36	1

**Key to Instrument Codes Reported by Participants**

EM	Emerson 1200	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	LO	Lansmont 152-30k
LS	Lansmont Squeezer	TB	TMI Monitor/Compression Tester, Model 17-70
TE	Testometric M500 - 25 KN		



**Containerboard Interlaboratory Testing Program**  
 Analysis 202  
**Edgewise Compressive Strength, by T811, Corrugated Board - EC14**  
 TAPPI Official Test Method T811

**Report #638 (M)**  
**November 2022**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2UK2VZ	37.9	-0.82	1.85	37.3	-0.93	0.64	4	LE
8LMAWF	37.8	-0.85	0.70 <b>L</b>	38.3	-0.59	0.56	4	TS
DMZWVW	47.2	2.25 *	1.67	43.5	1.20	2.49	4	XX
E2YXD4	42.0	0.53	2.38	44.5	1.55	5.05 <b>H</b>	3	XX
ECFV28	39.3	-0.37	2.78	37.1	-1.01	2.90	4	EN
GCC3CY	43.3	0.94	2.30	43.3	1.12	0.00	1	EM
LD7EYZ	38.8	-0.55	1.28	38.9	-0.37	1.00	4	LC
NGFBJT	38.4	-0.66	1.21	37.2	-0.97	1.49	4	LD
QMG8HJ	41.0	0.21	1.01	41.6	0.54	0.54	4	LC
RGTZGP	38.3	-0.68	1.60	38.4	-0.54	0.11 <b>L</b>	4	LD

Consensus (All Labs) Results			
Month Mean	40.40	Grand Mean	40.00
Avg SD	1.79	Avg SD Months	2.22
SD btwn Labs	3.03	SD btwn Labs	2.91
Labs Incd	10	Labs Incd	10

**Key to Instrument Codes Reported by Participants**

- |  |   |
|--|---|
| <b>EM</b> Emerson 1200 Series<br><b>LC</b> L&W Crush Tester 48<br><b>LE</b> L&W Crush Tester 840<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>TS</b> TMI Digital Crush Tester, Model 17-56 |
|--|---|



**Containerboard Interlaboratory Testing Program**  
 Analysis 203  
**Edgewise Compressive Strength by T839, Corrugated Board - EC14**  
 TAPPI Official Test Method T839

**Report #638 (M)**  
**November 2022**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2UK2VZ	39.9	-0.76	1.53	41.8	-0.26	1.44	4	LY
42PLXV	39.5	-0.89	1.35	38.7	-1.97 *	1.18	4	BU
4AKRRW	45.2	1.06	1.01	45.7	1.89	0.80	4	TU
63JRVZ	34.4	-2.64 *	1.32	31.9	-5.75 X	3.52	2	TD
6YJEE3	41.9	-0.09	1.48	41.3	-0.55	0.81	4	CT
6YJGZZ	42.7	0.20	0.90	41.8	-0.29	1.10	4	LC
8LMAWF	40.6	-0.52	0.87	41.4	-0.48	0.95	4	TS
B74JW6	43.1	0.33	1.38	40.7	-0.88	1.75	4	LD
BHX24X	43.6	0.51	1.57	44.6	1.30	0.76	4	TG
CHA6BU	41.9	-0.07	2.42	35.9	-3.53 X	7.58 H	4	XX
DMZWVW	46.7	1.59	1.91	43.6	0.71	2.31	4	XX
E4LP97	42.9	0.27	0.88	43.3	0.58	0.33	4	LD
ECFV28	43.0	0.31	1.26	41.9	-0.23	1.24	4	EN
F2UZDR	37.2	-1.69	2.44	40.2	-1.15	2.81	4	LD
FMD622	43.7	0.54	2.11	42.2	-0.03	2.39	4	LD
G8BXHQ	35.5	-2.29 *	1.86	36.3	-3.32 X	1.56	3	TK
GLW7JX	40.8	-0.45	0.87	43.0	0.39	2.03	3	EM
GXQM9Y	42.9	0.27	0.87	41.6	-0.37	1.33	4	TD
HLT9KL	147.9	36.40 X	3.11 H	147.9	58.71 X	0.00	1	LD
JDG73R	41.0	-0.39	1.40	39.5	-1.57	1.87	4	EM
JYUY7Q	40.9	-0.43	0.83	41.2	-0.60	0.38	4	BU
KUZMJT	49.3	2.47 *	1.82	46.1	2.14 *	2.79	4	LC
LD7EYZ	41.1	-0.33	1.49	41.9	-0.24	1.87	4	LC
LWFE82	47.8	1.97 *	1.05	45.5	1.78	2.04	4	MK
M96YKA	43.4	0.46	1.12	45.5	1.79	1.67	4	TH
NGFBJT	43.0	0.31	1.06	42.5	0.11	0.87	4	LD
P3FUAK	45.4	1.13	1.35	43.0	0.40	1.97	4	EM
P8MMYA	41.6	-0.19	1.29	41.4	-0.49	0.21 L	4	EM
PEPMKX	42.3	0.07	1.49	42.5	0.12	0.62	4	LD
QCXXPJ	39.6	-0.85	1.28	40.6	-0.96	1.24	4	LD
QMG8HJ	43.5	0.49	1.32	44.0	0.96	0.43	4	LC
RGTZGP	41.9	-0.06	1.44	42.5	0.10	0.88	4	LD
RJB46M	45.3	1.11	0.46 L	44.3	1.12	0.82	4	LD
RKLDP8	39.2	-0.99	3.99 H	40.9	-0.74	1.39	4	TH
RP2F34	39.1	-1.02	3.45 H	39.9	-1.34	1.09	4	LC
RZH8M8	42.9	0.29	1.75	43.3	0.57	0.65	4	TS
VUFMQD	41.2	-0.32	2.09	40.9	-0.77	2.27	4	TG
XJEUKJ	42.1	-0.01	1.75	43.3	0.56	0.88	4	EM
XXDLHG	40.4	-0.59	1.34	41.7	-0.30	1.20	4	EM





**Containerboard Interlaboratory Testing Program**  
Analysis 203

**Report #638 (M)**  
**November 2022**

**Edgewise Compressive Strength by T839, Corrugated Board - EC14**

TAPPI Official Test Method T839

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
XYMV78	41.2	-0.32	0.84	39.3	-1.67	1.94	3	XX
XYPHP8	45.7	1.22	1.85	42.8	0.31	1.96	4	TL
ZZB499	42.9	0.28	1.48	42.4	0.05	1.08	4	LD

Consensus (All Labs) Results				
Month Mean		42.10	Grand Mean	42.28
Avg SD		1.65	Avg SD Months	1.51
SD btwn Labs		2.91	SD btwn Labs	1.80
Labs Incl		41	Labs Incl	38

**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>MK</b> Mark-10 ESM303
<b>TD</b> TMI Digital Crush Tester, Model 17-09	<b>TG</b> TMI Digital Crush Tester, 17-76
<b>TH</b> TMI Monitor/Compression Tester, Model 17-76	<b>TK</b> TLS Compression Tester, Model 5184
<b>TL</b> Tech-Lab Systems Compression	<b>TS</b> TMI Digital Crush Tester, Model 17-56
<b>TU</b> TMI Universal Crush Tester (TMI K440)	<b>XX</b> Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 205  
**Bursting Strength (Mullen), 42 lb Linerboard - 42H1**  
 TAPPI Official Test Method T807

**Report #638 (M)**  
**November 2022**

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	
2Q4JUJ_AL	115.3	116.3	120.2	117.1	117.2	0.07	11.0	2.1	115.9	-0.22	10.6	2.8	16	AL
2UK2VZ	122.2	121.4	125.2	125.8 *	123.7	1.60	7.8	2.2	121.0	1.42	8.1	3.8	16	AH
42B7VF	114.0	114.9	112.4	113.7	113.8	-0.75	7.8	1.0	111.7	-1.56	9.8	2.2	16	LC
4R6HQV	120.0	124.6	118.2	114.0	119.2	0.54	6.0	4.4	120.4	1.21	7.5	3.0	16	AC
6YJEE3	120.0	115.5	117.0	120.5	118.3	0.32	9.0	2.4	119.0	0.78	9.3	3.5	16	XX
7G2QP9	122.3	121.5	123.1	115.8	120.7	0.90	10.5	3.3	117.8	0.39	10.2	8.9 H	16	LA
89GXQU	117.6	117.7	117.8	118.0	117.8	0.20	10.2	0.2 L	118.4	0.57	12.7	4.0	16	LJ
8ADMUB	116.9	111.1	118.1 H	124.0	117.5	0.15	11.5	5.3	117.3	0.22	11.0	4.0	16	LB
8MGXFC	130.6 *	123.0	121.6	124.6	125.0	1.91	8.0	4.0	123.8	2.30 *	8.7	3.6	16	AX
9NAD3T_AL	114.3	118.4	119.4	115.8	117.0	0.01	6.9	2.3	115.6	-0.32	7.6	4.6	16	AL
9VTFBV_AL	111.9	122.7	115.1	No DATA	116.5	-0.09	9.9	5.6	116.4	-0.06	8.4	3.9	15	AL
BGMGYG_AI	116.9	122.8	118.9	114.4	118.3	0.32	9.4	3.5	120.4	1.22	9.9	3.1	16	AL
DMZWVW	117.5	115.1	117.9	115.7	116.5	-0.09	5.6	1.4	116.2	-0.14	6.3	2.0	16	LC
E4LP97	114.6	112.9	115.6	116.1	114.8	-0.50	8.8	1.4	114.2	-0.77	9.8	3.8	16	LA
ER9HJT	113.2	112.8	115.3	116.8 L	114.5	-0.57	4.9	1.9	117.1	0.17	6.3	4.4	16	LA
F2UZDR	116.4	122.0	No DATA	No DATA	119.2	0.54	8.7	4.0	118.3	0.54	10.0	2.6	14	AH
FVBNM7	112.0	110.7	114.4	115.2	113.1	-0.91	5.7	2.1	113.5	-0.98	8.3	3.4	16	LC
FW6C62	113.0	113.5	No DATA	107.3	111.3	-1.34	12.6	3.4	111.2	-1.72	9.0	3.1	15	ME
G98AHZ	123.7	118.7	115.6	116.3	118.6	0.40	8.8	3.7	119.0	0.76	9.5	3.4	16	LC
G9UVWC_AL	109.5	109.1	112.5	111.5	110.7	-1.49	9.4	1.6	117.0	0.13	10.1	4.5	16	AL
HJA6ZV_AL	123.3	120.3	125.0	116.9	121.4	1.06	7.6	3.6	120.4	1.21	7.5	3.1	16	AL
HLR9NT	116.1	118.0	No DATA	No DATA	117.1	0.03	6.9	1.3	116.3	-0.07	6.8	1.4	14	AH
J6HQ9D	109.2	109.6	108.3	110.8	109.5	-1.76	7.1	1.1	111.1	-1.73	6.1	1.7	16	XX
KBQH4W	118.2	121.6	118.7	119.7	119.6	0.63	7.4	1.5	119.0	0.76	7.5	2.0	16	LA
KQZDDX	128.2 *	127.9 *	128.5 *L	128.5 *L	128.3	2.70 *	3.7	0.3 L	128.4	3.75 X	3.7	1.3	16	AH
NGFBJT	116.0	117.1	120.7	117.3	117.8	0.21	7.1	2.0	115.6	-0.30	8.4	3.5	16	LA
PEPMKX	117.5	118.1	118.0	115.5	117.3	0.09	8.1	1.2	116.2	-0.11	7.8	3.3	16	AH
PPP6AE	119.8	119.1	120.6	118.8	119.6	0.64	9.0	0.8	117.2	0.19	9.1	2.9	16	TP
PPP6AE_AL	111.6	111.1	111.3	111.8	111.4	-1.30	6.9	0.3 L	110.7	-1.85	7.0	1.4	16	XX
QCXXPJ	111.3	112.1	108.9	112.8	111.3	-1.34	8.9	1.7	110.9	-1.80	9.6	4.3	16	LZ
QMG8HJ	122.1	125.1	116.3	119.7	120.8	0.92	9.1	3.7	115.7	-0.29	9.2	5.1	16	AH
RALDKF_AL	113.3	112.6	113.8	114.1	113.4	-0.82	6.8	0.6	116.8	0.06	8.3	3.5	16	AL
RGTZGP	109.0 L	116.2 L	109.8	105.3 *	110.1	-1.63	4.9	4.5	111.5	-1.61	7.0	3.1	16	LA
TWV72J	117.3	115.7	No DATA	No DATA	116.5	-0.10	7.5	1.1	115.8	-0.24	7.0	1.7	14	TP
UUMAUL	116.2	117.1	116.2	116.1	116.4	-0.12	9.7	0.5 L	116.8	0.07	6.4	0.6 L	16	LA



**Containerboard Interlaboratory Testing Program**  
 Analysis 205  
**Bursting Strength (Mullen), 42 lb Linerboard - 42H1**  
 TAPPI Official Test Method T807

**Report #638 (M)**  
**November 2022**

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	
UVLB3Y_AL	116.2	120.2	112.7	116.0	116.3	-0.15	7.9	3.1	118.9	0.73	7.4	3.2	16	AL
UWNF87_AL	116.5	119.1	No DATA	114.0	116.6	-0.09	9.3	2.5	116.4	-0.07	9.3	3.6	13	AL
V47777	103.6 *	108.8	110.4	109.0	108.0	-2.13 *	10.6	3.0	114.5	-0.65	10.8	7.9 H	8	RE
VCJ3BD	127.8	123.2	119.5	123.8	123.6	1.58	11.0	3.4	123.3	2.14 *	10.6	3.1	16	LC
VGTD7T	121.7	115.7	107.3 *	109.9	113.7	-0.77	8.2	6.4 H	113.8	-0.88	8.6	3.8	16	LA
VNF4UA_AL	126.9	113.9	118.7	115.3	118.7	0.42	10.3	5.9	119.7	1.00	9.4	3.4	16	AL
XGMV7K	114.6	117.8	110.5	111.4	113.6	-0.79	9.2	3.3	113.9	-0.86	9.5	2.6	16	LA
XN2QY9	116.7	116.1	116.8	116.3	116.5	-0.11	5.8	0.3 L	116.5	-0.04	5.4	0.3 L	16	LJ
YB23VL	119.3	115.6 L	115.7	118.4	117.3	0.08	8.2	1.9	116.7	0.04	9.0	2.5	16	TB
ZHRC8N_AL	112.5	113.1	112.6	111.0	112.3	-1.09	7.8	0.9	113.1	-1.09	9.8	5.9	16	AL
ZNYFHV	125.0	116.8	116.6	117.0	118.9	0.46	8.8	4.1	117.0	0.14	10.2	4.4	16	AH
ZNYFHV_AL	124.2	126.5 *	120.4	125.0	124.0	1.69	11.8	2.6	126.3	3.09 X	10.2	2.9	16	AL
ZZB499_AL	120.8	122.3	116.8	115.4	118.8	0.45	7.7	3.3	120.8	1.33	7.5	3.2	16	AK

Consensus (All Labs) Results									
Wk Mean	117.44	117.40	116.56	116.19	Month Mean	116.91	Grand Mean	116.58	
Avg SDr	8.89	8.41	8.07	8.65	Avg SD	8.53	Avg SD	8.78	
SD btwn Labs	5.54	4.71	4.64	4.87	SD btwn Labs	4.21	SD btwn Labs	3.16	
Labs Incl	48	48	43	44	SD btwn Wks	2.96	SD btwn Wks	3.72	
Labs Excl	0	0	0	0	Labs Incl	48	Labs Incl	46	
Labs not Rcvd	0	0	5	4					

**Key to Instrument Codes Reported by Participants**

AC	Perkins Model C	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)
ME	Messmer Automatic Burst Tester ME-06	RE	Regmed/Mullen Tester
TB	TMI Monitor/Burst 1000	TP	Technidyne PROFILE/Plus
XX	Instrument make/model not specified by lab		



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

**Report #638 (M)**  
**November 2022**

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	
2Q4JUJ_AL	115.0	119.1	125.8	115.5	118.9	0.68	10.7	5.0	116.8	0.22	11.2	4.2	12	AL
2UK2VZ	113.1	120.6	126.2	122.1	120.5	1.09	8.7	5.5	120.9	1.67	8.3	3.6	12	AH
42B7VF	117.4	115.4	116.3	115.1	116.1	-0.03	8.9	1.0	114.1	-0.74	9.0	3.2	12	LA
4R6HQV	127.7 *	148.4 X	143.1 X	139.8 X	139.8	5.90 X	12.8	8.8 H	138.2	7.73 X	13.5	6.1	12	AC
6YJEE3	111.5	123.0	117.0	114.5	116.5	0.09	9.9	4.9	117.3	0.39	10.0	3.6	12	XX
7G2QP9	119.0	120.0	120.0	114.2	118.3	0.53	9.8	2.8	119.0	1.00	9.6	4.2	12	LA
89GXQU	116.9	125.3	118.4	115.1	118.9	0.69	10.7	4.5	116.6	0.16	15.4	4.2	12	LZ
8ADMUB	110.6	115.2	117.1	120.0	115.7	-0.11	10.1	4.0	114.2	-0.70	11.0	4.2	12	LB
8MGXFC	125.2 *	121.8	128.6 *	122.2	124.5	2.07 *	7.7	3.2	121.4	1.84	8.8	3.7	12	XX
9NAD3T_AL	113.8	112.6	115.1	113.4	113.7	-0.61	7.0	1.0	115.2	-0.33	6.9	2.6	12	AL
9VTFBV_AL	118.8	127.1 *	117.8	No DATA	121.2	1.27	11.7	5.1	116.3	0.06	10.6	6.0	10	AL
BGMGYG_AI	114.4	109.9	109.8	122.3	114.1	-0.52	10.1	5.9	118.5	0.84	9.6	4.7	12	AL
E4LP97	116.0	117.0	116.2	110.5	114.9	-0.31	11.6	3.0	113.7	-0.86	10.5	2.6	12	LA
ER9HJT	120.6 L	121.6 L	122.0 L	124.0 L	122.1	1.47	2.6	1.4	119.4	1.15	5.6	4.9	12	LA
F2UZDR	118.0	120.4	No DATA	No DATA	119.2	0.76	9.3	1.7	117.6	0.51	9.4	3.1	10	AH
FVBNM7	111.7	111.0	118.7	110.1	112.9	-0.83	9.4	3.9	112.1	-1.42	9.6	3.3	12	LC
FW6C62	111.4	115.9	122.9	112.1	115.6	-0.15	12.0	5.3	113.9	-0.80	10.1	5.5	12	LA
G98AHZ	119.8	120.6	125.8	123.1	122.3	1.54	11.3	2.7	121.4	1.85	10.5	4.2	12	XX
G9UVWC_AL	109.1	108.8	105.6 *	112.8	109.1	-1.77	10.8	2.9	113.5	-0.92	11.8	4.8	12	XX
HJA6ZV_AL	122.1	117.8	114.9	119.5	118.6	0.61	8.6	3.0	118.8	0.95	8.5	2.6	12	AL
HLR9NT	115.3	114.8	No DATA	No DATA	115.1	-0.28	6.2	0.4	115.4	-0.27	8.0	1.5	10	AH
HLT9KL	110.0	115.9	112.2	109.1	111.8	-1.10	8.8	3.0	111.8	-1.54	9.0	3.2	12	LA
J6HQ9D	110.9	110.3	109.2	108.6	109.7	-1.61	8.6	1.0	110.2	-2.09 *	8.2	1.9	12	XX
KBQH4W	122.3	119.3	124.6	116.0	120.6	1.10	7.6	3.7	119.8	1.30	7.5	4.2	12	LA
KQZDDX	139.8 XL	139.7 XL	140.2 X	140.5 XL	140.1	5.98 X	3.9	0.4 L	140.0	8.40 X	3.4	0.5 L	12	AH
NGFBJT	118.1	118.6	114.8	121.2	118.2	0.50	9.8	2.6	118.3	0.74	9.6	2.4	12	LA
PEPMKX	115.7	128.3 *	121.4	114.2	119.9	0.94	8.0	6.4	119.1	1.02	9.4	5.0	12	AH
PPP6AE	118.6	121.3	119.3	122.2	120.4	1.05	11.3	1.7	117.2	0.37	10.2	3.3	12	TP
PPP6AE_AL	113.9	108.9	113.3	103.8 *	109.9	-1.55	8.9	4.7	110.1	-2.13 *	8.9	3.0	12	XX
QCXXPJ	113.1	120.4	116.1	113.9	115.9	-0.07	12.0	3.3	112.1	-1.41	11.4	4.9	12	LZ
QMG8HJ	120.2	120.1	118.7	118.4	119.4	0.80	12.0	0.9	116.0	-0.04	10.6	4.6	12	AH
RALDKF_AL	113.5	113.3	115.2	113.8	114.0	-0.55	11.8	0.9	116.9	0.28	12.0	3.3	12	AL
RGTZGP	109.4	109.8	110.2	110.8	110.0	-1.53	11.0	0.6	112.2	-1.39	8.8	2.5	12	LA
TWV72J	113.7	115.8	No DATA	No DATA	114.8	-0.35	8.3	1.5	115.4	-0.28	7.9	1.5	10	TP
UUMAUL	115.1	115.5	116.4	116.2	115.8	-0.09	6.6	0.6	116.2	0.01	5.4	1.1	12	LA



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

**Report #638 (M)**  
**November 2022**

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	
UVLB3Y_AL	115.9	107.6	110.2	115.4	112.3	-0.98	10.9	4.0	114.8	-0.49	9.8	3.8	12	AL
UWNF87_AL	120.3	117.9	No DATA	115.2	117.8	0.41	8.5	2.6	118.1	0.67	10.3	4.2	11	AL
V47777	114.2	102.8 *	112.8	106.8	109.2	-1.75	8.6	5.3	114.8	-0.47	10.4	5.9	12	RE
VCJ3BD	120.5	119.4 H	119.1	119.8	119.7	0.88	12.5	0.6	118.7	0.91	11.2	1.9	12	LC
VGTD7T	115.0	115.8	110.5	104.8	111.5	-1.16	10.5	5.1	111.8	-1.52	11.6	4.0	12	LA
VNF4UA_AL	124.6	121.3	119.1	113.6	119.6	0.87	12.2	4.6	118.4	0.79	11.2	3.9	12	AL
XGMV7K	109.6	113.9	108.8	101.1 *	108.4	-1.95 *	11.7	5.3	113.6	-0.91	10.6	5.7	12	LA
XN2QY9	116.1	116.8	116.1	116.0	116.2	0.02	5.8	0.4 L	115.9	-0.08	5.9	0.6 L	12	LJ
YB23VL	120.9	114.4 L	119.6	119.6	118.6	0.62	11.9	2.9	118.6	0.88	11.9	4.3	8	TB
ZHRC8N_AL	118.0	108.6	109.1	111.6	111.8	-1.08	8.8	4.3	117.0	0.29	8.8	6.9	12	AL
ZNYFHV	114.6 L	119.2	111.4	116.4	115.4	-0.19	11.9	3.3	116.7	0.21	11.4	3.2	10	AH
ZNYFHV_AL	119.9	115.6	109.3	114.5	114.8	-0.33	9.2	4.4	115.4	-0.28	9.5	3.2	10	AL
ZZB499_AL	121.2	122.4	120.5	115.3	119.9	0.92	8.4	3.1	117.8	0.57	8.1	3.9	12	AL

Consensus (All Labs) Results									
Wk Mean	116.43	116.76	116.57	114.88	Month Mean	116.16	Grand Mean	116.15	
Avg SDr	10.19	9.52	9.79	10.02	Avg SD	9.83	Avg SD	9.82	
SD btwn Labs	4.41	5.34	5.47	5.32	SD btwn Labs	4.00	SD btwn Labs	2.85	
Labs Incd	47	46	42	42	SD btwn Wks	3.56	SD btwn Wks	3.90	
Labs Exclcd	1	2	2	2	Labs Incd	46	Labs Incd	46	
Labs not Rcvd	0	0	4	4					

**Key to Instrument Codes Reported by Participants**

AC	Perkins Model C	AH	Perkins Model AH
AL	L & W Autoline 400	LA	L&W Bursting Strength Tester
LB	L&W Burst-O-Matic	LC	L&W Autoline (206 Enrollment)
LJ	L&W Bursting Strength Tester J-Type	LZ	L&W (model not specified)
RE	Regmed/Mullen Tester	TB	TMI Monitor/Burst 1000
TP	Technidyne PROFILE/Plus	XX	Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 215  
**Ring Crush, 42 lb Linerboard - 42H1**  
 TAPPI Official Test Method T822

**Report #638 (M)**  
**November 2022**

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
2Q4JUJ	98.1	93.8	91.7	92.8	94.1	-0.64	2.9	2.8	94.0	-0.76	3.4	2.1	16	LD
2UK2VZ	93.9	97.5	96.7	95.2	95.8	-0.22	2.7	1.6	95.9	-0.19	2.7	1.4	16	LG
42B7VF	94.0	96.5	97.3	96.4 L	96.0	-0.17	2.4	1.4	95.4	-0.36	2.4	1.4	16	LD
6RXKYW	101.1 L	102.1	95.3	96.8 L	98.8	0.50	2.8	3.3	99.7	0.91	2.7	3.0	16	LD
8ADMUB	96.8	97.7 L	99.8	95.5	97.4	0.17	3.0	1.8	98.8	0.64	3.2	3.6	16	LC
8MGXFC	93.2	97.2	92.1	93.4	94.0	-0.66	3.7	2.2	92.7	-1.14	4.1	2.3	16	LD
9VTFBV	99.5 H	101.4	100.1	97.7	99.7	0.70	5.9	1.5	102.7	1.80	5.1	2.6	16	LC
BHX24X	96.9	96.2	98.4	97.3	97.2	0.10	2.6	0.9	98.1	0.43	3.0	1.2	16	TH
ECFV28	88.9	90.2	93.1	94.3	91.7	-1.22	2.8	2.5	93.3	-0.98	2.7	1.8	16	EN
ER9HJT	103.4	103.1	104.3 L	103.9	103.7	1.66	2.4	0.5	101.5	1.46	2.8	2.9	16	TU
FVBNM7	102.3	94.9 L	95.7	102.1	98.8	0.48	2.8	4.0	98.5	0.57	3.3	2.2	16	LD
FW6C62	105.7	101.4	103.9	101.2	103.1	1.51	4.2	2.2	102.3	1.67	5.4	1.9	14	LX
G8BXHQ	93.5	93.3 L	93.6 L	93.3 L	93.4	-0.79	1.7	0.2 L	94.8	-0.54	1.6	1.2	16	MB
G98AHZ	105.1	100.7	103.2	103.4	103.1	1.53	3.1	1.8	101.1	1.32	3.3	3.6	16	MB
G9UVWC	93.2	92.2	91.5 L	95.1	93.0	-0.90	2.2	1.6	94.2	-0.71	2.5	1.2	16	LD
GCC3CY	97.2	97.0	94.7 L	97.9	96.7	-0.01	2.8	1.4	97.1	0.14	3.0	1.5	16	EM
HLT9KL	146.4XH	99.5 H	99.1 H	102.3 H	111.8	3.61 X	19.8	23.1 H	114.8	5.36 X	15.7	21.8 H	16	LB
J6HQ9D	106.7	108.3 *	102.9	106.7 *	106.2	2.26 *	3.5	2.3	100.3	1.09	4.1	4.8	16	TU
KBQH4W	92.9 L	91.7	90.9 L	93.8 L	92.3	-1.06	2.1	1.3	93.8	-0.82	3.0	2.2	16	LC
KQZDDX	91.6	92.3	91.7	91.7	91.8	-1.18	2.9	0.3 L	92.8	-1.12	2.6	1.7	16	LD
KUWZ7L	108.8 *	103.5	104.0 L	101.3	104.4	1.84	3.7	3.2	99.7	0.92	3.7	4.6	16	MB
KUZMJT	98.1	102.2	92.3 H	88.8	95.4	-0.33	6.7	6.0 H	81.5	-4.44 X	4.0	20.7 H	16	LC
LRRKGV	110.3 *	106.5 *	106.8 *	107.3 *	107.7	2.63 *	3.0	1.7	105.0	2.46 *	3.7	5.1 H	16	TU
NGFBJT	90.7	93.6	94.0	91.2 L	92.4	-1.04	3.1	1.7	94.5	-0.61	2.7	2.2	16	LD
NHDLEV	98.6	96.7 L	95.1 L	96.1 L	96.6	-0.03	2.1	1.5	96.6	0.01	2.1	1.5	4	TH
PEPMKX	92.7	98.8	98.9	93.9 L	96.1	-0.16	2.7	3.2	95.8	-0.24	2.8	1.7	16	LD
PPP6AE	95.3	95.9	95.5	97.3	96.0	-0.18	2.4	0.9	97.7	0.33	2.5	1.5	16	LD
QCXXPJ	92.0	96.1 L	97.3	94.8	95.1	-0.40	3.2	2.3	96.7	0.02	2.6	1.8	16	LD
QMG8HJ	96.6	96.8	97.7 L	96.3	96.8	0.03	2.6	0.6	97.0	0.12	2.7	1.2	16	LC
RALDKF	94.7	95.5	No DATA	99.7	96.6	-0.03	2.9	2.7	94.5	-0.61	3.1	3.0	15	LD
RGTZGP	92.4	93.0 L	93.0 L	94.0 L	93.1	-0.87	2.2	0.7	93.2	-0.99	2.1	1.0	16	LD
RTG77D	87.9	86.3 *	93.8	86.4 *	88.6	-1.95 *	5.4	3.5	91.0	-1.65	5.6	3.7	12	LD
TWV72J	96.1	94.6	No DATA	No DATA	95.3	-0.34	4.0	1.0	95.0	-0.46	3.2	1.5	14	TJ
UVLB3Y	92.8 H	95.9	96.1	98.5	95.8	-0.22	5.9	2.3	96.2	-0.12	5.5	2.1	16	LZ
V47777	105.0	101.6	101.2 L	104.8	103.1	1.53	3.6	2.0	103.5	2.04 *	3.7	2.8	16	EX



**Containerboard Interlaboratory Testing Program**  
 Analysis 215  
**Ring Crush, 42 lb Linerboard - 42H1**  
 TAPPI Official Test Method T822

**Report #638 (M)**  
**November 2022**

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
VCJ3BD	94.7	95.3	95.1	95.4	95.1	-0.38	3.1	0.3 L	94.2	-0.70	2.6	1.7	16	LD
VNF4UA	94.2	93.5	92.0	92.1	93.0	-0.90	3.9	1.1	91.9	-1.37	3.4	1.4	16	LD
XN2QY9	95.7	95.6	95.2 L	95.2 L	95.4	-0.31	2.0	0.3 L	95.6	-0.29	2.3	0.2 L	16	LD
XN4EH8	96.1 H	94.6	96.6	95.8	95.8	-0.23	4.8	0.8	93.2	-1.01	4.1	3.5	16	EM
YB23VL	90.4	95.9	96.9 L	94.8 L	94.5	-0.54	2.5	2.9	93.5	-0.92	3.0	3.7	16	LD
ZJKZQJ	98.7	97.2	95.1 L	96.0	96.7	0.00	1.9	1.6	96.7	0.05	1.9	1.6	4	TH
ZZB499	96.2	96.4 L	95.5	96.1	96.0	-0.18	2.4	0.4	95.3	-0.37	2.6	1.8	16	LD

Consensus (All Labs) Results														
Wk Mean	96.88	96.96	96.70	96.74	Month Mean	96.74			Grand Mean	96.59				
Avg SDr	3.35	4.66	5.07	4.87	Avg SD	3.39			Avg SD	3.30				
SD btwn Labs	5.39	4.31	4.08	4.53	SD btwn Labs	4.18			SD btwn Labs	3.40				
Labs Incl	41	42	40	41	SD btwn Wks	2.16			SD btwn Wks	2.51				
Labs Excl	1	0	0	0	Labs Incl	41			Labs Incl	40				
Labs not Rcvd	0	0	2	1										

**Key to Instrument Codes Reported by Participants**

EM	Emerson 1200	EN	Emerson 2200
EX	Emerson (model not specified)	LB	L&W Crush Tester 240
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LG	L&W 753	LX	L&W 506
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TH	TMI Compression Tester, Model 17-76	TJ	TLS Compression Tester, Model CDM-5
TU	TMI Universal Crush Tester (TMI K440)		



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

**Report #638 (M)**  
**November 2022**

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	
2Q4JUJ	135.5	134.6	133.3	L 130.7	133.5	-0.33	3.8	2.1	133.3	-0.43	3.8	2.2	11	LD
2UK2VZ	134.6	133.5	135.4	137.3	135.2	-0.01	3.1	1.6	133.7	-0.36	3.5	2.0	12	LY
42B7VF	135.5	135.9	134.8	L 136.8	135.7	0.09	3.1	0.8	134.6	-0.15	3.1	1.7	12	LD
6RXKYW	144.4	145.9 *	142.2	L 139.5	143.0	1.48	3.4	2.8	141.2	1.30	4.2	3.7	12	LD
8ADMUB	138.8	138.0	139.1	131.5	136.9	0.31	4.5	3.6	140.3	1.11	4.0	4.0	12	LC
8MGXFC	132.8	137.2	134.5	129.1	133.4	-0.36	5.3	3.4	133.7	-0.34	5.4	2.3	12	LD
9VTFBV	138.3	137.6	141.7	136.3	138.5	0.62	5.1	2.3	135.2	-0.01	8.6	7.9	12	LC
BHX24X	133.7	134.6	134.3	135.1	134.4	-0.16	4.0	0.6	133.9	-0.31	3.5	3.4	12	TH
ECFV28	128.1	129.0	129.2	126.1	128.1	-1.38	4.3	1.4	128.1	-1.60	4.0	2.5	12	EN
ER9HJT	137.0	136.0	140.5	138.5	L 138.0	0.53	3.0	1.9	138.0	0.59	3.4	2.9	12	TU
FVBNM7	144.2	135.7	136.6	139.1	138.9	0.70	4.2	3.8	139.3	0.89	5.3	3.8	12	LD
FW6C62	146.0 *	136.6	143.7	137.9	141.1	1.11	3.9	4.5	142.6	1.61	4.0	4.2	8	LY
G8BXHQ	135.7	L 135.1	L 135.1	L 135.8	L 135.4	0.03	1.8	0.4	L 137.5	0.48	1.7	1.5	12	MB
G98AHZ	142.1	133.7	135.5	140.7	138.0	0.53	4.8	4.0	136.8	0.34	4.8	4.2	9	MB
G9UVWC	131.0	132.9	L 128.3	L 133.5	131.4	-0.74	2.9	2.3	135.8	0.11	2.8	3.9	12	LD
GCC3CY	132.7	132.9	134.6	L 132.4	133.1	-0.40	3.5	1.0	132.8	-0.55	3.8	2.0	12	EM
HLT9KL	99.5	XH 106.1	XH 117.9	*H 114.8	XH 109.6	-4.93	X 22.1	8.4	H 138.3	0.68	14.4	23.2	H 12	LB
J6HQ9D	139.9	145.4 *	147.5 *	146.6 *	144.8	1.84	3.9	3.4	139.7	0.97	4.0	5.1	12	TU
KBQH4W	138.2	132.1	127.1	131.6	L 132.3	-0.58	4.8	4.6	135.0	-0.07	4.4	4.5	12	LC
KQZDDX	130.0	129.8	129.8	L 130.8	130.1	-0.99	2.5	0.5	130.0	-1.16	2.5	0.5	L 12	LD
KUWZ7L	144.0	141.0	140.8	141.4	141.8	1.26	4.8	1.5	139.0	0.81	4.3	4.0	12	MB
KUZMJT	132.3	H 119.5	XH 119.5	*H 120.8	*H 123.0	-2.35	* 15.6	6.2	H 128.9	-1.41	11.3	7.5	8	LC
LRRKGV	154.1	X 147.5	* 144.2	146.5 *	148.1	2.46	* 4.6	4.2	145.2	2.20	* 4.4	4.5	12	TU
NGFBJT	129.3	129.6	130.1	129.6	129.6	-1.08	4.1	0.4	L 130.3	-1.11	3.6	3.0	12	LD
NHDLEV	138.6	138.3	L 137.4	L 135.8	137.5	0.44	2.4	1.3	137.5	0.50	2.4	1.3	L 4	TH
PEPMKX	131.8	136.4	138.1	L 131.5	134.5	-0.15	2.8	3.3	132.3	-0.67	3.2	2.7	12	LD
PPP6AE	135.0	131.2	135.5	134.0	133.9	-0.25	3.5	1.9	135.4	0.03	3.7	2.7	12	LD
QCXXPJ	128.8	129.5	135.2	130.7	131.1	-0.80	3.2	2.9	134.8	-0.11	3.6	3.3	12	LD
QMG8HJ	138.3	135.1	139.1	138.5	137.8	0.48	4.0	1.8	138.3	0.67	3.8	1.8	12	LC
RALDKF	132.3	136.1	No DATA	135.7	134.7	-0.11	2.8	2.1	129.5	-1.29	4.1	4.1	11	LD
RGTZGP	132.6	133.9	131.9	133.2	132.9	-0.45	3.6	0.9	133.4	-0.42	3.1	1.4	12	LD
RTG77D	120.3 *	112.3	X 120.0 *	119.1 *	117.9	-3.33	X 4.1	3.8	117.5	-3.93	X 5.0	3.7	12	LD
TWV72J	137.4	138.0	No DATA	No DATA	137.7	0.47	5.5	0.4	136.1	0.18	5.0	2.7	10	TJ
UVLB3Y	133.8	131.7	132.2	134.2	H 133.0	-0.44	6.3	1.2	134.3	-0.22	7.6	2.2	12	LZ
V47777	139.1	H 144.3	141.2	144.3	142.2	1.34	6.3	2.6	145.2	2.19	* 5.0	2.8	12	EX





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

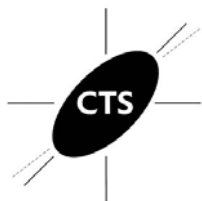
**Report #638 (M)**  
**November 2022**

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
VCJ3BD	133.7	135.2	135.6	133.4	134.5	-0.15	3.5	1.1	132.9	-0.53	3.7	2.7	12	LD
VNF4UA	107.5 <b>XH</b>	105.2 <b>XH</b>	106.2 <b>XH</b>	107.1 <b>XH</b>	106.5	-5.52 <b>X</b>	10.0	1.0	116.3	-4.21 <b>X</b>	7.8	10.2 <b>H</b>	12	LD
XN2QY9	137.1 <b>L</b>	136.5	135.9 <b>L</b>	136.2	136.4	0.22	2.5	0.5	136.5	0.26	2.6	0.5 <b>L</b>	12	LD
XN4EH8	122.8 <b>*</b>	124.7 <b>*</b>	124.6	123.7	123.9	-2.18 <b>*</b>	4.5	0.9	123.8	-2.54 <b>*</b>	4.9	2.1	12	EM
YB23VL	131.9	140.3	136.6	133.1	135.5	0.04	3.5	3.8	135.9	0.13	3.2	2.7	8	LD
ZJKZQJ	137.0	138.7 <b>L</b>	138.0 <b>L</b>	138.2	138.0	0.53	3.2	0.7	134.2	-0.25	3.5	4.7	8	TH
ZZB499	126.9	126.1	129.4	126.0	127.1	-1.56	2.7	1.6	128.3	-1.53	5.8	2.1	12	LD

Consensus (All Labs) Results														
Wk Mean	134.90	135.54	134.53	134.23	Month Mean	135.25			Grand Mean	135.29				
Avg SDr	4.75	3.82	5.98	4.43	Avg SD	4.65			Avg SD	5.07				
SD btwn Labs	5.60	5.05	6.65	6.11	SD btwn Labs	5.21			SD btwn Labs	4.52				
Labs Incl	39	38	39	39	SD btwn Wks	2.59			SD btwn Wks	5.03				
Labs Excl	3	4	1	2	Labs Incl	39			Labs Incl	40				
Labs not Rcvd	0	0	2	1										

**Key to Instrument Codes Reported by Participants**

<b>EM</b>	Emerson 1200	<b>EN</b>	Emerson 2200
<b>EX</b>	Emerson (model not specified)	<b>LB</b>	L&W Crush Tester 240
<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>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)



Containerboard Interlaboratory Testing Program

Analysis 223

STFI, 42 lb Linerboard - 42H1

TAPPI Official Test Method T826

Report #638 (M)

November 2022

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	
2Q4JUI_AL	24.0	26.0	24.4	25.1	24.9	0.68	1.8	0.9	24.5	0.70	2.0	0.6	16	AL
2UK2VZ	23.3	24.6	23.9	23.0	23.7	-0.28	2.0	0.7	23.2	-0.53	1.9	0.8	16	BK
42B7VF	23.2	24.4	24.3	23.9	23.9	-0.09	1.8	0.5	23.8	-0.01	1.6	0.5	16	LA
4R6HQV	22.5	21.8	22.3	22.9	22.4	-1.35	1.5	0.5	22.5	-1.25	1.5	0.4	16	LH
6RXKYW	25.3	25.5	26.4	26.0	25.8	1.43	1.8	0.5	25.6	1.74	1.9	0.5	16	LH
7G2QP9	22.4	22.9	22.8	23.2	22.8	-0.99	1.7	0.3	22.8	-0.99	1.8	0.4	16	LU
89GXQU	26.1	27.1 *	27.8 XH	25.9 H	26.7	2.16 *	4.3	0.9	27.6	3.71 X	3.0	3.6 H	16	LH
8ADMUB	23.0	22.6	23.9	22.8	23.1	-0.80	1.4	0.6	23.6	-0.20	1.7	1.0	16	LW
8MGXFC	24.7 L	24.5 L	24.0 L	25.0 L	24.5	0.40	0.6	0.4	23.9	0.17	0.8	0.6	16	LH
9NAD3T	23.7	24.9	24.7	25.4	24.7	0.52	2.1	0.7	24.0	0.19	1.8	0.8	15	LU
9VTFBV	24.7	25.2	24.0	No DATA	24.6	0.47	2.0	0.6	24.2	0.37	2.0	1.1	14	LU
B74JW6	23.9	24.9	25.6	24.8	24.8	0.61	1.7	0.7	24.6	0.84	2.0	0.7	16	LH
BGMYGY_AI	25.3	26.4	26.4	25.5	25.9	1.50	1.9	0.6	25.2	1.38	1.9	1.3	16	AL
CHA6BU	25.1	25.4	25.3	25.5 L	25.3	1.03	1.5	0.2	24.4	0.64	1.7	1.0	16	XX
DMZWVW	23.6	24.5 H	23.2	23.3	23.7	-0.32	2.4	0.6	24.1	0.32	1.8	0.8	16	LA
ECFV28	22.0	22.1	21.9 L	22.1	22.0	-1.64	1.6	0.1 L	22.0	-1.70	1.6	0.7	16	LY
FMD622	27.4 X	26.6	26.8 *	27.6 *	27.1	2.45 *	1.8	0.5	25.7	1.88	1.7	1.0	16	LA
FVBNM7	25.1	23.8	24.2	27.3 *	25.1	0.86	2.0	1.6 H	24.8	0.97	2.0	1.1	16	LA
FW6C62	23.4 H	20.8 *H	25.1 H	21.5 H	22.7	-1.12	3.9	1.9 H	22.6	-1.13	2.9	1.9 H	15	LZ
G98AHZ	26.0	25.2	25.2	27.4 *	26.0	1.56	1.9	1.0	25.7	1.83	1.8	1.6	16	LA
G9UVWC_AI	23.6	24.1 H	24.7	23.9	24.1	0.02	1.9	0.5	23.7	-0.10	1.5	0.7	16	AL
HJA6ZV_AL	24.0 H	24.8	24.3 L	23.7	24.2	0.13	2.0	0.4	24.2	0.38	1.9	0.8	16	AL
HLR9NT	23.8	24.1	No DATA	No DATA	24.0	-0.08	1.7	0.2	24.1	0.34	1.6	0.3	6	TT
HLT9KL	25.4	26.0	26.4	26.8	26.2	1.71	1.9	0.6	25.3	1.48	1.8	1.0	16	LH
J6HQ9D	25.1	25.0	26.0	25.5	25.4	1.10	2.0	0.4	24.4	0.60	1.9	0.8	16	TT
KBQH4W	23.6	23.7	23.5	23.4	23.6	-0.40	1.8	0.1	23.7	-0.09	1.5	0.3	16	LA
KUWZ7L	26.7 *	24.5	24.7	23.0	24.7	0.54	1.9	1.5 H	24.7	0.87	2.0	1.1	16	LA
LRRKGV	23.8 L	24.9 L	25.5	25.6	24.9	0.72	1.3	0.8	23.8	0.07	1.7	1.6	16	LA
NGFBJT	24.0	22.2	22.8	23.0	23.0	-0.83	2.1	0.8	23.2	-0.56	1.9	0.5	16	LZ
NHDLEV	22.3	23.2	22.5 L	22.7	22.6	-1.13	1.4	0.4	22.6	-1.09	1.4	0.4	4	LZ
PEPMKX	21.9	22.7	22.5	21.7	22.2	-1.49	1.7	0.5	22.7	-1.04	1.9	0.4	16	LU
PPP6AE_AL	24.2	23.8	23.5	23.2	23.7	-0.30	1.7	0.4	23.6	-0.20	1.7	0.4	14	XX
QCXXPJ	22.8	22.7	22.8	22.7	22.8	-1.05	1.6	0.1 L	22.7	-0.99	1.6	0.3	16	LY
QMG8HJ	23.6	23.1	22.9	23.3	23.2	-0.67	1.8	0.3	23.6	-0.21	2.0	0.6	16	LU
QVTNPJ	24.2	23.7	23.5	24.4	23.9	-0.08	2.2	0.4	23.9	0.17	2.2	0.4	4	LY



**Containerboard Interlaboratory Testing Program**  
 Analysis 223  
**STFI, 42 lb Linerboard - 42H1**  
 TAPPI Official Test Method T826

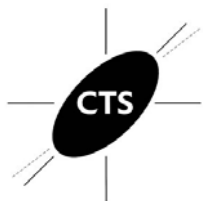
**Report #638 (M)**  
**November 2022**

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
RALDKF_AL	25.1 H	25.1	25.7	25.9	25.5	1.14	2.4	0.4	25.4	1.52	2.7	1.0	16	AL
RGTZGP	23.0 L	24.1	23.7	23.4 L	23.5	-0.41	1.2	0.5	23.4	-0.35	1.2	0.5	16	LH
RWLR3Q	23.8	23.5	23.7 L	23.7	23.7	-0.30	1.5	0.1 L	23.3	-0.46	1.6	0.5	16	LW
RXA88R	25.2 L	25.5	25.6	25.8	25.5	1.20	1.5	0.2	25.2	1.36	1.5	1.1	16	LH
RZH8M8	22.1	20.8 *L	23.6	23.0	22.4	-1.35	1.6	1.2	22.8	-0.91	1.2	1.2	16	LH
TWV72J	23.9	24.5	No DATA	No DATA	24.2	0.11	1.5	0.4	23.8	0.03	1.5	0.4	14	XX
UUMAUL	24.3	24.7	25.0	24.4	24.6	0.45	2.0	0.3	24.2	0.42	1.9	0.5	16	LA
UVLB3Y_AL	22.8	24.3	23.3	24.7	23.8	-0.21	1.7	0.9	22.9	-0.82	1.7	0.9	16	AL
VCJ3BD	24.3	24.0	23.5	24.5	24.1	0.01	1.8	0.5	24.1	0.31	1.7	0.7	16	LA
VGTD7T	22.9	25.0	24.7	22.7	23.8	-0.20	2.3	1.2	24.8	1.00	2.4	1.2	16	LH
VNF4UA	23.4	22.5	23.6	23.0	23.1	-0.77	1.7	0.5	22.5	-1.21	1.8	0.6	16	LY
VNF4UA_AL	23.6	24.2	24.3	24.0	24.0	-0.01	1.7	0.3	23.6	-0.13	1.7	0.4	16	AL
XGMV7K	24.0	24.5	23.1 H	24.0	23.9	-0.13	3.5	0.5	22.0	-1.71	2.2	1.3	16	LY
YB23VL	24.6	22.9	23.6	25.1	24.0	-0.02	2.1	1.0	24.2	0.39	2.2	0.7	16	LW
ZHRC8N_AL	24.1	24.8	24.1	24.1	24.3	0.19	1.4	0.4	24.6	0.83	1.8	1.0	16	AL
ZJKZQJ	20.9 *	21.9	21.3 *	22.4	21.6	-1.95 *	1.7	0.7	21.6	-2.06 *	1.7	0.7	4	LZ
ZNYFHV	22.4	22.6	22.4	21.7	22.3	-1.43	1.9	0.4	21.9	-1.79	1.7	1.2	16	LH
ZNYFHV_AL	21.7	22.6	22.9	21.8	22.3	-1.46	1.7	0.6	22.0	-1.69	1.6	0.5	16	AL
ZZB499_AL	23.9	23.6	24.2 L	24.0	23.9	-0.10	1.4	0.2	24.2	0.43	1.5	0.6	16	AK

Consensus (All Labs) Results									
Wk Mean	23.81	24.05	24.08	24.10	Month Mean	24.05	Grand Mean	23.77	
Avg SDr	1.81	1.85	2.00	2.09	Avg SD	1.96	Avg SD	1.82	
SD btwn Labs	1.19	1.38	1.25	1.53	SD btwn Labs	1.23	SD btwn Labs	1.04	
Labs Incl	53	54	51	51	SD btwn Wks	0.69	SD btwn Wks	0.87	
Labs Excl	1	0	1	0	Labs Incl	54	Labs Incl	53	
Labs not Rcvd	0	0	2	3					

**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 224

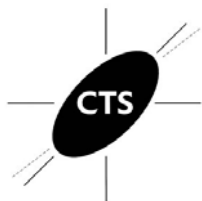
Report #638 (M)

November 2022

STFI, 56 lb Linerboard - 56G3

TAPPI Official Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2Q4JUI_AL	34.3	36.0	36.1	34.4	35.2	0.63	2.3	1.0	34.9	0.65	1.8	0.6	12	AL
2UK2VZ	34.6	35.6	34.8	35.4	35.1	0.57	2.4	0.5	33.3	-0.37	2.2	1.4	12	BK
42B7VF	35.3 L	34.8	35.3	35.1	35.1	0.56	1.9	0.2	34.5	0.40	2.1	0.8	12	LW
4R6HQV	32.5	32.2	33.1	33.0	32.7	-1.07	2.3	0.4	32.4	-0.97	2.0	0.6	12	LH
6RXKYW	35.6	35.6	35.6	35.5	35.6	0.88	1.8	0.1 L	35.5	1.04	2.2	0.6	12	LH
7G2QP9	32.2	32.0	33.1	33.4	32.7	-1.10	2.5	0.7	32.8	-0.66	2.6	0.6	12	LU
89GXQU	39.8 X	39.1 *	40.7 XH	38.0	39.4	3.48 X	2.9	1.1	39.5	3.57 X	2.3	1.1	8	LZ
8ADMUB	33.1 L	33.0 L	33.2	33.6	33.2	-0.71	1.6	0.3	32.3	-1.00	2.1	3.2 H	12	ID
8MGXFC	34.7 L	35.6 L	35.3 L	34.9 L	35.1	0.57	0.9	0.4	35.2	0.83	1.0	1.1	12	LH
9NAD3T	38.0 *	33.8	33.6 H	34.9 H	35.0	0.53	3.0	2.0	34.2	0.19	2.4	1.5	12	LU
9VTFBV	34.4	32.9	34.6	No DATA	34.0	-0.21	2.9	0.9	34.1	0.15	2.5	1.0	10	LU
B74JW6	34.9	35.7 H	35.5	35.2	35.3	0.71	2.8	0.4	35.7	1.15	2.5	1.3	12	LH
BGMGYG_AI	36.5	38.0 *	38.4 *	38.5 *	37.8	2.43 *	2.7	0.9	36.0	1.34	2.6	2.0	12	AL
CHA6BU	35.4	35.4	35.6	36.5	35.7	0.98	2.1	0.5	33.5	-0.26	2.2	1.8	12	XX
DMZWVW	33.1 L	32.5 L	33.3	30.8	32.4	-1.26	1.5	1.1	34.6	0.48	2.0	2.1	12	LA
ECFV28	31.2	31.9	32.7	31.9	31.9	-1.61	2.4	0.6	32.0	-1.17	2.2	0.6	12	LY
FMD622	35.4	34.3 L	34.6	35.1 L	34.8	0.38	1.5	0.5	33.1	-0.49	1.9	2.0	8	LA
FVBNM7	35.1	34.1	33.7	37.1 H	35.0	0.50	3.0	1.5	36.1	1.43	2.7	2.0	12	LA
FW6C62	33.8 H	29.0 *H	36.3	38.8 *H	34.5	0.14	4.6	4.2 H	33.9	0.02	3.6	3.1	11	LZ
G98AHZ	35.5 L	35.5	37.5 *	37.6	36.5	1.53	2.2	1.2	36.1	1.43	2.3	1.4	12	LA
G9UVWC_AI	34.0 L	34.5 L	33.6 L	33.0 L	33.8	-0.35	0.6	0.6	33.8	-0.04	1.4	0.7	12	XX
HJA6ZV_AL	33.5	34.4	34.3	34.4	34.1	-0.09	1.8	0.5	34.1	0.15	1.9	0.6	12	AL
HLR9NT	34.9	34.6	No DATA	No DATA	34.7	0.32	1.7	0.2	34.7	0.56	1.8	0.2 L	5	TT
HLT9KL	36.7	36.7 H	32.4	37.2	35.8	1.01	2.8	2.2 H	39.0	3.26 X	3.2	5.2 H	12	LH
J6HQ9D	35.7	36.4	36.7	35.8	36.1	1.28	2.8	0.5	35.2	0.83	2.5	1.4	12	TT
KBQH4W	35.4	33.4	32.9	32.4	33.5	-0.51	2.1	1.3	34.3	0.28	1.9	1.3	12	LA
KUWZ7L	35.2	34.8	35.0	34.5	34.9	0.40	2.8	0.3	34.8	0.57	2.4	1.0	12	LA
LRRKGV	24.8 X	21.2 X	21.9 X	22.1 X	22.5	-8.03 X	1.5	1.6	30.4	-2.21 *	2.2	6.2 H	12	LA
NGFBJT	33.8	33.8	34.0	34.0	33.9	-0.26	2.0	0.1 L	33.8	-0.05	2.2	0.3 L	12	LZ
NHDLEV	30.9 *	31.6	32.2	33.6	32.1	-1.48	1.9	1.2	32.1	-1.12	1.9	1.2	4	XX
PEPMKX	32.1	32.4	32.3	31.3	32.0	-1.54	2.5	0.5	32.0	-1.18	2.5	0.6	12	LU
PPP6AE_AL	34.0	33.5	35.4	33.9	34.2	-0.05	1.9	0.8	34.4	0.34	2.0	0.8	8	XX
QCXXPJ	33.0	33.6	32.8	33.1	33.1	-0.78	1.9	0.3	33.0	-0.53	2.1	0.7	11	LZ
QMG8HJ	33.9	33.9	33.7	32.8	33.6	-0.46	1.9	0.5	33.8	-0.05	2.1	0.7	12	LU
QVTNPJ	33.5	34.2	34.6	35.9	34.5	0.17	2.4	1.0	34.5	0.42	2.4	1.0	4	LY



Containerboard Interlaboratory Testing Program

Analysis 224

Report #638 (M)

November 2022

STFI, 56 lb Linerboard - 56G3

TAPPI Official Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
RALDKF_AL	36.2	38.0 *	38.2 *	36.6	37.3	2.03 *	2.6	1.0	36.6	1.72	3.1	1.0	12	XX
RGTZGP	35.0	34.5	34.5 L	34.5 L	34.6	0.22	1.6	0.2	34.2	0.21	1.5	0.5	12	LH
RWLR3Q	32.3	32.0 L	31.7	32.0	32.0	-1.55	1.7	0.2	32.7	-0.72	2.0	0.8	12	LW
RXA88R	36.5	36.7	36.4	37.3	36.7	1.67	1.9	0.4	37.2	2.16 *	1.6	0.5	12	LH
RZH8M8	32.3	29.3 *L	34.0	33.4	32.2	-1.40	2.3	2.1	31.7	-1.38	2.1	2.3	12	LH
TWV72J	33.7 L	34.7	No DATA	No DATA	34.2	-0.07	1.5	0.7	34.3	0.25	1.8	0.4 L	10	LZ
UUMAUL	35.1	34.8	35.2	35.3	35.1	0.57	2.7	0.2	34.9	0.69	3.0	0.3 L	12	LA
UVLB3Y_AL	33.7	34.5	33.7	33.6	33.9	-0.27	2.3	0.4	32.5	-0.88	2.2	1.3	12	AL
VCJ3BD	36.2	34.3	33.8	35.3	34.9	0.43	2.1	1.0	34.5	0.38	2.0	1.0	12	LU
VGTD7T	35.5	35.0	35.6	33.1	34.8	0.36	2.5	1.2	36.2	1.47	2.7	1.6	12	LH
VNF4UA	32.6	33.0	33.3	32.7	32.9	-0.95	2.1	0.3	32.8	-0.68	2.1	0.3 L	12	LY
VNF4UA_AL	33.8	33.4	34.1	33.0	33.6	-0.46	1.8	0.5	33.4	-0.27	2.1	0.5	12	AL
XGMV7K	34.6	34.8	34.2	35.5	34.8	0.34	2.0	0.5	32.1	-1.14	2.3	2.1	12	LU
YB23VL	34.0 H	32.5	33.3	35.8	33.9	-0.24	2.8	1.4	33.8	-0.03	2.9	1.3	12	LW
ZHRC8N_AL	33.8 L	36.4	35.9	37.5	35.9	1.11	2.3	1.6	35.6	1.08	2.6	1.1	12	AL
ZJKZQJ	30.2 *	31.4 L	31.7	31.3	31.2	-2.13 *	1.8	0.7	30.1	-2.43 *	2.1	1.4	8	LU
ZNYFHV	31.2	34.5	33.7	33.8	33.3	-0.66	2.5	1.4	31.9	-1.25	2.4	1.8	10	LH
ZNYFHV_AL	31.9	31.7	32.1	31.6	31.8	-1.67	2.3	0.2	31.1	-1.74	2.2	1.0	10	AL
ZZB499_AL	36.4	35.4	33.8	34.5	35.0	0.51	2.2	1.1	34.5	0.39	2.1	1.1	12	XX

Consensus (All Labs) Results									
Wk Mean	34.17	34.18	34.34	34.57	Month Mean	34.27	Grand Mean	33.87	
Avg SDr	2.13	2.37	2.40	2.28	Avg SD	2.28	Avg SD	2.25	
SD btwn Labs	1.65	1.96	1.57	1.96	SD btwn Labs	1.47	SD btwn Labs	1.57	
Labs Incl	52	53	50	50	SD btwn Wks	1.08	SD btwn Wks	1.57	
Labs Excl	2	1	2	1	Labs Incl	52	Labs Incl	52	
Labs not Rcvd	0	0	2	3					

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	BK	Buchel Strip Compression Tester BK-155
ID	IDM Compression Tester	LA	L&W Autoline (224 Enrollment)
LH	L&W 282	LU	L&W 52 without moisture correction (was 53)
LW	L&W 53 with moisture correction (was 53M)	LY	L&W 152 with moisture correction
LZ	L&W (model not specified)	TT	TMI Short Span Compression, 17-34 (MB K455)
XX	Instrument make/model not specified by lab		



**Containerboard Interlaboratory Testing Program**  
 Analysis 228  
**Roughness - Stylus Method, 42 lb Linerboard - 42H1**  
 TAPPI Official Test Method T575

**Report #638 (M)**  
**November 2022**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2Q4JUJ_AL	365.4	8.33 X	9.58	365.4	14.86 X	0.00	1	AL
42B7VF	141.6	-0.34	20.37	151.3	0.46	20.72	4	LA
7G2QP9	148.6	-0.07	10.66	142.0	-0.16	4.77	4	EV
89GXQU	217.8	2.61 *	50.33 H	211.1	4.48 X	24.77	4	LS
9NAD3T	174.7	0.94	16.91	168.1	1.59	16.52	4	EV
9VTFBV	170.9	0.79	14.65	169.1	1.66	34.62 H	4	EV
BGMYGY_AL	113.6	-1.43	11.12	120.0	-1.64	4.61	4	AL
ECFV28	140.7	-0.38	9.64	158.8	0.97	21.52	4	EV
FVBNM7	143.7	-0.26	20.92	140.7	-0.25	12.83	4	LA
G98AHZ	192.3	1.62	34.25 H	169.5	1.69	23.48	4	LA
HJA6ZV_AL	147.2	-0.12	17.02	134.6	-0.66	25.16	4	AL
KBQH4W	131.2	-0.74	14.73	124.0	-1.38	5.16	4	EV
KUWZ7L	157.8	0.29	28.13	155.3	0.73	15.23	4	LA
LRRKGV	217.8	2.61 *	18.98	170.3	1.74	39.56 H	4	LA
NGFBJT	126.4	-0.93	12.69	136.8	-0.52	9.25	4	LS
PEPMKX	157.0	0.26	9.74	152.8	0.56	3.16	4	EV
QCXXPJ	144.9	-0.21	14.32	145.8	0.09	7.28	4	EV
UUMAUL	138.2	-0.47	11.29	140.5	-0.26	1.87 L	4	LS
UVLB3Y_AL	146.9	-0.14	15.78	136.0	-0.57	8.36	4	XX
VGTD7T	137.6	-0.49	16.16	136.8	-0.51	3.85	4	EV
VNF4UA	148.0	-0.09	24.64	144.6	0.01	3.90	4	XX
VNF4UA_AL	134.7	-0.61	16.40	145.4	0.07	12.27	4	AL
XEDXPW	133.6	-0.65	7.93 L	131.9	-0.85	8.85	4	LS
YB23VL	122.3	-1.09	11.88	120.0	-1.64	2.76	4	XX
ZHRC8N_AL	129.0	-0.83	26.59	128.5	-1.07	3.38	4	AL
ZNYFHV_AL	143.1	-0.28	12.93	139.0	-0.36	20.94	4	AL
ZZB499	150.9	0.02	14.48	149.1	0.32	3.80	4	EV

Consensus (All Labs) Results			
Month Mean	150.40	Grand Mean	144.43
Avg SD	19.91	Avg SD Months	16.17
SD btwn Labs	25.82	SD btwn Labs	14.87
Labs Incl	26	Labs Incl	25



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

**Report #638 (M)**  
**November 2022**

**Key to Instrument Codes Reported by Participants**

<b>AL</b>	L & W Autoline 400	<b>EV</b>	Emveco Microgauge 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 - 42H1**  
 TAPPI Official Test Method T538

**Report #638 (M)**  
**November 2022**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
BGMYGY_AL	370.8	-0.40	6.94	368.1	-1.07	2.13	4	AL
DMZWVW	382.1	0.40	7.77	386.4	1.30	4.13	4	XX
G9UVWC_AL	382.8	0.45	10.35	383.9	0.98	1.16	4	AL
HLT9KL	345.8	-2.16 *	2.98 L	966.3	76.73 X	1,247.14H	4	HM
NGFBJT	372.8	-0.26	9.22	376.9	0.06	4.16	4	XX
PPP6AE	375.2	-0.09	5.30	370.8	-0.73	3.02	4	PP
PPP6AE_AL	380.8	0.31	4.96	378.8	0.31	3.63	4	XX
QMG8HJ	377.2	0.05	9.22	381.2	0.63	4.47	4	XX
RALDKF	372.5	-0.28	10.63	375.1	-0.17	2.30	4	PP
VNF4UA_AL	369.9	-0.46	11.45	371.1	-0.69	1.24	4	AL
XN4EH8	411.2	2.45 *	7.67	415.0	5.03 X	2.96	4	TS
ZHRC8N_AL	361.6	-1.05	3.78 L	367.9	-1.11	7.12	4	AL
ZNYFHV_AL	370.7	-0.41	19.93 H	363.3	-1.70	5.40	4	AL
ZZB499	389.3	0.91	10.31	387.0	1.38	1.80	4	LA
ZZB499_AL	384.0	0.53	8.69	382.6	0.81	3.93	4	AK

Consensus (All Labs) Results			
Month Mean	376.45	Grand Mean	376.38
Avg SD	9.46	Avg SD Months	3.80
SD btwn Labs	14.18	SD btwn Labs	7.69
Labs Incd	15	Labs Incd	13

**Key to Instrument Codes Reported by Participants**

<b>AK</b>	L & W Autoline 300	<b>AL</b>	L & W Autoline 400
<b>HM</b>	Technidyne - Hagerty Model	<b>LA</b>	L & W Autoline (229 Enrollment)
<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 #638 (M)  
November 2022

Internal Bond, 42 Ib Linerboard - 42H

TAPPI Official Test Method T569

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2Q4JUJ	123.7	-0.52	4.40	114.8	-0.97	6.93	4	TM
3CXU93	128.6	-0.12	6.43	128.7	0.10	7.99	4	XX
42B7VF	141.4	0.93	8.44	151.7	1.88	16.06	H 4	HY
6D6UH2	137.0	0.57	6.56	139.3	0.92	2.99	4	TM
9NAD3T	115.2	-1.22	7.05	119.8	-0.59	4.71	4	TM
9VTFBV	102.0	-2.30 *	9.30	97.2	-2.33 *	3.41	4	TM
DMZWVW	112.5	-1.44	3.03	107.3	-1.55	6.80	4	SC
G9UVWC	58.7	-5.84 X	1.04 L	57.4	-5.40 X	0.89 L	4	LZ
HLDWR9	127.0	-0.25	11.58	127.0	-0.03	0.00	1	XX
HQ4ATW	125.5	-0.37	2.53	121.7	-0.43	2.58	4	SC
J6HQ9D	115.8	-1.16	7.57	117.4	-0.77	5.46	4	TM
KBQH4W	119.2	-0.89	4.21	121.1	-0.49	5.44	4	TM
PEPMKX	124.0	-0.50	8.15	126.4	-0.08	3.60	4	TM
PPP6AE	137.8	0.63	10.18	140.3	1.00	3.23	4	HY
QCXXPJ	142.2	0.99	6.38	140.3	1.00	6.91	3	HZ
QMG8HJ	148.1	1.47	9.57	146.6	1.49	3.58	4	HY
RALDKF	141.8	0.96	4.66	142.4	1.16	0.85 L	4	HY
UVLB3Y	133.6	0.29	8.88	122.7	-0.36	7.78	4	TM
VCJ3BD	124.6	-0.45	2.51	126.7	-0.05	3.19	4	HZ
VGTD7T	146.0	1.30	7.07	130.6	0.25	15.94 H	4	TM
VNF4UA	134.8	0.39	7.40	127.9	0.04	11.73	4	TM
XEDXPW	143.0	1.06	5.79	139.6	0.94	3.95	4	HY
ZHRC8N	143.2	1.08	16.02 H	124.3	-0.24	13.09	4	TM
ZZB499	124.2	-0.48	7.43	115.9	-0.89	5.56	4	TM

Consensus (All Labs) Results

Month Mean	130.06	Grand Mean	127.36
Avg SD	7.79	Avg SD Months	7.66
SD btwn Labs	12.22	SD btwn Labs	12.94
Labs Incl	23	Labs Incl	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	129.28	12.58	0.78	18
Modified Scott Bond Mechanics	144.74	4.72	14.68	2

Analysis Notes

G9UVWC - Method used is not covered in this test. Data excluded from consensus calculation.



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

**Report #638 (M)**  
**November 2022**

**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 lb Linerboard - 42H**  
 TAPPI Official Test Method T815

**Report #638 (M)**  
**November 2022**

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SD	Mean	CPV	SD Months	Months
2Q4JUJ	28.2	-0.03	1.48	25.3	-0.93	2.20	4
42B7VF	26.6	-0.58	3.91	26.5	-0.48	2.13	4
7G2QP9	24.8	-1.21	1.30	26.8	-0.37	1.59	4
89GXQU	23.4	-1.69	4.98	21.4	-2.39 *	1.49	4
8MGXFC	27.2	-0.37	1.35	27.5	-0.08	0.68	4
9NAD3T	31.6	1.15	2.07	32.4	1.77	1.76	4
9VTFBV	27.8	-0.17	3.19	27.1	-0.25	2.88	4
BGMYGY	31.1	0.98	1.48	30.7	1.14	0.96	4
DMZWVW	28.4	0.04	0.55 L	28.4	0.24	0.41	4
ECFV28	27.5	-0.28	1.16	29.8	0.77	1.74	4
G98AHZ	26.3	-0.69	6.88 H	27.9	0.05	2.51	4
G9UVWC	24.0	-1.48	3.98	22.6	-1.94 *	3.66	4
HJA6ZV	30.2	0.67	1.30	28.2	0.16	1.72	4
NGFBJT	32.0	1.29	4.06	30.7	1.14	1.39	4
PEPMKX	26.8	-0.51	2.17	27.8	0.03	2.30	4
PPP6AE	30.8	0.88	1.30	27.3	-0.18	2.90	4
QCXXPJ	17.3	-3.81 X	2.49	22.0	-2.18 *	5.44 H	4
QDFTMC	26.6	-0.58	1.34	25.9	-0.69	2.08	4
QMG8HJ	25.7	-0.91	3.64	27.9	0.07	1.60	4
RALDKF	32.8	1.57	1.79	30.2	0.92	1.89	4
UUMAUL	28.0	-0.10	0.00 L	27.7	-0.02	0.30 L	4
UVLB3Y	32.0	1.29	2.06	31.6	1.47	0.86	4
UWNF87	33.0	1.64	1.22	30.4	1.00	3.69	4
VGTD7T	31.0	0.95	1.87	29.2	0.56	2.70	4
VKCEF8	25.4	-1.00	1.82	25.6	-0.82	0.82	4
VNF4UA	29.2	0.32	2.49	28.2	0.16	1.71	4
XEDXPW	28.0	-0.10	0.71	28.0	0.11	0.16 L	4
YB23VL	22.2	-2.11 *	5.07	25.9	-0.69	2.83	4
ZHRC8N	29.4	0.39	3.13	29.8	0.79	1.20	4
ZZB499	30.1	0.63	3.75	29.4	0.64	1.01	4

Consensus (All Labs) Results			
Month Mean	28.28	Grand Mean	27.72
Avg SD	2.92	Avg SD Months	2.19
SD btwn Labs	2.88	SD btwn Labs	2.64
Labs Incl	29	Labs Incl	30



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

**Report #638 (M)**  
**November 2022**

**Key to Instrument Codes Reported by Participants**

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program  
Analysis 237

Report #638 (M)  
November 2022

Air Resistance, 42 lb Linerboard - 42H1

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD	Months	Inst
2Q4JUJ_AL	29.8	-1.01	1.37	32.1	0.14	1.78	4	AL
42B7VF	32.9	0.67	2.23	32.8	0.65	1.19	4	LP
6RXKYW	30.0	-0.90	3.40	28.9	-2.09 *	2.16	4	XX
7G2QP9	32.4	0.40	2.17	31.3	-0.38	0.82	4	LP
89GXQU	27.7	-2.13 *	3.36	28.2	-2.58 *	2.13	4	TD
9NAD3T_AL	33.3	0.91	3.75	33.1	0.85	0.81	4	AL
BGMYGY_AL	26.8	-2.64 *	1.32	28.9	-2.11 *	2.12	4	AL
BLWGCK	32.0	0.18	2.37	31.8	-0.03	0.45	4	LP
FMD622	30.1	-0.84	2.33	31.4	-0.34	0.93	4	LA
FVBNM7	31.6	-0.06	2.29	31.7	-0.15	0.87	4	LA
G98AHZ	30.6	-0.57	3.86	30.5	-1.00	0.19	L 4	LA
G9UVWC_AL	32.9	0.65	1.63	34.3	1.75	1.68	4	AL
HJA6ZV_AL	31.5	-0.09	2.08	31.0	-0.59	0.53	4	AL
HLT9KL	29.4	-1.24	2.57	23.2	-6.16 X	12.31	H 4	LA
KUWZ7L	29.6	-1.10	1.44	31.1	-0.56	1.28	4	LA
LRRKGV	31.7	0.00	3.00	31.8	-0.02	0.92	4	LA
M4FDXG	32.4	0.40	4.33	32.9	0.71	1.50	4	TD
NGFBJT	34.0	1.26	2.65	33.5	1.14	0.93	4	GA
PEPMKX	31.1	-0.31	3.41	31.1	-0.53	1.35	4	GA
PPP6AE	30.6	-0.60	3.44	30.9	-0.69	1.26	4	TP
PPP6AE_AL	31.3	-0.21	1.25	L 31.4	-0.36	0.33	4	XX
QCXXPJ	31.9	0.10	2.61	32.1	0.17	0.50	4	LP
QMG8HJ	32.9	0.70	2.90	31.8	-0.04	0.88	4	TP
QVTNPJ	33.7	1.11	1.89	33.6	1.22	0.96	4	LP
RALDKF	35.9	2.31 *	7.70	H 34.2	1.68	2.79	H 4	TP
RTG77D	30.6	-0.58	3.17	33.2	0.95	2.39	3	GG
UUMAUL	32.2	0.29	1.87	31.9	0.05	0.18	L 4	LA
UVLB3Y_AL	33.5	1.02	1.99	33.7	1.30	0.26	4	XX
UWNF87_AL	32.4	0.41	1.15	L 32.0	0.11	1.31	4	AL
VGTD7T	31.4	-0.13	2.22	30.9	-0.65	0.51	4	LP
VKCEF8	31.3	-0.19	3.73	31.6	-0.18	0.27	3	XX
VNF4UA	30.4	-0.69	2.65	31.9	0.06	3.31	H 4	LP
VNF4UA_AL	36.3	2.51 *	1.78	34.9	2.15 *	1.05	4	AL
XEDXPW	32.6	0.54	1.77	32.0	0.08	0.90	4	LP
Y4HWWT	29.7	-1.06	2.14	31.2	-0.45	1.32	3	LP
YB23VL	32.8	0.61	3.41	30.8	-0.73	1.33	4	LP
ZHRC8N_AL	30.8	-0.48	1.89	31.9	-0.01	0.79	4	AL
ZNYFHV_AL	32.3	0.34	1.42	33.1	0.85	1.20	4	AL
ZRXWT6	31.9	0.11	3.01	31.3	-0.43	1.21	3	GG



**Containerboard Interlaboratory Testing Program**  
Analysis 237

**Report #638 (M)**  
**November 2022**

**Air Resistance, 42 lb Linerboard - 42H1**

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
ZZB499_AL	32.2	0.28	2.08	31.9	0.05	1.15	4	AK

Consensus (All Labs) Results			
Month Mean	31.66	Grand Mean	31.87
Avg SD	2.83	Avg SD Months	1.36
SD btwn Labs	1.84	SD btwn Labs	1.41
Labs Incd	40	Labs Incd	39

**Key to Instrument Codes Reported by Participants**

- |           |   |           |   |
|-----------|---|-----------|---|
| <b>AK</b> | L & W Autoline 300                          | <b>AL</b> | L & W Autoline 400                            |
| <b>GA</b> | Gurley Precision #4340 Automatic Densometer | <b>GG</b> | Gurley Precision #4320 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 #638 (M)  
November 2022

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

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2UK2VZ	57.7	59.1	57.7	62.3	59.2	0.48	3.6	2.1	58.4	0.17	3.3	1.8	16	LZ
42B7VF	58.3	58.4	57.1	58.7	58.1	0.00	4.1	0.7	56.6	-0.64	3.7	1.4	16	XX
4R6HQQ	57.8	56.5	57.6	55.7	56.9	-0.52	2.8	1.0	57.1	-0.43	2.5	0.7	16	EN
6RXKYW	54.0	51.6 *	52.9	54.9	53.3	-2.07 *	3.3	1.4	54.8	-1.46	3.3	2.3	16	LD
7F827C	56.1	55.1	54.3	55.8	55.3	-1.21	2.8	0.8	55.7	-1.07	2.8	0.6	16	LD
8ADMUB	62.4	61.2 H	60.6	59.0	60.8	1.18	4.3	1.4	59.9	0.84	3.3	1.6	16	LD
8MGXFC	63.7	59.7	62.6	60.1	61.5	1.48	4.0	1.9	62.6	2.02 *	4.4	1.5	16	LD
9VTFBV	56.3	58.6	58.3	61.3	58.6	0.23	4.4	2.1	60.6	1.13	3.9	5.4 H	15	LC
A4FWGB	58.1 L	58.2 L	58.1 L	58.1 L	58.1	0.01	0.5	0.0 L	58.3	0.11	0.7	0.2 L	16	LD
A77XHR	59.3	62.5	62.2	62.7	61.7	1.54	2.9	1.6	61.4	1.48	2.9	2.7	16	LC
BLWGCK	61.1	58.6	58.3	60.4	59.6	0.65	3.8	1.3	58.1	0.02	3.3	2.0	16	LD
CHA6BU	59.2 L	58.3 L	61.0 L	59.2 L	59.4	0.57	0.8	1.1	60.0	0.85	1.0	1.2	16	XX
ECFV28	59.8	58.5	57.9	57.0	58.3	0.09	3.8	1.1	59.2	0.52	3.8	1.7	16	EN
ER9HJT	57.7	57.5	56.1	56.3	56.9	-0.52	2.6	0.8	56.2	-0.82	2.9	1.3	16	TU
FW6C62	No DATA	57.1	55.0	58.6	56.9	-0.52	3.9	1.8	58.2	0.07	3.6	2.0	15	LD
G8BXHQ	56.1 L	56.9	56.5	56.4	56.5	-0.70	1.7	0.3	56.6	-0.63	1.7	0.5 L	16	MB
G98AHZ	49.5 *	57.6	55.9	55.4	54.6	-1.53	4.4	3.5 H	56.0	-0.92	4.0	2.3	16	MB
G9UVWC	54.3	55.0	55.9	56.4	55.4	-1.18	2.3	0.9	55.1	-1.31	2.8	1.5	16	LD
HF79E8	58.3	58.1	58.3	58.2	58.2	0.04	1.9	0.1 L	58.2	0.05	1.7	0.2 L	16	LD
HJA6ZV	60.2	59.7	59.3	57.4	59.2	0.46	4.0	1.2	61.0	1.32	4.0	3.0	16	LZ
HLR9NT	59.3	58.5 H	No DATA	No DATA	58.9	0.33	6.0	0.6	58.6	0.23	6.0	0.9	14	TG
HLT9KL	52.7	52.7	52.6	52.4 *	52.6	-2.40 *	2.9	0.2 L	52.8	-2.34 *	3.5	1.8	16	LD
HQ4ATW	55.2	52.7	55.1	56.3	54.8	-1.42	4.2	1.5	56.0	-0.92	4.5	2.1	16	LC
J6X3T4	57.7	62.9	60.5	61.1	60.5	1.05	4.1	2.1	62.3	1.90	4.6	2.5	16	TX
KBQH4W	64.9	56.6 H	55.9	64.5 *	60.5	1.03	4.1	4.9 H	60.3	1.00	3.3	2.3	16	LC
KUWZ7L	57.3	55.8	57.6	56.3	56.7	-0.60	3.7	0.8	53.7	-1.96 *	3.4	4.2	16	MB
LRRKGV	62.1	56.8	57.5	57.3	58.5	0.16	3.8	2.5	59.0	0.41	4.0	2.5	16	TU
M4FDXG	49.2 *	49.9 *	50.5 *	49.2 X	49.7	-3.66 X	3.2	0.6	51.3	-3.04 X	3.5	1.9	16	TH
MGHLXJ	63.7	69.2 X	68.2 X	62.8	66.0	3.42 X	3.7	3.2	60.8	1.22	4.1	4.7 H	16	LD
NGFBJT	58.5	58.1	59.1	60.2	59.0	0.37	2.8	0.9	58.0	-0.03	2.8	1.4	16	LZ
PEPMKX	57.9	58.9	59.2	57.0	58.3	0.06	2.9	1.0	57.6	-0.20	3.7	1.7	16	LD
PPP6AE	58.6	56.3	58.6	56.7	57.6	-0.23	2.9	1.2	57.6	-0.22	3.2	2.2	16	LD
QCXXPJ	56.5	56.7	58.5	59.4	57.8	-0.15	3.4	1.4	59.5	0.65	3.2	1.9	16	LZ
QMG8HJ	59.4	61.3	58.1	60.6	59.8	0.75	3.0	1.4	59.8	0.79	3.5	1.5	16	LC
RALDKF	58.4	57.6	No DATA	56.5	57.5	-0.25	2.9	0.9	56.1	-0.86	3.6	1.8	14	LD



Containerboard Interlaboratory Testing Program  
Analysis 240

Report #638 (M)  
November 2022

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

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
RXA88R	52.5	53.8	53.8	54.1	53.6	-1.98 *	3.4	0.7	55.8	-1.01	3.1	1.8	16	LD
TWV72J	60.0	60.7	No DATA	No DATA	60.4	0.99	4.8	0.5	58.3	0.10	6.1	1.7	14	XX
UUMAUL	58.1	58.4 L	58.6	58.2	58.3	0.10	1.7	0.2 L	58.5	0.21	1.5	0.3 L	16	LD
V47777	52.8	56.4	58.1	60.7	57.0	-0.48	3.7	3.3 H	55.7	-1.05	3.7	2.6	16	EM
VCJ3BD	56.1	59.7	56.2	56.5	57.1	-0.43	3.3	1.8	57.8	-0.11	3.0	1.7	16	LD
VKCEF8	64.1	63.9 *	62.9 H	61.4 H	63.1	2.16 *	4.8	1.3	61.4	1.52	4.4	1.8	16	LZ
VNF4UA	49.5 *	50.8 *	50.4 *	51.6 *	50.6	-3.29 X	2.9	0.9	53.7	-1.95 *	3.1	4.0	16	LD
XEDXPW	No DATA	No DATA	No DATA	56.0	56.0	-0.90	4.1	0.0	57.1	-0.42	2.6	1.8	4	LD
XGMV7K	62.8	59.4	59.6	62.5 H	61.1	1.29	4.6	1.8	58.9	0.36	4.7	3.3	16	LD
XN2QY9	58.5	58.1	58.5	58.4	58.4	0.12	2.1	0.2 L	58.5	0.21	2.4	0.3 L	16	LD
Y4HWWT	54.9	56.1	58.3	55.3	56.1	-0.85	3.0	1.5	57.5	-0.23	2.5	2.0	12	LD
YB23VL	61.5	60.6	63.5 *	62.5	62.0	1.71	3.9	1.3	61.4	1.51	3.9	1.4	16	LD
YCPJZM	59.8	60.9	57.7	60.1	59.6	0.66	3.4	1.4	58.3	0.10	3.6	1.9	16	LD
ZHRC8N	56.2	59.2	58.6 H	61.6	58.9	0.35	4.3	2.2	57.3	-0.33	4.1	2.5	16	LD
ZJKZQJ	59.8	58.0	57.6	57.7	58.3	0.07	2.7	1.1	58.3	0.09	2.7	1.1	4	TH

Consensus (All Labs) Results												
Wk Mean	57.87	57.68	57.61	58.33	Month Mean	58.10		Grand Mean	58.06			
Avg SDr	3.51	3.40	3.48	3.36	Avg SD	3.52		Avg SD	3.51			
SD btwn Labs	3.67	2.94	2.86	2.85	SD btwn Labs	2.30		SD btwn Labs	2.23			
Labs Incl	48	48	45	47	SD btwn Wks	1.63		SD btwn Wks	2.19			
Labs Excl	0	1	1	1	Labs Incl	47		Labs Incl	49			
Labs not Rcvd	2	1	4	2								

Key to Instrument Codes Reported by Participants

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





Containerboard Interlaboratory Testing Program  
Analysis 250

Report #638 (M)  
November 2022

Fluted Edge Crush Strength (FCF), 26 lb Corrugating Medium - CM12

TAPPI Official Test Method T843

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2UK2VZ	68.9	68.9	69.7 H	65.9	68.3	-0.69	5.3	1.7	66.7	-1.26	4.3	1.6	16	LZ
42B7VF	70.9	68.4	71.7	70.2	70.3	0.59	3.6	1.4	71.4	1.17	3.8	1.6	16	XX
8ADMUB	68.9	69.8	72.2	71.4	70.6	0.76	2.6	1.5	71.0	0.96	2.8	1.9	16	LD
9VTFBV	71.3 H	71.3	72.1	72.7	71.9	1.60	4.2	0.7	71.8	1.39	4.7	6.1 H	15	LC
BLWGCK	69.9	69.0	69.8	69.8	69.6	0.14	3.4	0.4	70.2	0.55	3.5	1.4	16	LD
CHA6BU	69.4 L	69.9 L	71.3 L	71.5 L	70.5	0.74	1.0	1.0	70.3	0.61	1.0	1.4	16	XX
G8BXHQ	68.6	68.9	68.3	68.6 L	68.6	-0.52	1.8	0.2 L	68.8	-0.16	1.7	0.4 L	16	MB
G9UVWC	68.9	67.8	68.6	68.6	68.5	-0.60	2.4	0.5	68.2	-0.49	2.8	1.3	16	LD
HF79E8	68.9	69.0	68.8 L	68.9	68.9	-0.32	1.7	0.1 L	69.1	-0.02	1.6	0.1 L	16	LD
HJA6ZV	67.3	67.1	67.6	67.3 H	67.3	-1.35	4.3	0.2 L	65.3	-1.99 *	4.2	3.7	16	LZ
HLT9KL	67.3	66.0 *	66.3	66.4	66.5	-1.88	4.1	0.5	58.4	-5.58 X	7.5	5.6 H	16	LD
PPP6AE	71.7 *	71.8	73.4	69.8	71.7	1.48	3.2	1.4	71.4	1.21	3.2	1.3	16	LD
QMG8HJ	68.4 H	70.2	69.9	71.9	70.1	0.45	3.8	1.4	70.3	0.60	3.5	1.6	16	LC
RALDKF	70.1	70.5	No DATA	66.8	69.2	-0.16	3.3	2.0	69.7	0.33	4.1	1.6	14	LD
RGTZGP	67.1	67.1	68.0	68.0	67.5	-1.22	3.0	0.5	67.8	-0.67	3.4	1.5	16	LD
UUMAUL	69.0	69.1 L	68.7	68.9	68.9	-0.31	1.8	0.2 L	68.8	-0.18	1.6	0.4 L	16	LD
VNF4UA	60.1 XH	57.4 XH	63.8 *	62.4 *	60.9	-5.53 X	6.9	2.8	65.6	-1.84	5.0	4.2	16	LD
Y4HWWT	69.2	69.1	72.6	72.2	70.8	0.91	2.8	1.9	70.7	0.84	2.6	1.5	12	LD
YB23VL	67.1	68.7	65.8	70.3	68.0	-0.93	3.6	2.0	67.5	-0.84	4.2	2.0	16	LD
ZHRC8N	74.5 X	72.3 *	74.0	64.8	71.4	1.30	3.3	4.5 H	68.7	-0.22	3.5	3.1	16	LD
ZJKZQJ	62.7 X	61.5 X	60.1 XL	60.8 *	61.3	-5.29 X	2.5	1.1	61.3	-4.06 X	2.5	1.1	4	TH

Consensus (All Labs) Results													
Wk Mean	69.04	69.20	69.61	68.44	Month Mean	69.39			Grand Mean	69.11			
Avg SDr	3.07	2.87	3.85	3.49	Avg SD	3.28			Avg SD	3.42			
SD btwn Labs	1.38	1.61	2.71	3.13	SD btwn Labs	1.53			SD btwn Labs	1.93			
Labs Incl	18	19	19	21	SD btwn Wks	1.55			SD btwn Wks	2.39			
Labs Excl	3	2	1	0	Labs Incl	19			Labs Incl	19			
Labs not Rcvd	0	0	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
TH	TMI Compression Tester, Model 17-76	XX	Instrument make/model not specified by lab



**Containerboard Interlaboratory Testing Program**  
 Analysis 255  
**Ring Crush (RCT), 26 lb Corrugating Medium - CM12**  
 TAPPI Official Test Method T822

**Report #638 (M)**  
**November 2022**

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
42B7VF	44.4	43.6	43.5	45.4	44.2	0.04	3.2	0.9	44.6	0.45	3.3	1.0	16	XX
6RXKYW	46.0	46.4	44.9	44.5	45.4	0.61	3.4	0.9	45.5	1.16	3.2	1.2	16	LD
7F827C	44.5	45.0	44.7	44.1	44.6	0.20	2.7	0.3	45.1	0.89	3.0	0.9	16	LC
A4FWGB	45.0 L	44.9 L	45.0 L	45.0 L	44.9	0.38	0.4	0.0 L	45.2	0.90	0.4	0.2 L	16	LD
A77XHR	38.7 *	37.5 X	39.0	39.3 *	38.6	-2.61 *	2.8	0.8	37.4	-5.23 X	3.7	3.4	16	XX
B74JW6	47.6	42.4	46.8	46.2	45.7	0.76	2.9	2.3	44.8	0.62	3.1	2.5	16	LD
BHX24X	45.0	43.2	45.2	43.3	44.2	0.01	2.9	1.1	44.2	0.13	3.0	1.9	16	TH
BLWGCK	42.5	42.0	39.3	41.2	41.2	-1.37	2.9	1.4	41.9	-1.63	3.4	1.4	16	LD
ER9HJT	43.1	42.9	45.9	43.4	43.8	-0.15	2.1	1.4	42.1	-1.48	2.3	1.9	16	TU
FMD622	42.4 H	44.9	47.2	46.9	45.3	0.57	3.1	2.2	44.2	0.16	2.7	2.0	16	LD
FW6C62	46.6	44.0	43.8	45.3	44.9	0.37	3.3	1.3	45.2	0.94	3.5	1.5	16	LZ
G8BXHQ	42.3	42.8	42.1	42.4 L	42.4	-0.82	1.6	0.3 L	43.0	-0.81	1.7	0.5	16	MB
G98AHZ	43.2	44.5	53.1 *H	45.9	46.7	1.20	4.5	4.4 H	45.1	0.85	3.5	3.3	13	MB
G9UVWC	44.3	43.3	43.3	43.1	43.5	-0.30	2.3	0.5	43.6	-0.34	2.4	1.2	16	LD
J6X3T4	39.6	42.7	50.1	43.8	44.0	-0.06	3.1	4.4 H	42.5	-1.18	3.4	2.9	16	LZ
MGHLXJ	45.7	46.7 H	48.3	46.7	46.9	1.29	4.0	1.0	46.1	1.66	3.3	3.0	16	EM
NGFBJT	41.1	42.5	41.3	40.5	41.4	-1.32	2.2	0.8	42.7	-1.03	3.1	1.1	16	LD
PPP6AE	49.6 *	48.6 *	46.5	51.1 X	48.9	2.27 *	3.3	1.9	44.4	0.28	2.7	3.6	16	LD
QMG8HJ	42.8	44.0	44.1	48.8 *	44.9	0.37	3.3	2.6	45.1	0.84	3.6	1.9	16	LC
RALDKF	42.5	45.4	No DATA	45.1	44.3	0.09	3.3	1.6	43.4	-0.52	3.3	2.0	15	LD
V47777	45.9	45.3	47.4 L	46.5	46.2	1.00	3.3	0.9	45.9	1.52	3.5	1.1	16	EM
VCJ3BD	43.9	44.9	41.8	43.9	43.6	-0.23	3.0	1.3	43.6	-0.35	3.0	1.2	16	LD
XN2QY9	43.8	44.1	43.7	43.7	43.8	-0.14	3.1	0.2 L	43.8	-0.19	2.6	0.1 L	16	LD
Y4HWWT	42.9	44.0 L	44.5	46.4	44.4	0.15	2.6	1.5	44.2	0.11	2.3	1.9	12	LD
YCPJZM	42.7 H	39.5 *	40.3	43.4	41.5	-1.26	4.0	1.9	42.4	-1.31	4.2	1.9	16	LD
ZJKZQJ	42.2	41.6	40.8	43.1	41.9	-1.05	1.9	1.0	41.9	-1.64	1.9	1.0	4	TH

Consensus (All Labs) Results														
Wk Mean	43.78	43.95	44.50	44.32	Month Mean	44.14			Grand Mean	44.02				
Avg SDr	3.02	3.07	2.96	2.94	Avg SD	3.01			Avg SD	2.99				
SD btwn Labs	2.35	1.84	3.30	2.14	SD btwn Labs	2.11			SD btwn Labs	1.27				
Labs Incl	26	25	25	25	SD btwn Wks	1.79			SD btwn Wks	1.87				
Labs Excl	0	1	0	1	Labs Incl	26			Labs Incl	25				
Labs not Rcvd	0	0	1	0										

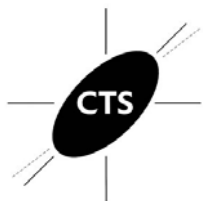


Containerboard Interlaboratory Testing Program  
Analysis 255  
**Ring Crush (RCT), 26 lb Corrugating Medium - CM12**  
TAPPI Official Test Method T822

**Report #638 (M)**  
**November 2022**

**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>XX</b>	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 261

STFI, 26 lb Corrugating Medium - CM12

TAPPI Official Test Method T826

Report #638 (M)

November 2022

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	
2Q4JUJ	15.1	15.0	15.2	14.2 H	14.9	1.74	1.3	0.5	14.4	0.78	1.0	0.6	16	LA
3CXU93	13.7	13.8	13.9	13.3	13.7	-0.40	1.1	0.3	13.7	-0.36	1.0	0.3	16	XX
4R6HQV	13.2	13.1	13.2 L	13.9	13.4	-0.97	0.9	0.4	13.5	-0.70	1.0	0.4	16	LH
7F827C	15.1	13.1	14.0 L	14.1	14.1	0.32	1.0	0.8	14.1	0.34	1.1	0.7	16	LH
8MGXFC	14.2 L	14.9	13.8	14.3 L	14.3	0.69	0.7	0.5	14.1	0.35	0.6	0.4	16	LH
B74JW6	15.0	14.1	14.4	14.0	14.4	0.83	1.0	0.4	14.5	0.91	1.1	0.4	16	XX
CHA6BU	14.5 L	14.9	14.5	14.2	14.5	1.14	1.0	0.3	14.0	0.08	1.0	0.8	16	XX
FMD622	14.7	14.2	15.5 *	15.2 *	14.9	1.79	1.3	0.5	14.7	1.19	1.2	0.5	16	LH
G98AHZ	14.2	13.7	14.8	13.1 L	14.0	0.12	0.9	0.7	14.3	0.61	1.2	0.6	16	LA
G9UVWC	14.0 L	14.1	13.9	14.2	14.0	0.26	0.9	0.1	14.0	0.08	0.9	0.4	16	LA
HF79E8	13.9 L	13.8 L	13.9 L	13.8 L	13.9	-0.06	0.4	0.1 L	13.8	-0.20	0.3	0.1 L	16	LA
KUWZ7L	13.4	13.9	12.3 *H	13.6	13.3	-1.05	2.0	0.7	15.2	1.99 *	2.9	3.1 H	16	LA
LRRKGV	8.8 XL	8.7 X	8.7 X	8.5 XL	8.7	-9.34 X	0.8	0.2	12.6	-2.09 *	1.8	2.8 H	16	LA
M4FDXG	13.2	13.3	13.1	13.6	13.3	-1.09	1.1	0.2	13.7	-0.28	1.1	0.5	16	TX
NGFBJT	14.3	14.0	13.4	13.4	13.8	-0.22	1.2	0.4	13.7	-0.39	1.1	0.3	16	LZ
PEPMKX	13.4	13.4	13.2	13.1	13.3	-1.13	1.1	0.1	13.5	-0.63	1.1	0.5	16	LU
QMG8HJ	13.9	14.4	14.5	14.0	14.2	0.51	1.2	0.3	14.0	0.16	1.1	0.4	16	LU
RALDKF	13.4	13.3	14.0	NO DATA	13.6	-0.58	1.2	0.4	13.6	-0.43	1.1	0.3	15	LB
TWV72J	13.2	13.9	NO DATA	NO DATA	13.5	-0.68	1.3	0.5	13.7	-0.27	1.1	0.5	14	TX
UUMAUL	14.3	14.2	14.2	14.2	14.2	0.59	1.0	0.1 L	13.9	0.04	1.1	0.4	16	LB
VNF4UA	14.0	13.4	13.9	14.0	13.8	-0.14	1.2	0.3	13.3	-0.93	1.1	0.4	16	LB
ZHRC8N	14.3	14.3	13.9	14.6	14.3	0.68	1.3	0.3	15.1	1.85	1.1	0.7	16	LA
ZJKZQJ	11.7 XL	12.4 *	13.0	13.3	12.6	-2.35 *	1.1	0.7	12.6	-2.09 *	1.1	0.7	4	LZ

Consensus (All Labs) Results														
Wk Mean	14.04	13.86	13.93	13.89	Month Mean	13.89			Grand Mean	13.92				
Avg SDr	1.04	1.06	1.29	1.15	Avg SD	1.14			Avg SD	1.23				
SD btwn Labs	0.61	0.65	0.76	0.52	SD btwn Labs	0.56			SD btwn Labs	0.64				
Labs Inclcd	21	22	21	20	SD btwn Wks	0.44			SD btwn Wks	0.99				
Labs Exclcd	2	1	1	1	Labs Inclcd	22			Labs Inclcd	23				
Labs not Rcvd	0	0	1	2										



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

**Report #638 (M)**  
**November 2022**

**Key to Instrument Codes Reported by Participants**

LA	L&W Autoline	LB	L&W Model 152
LH	L&W 282	LU	L&W 52 without moisture correction (was 53)
LZ	L&W (model not specified)	TX	TMI (model not specified)
XX	Instrument make/model not specified by lab		