

## Containerboard Interlaboratory Testing Program

Participant Summary Report #587 (J) - August 2018

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Collaborative Testing Services, Inc.  
CONTAINERBOARD INTERLABORATORY TESTING PROGRAM

## INTRODUCTION

The Interlaboratory Testing Program for Containerboard is operated and maintained by Collaborative Testing Services, Inc. (CTS), with technical guidance provided by the Containerboard Group of the American Forest & Paper Association. The tests are conducted on a monthly basis.

For these tests samples of linerboard and corrugating medium, that each have been separately randomized from narrow rolls, are distributed for testing weekly. One weight of medium (26 lb.) is used for Concora Flat Crush Strength, Corrugated Fluted Crush Strength, Ring Crush Strength, and STFI Compression. Two weights of linerboard are tested each month for Mullen Burst, Ring Crush, and STFI Compression: 42 lb. - every month; 36 lb. and 56 lb. - alternate months. The participants return their test results for analysis and receive a monthly report.

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

### USE OF AVERAGE MEAN AS A COLLABORATIVE REFERENCE VALUE

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

<b>Material</b>	<b>Lot Code</b>	<b>Dates in Use</b>
26 lb Corrugating Medium	CM92	January 2018-Current
	CM91	October 2016-December 2017
35 lb Linerboard	35E1	June 2017-Current
42 lb Linerboard	42D3	November 2017-Current
	42D2	August 2016-October 2017
56 lb Linerboard	56A2	January 2018-Current
	56A1	July 2016-November 2017

### ABOUT CTS

Founded in 1971, Collaborative Testing Services, Inc. (CTS) is a privately-owned company that specializes in interlaboratory tests for a wide variety of industries, including rubber, plastics, fasteners and metals, containerboard, paper, color, and wine, as well as proficiency tests for forensic laboratories. All of the tests are designed to assist organizations in achieving and maintaining quality control objectives. Labs from the U.S., as well as more than 80 countries, currently participate in the CTS programs.

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## EXPLANATION OF TABLES

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

### Definitions of Terms Used

#### Weekly Results

##### Laboratory Data

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

##### Consensus Data

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

#### Monthly Results

##### Laboratory Data

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

##### Consensus Data

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

## Cumulative Results

### Laboratory Data

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

### Consensus Data

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

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

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

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

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

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

Flags assigned to Weekly Means:

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

Flags assigned to Monthly SD Wks and Cumulative SD Wks:

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



Containerboard Interlaboratory Testing Program  
Analysis 201

Report #587 (J)  
August 2018

Top to Bottom Box Compression Strength, Corrugated Boxes - BX12

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2M994B	623.3	1.70	12.42	591.4	1.21	21.98	4	LG
4AF8ZA	555.8	-0.47	21.88	571.6	0.26	32.62	3	LH
76YHCH	606.0	1.14	32.07	592.3	1.25	19.30	2	EX
7BH4YU	527.2	-1.38	22.99	546.9	-0.91	13.78	4	EX
94G9E2	530.6	-1.27	32.00	533.1	-1.57	38.82	4	LS
AYK3FP	611.0	1.30	16.00	596.8	1.46	14.24	4	ES
ETYVKD	545.8	-0.79	25.66	547.8	-0.87	11.56	4	LM
FGJAR4	580.8	0.34	28.10	567.8	0.08	40.23	4	EX
FN2L66	590.2	0.64	34.94	588.8	1.08	3.61	L 4	ER
G2Z7MK	574.8	0.14	17.87	576.4	0.49	17.04	4	ET
GCGQ6W	563.2	-0.23	13.89	555.3	-0.51	18.42	4	LG
HG9KF3	572.0	0.05	15.84	578.0	0.57	11.36	4	LM
K8V8DP	583.8	0.43	5.57	L 596.4	1.45	12.98	4	LS
MMJYBV	522.9	-1.52	41.57	528.8	-1.77	19.83	4	LS
MPQEKM	554.1	-0.52	33.49	558.8	-0.34	11.46	4	TE
UB9TLN	548.4	-0.70	18.85	547.4	-0.89	3.83	L 4	LG
VEZGHL	542.0	-0.91	26.81	545.9	-0.96	4.30	4	LL
VW37NQ	635.2	2.08	* 31.28	646.4	3.83	X 10.42	4	ER
X3HJN2	601.8	1.01	14.39	571.6	0.26	22.13	4	ER
XZDZGT	557.4	-0.42	15.49	543.7	-1.06	9.92	4	LS
YBAGPV	598.2	0.89	24.86	584.9	0.90	12.91	4	LG
ZK8LBF	571.0	0.02	23.81	552.4	-0.65	60.25	H 4	LS
ZPJMEY	563.0	-0.24	21.16	556.3	-0.47	13.85	4	ER
ZQDHUF	529.9	-1.30	17.99	586.9	0.99	50.22	H 4	ET

Consensus (All Labs) Results

Month Mean	570.35	Grand Mean	566.06
Avg SD	24.36	Avg SD Months	24.82
SD btwn Labs	31.19	SD btwn Labs	20.99
Labs Incl	24	Labs Incl	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	561.50	33.32	8.84	6
Clip sealing	573.29	30.87	2.95	18



Containerboard Interlaboratory Testing Program  
Analysis 201

**Report #587 (J)**  
**August 2018**

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

TAPPI Official Test Method T804

**Key to Instrument Codes Reported by Participants**

ER	Emerson 6200 Series	ES	Emerson 8510
ET	Emerson 7200	EX	Emerson Apparatus (Model not specified)
LG	TLS / L.A.B. Validator Series	LH	L.A.B. Compression Tester Model #10610
LL	Lansmont 76-5K	LM	Lansmont 122-15k
LS	Lansmont Squeezer	TE	Testometric M500 - 25 KN



Containerboard Interlaboratory Testing Program  
Analysis 202

Report #587 (J)  
August 2018

Edgewise Compressive Strength, by T811, Corrugated Board - EC11

TAPPI Official Test Method T811

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
7BH4YU	41.5	0.22	1.17	40.7	-0.05	0.75	3	LC
DFBFYY	43.2	0.58	2.32	40.1	-0.19	3.69	H 3	LC
F3XXEA	33.8	-1.46	0.82	35.7	-1.29	2.72	2	WK
K6NPFT	40.8	0.06	1.32	41.1	0.06	1.28	3	TD
K8V8DP	30.7	-2.13 *	1.67	32.8	-2.04 *	1.80	3	EM
QY6FTR	40.4	-0.02	4.95	42.5	0.41	2.91	2	XX
UB9TLN	43.6	0.66	1.85	43.6	0.68	0.49	3	TH
XULTYK	48.1	1.65	1.96	48.1	1.83	0.00	1	TD
XZDZGT	43.4	0.63	1.98	43.9	0.76	0.85	3	LC
YBAGPV	42.3	0.39	1.61	43.1	0.55	0.81	3	LE
ZK8LBF	40.2	-0.06	2.11	40.0	-0.21	0.48	3	LD
ZPJMEY	38.1	-0.52	1.93	38.8	-0.52	0.60	3	EN

Consensus (All Labs) Results

Month Mean	40.52	Grand Mean	40.86
Avg SD	2.21	Avg SD Months	1.84
SD btwn Labs	4.60	SD btwn Labs	3.97
Labs Incd	12	Labs Incd	12

Key to Instrument Codes Reported by Participants

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



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

**Report #587 (J)**  
**August 2018**

WebCode	Monthly Results				Cumulative Results				Inst
	Mean	CPV	SD		Mean	CPV	SD Months	Months	
2M994B	46.4	1.37	1.68		44.7	0.53	1.45	3	EM
2UWMBQ	22.7	-9.68 X	0.61	L	22.7	-10.66 X	0.00	1	LD
4AF8ZA	44.3	0.40	1.73		43.4	-0.14	1.02	3	EM
4NHXG8	52.1	4.01 X	0.66	L	44.5	0.40	9.05	H 3	LD
76YHCH	43.9	0.23	0.86		44.0	0.15	0.09	2	TL
7BH4YU	42.7	-0.35	1.00		43.1	-0.30	0.46	3	LC
94G9E2	40.6	-1.32	2.12		41.9	-0.91	1.18	3	TB
9BE7ZJ	44.3	0.39	2.16		43.7	-0.01	0.54	3	LD
AYK3FP	45.0	0.73	1.80		45.0	0.64	1.24	3	LD
CW3WN6	45.9	1.14	1.66		46.0	1.16	0.12	L 3	LD
DFBFYY	44.5	0.49	1.50		44.7	0.48	0.19	L 3	LC
DFVY47	45.2	0.80	2.56		45.1	0.69	2.11	3	TK
ETYVKD	50.8	3.41 X	0.98		47.6	1.95 *	2.90	3	EM
F3XXEA	38.0	-2.52 *	1.00		39.0	-2.36 *	1.44	2	WK
FGJAR4	45.5	0.97	1.66		44.4	0.34	1.20	3	LD
G2Z7MK	41.5	-0.88	1.38		42.8	-0.43	2.02	3	EM
GCGQ6W	41.9	-0.72	2.13		42.9	-0.41	1.06	3	TJ
HG9KF3	46.2	1.27	0.88		46.4	1.35	0.19	L 3	TG
JNMN3V	41.4	-0.95	0.78		41.5	-1.13	0.11	L 3	LD
K6NPFT	42.9	-0.25	0.74	L	43.3	-0.21	0.69	3	TD
K8V8DP	41.5	-0.92	1.56		42.2	-0.76	0.86	3	EM
KXRVGW	45.1	0.76	1.74		45.0	0.66	0.09	L 3	EM
L3HHW2	43.7	0.14	1.79		42.3	-0.70	1.69	3	LC
M3X7PF	40.2	-1.51	0.40	L	40.0	-1.89	0.31	2	XX
M9GLY6	41.5	-0.91	1.77		43.2	-0.27	1.47	3	LD
MFLAT7	43.8	0.18	2.96	H	45.3	0.81	1.82	3	XX
MPQEKM	44.5	0.47	1.27		45.1	0.72	0.58	3	LD
NDAUY6	41.3	-1.00	1.23		43.9	0.10	2.29	3	LD
U8728W	46.3	1.35	1.69		46.3	1.34	1.15	3	CT
UB9TLN	44.3	0.40	0.94		44.8	0.54	0.70	3	TH
UDBVA6	44.8	0.64	1.31		44.5	0.38	0.62	3	LD
V8Z7ZV	42.9	-0.27	1.85		42.8	-0.46	1.05	3	EM
VEZGHL	43.9	0.22	1.56		43.8	0.06	0.18	L 3	LC
VW37NQ	41.4	-0.95	1.65		40.9	-1.42	0.48	3	EM
WHBY4V	49.1	2.65 *	1.40		48.4	2.37 *	1.03	3	TG
WKJBMH	41.6	-0.84	1.69		41.5	-1.13	1.98	3	TD
X3HJN2	43.3	-0.08	2.35		43.0	-0.37	0.64	3	LD
X3JCJN	40.9	-1.20	1.60		40.6	-1.58	1.04	3	LD
XZDZGT	45.5	0.95	2.08		44.3	0.31	1.41	3	LC





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

**Report #587 (J)**  
**August 2018**

WebCode	Monthly Results				Cumulative Results				Inst
	Mean	CPV	SD		Mean	CPV	SD Months	Months	
YBAGPV	43.3	-0.09	3.15	H	44.1	0.22	1.27	3	LY
YZ84MA	44.1	0.31	1.43		44.3	0.31	0.32	2	LC
ZK8LBF	46.2	1.27	1.55		46.3	1.31	0.51	3	LD
ZPJMEY	42.5	-0.45	1.58		40.7	-1.50	1.50	3	EN
ZQDHUF	41.5	-0.91	1.43		41.6	-1.05	0.24	L 3	TD
ZZ2B6R	41.3	-0.99	1.41		41.9	-0.90	0.64	3	TD

Consensus (All Labs) Results			
Month Mean	43.44	Grand Mean	43.71
Avg SD	1.69	Avg SD Months	1.82
SD btwn Labs	2.15	SD btwn Labs	1.97
Labs Incd	42	Labs Incd	43

**Key to Instrument Codes Reported by Participants**

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



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

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2JTGCH	105.6 L	106.3	106.9 L	106.3 L	106.3	-1.13	4.4	0.5 L	105.8	-1.09	5.2	2.0	16	LA
3RM2ZV	113.9	114.9	115.9	113.7	114.6	1.85	9.8	1.0	115.9	1.73	11.6	2.7	12	AH
3TRTLG	112.5	114.3	113.1 L	111.2	112.8	1.20	7.1	1.3	112.2	0.72	7.2	2.0	16	LC
4RHYPG	99.0 XH	115.0	111.2	113.4	109.7	0.08	16.9	7.3 H	105.1	-1.28	14.2	4.9	16	LC
4RKNUE	106.7	102.1	106.3	104.5	104.9	-1.64	10.2	2.1	105.3	-1.23	11.0	2.3	16	LA
843F8E	105.9	No DATA	No DATA	103.4	104.7	-1.72	9.2	1.8	106.5	-0.90	11.0	3.7	14	LC
96BEER	112.8	110.8	110.1	104.7	109.6	0.07	13.2	3.5	110.7	0.28	11.0	3.4	16	TB
9BE7ZJ	106.0	109.6	113.0	109.0	109.4	-0.01	10.3	2.9	113.2	0.97	12.2	5.3	16	LC
9ETZH2	106.4	106.0	108.8	108.9	107.5	-0.68	7.5	1.5	107.8	-0.52	6.8	1.7	16	TP
9U6EXD	109.0 L	110.0 L	109.1 L	109.2	109.3	-0.04	4.4	0.4 L	109.1	-0.15	4.2	0.7 L	8	LA
AYK3FP	106.9	112.5	105.4	107.7	108.1	-0.47	10.3	3.1	107.6	-0.59	11.3	3.0	16	LA
CLLC49	108.9	106.8	103.9	117.8	109.3	-0.03	9.4	6.0	107.8	-0.52	11.4	3.5	16	LA
CW3WN6	111.3	111.8	110.2	112.1	111.3	0.69	7.1	0.8	111.7	0.57	8.7	0.8 L	16	LA
DAR9JF	108.5	103.6	102.0	106.7	105.2	-1.52	11.4	3.0	107.2	-0.69	13.1	3.1	16	LC
DHJN9J	110.5	110.0	110.5	115.9 H	111.7	0.82	13.2	2.8	109.3	-0.11	11.4	3.2	16	TB
DLZVN7	109.2	109.2	109.4	109.3	109.3	-0.05	8.2	0.1 L	109.4	-0.09	7.5	0.2 L	16	LJ
EEW63F	110.3	106.6	110.2	102.5	107.4	-0.73	12.2	3.7	116.3	1.85	10.1	8.5	16	TB
EFQYJW	107.0	108.4	107.5	107.7	107.7	-0.64	7.3	0.6	108.5	-0.33	6.4	0.9 L	16	AH
FGJAR4	112.8	110.2	105.6	112.2	110.2	0.28	9.7	3.3	109.6	-0.02	10.9	3.1	16	AH
FN2L66	107.5	104.6	99.2 *	105.9	104.3	-1.84	11.7	3.6	104.2	-1.54	11.5	3.8	16	LZ
FZWMQL	114.9	111.2	103.8	106.0	109.0	-0.17	12.6	5.0	109.6	-0.03	10.8	4.9	16	LC
GAFJ8D	109.0	103.1	105.3	104.8	105.5	-1.40	11.1	2.5	106.5	-0.90	10.9	3.1	16	LC
HCCVYV	109.9	104.7	113.0	104.8	108.1	-0.48	10.0	4.1	106.1	-1.00	10.2	3.5	16	XX
K6NPFT	106.6	118.7 *	105.1	109.9	110.1	0.23	15.2	6.1	110.1	0.11	15.2	6.1	4	XX
L3HHW2	109.3	110.3	108.9	109.5	109.5	0.02	11.2	0.6	111.3	0.45	11.7	3.1	16	LA
LLWY2E	104.9	108.4	103.3	111.8	107.1	-0.85	14.2	3.8	106.9	-0.78	12.1	2.4	16	LC
LNWCFR	129.2 X	114.1	110.0	120.4 *	118.4	3.22 X	12.5	8.4 H	117.6	2.23 *	13.4	6.7	16	LC
M9GLY6	109.5	105.0	105.4	104.2	106.0	-1.23	8.9	2.4	106.6	-0.88	8.9	2.6	16	LA
MLQ4VE	121.1 X	113.9	114.8 H	106.9	114.2	1.71	13.6	5.8	115.4	1.59	13.0	4.1	16	LA
NQCKF4	110.9	114.0	110.2	113.4	112.1	0.97	11.1	1.8	111.2	0.43	10.1	3.7	16	LC
NXZYP4	107.9	113.8	110.3	112.7	111.2	0.62	11.3	2.6	112.2	0.69	12.0	3.2	12	AX
PK9UVC	106.9	119.0 *H	117.0 *	119.2 *	115.5	2.19 *	14.0	5.8	114.1	1.25	12.6	3.8	16	LZ
Q322KU	116.9 *	119.8 *	122.0 X	123.2 XH	120.5	3.96 X	14.4	2.8	115.8	1.70	13.7	4.3	12	LA
QFPF9K	118.8 *	108.6	111.2	110.6	112.3	1.03	9.9	4.5	113.9	1.17	11.3	5.1	13	LC
QPYLHZ	107.1	107.8	108.1	111.5	108.6	-0.29	12.3	2.0	107.1	-0.73	12.6	3.5	12	LC



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

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
QXBKCB	109.4	110.1	108.0	110.8	109.6	0.05	7.2	1.2	107.8	-0.52	8.3	2.1	16	LA
RJKHZW	106.7	106.7	112.5	111.4	109.4	-0.03	11.3	3.1	111.2	0.44	12.1	3.4	16	LC
T2JRJT	112.9	110.5	112.8	102.6	109.7	0.10	10.9	4.9	111.1	0.41	12.0	4.0	13	LZ
TP4ZVJ	114.9	114.5	115.9	121.5 *	116.7	2.61 *	8.0	3.3	118.8	2.56	*69.1	22.3 H	16	AH
U8728W	114.6	114.4	117.6 *	114.6	115.3	2.11 *	12.9	1.5	114.0	1.22	13.3	2.8	16	XX
UB6BL6	115.1	104.1	102.1	108.4	107.4	-0.72	9.3	5.8	105.4	-1.20	10.0	3.9	16	LC
UVPEXV	110.4 L	108.1 L	NO DATA	NO DATA	109.3	-0.07	3.7	1.6	109.7	0.00	4.2	1.7	9	XX
W7PHLP	107.7	105.6	106.8	104.2	106.1	-1.21	11.5	1.5	106.1	-1.01	11.5	1.5	4	LC
WJUX8K	112.2	115.6	106.2	109.2	110.8	0.49	10.8	4.0	111.2	0.41	10.1	3.9	16	AH
WNGRZC	108.6	109.4 L	109.6	108.2 L	109.0	-0.17	5.4	0.7	108.0	-0.48	5.6	2.0	16	RE
X3HJN2	111.0	111.9	107.2	107.9	109.5	0.02	11.3	2.3	106.9	-0.78	10.7	6.2	16	AH
X3JCJN	104.6	110.7	107.0	111.0	108.3	-0.40	10.3	3.1	107.1	-0.72	11.0	3.9	16	LC
X3M2NL	108.9	108.9	107.9	109.9	108.9	-0.19	11.6	0.8	107.6	-0.58	13.2	2.7	16	LC
XWQGCP	118.6 *	111.7	107.1	110.5	112.0	0.91	10.2	4.8	111.6	0.53	12.3	5.2	16	LA
XZDZGT	107.9	106.9	107.0	108.7	107.6	-0.65	12.0	0.8	103.6	-1.69	11.4	3.0	16	AH
Y7WL2K	111.1	112.7	106.4 H	112.8	110.8	0.48	14.5	3.0	111.1	0.39	12.4	3.3	16	LJ
YBAGPV	111.2	113.9	110.8	111.5	111.9	0.87	12.4	1.4	112.5	0.79	12.4	1.9	16	LZ
YYTUGU	105.7	104.8	108.7	107.5	106.7	-0.99	10.6	1.8	105.7	-1.10	10.9	2.4	16	LB
ZK8LBF	103.4	107.2	115.3	113.2	109.8	0.12	9.0	5.5	107.9	-0.50	10.3	5.1	16	LA
ZPN4EJ	108.5	107.1	109.4	110.9	109.0	-0.16	11.3	1.6	107.7	-0.55	11.1	2.7	16	LA

Consensus (All Labs) Results														
Wk Mean	109.76	109.99	108.90	109.86	Month Mean	109.43			Grand Mean	109.68				
Avg SDr	10.68	10.94	10.83	10.42	Avg SD	10.78			Avg SD	14.32				
SD btwn Labs	3.53	4.16	3.97	4.30	SD btwn Labs	2.79			SD btwn Labs	3.57				
Labs Includ	52	54	52	53	SD btwn Wks	3.31			SD btwn Wks	4.73				
Labs Exclcd	3	0	1	1	Labs Includ	53			Labs Includ	55				
Labs not Rcvd	0	1	2	1										

**Analysis Notes**

- DHJN9J - Data appears to be switched between Analysis 205 and Analysis 207 for Week 1. Data switched by CTS.
- QPYLHZ - Data appears to be switched between Analysis 205 and Analysis 207 for Week 1. Data switched by CTS.



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

**Report #587 (J)**  
**August 2018**

**Key to Instrument Codes Reported by Participants**

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



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

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2JTGCH	90.1	89.1	90.6	89.9	89.9	-0.81	4.0	0.6	88.5	-1.27	4.5	3.9	12	LA
3RM2ZV	99.4 *	97.6	103.3 X	100.2 *	100.1	3.06 X	8.1	2.4	97.9	1.90	8.5	3.2	8	AH
4RHYPG	88.0	95.6	93.9	89.2	91.7	-0.15	8.2	3.6	89.0	-1.09	9.4	3.7	12	LC
4RKNUE	89.0	92.4	94.5	91.6	91.9	-0.08	7.8	2.3	90.9	-0.45	7.3	3.1	12	LA
843F8E	90.1	No DATA	No DATA	92.9	91.5	-0.21	5.6	2.0	89.8	-0.85	7.4	3.4	10	LA
96BEER	93.2	90.4	92.5	82.7 *	89.7	-0.91	9.2	4.8	92.7	0.14	9.8	3.7	12	TB
9BE7ZJ	93.0	90.7	90.5	92.0	91.6	-0.20	6.5	1.2	94.1	0.62	8.8	2.6	12	LC
9ETZH2	87.8	89.7	88.1	90.0	88.9	-1.20	6.8	1.1	89.0	-1.11	5.6	0.8 L	12	TP
9U6EXD	92.8	91.8 L	92.0	93.0	92.4	0.13	4.3	0.6	92.3	0.02	3.7	0.4 L	12	LA
AYK3FP	89.2	90.1	90.2	86.0	88.9	-1.21	7.0	2.0	90.3	-0.65	8.4	2.0	12	LA
CLLC49	89.2	94.5	91.6	100.5 *	93.9	0.71	8.4	4.8	90.9	-0.46	8.3	4.0	12	LA
CW3WN6	91.6	92.3	92.3	92.7	92.2	0.05	7.1	0.5	92.4	0.03	6.8	1.0	12	LA
DAR9JF	92.1	89.2	91.5	95.2	92.0	-0.02	7.0	2.5	92.2	-0.03	8.2	2.6	12	LC
DHJN9J	93.9	97.4	98.8	88.7	94.7	1.00	8.3	4.5	93.9	0.54	8.6	3.5	11	TB
DLZVN7	92.1	92.1	92.1	92.1	92.1	0.01	5.6	0.0 L	91.9	-0.13	6.4	0.6 L	12	LJ
EEW63F	93.3	98.7	94.1	93.3	94.9	1.06	8.9	2.6	100.1	2.64 *	8.1	4.7	12	TB
EFQYJW	91.0	90.4	89.6	90.1	90.3	-0.68	6.2	0.6	89.7	-0.88	5.5	1.0	12	AH
FGJAR4	92.2	94.4	93.4	95.4	93.9	0.68	7.4	1.4	90.7	-0.55	8.6	7.2 H	12	AH
FN2L66	91.1	88.8	86.0	85.0	87.7	-1.65	7.6	2.7	86.6	-1.91	8.7	2.8	12	LA
FZWMQL	91.8	93.4	88.8	94.8 H	92.2	0.05	9.7	2.6	91.9	-0.11	9.0	1.9	12	LC
GAFJ8D	89.9	87.7	89.7	85.9	88.3	-1.43	7.3	1.8	88.7	-1.22	8.0	2.4	12	LA
HCCVYV	92.5	87.4	91.4	90.1	90.4	-0.65	8.4	2.2	95.7	1.16	8.8	8.1 H	12	XX
K6NPFT	91.5	92.6	87.6	92.9	91.2	-0.35	7.7	2.4	91.2	-0.38	7.7	2.4	4	XX
L3HHW2	94.5 H	93.6	96.0	92.6	94.2	0.80	9.2	1.4	95.3	1.03	8.9	2.8	12	LA
LLWY2E	90.2	87.2	89.4	91.8	89.7	-0.91	8.3	1.9	91.1	-0.40	8.1	2.0	12	LC
LNWCFR	92.5	90.1	95.5	93.5	92.9	0.32	7.9	2.3	94.6	0.78	8.5	7.2 H	12	LC
M9GLY6	87.5	95.4 L	93.1	89.8	91.5	-0.23	5.2	3.5	87.8	-1.51	6.9	4.3	12	LA
MLQ4VE	97.2	92.6 H	98.6	101.7 *	97.5	2.07 *	10.8	3.8	97.9	1.89	9.1	2.2	12	LA
NQCKF4	94.9	96.1	92.4	98.3	95.4	1.27	9.6	2.5	95.4	1.05	9.2	3.9	12	LC
NXZYP4	101.1 XH	91.5	92.8	90.0	93.8	0.67	8.6	5.0	93.2	0.33	8.3	3.5	12	AX
PK9UVC	95.1	99.6 *	100.1 *	94.4	97.3	1.99 *	8.4	3.0	97.5	1.77	8.3	2.8	10	LZ
Q322KU	92.6	98.3	91.0 H	102.2 *	96.0	1.51	10.5	5.2	95.0	0.94	9.7	4.1	12	LA
QFPF9K	93.5	88.3	89.7	90.9	90.6	-0.56	9.9	2.2	93.6	0.44	9.4	3.4	11	LC
QPYLHZ	88.6	92.0	92.3	87.5	90.1	-0.75	6.6	2.4	89.4	-0.96	7.3	1.8	8	LC
QXBKCB	90.1	87.8	89.0	93.3	90.0	-0.77	6.3	2.3	91.4	-0.30	7.1	2.7	12	LA



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

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
RJKHZW	91.4	98.2	90.4	90.3	92.6	0.20	9.2	3.8	92.0	-0.10	9.6	2.6	12	LC
T2JRJT	95.4	95.9	95.0	92.2	94.6	0.97	8.5	1.6	93.0	0.25	9.6	2.1	12	LZ
TP4ZVJ	90.3	99.1	98.2	91.2	94.7	1.00	7.3	4.6	94.1	0.62	6.9	3.1	12	AH
U8728W	96.7	91.6	101.0 *	94.3	95.9	1.46	7.6	4.0	96.1	1.30	8.9	4.1	12	XX
UB6BL6	89.6	93.9	89.3	90.0	90.7	-0.52	8.3	2.1	88.6	-1.24	8.3	3.4	12	LC
UVPEXV	89.7	89.1	No DATA	No DATA	89.4	-1.01	4.8	0.4	90.0	-0.77	4.8	1.8	9	XX
W7PHLP	92.7	88.8	92.6	90.0	91.0	-0.40	8.0	1.9	91.0	-0.42	8.0	1.9	4	XX
WJUX8K	93.5	95.2	94.4	97.2	95.1	1.14	7.3	1.6	95.3	1.02	7.8	2.5	12	AH
WNGRZC	95.2	94.0	94.0	94.2	94.4	0.87	5.0	0.6	94.2	0.64	6.2	0.8 L	12	RE
X3HJN2	89.1	90.9	89.2	90.1	89.8	-0.85	9.0	0.8	88.3	-1.34	7.8	2.3	12	AH
X3JCJN	89.8	95.5	86.6	91.7	90.9	-0.44	7.4	3.7	90.7	-0.51	8.5	3.2	12	LC
X3M2NL	94.7	93.0	90.7	89.4	92.0	-0.04	8.9	2.4	91.2	-0.35	8.9	3.4	12	LC
XWQGCP	94.8	95.3	93.7	94.9	94.7	1.00	9.1	0.7	94.7	0.82	9.0	1.8	12	LA
XZDZGT	88.2	91.3	88.5	88.8	89.2	-1.09	7.0	1.4	88.8	-1.19	8.2	1.7	12	AH
Y7WL2K	93.2	93.1	88.3	90.2 H	91.2	-0.33	9.9	2.4	92.7	0.14	9.0	2.5	8	LJ
YBAGPV	97.5 *	95.5	100.3 *	98.1	97.8	2.19 *	8.4	2.0	96.3	1.36	8.8	2.8	12	LZ
YYTUGU	86.7	83.4 *	86.0	85.6	85.5	-2.51 *	6.2	1.4	88.4	-1.30	6.2	2.5	12	LB
ZK8LBF	88.5	92.8	92.3	92.3	91.5	-0.23	7.0	2.0	93.9	0.56	7.5	3.8	12	LA
ZPN4EJ	88.5	88.4	90.9	90.1	89.5	-0.98	7.0	1.2	90.8	-0.51	7.6	1.6	12	LA

Consensus (All Labs) Results														
Wk Mean	91.83	92.52	92.17	92.09	Month Mean	92.06			Grand Mean	92.26				
Avg SDr	7.74	7.91	8.25	7.44	Avg SD	7.82			Avg SD	8.04				
SD btwn Labs	2.82	3.54	3.59	4.06	SD btwn Labs	2.63			SD btwn Labs	2.96				
Labs Incl	53	53	51	53	SD btwn Wks	2.62			SD btwn Wks	3.28				
Labs Excl	1	0	1	0	Labs Incl	53			Labs Incl	54				
Labs not Rcvd	0	1	2	1										

**Analysis Notes**

- DHJN9J - Data appears to be switched between Analysis 205 and Analysis 207 for Week 1. Data switched by CTS.
- QPYLHZ - Data appears to be switched between Analysis 205 and Analysis 207 for Week 1. Data switched by CTS.



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

**Report #587 (J)**  
**August 2018**

**Key to Instrument Codes Reported by Participants**

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



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

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2JTGCH	83.7	84.4 L	83.9 L	83.7 L	83.9	-0.95	1.8	0.3 L	84.0	-0.94	2.3	0.9 L	16	TU
2M994B	87.5 H	82.1	84.7	82.1	84.1	-0.92	4.3	2.6	84.6	-0.80	4.1	2.2	16	EM
3LVWYE	87.8	84.6	83.4	84.2	85.0	-0.72	3.8	1.9	86.8	-0.27	4.2	2.5	12	XX
4RHYPG	90.1	89.5 L	94.6	92.8	91.8	0.72	3.8	2.4	90.0	0.47	3.7	4.4	16	LC
4RKNUE	85.8	90.7	85.4	91.3 H	88.3	-0.02	4.4	3.1	86.3	-0.39	4.9	3.7	16	LZ
843F8E	88.8	90.7	92.2	88.6	90.1	0.36	3.4	1.7	88.3	0.06	3.7	1.9	16	LD
8R7GB2	72.7 X	71.4 *	73.1 *	71.9 X	72.2	-3.46 X	2.9	0.8	72.2	-3.68 X	2.9	0.8 L	4	TH
9BE7ZJ	88.0	85.9	87.3	88.3	87.4	-0.21	3.9	1.1	86.0	-0.47	3.8	2.1	16	LD
9BTPJF	80.3 *	75.6	77.3	76.6 *	77.4	-2.35 *	5.3	2.1	77.2	-2.52 *	4.9	1.8	12	LC
9ETZH2	86.5	88.9	85.5	87.9	87.2	-0.26	3.0	1.5	89.1	0.26	3.7	1.6	16	TH
9U6EXD	88.5	88.4 L	88.7	88.7 L	88.6	0.05	1.9	0.1 L	89.0	0.23	2.4	0.9 L	8	LZ
CLLC49	91.7	96.4	91.6	69.6 XH	87.3	-0.23	5.9	12.1 H	90.7	0.64	5.4	9.1 H	16	LC
CW3WN6	91.6	91.2	92.1	92.8	91.9	0.76	3.7	0.7	91.5	0.81	3.3	0.6 L	16	LD
DAR9JF	94.8	85.7	84.9 H	84.0 H	87.4	-0.22	8.3	5.0	90.0	0.47	7.8	5.2	15	LC
DFBFYY	85.3	84.5	86.5	85.8	85.5	-0.61	2.8	0.9	85.4	-0.62	3.2	1.9	16	LC
DFVY47	70.0 X	74.0 *	72.7 *H	74.9 *	72.9	-3.32 X	5.7	2.2	71.7	-3.82 X	4.4	4.9	16	MZ
DHJN9J	94.2	85.9 L	93.7	87.8	90.4	0.43	4.1	4.2	90.7	0.62	4.6	2.7	16	LD
DLZVN7	87.6	87.5	87.8	87.7	87.6	-0.16	4.4	0.1 L	88.8	0.19	4.2	0.9 L	16	LD
EBDA39	85.9	85.2	No DATA	No DATA	85.5	-0.61	3.7	0.5	85.5	-0.58	3.7	0.5	2	EX
EEW63F	103.9 X	95.8 L	103.5 *	96.4	99.9	2.47 *	3.8	4.4	102.1	3.28 X	4.6	3.9	16	LX
FD33CH	93.4	94.3	91.0	94.5	93.3	1.06	3.6	1.6	91.9	0.92	3.6	1.5	16	LD
FN2L66	87.8	85.7 L	87.5	83.8	86.2	-0.47	3.6	1.9	86.5	-0.37	4.0	2.8	16	LD
GAFJ8D	86.5	86.2	84.2	85.6	85.6	-0.59	3.4	1.0	83.7	-1.02	3.8	2.5	16	LC
HKU4K7	89.0	74.3 *H	82.5	82.8	82.2	-1.33	12.9	6.0	85.1	-0.67	8.2	5.6	14	MB
KXRVG V	83.8	78.9	85.3	81.7	82.4	-1.28	3.8	2.8	82.3	-1.33	4.2	2.3	16	EM
L3HHW2	96.5	72.2 *	73.2 *H	94.5	84.1	-0.92	6.7	13.2 H	78.9	-2.12 *	7.6	10.0 H	16	LC
LLWY2E	85.6	85.2	85.3	87.8	86.0	-0.52	3.1	1.2	86.8	-0.27	3.1	1.3	16	LD
M9GLY6	82.1	85.5	83.6	89.3	85.1	-0.70	3.3	3.1	86.0	-0.47	3.5	1.9	16	LD
MLQ4VE	92.1	92.9	93.0	92.3	92.6	0.90	4.0	0.4 L	93.1	1.19	4.1	2.9	16	LZ
MPQEK M	90.5	92.2	92.3	91.7	91.7	0.71	2.5	0.9	91.6	0.85	2.3	0.9	16	LD
NXZYP4	72.9 X	80.3	81.1	79.7	78.5	-2.12 *	5.4	3.8	76.5	-2.70 *	4.8	5.3	12	LC
PK9UVC	86.9	87.0	86.5	87.1	86.9	-0.32	4.2	0.3 L	87.3	-0.16	4.0	2.0	16	LC
Q322KU	100.2 *	100.7 *	99.9	100.6 *	100.3	2.56 *	4.3	0.4 L	96.5	1.99 *	5.8	3.8	12	LD
QFPF9K	90.6	89.8 L	93.1	88.0	90.4	0.42	3.3	2.1	90.9	0.68	3.6	2.1	13	LD
QXBKCB	86.5	86.8 L	88.1 L	86.5	87.0	-0.30	2.3	0.8	88.1	0.03	3.9	4.7	16	LD





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

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
TH937V	93.3	95.2	92.9	92.6	93.5	1.10	4.3	1.2	93.5	1.28	4.3	1.2	4	EM
TP4ZVJ	96.2	92.1	94.9	89.8	93.2	1.04	4.9	2.8	95.2	1.67	4.7	3.9	16	LZ
UB6BL6	90.6	87.3	89.0	95.1	90.5	0.46	4.7	3.4	90.5	0.57	4.3	3.8	16	LD
UE4QPL	95.4	95.8	95.2	95.8	95.5	1.54	3.5	0.3 L	95.7	1.80	3.8	2.5	12	LD
UVPEXV	80.0 *	86.5	77.8	No DATA	81.4	-1.49	4.0	4.5	82.1	-1.39	3.6	3.6	10	LD
WHBY4V	92.6	92.6 L	94.2	92.8	93.0	1.00	2.9	0.8	90.3	0.54	3.2	2.3	16	TH
WJUX8K	88.4	95.0	91.8	92.2	91.8	0.74	3.7	2.7	88.3	0.06	6.1	6.9 H	15	LC
WNGRZC	86.8	87.9	87.6	87.1	87.4	-0.22	2.5	0.5 L	89.5	0.35	3.2	1.7	16	LZ
X3HJN2	83.7	87.0	84.1	84.2	84.8	-0.78	3.3	1.5	85.9	-0.49	3.8	1.7	16	LD
X3JCJN	85.6	88.4	82.6	86.4	85.8	-0.56	3.9	2.4	86.5	-0.35	4.1	1.7	16	LD
X3M2NL	90.8	88.3	92.7	88.7	90.1	0.37	4.1	2.0	90.8	0.65	4.6	1.4	16	LD
XZDZGT	89.4	90.1	91.4	91.1	90.5	0.45	4.4	0.9	90.5	0.58	4.4	1.7	16	LC
Y7WL2K	90.0	86.6	93.2	91.0	90.2	0.39	5.1	2.7	88.4	0.09	4.6	2.8	16	LD
YBAGPV	86.6	85.2	88.5	86.5	86.7	-0.36	3.2	1.3	86.8	-0.29	3.6	1.3	16	LG
YYTUGU	95.8	97.2	92.5	92.6	94.5	1.32	4.8	2.4	92.6	1.06	4.3	2.3	16	LC
ZK8LBF	88.8	90.7	90.1	90.2	90.0	0.34	3.8	0.8	87.3	-0.16	3.7	2.1	16	LD
ZPJMEY	83.6	80.1	81.5	81.8	81.7	-1.42	3.9	1.4	82.2	-1.36	4.1	1.5	16	EN
ZPN4EJ	91.1	91.2	90.7	90.4	90.9	0.53	4.5	0.4 L	91.4	0.78	4.1	1.6	16	LD
ZZ2B6R	90.6 L	93.8 L	91.5 L	94.6 L	92.6	0.91	1.3	1.9	91.9	0.91	1.3	1.7	16	TD

Consensus (All Labs) Results									
Wk Mean	88.97	87.43	87.88	88.44	Month Mean	88.37	Grand Mean	88.02	
Avg SDr	3.77	5.05	4.63	3.93	Avg SD	4.41	Avg SD	4.35	
SD btwn Labs	4.26	6.34	6.28	5.10	SD btwn Labs	4.66	SD btwn Labs	4.28	
Labs Incl	50	54	53	50	SD btwn Wks	3.36	SD btwn Wks	3.34	
Labs Excl	4	0	0	2	Labs Incl	52	Labs Incl	51	
Labs not Rcvd	0	0	1	2					

**Key to Instrument Codes Reported by Participants**

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



Containerboard Interlaboratory Testing Program

Analysis 217

Report #587 (J)

August 2018

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	
2JTGCH	72.7	73.7	73.6 L	73.1 L	73.3	-0.80	1.8	0.5 L	74.2	-0.75	1.8	0.7 L	12	TU
2M994B	79.9	75.2	75.0	73.5	75.9	-0.32	4.0	2.8	77.6	-0.04	3.5	2.7	12	EM
3LVWYE	78.0	75.2	78.1	78.0	77.3	-0.06	3.9	1.4	78.3	0.10	3.7	2.9	10	XX
4RHYPG	79.1	80.6	80.5	78.9	79.8	0.38	3.1	0.9	80.2	0.49	3.4	2.5	12	LC
4RKNUE	71.9	79.6	75.6	75.5	75.6	-0.37	3.5	3.1	74.5	-0.67	4.7	5.9	12	LZ
843F8E	79.4	82.6	79.7	82.9	81.1	0.63	2.7	1.8	80.5	0.56	3.1	1.3	12	LD
8R7GB2	64.9 *	66.9	65.7 *	66.6	66.0	-2.12 *	2.4	0.9	66.0	-2.42 *	2.4	0.9 L	4	TH
9BE7ZJ	76.5	76.3	76.8	76.8 L	76.6	-0.20	2.7	0.2 L	76.7	-0.22	2.6	0.5 L	12	LD
9BTPJF	69.4	68.1	67.2 *	68.0	68.2	-1.73	4.4	0.9	67.5	-2.11 *	4.2	1.4	8	LC
9ETZH2	78.7	77.2	78.5	78.4	78.2	0.09	3.0	0.7	77.9	0.02	3.3	1.3	12	TH
9U6EXD	78.9	82.0 L	79.6 L	79.8	80.1	0.43	1.6	1.3	80.2	0.49	2.4	1.0	12	LZ
BRV2CH	60.8 XH	63.1 *H	64.0 *H	64.6 *	63.1	-2.65 *	6.0	1.7	71.5	-1.29	6.4	8.9 H	12	MB
CLLC49	87.2	85.8	86.2	62.1 *H	80.3	0.48	5.1	12.2 H	81.6	0.78	5.7	11.4 H	12	LC
CW3WN6	80.9	81.5	81.6	81.0	81.3	0.65	3.6	0.4 L	81.1	0.67	3.1	0.5 L	12	LD
DAR9JF	79.8	76.9	76.7	76.1 H	77.4	-0.06	5.4	1.7	78.8	0.21	5.4	2.8	12	LC
DFBFYY	77.8	77.1	78.0	77.3	77.5	-0.03	2.4	0.4 L	76.7	-0.23	2.9	1.2	12	LC
DFVY47	66.2 *	65.3 *	60.1 X	64.7 *	64.1	-2.48 *	3.8	2.7	60.7	-3.52 X	4.7	5.1	12	MB
DHJN9J	80.3	78.8 H	79.5 H	77.5	79.0	0.24	5.4	1.2	80.4	0.54	4.7	3.2	11	LC
DLZVN7	77.6	77.8	77.8	77.9	77.8	0.02	4.4	0.2 L	78.5	0.15	4.7	0.9 L	12	LD
EBDA39	75.1	75.7	No DATA	No DATA	75.4	-0.41	3.0	0.4	76.5	-0.27	3.9	1.3	4	EX
EEW63F	94.5 X	84.7	86.0 H	92.5 *	89.4	2.13 *	5.6	4.8	89.9	2.48 *	4.9	2.8	12	LX
FD33CH	81.7	83.2	80.8	83.1	82.2	0.82	2.6	1.2	81.2	0.69	2.7	1.5	12	LD
FN2L66	77.8	74.6	76.4	77.4	76.6	-0.21	3.6	1.4	77.6	-0.05	3.9	1.8	12	LD
GAFJ8D	74.3	72.2	76.5	74.8	74.5	-0.59	3.1	1.8	75.7	-0.42	3.2	3.2	12	LC
HKU4K7	83.7	79.5	79.2	73.5 H	79.0	0.23	4.4	4.2	76.7	-0.23	5.7	5.1	11	MB
KXRVGv	72.1	69.4	72.2	71.3	71.3	-1.17	4.1	1.3	71.2	-1.35	4.2	1.6	12	EM
L3HHW2	83.3	64.4 *H	64.5 *H	83.1	73.8	-0.70	6.1	10.8 H	68.7	-1.88	7.1	7.6 H	12	LC
LLWY2E	76.5	80.7	78.4	78.6 L	78.6	0.16	2.4	1.7	78.0	0.05	2.3	1.1	12	LD
M9GLY6	78.0	79.5	76.2	76.7	77.6	-0.01	2.6	1.4	76.0	-0.37	2.9	1.5	12	LD
MLQ4VE	83.1	84.2	82.4	84.5	83.6	1.07	4.1	1.0	80.1	0.47	5.2	8.1 H	12	LZ
MPQEKM	82.8	83.0	82.5	83.1	82.8	0.94	2.1	0.3 L	82.3	0.91	2.1	0.7 L	12	LD
NXZYP4	64.3 *	64.4 *	66.6 *	65.6	65.2	-2.27 *	3.3	1.1	64.7	-2.69 *	3.8	3.6	12	LC
PK9UVC	74.3	73.4	72.0	71.3	72.8	-0.90	3.5	1.3	74.7	-0.63	3.4	2.6	10	LC
Q322KU	87.8	87.8	89.4 *	88.6	88.4	1.95 *	3.3	0.8	87.4	1.96 *	3.9	1.7	12	LD
QFPF9K	77.0	81.1	80.4	76.4	78.7	0.19	2.9	2.3	79.5	0.35	2.9	2.2	11	LD



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

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
QXBKCB	79.5	79.1	78.0	79.5	79.0	0.24	2.6	0.7	78.6	0.17	2.7	1.2	12	LD
TH937V	82.0	80.8	83.9	77.2	81.0	0.59	3.0	2.8	80.3	0.51	3.3	2.6	7	EM
TP4ZVJ	80.6	80.7	81.4	83.0	81.4	0.68	4.8	1.1	82.8	1.02	4.4	3.3	12	LZ
UB6BL6	82.2	84.7	80.0	79.2	81.5	0.70	4.1	2.5	81.7	0.81	4.4	1.6	12	LD
UE4QPL	86.4	86.1	85.1	85.8	85.8	1.48	3.5	0.5	84.7	1.41	3.6	1.4	12	LD
UVPEXV	66.5 *	71.5	72.6	No DATA	70.2	-1.36	3.2	3.3	70.3	-1.55	3.1	3.5	10	LD
WHBY4V	78.2	77.3	79.7	L 80.3	78.9	0.22	2.4	1.3	78.3	0.10	2.9	0.9	L 12	TH
WJUX8K	74.2 H	82.2	78.6	84.4	79.9	0.40	4.0	4.5	78.3	0.09	6.2	8.3	H 11	LC
WNGRZC	78.6	78.7	78.8	76.4	78.1	0.08	3.5	1.1	81.6	0.78	3.0	2.8	12	LZ
X3HJN2	74.2	75.4	74.7	74.6	74.7	-0.54	3.2	0.5	75.1	-0.57	3.0	0.9	L 12	LD
X3JCJN	74.6	78.1	76.3	73.1	75.5	-0.40	3.7	2.2	75.7	-0.43	3.4	1.5	12	LD
X3M2NL	80.0	81.5	83.8	85.7	82.7	0.92	3.0	2.5	81.7	0.81	2.9	1.6	12	LD
XZDZGT	83.7	82.5	80.9	82.4	82.4	0.85	2.8	1.1	82.2	0.90	3.5	0.9	L 12	LC
Y7WL2K	82.0	81.6	78.8	82.4	81.2	0.64	3.4	1.6	80.3	0.51	3.2	3.2	12	LD
YBAGPV	80.0	80.1	81.6	79.1	80.2	0.45	3.1	1.1	79.5	0.35	3.2	1.2	12	LG
YYTUGU	88.9 *	85.7	87.1	86.6	87.1	1.71	3.8	1.3	84.6	1.40	4.0	2.3	12	LC
ZK8LBF	77.8	78.7	80.9	77.8	L 78.8	0.21	3.1	1.5	75.6	-0.46	3.5	3.6	12	LD
ZPJMEY	77.0	74.9	73.2	H 76.1	75.3	-0.43	4.1	1.7	75.4	-0.48	3.4	1.5	12	EN
ZPN4EJ	79.0	79.5	77.6	79.4	78.9	0.22	4.0	0.9	78.9	0.23	3.4	0.9	L 12	LD
ZZ2B6R	79.7	75.6	L 80.3	75.3	L 77.7	0.01	1.6	2.6	73.5	-0.89	2.1	3.7	12	TD

Consensus (All Labs) Results									
Wk Mean	78.04	77.75	77.95	77.57	Month Mean	77.69	Grand Mean	77.81	
Avg SDr	3.41	3.66	3.78	3.71	Avg SD	3.65	Avg SD	3.85	
SD btwn Labs	5.38	5.85	5.47	6.21	SD btwn Labs	5.50	SD btwn Labs	4.87	
Labs Incl	53	55	53	53	SD btwn Wks	2.87	SD btwn Wks	3.53	
Labs Excl	2	0	1	0	Labs Incl	55	Labs Incl	54	
Labs not Rcvd	0	0	1	2					



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

**Report #587 (J)**  
**August 2018**

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



Containerboard Interlaboratory Testing Program

Analysis 223

Report #587 (J)

August 2018

STFI, 42 lb Linerboard - 42D3

TAPPI Official Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2UWMBQ	25.8 *H	25.2 *H	21.8	24.0	24.2	1.50	2.4	1.8 H	23.5	1.05	2.1	1.2	16	LH
3LVWYE	44.0 XH	23.4	22.4	23.1	28.2	5.30 X	3.0	10.6 H	24.1	1.76	2.3	6.3 H	12	XX
3RM2ZV	24.1	24.8	26.2 X	24.8 H	25.0	2.23 *	1.9	0.9	24.1	1.76	2.4	1.4	12	LU
3RNUWH	22.6	No DATA	No DATA	23.7 L	23.1	0.50	1.2	0.7	22.4	-0.21	1.7	0.6	10	LW
3TRTLG	22.5	21.7	22.1	22.2	22.1	-0.47	1.8	0.3	23.0	0.46	1.8	1.0	16	LA
4RHYPG	20.5	27.4 XL	29.7 X	27.4 X	26.2	3.42 X	1.6	4.0 H	23.3	0.84	2.0	2.6 H	16	LA
4RKNUE	20.8	21.2	21.7	20.7	21.1	-1.44	1.5	0.5	20.9	-1.98 *	1.8	0.9	16	LA
843F8E	23.0	No DATA	No DATA	22.3	22.7	0.04	2.0	0.5	22.5	-0.06	1.8	0.7	14	LA
8R7GB2	21.0	21.9	20.8	19.6 *	20.8	-1.71	1.8	1.0	20.8	-2.14 *	1.8	1.0	4	LH
96BEER	20.7	21.8	21.9	21.5	21.5	-1.07	1.6	0.6	21.3	-1.54	1.7	0.5	16	LZ
9BE7ZJ	21.9	21.8	21.8	23.4	22.2	-0.36	2.0	0.8	22.1	-0.62	1.8	0.7	16	LA
9ETZH2	21.8	22.4	22.3	22.3 L	22.2	-0.39	1.3	0.3	22.2	-0.44	1.2	0.2 L	16	TT
BAWTCX	20.8	24.3	22.7 H	23.6	22.9	0.23	2.2	1.5	22.6	0.02	2.2	1.0	16	LY
BRV2CH	22.0	22.6	20.9	20.8	21.6	-0.96	2.0	0.9	22.3	-0.32	2.0	0.8	16	BK
CW3WN6	22.5	22.7 L	22.6	22.8	22.6	0.02	1.4	0.2	22.6	-0.01	1.3	0.2 L	16	LA
DAR9JF	21.5	23.8	22.3	23.2	22.7	0.09	1.9	1.0	22.8	0.27	2.2	1.0	15	LA
DHJN9J	23.0	23.4	23.1	23.8	23.3	0.67	1.9	0.4	23.5	1.05	1.9	0.4	16	LW
EBDA39	24.1 L	21.2 L	No DATA	No DATA	22.6	0.02	0.0	2.1	22.6	0.03	0.0	2.1	2	TT
EFQYJW	22.3 L	22.4	22.4	22.6	22.4	-0.20	1.3	0.1 L	22.5	-0.12	1.2	0.2 L	16	TT
FD33CH	21.0	22.7	23.7	22.7	22.5	-0.08	1.8	1.1	22.6	-0.01	1.7	0.9	16	LY
FN2L66	21.8	21.9	22.6	23.0	22.3	-0.25	1.8	0.6	22.1	-0.56	1.8	0.6	16	LY
FZWMQL	22.6	22.6	24.4	23.3	23.2	0.56	1.7	0.8	22.4	-0.24	1.9	1.1	16	LA
GAFJ8D	22.6	22.5	22.3	22.3	22.4	-0.17	1.4	0.2	22.1	-0.65	1.6	0.6	16	LA
HCCVYV	22.4	24.0	22.4	24.6	23.3	0.69	2.2	1.1	22.8	0.23	2.1	1.0	16	LH
HKU4K7	23.2	23.0	24.6 *	23.4	23.5	0.87	1.9	0.7	23.0	0.46	1.7	0.7	14	LA
JBGA74	23.8	24.0	23.6	24.2	23.9	1.20	2.0	0.3	23.9	1.53	2.0	0.5	16	XX
JNMN3V	20.2	20.7	21.3	19.7 *	20.5	-2.01 *	1.8	0.7	20.9	-1.99 *	1.8	0.6	16	LH
L3HHW2	24.1	25.1	23.1	24.0	24.1	1.39	2.2	0.8	23.6	1.21	2.1	0.7	16	LU
LNWCFR	22.5	21.7	22.9	23.1	22.6	-0.04	2.2	0.6	22.8	0.26	2.0	1.3	16	LA
M9GLY6	21.2	21.6	21.9	21.5 L	21.5	-1.00	1.4	0.3	21.9	-0.84	1.5	0.4	16	BK
MFZW7E	23.4	24.1 L	23.9	23.4	23.7	1.05	1.7	0.4	23.7	1.33	1.7	0.4	4	XX
MLQ4VE	21.1	21.3	21.7	22.2	21.6	-0.96	1.8	0.5	21.8	-0.98	1.9	0.4	16	LW
MPQEKM	20.2	21.1	19.3 X	21.4	20.5	-1.97 *	1.5	0.9	20.7	-2.22 *	1.5	0.6	16	LY
NQCKF4	21.9	22.1	22.0	22.1	22.0	-0.56	1.9	0.1 L	22.5	-0.06	1.9	0.6	16	LA
NXZYP4	23.7	23.8	26.0 X	24.9	24.6	1.86	1.7	1.1	23.3	0.83	1.7	1.6	12	XX



**Containerboard Interlaboratory Testing Program**  
 Analysis 223  
**STFI, 42 lb Linerboard - 42D3**  
 TAPPI Official Test Method T826

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
PACQT4	25.0 *	29.2 XH	28.8 X	28.6 X	27.9	4.97 X	2.1	1.9 H	25.1	3.02 X	2.0	3.6 H	15	LW
PK9UVC	22.5	21.4	21.4	21.9	21.8	-0.75	2.1	0.5	22.3	-0.31	2.0	0.7	16	LW
QFPF9K	21.8	19.9 *	22.5	20.3	21.1	-1.38	1.9	1.2	21.3	-1.50	2.0	1.1	13	LZ
QPYLHZ	23.2	24.2	24.6 *H	23.9	24.0	1.28	2.3	0.6	23.6	1.15	2.4	1.4	12	LA
QXBKCB	22.7	23.1	21.4 L	22.4	22.4	-0.19	1.4	0.7	22.5	-0.07	1.8	0.8	16	LA
RJKHZW	24.1	23.6	23.0	23.2	23.5	0.82	1.8	0.5	23.2	0.73	1.8	0.5	16	LA
T2JRJT	26.3 X	24.9	23.6	23.7	24.6	1.90	2.2	1.3	25.2	3.12 X	2.2	4.6 H	13	LZ
UB6BL6	22.2	23.7	24.8 *	22.8	23.4	0.70	1.9	1.1	23.6	1.22	2.1	0.7	16	LA
UE4QPL	23.1	23.3	23.2	23.4	23.2	0.60	1.5	0.1	23.6	1.15	1.6	1.0	12	LH
WJUX8K	23.6 H	24.0 H	21.8	22.9 H	23.1	0.43	3.7	1.0	22.4	-0.24	3.2	1.0	16	LH
X3HJN2	22.0 L	20.5	21.9	19.8 *	21.0	-1.49	1.3	1.1	21.2	-1.66	1.8	0.6	16	LU
X3JCJN	22.0	22.8	21.1	22.4 L	22.1	-0.51	1.8	0.7	22.2	-0.43	1.8	0.6	16	LA
X3M2NL	21.7	22.6	23.2	22.9	22.6	0.00	2.0	0.6	23.2	0.68	1.9	0.6	16	LA
XWQGCP	22.4	23.3	24.0	24.8	23.6	0.95	2.1	1.0	23.6	1.14	1.9	1.0	16	LU
XZDZGT	21.1	22.5	21.2	21.9	21.7	-0.88	2.0	0.6	22.2	-0.49	2.0	0.5	16	LU
Y7WL2K	24.6	21.8	22.0	23.0	22.8	0.23	1.9	1.3	23.2	0.69	2.0	1.5	16	LU
YBAGPV	21.6	21.8	21.7	20.7	21.4	-1.09	1.8	0.5	21.6	-1.15	1.7	0.4	16	LU
YYTUGU	23.5 H	22.9 L	23.0	23.5	23.2	0.58	2.0	0.3	22.9	0.38	1.7	0.4	16	LW
ZK8LBF	20.3 L	23.7	24.2	22.7 L	22.7	0.11	1.4	1.7 H	22.8	0.27	1.9	1.3	16	LZ
ZPJMEY	21.1	21.9	21.6	21.1 L	21.4	-1.10	1.5	0.4	21.1	-1.74	1.9	0.5	16	LY
ZPN4EJ	23.6	23.2	22.7	23.2	23.2	0.52	1.8	0.3	22.7	0.08	1.7	0.4	16	LY

Consensus (All Labs) Results												
Wk Mean	22.38	22.73	22.54	22.65	Month Mean	22.61	Grand Mean	22.60				
Avg SDr	1.85	1.96	1.77	1.91	Avg SD	1.88	Avg SD	1.90				
SD btwn Labs	1.28	1.23	1.03	1.29	SD btwn Labs	1.06	SD btwn Labs	0.84				
Labs Incl	54	52	48	53	SD btwn Wks	0.86	SD btwn Wks	1.27				
Labs Excl	2	2	5	2	Labs Incl	53	Labs Incl	53				
Labs not Rcvd	0	2	3	1								



Containerboard Interlaboratory Testing Program  
Analysis 223  
**STFI, 42 lb Linerboard - 42D3**  
TAPPI Official Test Method T826

**Report #587 (J)**  
**August 2018**

**Key to Instrument Codes Reported by Participants**

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



Containerboard Interlaboratory Testing Program

Analysis 225

STFI, 35 lb Linerboard - 35E1

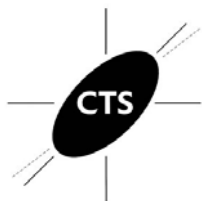
TAPPI Official Test Method T826

Report #587 (J)

August 2018

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2UWMBQ	23.9	24.1	23.3	23.5	23.7	1.53	1.6	0.4	23.5	1.48	1.5	0.8	12	LH
3LVWYE	21.7 H	22.0	22.2	22.0	22.0	-0.16	2.0	0.2	22.4	0.24	1.9	0.8	10	XX
3RM2ZV	23.4	24.5	23.6	24.6 *	24.0	1.83	1.8	0.6	23.6	1.68	1.9	0.7	8	LU
3RNUWH	21.8	No DATA	No DATA	22.8	22.3	0.16	1.8	0.7	21.9	-0.37	1.7	0.6	10	LW
3TRTLG	22.7	22.0	21.9	21.1 L	21.9	-0.26	1.5	0.7	22.2	-0.12	1.8	1.2	12	LA
4RHYPG	22.4	24.6 H	27.7 X	26.2 X	25.2	3.04 X	2.0	2.3 H	23.0	0.88	1.9	2.1 H	12	LA
4RKNUE	20.7	20.6	21.3	20.1	20.7	-1.49	1.8	0.5	21.2	-1.23	1.6	0.8	12	LA
843F8E	23.2	No DATA	No DATA	22.4	22.8	0.62	1.2	0.6	22.5	0.32	1.4	0.6	10	LW
8R7GB2	21.0	20.6	21.0	19.9 *	20.6	-1.52	1.6	0.5	20.6	-1.96 *	1.6	0.5	4	LH
96BEER	20.3	21.5	21.4	21.7	21.2	-0.95	1.5	0.6	21.1	-1.37	1.4	0.5	12	LZ
9BE7ZJ	21.2	22.2	21.8	22.4	21.9	-0.26	1.7	0.5	22.2	-0.12	1.6	0.5	12	LA
9ETZH2	21.9	21.7	21.5	21.7 L	21.7	-0.47	1.2	0.2	21.6	-0.81	1.1	0.2	12	TT
BAWTCX	21.0	23.7	22.7	23.3	22.7	0.51	1.6	1.2	23.5	1.46	1.9	1.1	12	LY
BRV2CH	19.5 *	19.8	19.4 *	19.7 *	19.6	-2.54 *	1.7	0.2	21.3	-1.13	1.7	1.5 H	12	BK
CW3WN6	22.1 L	22.4	22.0	22.2	22.2	0.00	1.3	0.2	22.1	-0.20	1.4	0.1 L	12	LA
DAR9JF	21.7	23.8	23.9	24.8 *	23.6	1.37	1.7	1.3 H	23.1	1.00	1.7	1.1	12	LA
DHJN9J	22.3	22.5	22.7	23.7	22.8	0.65	1.7	0.6	23.0	0.88	1.6	0.6	11	LW
EBDA39	21.7 L	22.8 L	No DATA	No DATA	22.3	0.10	0.0	0.8	22.2	-0.05	0.0	0.4	4	LZ
EFQYJW	21.9 L	21.3	22.0	22.0 L	21.8	-0.38	1.0	0.3	21.9	-0.45	1.0	0.3	12	TT
FD33CH	21.5	22.3	22.1	21.9	22.0	-0.20	1.7	0.4	22.0	-0.35	1.6	0.3	12	LY
FN2L66	22.0	21.4	21.8	22.5	21.9	-0.24	1.6	0.4	21.9	-0.40	1.5	0.4	12	LY
FZWMQL	22.4	23.1	23.3	23.0	23.0	0.78	1.5	0.4	22.2	-0.01	1.7	0.7	12	LA
GAFJ8D	21.7	20.1 L	20.3	20.4	20.6	-1.52	1.4	0.7	21.2	-1.25	1.7	0.7	12	LA
HCCVYV	22.2	23.7	23.1	23.0	23.0	0.84	2.0	0.6	23.0	0.89	1.9	0.5	12	LH
HKU4K7	22.2	20.5	21.5	22.2	21.6	-0.55	1.9	0.8	22.0	-0.33	1.7	1.3	11	LA
JBGA74	22.7	24.0	22.0	22.9	22.9	0.72	1.6	0.8	23.5	1.48	1.6	0.7	12	XX
JNMN3V	21.1	20.3	20.4	21.1	20.7	-1.44	1.5	0.4	21.1	-1.43	1.5	0.6	8	LH
L3HHW2	23.6	23.9	22.2	22.7	23.1	0.94	1.5	0.8	23.4	1.44	1.7	0.6	12	LU
LNWCFR	22.1	21.3	21.9	22.1	21.9	-0.31	1.5	0.4	22.0	-0.27	1.6	0.3	12	LA
M9GLY6	21.1	20.8	21.3	21.2	21.1	-1.06	1.5	0.2	21.1	-1.36	1.3	0.4	12	BK
MFZW7E	21.8	21.6	22.4	21.5	21.8	-0.33	1.8	0.4	21.8	-0.50	1.8	0.4	4	XX
MLQ4VE	21.3	21.3	21.4	21.6	21.4	-0.76	1.2	0.1	21.5	-0.92	1.6	0.3	12	LW
MPQEKM	20.1 *	20.6	19.2 *	20.6	20.1	-2.04 *	1.4	0.6	20.5	-2.06 *	1.4	0.5	12	LY
NQCKF4	21.8	22.8	22.6	22.0	22.3	0.14	1.7	0.5	22.4	0.20	1.6	0.5	12	LA
NXZYP4	23.5	24.2	23.8	23.1	23.6	1.46	1.7	0.4	23.0	0.93	1.5	1.0	12	XX





Containerboard Interlaboratory Testing Program

Analysis 225

Report #587 (J)

August 2018

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	
PACQT4	24.7 *	28.8 X	27.4 X	26.8 X	26.9	4.73 X	1.6	1.7 H	25.8	4.28 X	1.7	2.6 H	12	LW
PK9UVC	22.8	21.2	21.0	21.1	21.5	-0.64	1.7	0.8	22.0	-0.36	1.7	0.8	10	LW
QFPF9K	21.2	21.1	21.4	21.7	21.3	-0.81	1.5	0.3	21.5	-0.87	1.8	0.7	11	LZ
QPYLHZ	23.2	23.3	23.6 L	23.2 L	23.3	1.14	1.3	0.2	23.0	0.86	1.5	0.5	8	LA
QXBKCB	22.0	21.7 H	21.7	22.0	21.9	-0.31	1.9	0.2	22.0	-0.32	1.6	0.5	12	LA
RJKHZW	23.5	23.4	23.2	22.9	23.2	1.05	1.9	0.3	23.1	0.99	1.7	0.6	12	LA
T2JRJT	26.4 XH	24.4	23.1	23.1 H	24.3	2.08 *	2.2	1.6 H	24.1	2.24 *	1.9	1.1	12	LZ
UB6BL6	21.8	22.9	22.3	20.2	21.8	-0.35	2.0	1.1	22.3	0.03	1.8	0.7	12	LA
UE4QPL	22.7	23.0	22.8	22.9	22.8	0.67	1.5	0.1	22.8	0.70	1.5	0.3	12	LH
WJUX8K	23.5 H	23.6 H	22.3 H	23.2 H	23.2	0.99	3.3	0.6	22.5	0.24	3.4	1.2	11	LH
X3HJN2	21.2 L	21.0	21.5	21.1	21.2	-0.97	1.1	0.2	21.3	-1.21	1.5	0.3	12	LU
X3JCJN	21.4	22.6	20.7	22.1	21.7	-0.46	1.5	0.8	22.0	-0.31	1.5	0.7	12	LA
X3M2NL	22.1	21.8	23.8	21.7	22.3	0.18	1.8	1.0	22.7	0.51	1.5	0.6	12	LA
XWQGCP	23.2	24.1	24.4 *	23.4	23.8	1.58	1.7	0.6	23.7	1.75	1.8	0.6	12	LU
XZDZGT	22.7	22.1	22.3	22.2	22.3	0.16	1.6	0.3	22.3	0.10	1.6	0.4	12	LU
Y7WL2K	23.4	23.0	23.7	23.2	23.3	1.16	1.6	0.3	23.1	1.03	1.8	0.4	12	LU
YBAGPV	21.9	21.2	21.3	21.8	21.6	-0.59	1.6	0.3	21.5	-0.96	1.5	0.3	12	LW
YYTUGU	22.2	23.0 L	23.1	23.0	22.8	0.64	1.2	0.4	22.8	0.61	1.3	0.4	12	LW
ZK8LBF	22.6	21.8	22.6	22.1	22.3	0.11	1.6	0.4	22.2	-0.08	1.7	0.6	12	LZ
ZPJMEY	20.8	21.3	21.4	21.4	21.2	-0.92	1.7	0.3	21.1	-1.34	1.6	0.3	12	LY
ZPN4EJ	23.0	22.0	22.2	22.0	22.3	0.13	1.7	0.5	22.4	0.17	1.7	0.4	12	LU

Consensus (All Labs) Results												
Wk Mean	22.10	22.27	22.12	22.15	Month Mean	22.16	Grand Mean	22.25				
Avg SDr	1.64	1.71	1.60	1.69	Avg SD	1.66	Avg SD	1.67				
SD btwn Labs	1.02	1.29	1.11	1.10	SD btwn Labs	1.01	SD btwn Labs	0.83				
Labs Incl	55	53	51	53	SD btwn Wks	0.61	SD btwn Wks	0.73				
Labs Excl	1	1	2	2	Labs Incl	54	Labs Incl	55				
Labs not Rcvd	0	2	3	1								



Containerboard Interlaboratory Testing Program  
Analysis 225  
**STFI, 35 lb Linerboard - 35E1**  
TAPPI Official Test Method T826

**Report #587 (J)**  
**August 2018**

**Key to Instrument Codes Reported by Participants**

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



**Containerboard Interlaboratory Testing Program**  
 Analysis 228  
**Roughness - Stylus Method, 56 lb Linerboard - 56A**  
 TAPPI Official Test Method T575

**Report #587 (J)**  
**August 2018**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3LVWYE	225.3	4.09 X	27.53	232.7	3.55 X	22.19 H	4	EV
4RHYPG	190.8	1.69	20.08	185.5	1.12	4.11	4	LA
4RKNU	172.9	0.44	11.58	150.2	-0.70	15.84	4	EV
843F8E	171.0	0.31	14.44	175.8	0.61	5.27	3	LA
96BEER	154.8	-0.82	3.85 L	157.4	-0.34	7.36	4	EV
BNUXMG	145.7	-1.45	13.78	149.2	-0.76	3.55	3	EV
BRV2CH	192.3	1.79	20.67	204.5	2.09 *	11.24	4	EV
CW3WN6	166.9	0.02	20.87	165.9	0.10	0.80 L	4	XX
DAR9JF	142.5	-1.67	22.09	142.7	-1.09	20.80 H	4	LA
FN2L66	181.5	1.04	18.64	178.6	0.76	3.96	3	EV
HKU4K7	179.3	0.89	25.17	188.5	1.27	8.72	4	LA
L3HHW2	142.8	-1.65	8.48	133.1	-1.59	8.65	4	EV
MLQ4VE	183.5	1.18	14.41	175.7	0.61	5.67	4	EV
NQCKF4	163.7	-0.20	22.43	171.9	0.41	11.63	4	LA
PK9UVC	166.8	0.02	16.67	170.3	0.33	4.42	4	XX
Q322KU	150.4	-1.12	16.44	150.1	-0.71	7.30	3	EV
QFP9K	158.1	-0.59	15.36	152.1	-0.61	7.70	4	LA
QPYLHZ	157.8	-0.61	19.50	156.6	-0.37	3.40	3	LA
T2JRJT	170.3	0.26	22.61	174.8	0.56	4.00	3	XX
UB6BL6	165.2	-0.10	22.08	161.2	-0.14	5.63	4	LA
WJUX8K	118.2	-3.36 X	11.23	116.7	-2.43 *	8.00	4	EV
X3HJN2	176.2	0.67	15.19	178.0	0.73	1.33 L	4	EV
XWQGCP	158.4	-0.57	20.10	156.3	-0.39	3.82	4	EV
ZPJMEY	173.2	0.46	7.78 L	174.5	0.55	4.63	4	EV

Consensus (All Labs) Results			
Month Mean	166.54	Grand Mean	163.89
Avg SD	17.74	Avg SD Months	8.21
SD btwn Labs	14.37	SD btwn Labs	19.39
Labs Incl	22	Labs Incl	23

**Key to Instrument Codes Reported by Participants**

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



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

**Report #587 (J)**  
**August 2018**

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3TRTLG	364.3	-0.06	5.58	365.4	0.10	0.87	L 4	XX
QXBKCB	374.9	1.28	9.61	368.7	0.44	6.53	4	LA
TP4ZVJ	323.7	-5.18 X	97.88 H	349.7	-1.46	17.94	H 4	TS
W7PHLP	354.3	-1.32	9.57	352.9	-1.14	1.64	4	LA
X3JCJN	355.1	-1.22	9.99	356.7	-0.77	1.32	4	LA
X3M2NL	370.6	0.74	9.32	374.1	0.98	3.22	4	LA
XZDZGT	370.8	0.76	6.20	371.7	0.74	3.17	4	XX
ZK8LBF	363.3	-0.18	16.89 H	375.5	1.12	8.94	4	XX

Consensus (All Labs) Results				
Month Mean		364.77	Grand Mean	364.34
Avg SD		10.18	Avg SD Months	7.66
SD btwn Labs		7.93	SD btwn Labs	9.98
Labs Incd		7	Labs Incd	8

**Key to Instrument Codes Reported by Participants**

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



**Containerboard Interlaboratory Testing Program**  
 Analysis 231  
**Internal Bond, 36 lb Linerboard - 36Z**  
 TAPPI Official Test Method T569

**Report #587 (J)**  
**August 2018**

WebCode	Monthly Results				Cumulative Results				
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3TRTLG	140.6	-1.27	5.68		128.9	-1.56	23.19	4	SC
3YKXEL	155.4	-0.51	4.16		157.2	-0.24	12.09	4	TM
4RHYPG	192.0	1.35	51.43	H	205.9	2.03 *	15.72	4	SC
4RKNUE	163.8	-0.09	8.58		155.2	-0.33	5.68	4	TM
843F8E	190.4	1.27	12.86		182.9	0.96	28.93	4	HY
9BE7ZJ	159.0	-0.33	1.73	L	172.9	0.49	11.99	4	TM
DAR9JF	185.0	0.99	17.68		168.3	0.27	39.19	H 4	SC
FN2L66	180.2	0.75	4.87		181.7	0.90	11.71	4	XX
GAFJ8D	162.0	-0.18	6.36		156.9	-0.25	4.24	4	TM
L3HHW2	145.2	-1.04	11.43		147.6	-0.69	6.10	4	TM
LLWY2E	187.0	1.10	6.17		181.0	0.87	5.39	4	SC
NXZYP4	131.3	-1.74	7.85		124.1	-1.78	6.59	3	SC
Q322KU	173.4	0.40	18.62		173.1	0.50	14.20	3	HY
QXBKCB	181.0	0.79	5.84		178.8	0.76	2.62	L 4	SC
RJKHZW	164.6	-0.05	6.31		163.5	0.05	5.00	4	TM
T2JRJT	132.4	-1.68	6.69		138.4	-1.12	20.08	3	TM
X3HJN2	155.6	-0.50	7.54		154.0	-0.39	5.77	4	TM
X3M2NL	62.2	-5.26 X	1.60	L	64.5	-4.56 X	4.22	4	LZ
XWQGCP	144.4	-1.08	2.74	L	132.1	-1.41	14.92	4	TM
XZDZGT	185.5	1.02	8.00		188.4	1.21	6.26	4	HY
Y7WL2K	181.0	0.79	11.85		156.7	-0.27	33.02	4	HZ

Consensus (All Labs) Results			
Month Mean	165.49	Grand Mean	162.36
Avg SD	14.62	Avg SD Months	16.98
SD btwn Labs	19.64	SD btwn Labs	21.46
Labs Incl	20	Labs Incl	20

**Consensus By Method**

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	163.05	19.67	2.44	17
Modified Scott Bond Mechanics	187.97	3.44	22.48	2

**Analysis Notes**

- RJKHZW - Data appears to be reported in the wrong unit. Data corrected by CTS.
- X3M2NL - Method used is not covered in this test. Data excluded from consensus calculation.



Containerboard Interlaboratory Testing Program  
Analysis 231  
**Internal Bond, 36 lb Linerboard - 36Z**  
TAPPI Official Test Method T569

**Report #587 (J)**  
**August 2018**

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

**Report #587 (J)**  
**August 2018**

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SD	Mean	CPV	SD Months	Months
3TRTLG	27.8	0.25	1.30	27.1	0.07	2.64	4
4RHYPG	31.0	1.32	1.10	30.6	1.27	1.03	4
4RKNUE	26.8	-0.08	4.76	29.4	0.84	3.26	4
843F8E	25.0	-0.67	2.00	24.1	-0.97	1.17	4
96BEER	24.6	-0.81	1.14	24.8	-0.73	1.00	4
9BE7ZJ	25.1	-0.65	2.55	22.6	-1.46	2.09	4
CW3WN6	26.2	-0.28	0.84	26.3	-0.20	0.26	L 4
DAR9JF	21.6	-1.80	0.89	21.8	-1.76	0.72	4
DHJN9J	31.0	1.31	3.54	28.7	0.62	2.09	4
FN2L66	19.2	-2.59 *	2.17	20.6	-2.14 *	1.46	4
HCCVYV	28.2	0.38	3.90	27.6	0.23	1.45	4
JBGA74	26.2	-0.28	5.23	H 28.0	0.38	2.75	4
L3HHW2	28.3	0.42	4.71	28.2	0.44	0.84	4
LNWCFR	31.0	1.31	3.00	30.0	1.06	1.61	4
MLQ4VE	27.0	-0.01	3.00	26.2	-0.25	1.06	4
NQCKF4	29.2	0.71	1.62	28.6	0.59	1.62	4
PK9UVC	26.8	-0.08	2.77	26.0	-0.32	1.96	4
QG4NVW	31.1	1.34	1.85	31.6	1.61	1.24	4
T2JRJT	23.5	-1.16	0.60	L 22.6	-1.47	1.26	3
X3HJN2	26.8	-0.08	3.42	28.6	0.59	3.44	4
X3M2NL	24.9	-0.71	1.02	27.5	0.20	4.11	H 4
XWQGCP	27.6	0.19	3.71	27.0	0.05	2.91	4
XZDZGT	27.5	0.15	1.15	25.5	-0.46	1.44	4
ZK8LBF	31.9	1.61	0.42	L 31.5	1.58	2.80	4
ZPJMEY	27.6	0.20	3.30	27.6	0.24	1.28	4

Consensus (All Labs) Results			
Month Mean	27.04	Grand Mean	26.89
Avg SD	2.77	Avg SD Months	2.05
SD btwn Labs	3.03	SD btwn Labs	2.92
Labs Incl	25	Labs Incl	25

**Key to Instrument Codes Reported by Participants**

**ZZ** Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program  
Analysis 237

Report #587 (J)  
August 2018

**Air Resistance, 36 lb Linerboard - 36Z**

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3LVWYE	49.5	-0.13	1.82	49.4	-0.08	1.67	4	LP
4RHYPG	55.9	1.48	3.40	53.1	0.75	1.91	4	LA
4RKNUE	50.2	0.05	2.08	51.3	0.34	0.93	4	LP
843F8E	50.0	0.00	1.80	53.5	0.86	2.39	4	LP
96BEER	50.2	0.04	1.79	42.3	-1.72	15.56	H 4	LP
9BE7ZJ	53.0	0.75	2.27	51.9	0.49	1.19	4	LA
9U6EXD	51.0	0.25	3.43	49.9	0.02	1.56	2	XX
AXNJFA	49.4	-0.17	2.04	49.0	-0.18	0.46	L 4	LP
BRV2CH	51.9	0.46	1.16	51.4	0.37	0.64	L 4	XX
CW3WN6	53.1	0.76	1.32	52.7	0.67	1.09	4	LA
DAR9JF	45.4	-1.16	2.22	41.7	-1.86	6.59	4	LA
DHJN9J	47.0	-0.76	2.62	48.5	-0.29	1.23	4	LP
FN2L66	51.0	0.24	1.83	51.7	0.43	0.70	4	LP
JBGA74	40.4	-2.41 *	1.65	41.0	-2.01 *	0.62	L 4	LA
JMXALX	42.6	-1.86	1.67	48.1	-0.40	3.81	4	XX
L3HHW2	53.4	0.85	1.42	53.6	0.87	0.14	L 3	LA
MLQ4VE	36.2	-3.45 X	4.64 H	35.4	-3.30 X	1.70	4	XX
MPQEKM	48.6	-0.36	1.51	48.8	-0.24	0.31	L 4	LP
QG4NVW	52.5	0.62	1.80	55.0	1.20	4.51	4	GA
QXBKCB	55.1	1.27	2.70	55.2	1.24	0.21	L 4	LA
T2JRJT	42.7	-1.83	3.97 H	40.1	-2.22 *	7.48	3	TD
UB6BL6	51.2	0.31	2.09	51.1	0.30	0.96	4	LA
UB9TLN	53.2	0.80	3.04	52.1	0.53	1.82	4	TL
UVPEXV	47.8	-0.56	2.70	49.2	-0.15	3.54	4	GG
X3M2NL	54.4	1.11	2.51	53.8	0.91	0.86	4	LA
XWQGCP	45.1	-1.24	1.80	44.0	-1.32	1.84	4	LA
XZDZGT	53.5	0.87	4.17 H	52.7	0.65	0.91	4	TP
ZK8LBF	52.5	0.61	3.05	53.5	0.84	2.11	4	XX

**Consensus (All Labs) Results**

Month Mean	50.02	Grand Mean	49.80
Avg SD	2.42	Avg SD Months	3.96
SD btwn Labs	4.00	SD btwn Labs	4.36
Labs Incl	27	Labs Incl	27





Containerboard Interlaboratory Testing Program  
Analysis 237

**Report #587 (J)**  
**August 2018**

**Air Resistance, 36 lb Linerboard - 36Z**

TAPPI Official Test Method T460

**Key to Instrument Codes Reported by Participants**

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



Containerboard Interlaboratory Testing Program  
Analysis 240

Report #587 (J)  
August 2018

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

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2JTGCH	62.8 L	62.5	62.4	62.8	62.6	0.96	1.9	0.2 L	62.7	1.11	2.1	1.4	16	TU
2UWMBQ	63.2	61.4	62.1	60.9	61.9	0.69	3.7	1.0	61.9	0.70	3.3	1.0	16	LD
3K32HX	60.2	61.0	60.4	60.7	60.6	0.21	3.8	0.4 L	60.4	-0.18	3.3	0.5 L	16	LC
3K7HHG	62.6	60.0	60.1	59.2	60.5	0.17	2.9	1.5	60.1	-0.36	2.8	1.6	16	EM
3LVWYE	42.6 X	53.2 *	33.2 X	54.6 X	45.9	-5.21 X	3.6	10.0 H	50.0	-6.08 X	3.9	7.9 H	12	XX
843F8E	57.8	58.2	57.4	59.2	58.1	-0.69	3.2	0.8	64.8	2.31 *	3.0	9.9 H	12	LD
8HHPPA	59.7	60.5	60.1	59.9	60.1	0.01	1.9	0.3 L	59.9	-0.44	2.2	0.9	16	TH
8R7GB2	53.3 *	54.7	52.3 X	52.1 X	53.1	-2.56 *	2.6	1.2	53.1	-4.31 X	2.6	1.2	4	TH
96BEER	58.0	59.8	60.9	60.9	59.9	-0.04	3.3	1.4	58.8	-1.05	3.1	1.5	16	LZ
AXNJFA	60.7	60.9	60.5	62.5	61.1	0.42	2.8	0.9	61.4	0.42	2.8	1.2	16	LD
BRV2CH	58.1	55.0 H	59.4	58.8 H	57.8	-0.81	5.5	2.0	60.0	-0.40	4.6	2.8	16	MB
CW3WN6	61.2	61.4	61.3	61.5	61.3	0.49	2.1	0.1 L	61.0	0.17	2.0	0.5 L	16	LD
DFVY47	75.2 X	71.1 X	73.3 XH	72.1 XH	72.9	4.78 X	4.8	1.8	71.5	6.14 X	4.8	3.8	16	MB
DHJN9J	63.8	64.0	63.1	62.6	63.4	1.24	3.0	0.7	61.8	0.63	3.2	2.0	16	LD
DLZVN7	60.2	60.8	60.9	60.4	60.6	0.21	3.7	0.3 L	60.8	0.07	3.2	0.6 L	16	LD
EBDA39	54.9	54.7	No DATA	No DATA	54.8	-1.93 *	3.6	0.1	54.8	-3.35 X	3.6	0.1	2	EM
EFQYJW	61.8	58.9	60.4	59.0	60.0	0.01	4.5	1.4	60.1	-0.34	5.0	2.0	16	TG
FD33CH	60.4	59.3	61.7	60.6	60.5	0.19	3.0	1.0	61.9	0.67	2.9	1.9	16	LD
FN2L66	58.4	59.8	59.3	No DATA	59.2	-0.32	3.3	0.7	59.4	-0.76	3.2	2.8	15	LZ
FZWMQL	60.5 H	65.0 H	59.4 H	27.9 X	53.2	-2.52 *	8.4	17.1 H	61.7	0.55	7.4	9.7 H	16	XX
GAJ8D	59.0	62.8	58.6	59.3	59.9	-0.03	2.8	1.9	57.4	-1.89	2.7	2.5	16	LC
GBM6C6	64.8	63.9	66.5 *	64.2 *	64.9	1.79	4.2	1.2	67.7	3.99 X	4.1	2.5	16	LC
HKU4K7	52.6 *	56.8	56.7	57.0 *	55.8	-1.56	2.2	2.2	58.5	-1.25	3.3	2.9	14	MB
JMXALX	60.5	63.3	62.2	No DATA	62.0	0.73	3.2	1.4	60.1	-0.36	3.2	1.5	15	LD
KKHE96	61.0	63.9	61.3	62.1	62.1	0.76	3.2	1.3	61.7	0.56	3.1	1.6	16	LC
L3HHW2	68.6 X	56.5	58.1	59.3	60.6	0.23	3.0	5.4	59.8	-0.52	3.7	3.1	16	LC
LBFCRE	60.0	60.5	59.9	60.9	60.3	0.12	3.4	0.5 L	60.3	-0.22	3.0	0.5 L	16	LD
LNWCFR	63.3	63.9	65.9 *	62.0	63.8	1.39	2.5	1.6	62.7	1.12	2.9	1.6	16	LD
NXZYP4	57.8	56.9	58.0	59.4	58.0	-0.73	3.0	1.1	58.4	-1.32	3.4	1.7	12	LC
QFPF9K	57.4	52.9 *	56.1 *	54.2 X	55.1	-1.80	3.8	2.0	56.2	-2.57 *	3.7	1.8	13	LD
RJKHZW	63.2	61.3	60.2	59.2	61.0	0.35	3.1	1.7	62.1	0.79	3.7	1.7	16	LC
TCK9FP	60.4 L	60.4 L	60.4 L	60.1 L	60.3	0.12	1.1	0.1 L	60.5	-0.11	1.3	0.2 L	16	LD
UE4QPL	60.9	59.2	60.3	62.0	60.6	0.22	2.7	1.2	61.5	0.48	3.0	1.8	12	LD
WNGRZC	58.2	59.5	59.5	58.6	58.9	-0.40	2.0	0.6	59.4	-0.72	2.1	0.6 L	16	XX
X3HJN2	56.9	57.7	57.8	58.8	57.8	-0.82	3.1	0.8	59.1	-0.88	3.4	1.7	16	LD



Containerboard Interlaboratory Testing Program  
Analysis 240

Report #587 (J)  
August 2018

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

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
X3M2NL	55.1	53.5 *	57.5	57.1 *	55.8	-1.56	2.7	1.9	53.2	-4.22 X	2.8	2.0	16	LD
XWQGCP	65.2	56.4	56.7	61.1	59.9	-0.06	3.6	4.2	59.2	-0.83	3.4	2.9	16	XX
XZDZGT	60.6	61.2	60.8	NO DATA	60.8	0.30	3.5	0.3 L	61.4	0.42	3.7	1.4	15	LC
Y7WL2K	58.6 H	62.2 H	62.5 H	65.2 *	62.1	0.78	6.4	2.7	61.6	0.51	6.7	2.5	16	LC
YBAGPV	59.8	60.6	61.4	58.9	60.2	0.06	3.9	1.1	62.5	1.01	3.3	1.8	16	LZ
YC3C7C	61.1	60.8	60.9	60.9	60.9	0.34	2.0	0.1 L	61.4	0.41	2.2	0.7 L	8	TM
YJKMHR	62.9	63.6	65.2 *	67.3 X	64.7	1.75	3.9	1.9	63.9	1.79	3.6	1.8	8	LD
YYTUGU	62.0	64.6	62.7	62.3	62.9	1.07	3.5	1.2	63.0	1.29	3.0	0.9	16	LD
ZK8LBF	57.7	59.2	59.6	59.6	59.0	-0.36	2.9	0.9	59.0	-0.97	2.8	1.1	16	LZ
ZPJMEY	56.8	60.0	60.6	61.8	59.8	-0.08	3.4	2.1	58.3	-1.35	3.0	2.0	16	EN
ZPN4EJ	63.1	61.0	61.5	61.8	61.9	0.68	3.5	0.9	61.1	0.24	3.2	1.2	16	LD
ZZ2B6R	61.5 L	65.7 L	62.6 L	61.3	62.8	1.02	1.2	2.0	62.9	1.26	1.0	2.0	16	TD

Consensus (All Labs) Results									
Wk Mean	59.95	59.98	60.53	60.60	Month Mean	60.01	Grand Mean	60.69	
Avg SDr	3.89	3.48	3.35	3.19	Avg SD	3.49	Avg SD	3.41	
SD btwn Labs	2.87	3.24	2.27	1.78	SD btwn Labs	2.71	SD btwn Labs	1.76	
Labs Incd	44	46	43	37	SD btwn Wks	3.01	SD btwn Wks	2.76	
Labs Excd	3	1	3	6	Labs Incd	45	Labs Incd	41	
Labs not Rcvd	0	0	1	4					

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
TD	TMI Digital Crush Tester, Model 17-09	TG	TMI Compression Tester, Model 17-10
TH	TMI Compression Tester, Model 17-76	TM	TMI/Hinde & Dauch
TU	TMI Universal Crush Tester (TMI K440)	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program  
Analysis 250

Report #587 (J)  
August 2018

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

TAPPI Official Test Method T843

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
3K32HX	72.1	72.6	73.0	72.8	72.6	-0.33	3.6	0.4	73.3	0.17	3.2	0.7	L 16	LD
843F8E	78.5	77.9	79.2 *	77.8 *	78.3	1.81	2.9	0.7	71.3	-0.52	2.7	10.4	H 12	LD
96BEER	75.6	74.0	73.8	72.4	73.9	0.16	2.5	1.3	73.8	0.33	2.5	1.6	16	LZ
9U6EXD	71.1	68.7	73.3	L 72.0	71.3	-0.83	1.4	1.9	72.1	-0.24	1.4	1.6	8	LZ
AXNJFA	74.8	77.0	77.8	75.2	76.2	1.01	2.7	1.4	75.2	0.81	2.6	1.4	16	LD
CW3WN6	73.1	73.0	73.1	72.4	72.9	-0.23	2.6	0.3	L 73.5	0.24	2.3	0.5	L 16	LD
DFVY47	67.3 *	66.5 *	69.2	H 72.7	68.9	-1.71	3.6	2.8	66.4	-2.21 *	2.9	3.4	16	MB
DHJN9J	77.0	77.0	76.1	77.5 *	76.9	1.27	3.1	0.6	75.3	0.86	4.3	1.4	16	LD
JMXALX	72.2	72.0	72.7	NO DATA	72.3	-0.46	3.0	0.4	72.3	-0.19	2.8	0.8	L 15	XX
L3HHW2	77.4	71.7	H 62.6	XH 64.6	XH 69.1	-1.66	6.8	6.8	H 66.4	-2.24 *	7.3	3.7	16	XX
M9GLY6	68.3	72.2	72.9	71.3	71.2	-0.87	2.7	2.0	71.6	-0.42	2.6	1.3	16	XX
TCK9FP	73.2	L 73.3	L 73.1	73.3	L 73.2	-0.11	1.0	0.1	L 73.7	0.32	1.1	0.5	L 16	LD
X3M2NL	74.7	75.8	74.8	74.6	75.0	0.55	2.2	0.6	75.8	1.03	2.5	1.0	16	LD
XZDZGT	76.1	79.7	76.9	NO DATA	77.6	1.52	2.4	1.9	77.7	1.70	2.5	1.1	15	LC
YBAGPV	75.3	72.0	77.2	73.5	74.5	0.37	2.0	2.2	73.8	0.36	2.2	1.5	16	LZ
YJKMHR	72.8	73.8	75.6	74.7	74.2	0.25	2.5	1.2	74.7	0.67	2.4	1.2	8	LD
YYTUGU	71.0	71.5	70.7	71.6	71.2	-0.86	1.7	0.4	71.1	-0.58	1.9	0.8	L 16	LD
ZZ2B6R	74.2	76.5	L 71.1	L 73.4	L 73.8	0.11	1.0	2.2	72.5	-0.09	1.1	2.3	16	TD

Consensus (All Labs) Results														
Wk Mean	73.60	73.62	74.14	73.68	Month Mean	73.51	Grand Mean	72.82						
Avg SDr	2.65	2.82	2.69	2.22	Avg SD	2.93	Avg SD	3.00						
SD btwn Labs	2.99	3.27	2.69	1.97	SD btwn Labs	2.67	SD btwn Labs	2.88						
Labs Incl	18	18	17	15	SD btwn Wks	2.14	SD btwn Wks	2.96						
Labs Excl	0	0	1	1	Labs Incl	18	Labs Incl	18						
Labs not Rcvd	0	0	0	2										

Key to Instrument Codes Reported by Participants

LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TD	TMI Digital Crush Tester, Model 17-09	XX	Instrument make/model not specified by lab



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

**Report #587 (J)**  
**August 2018**

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	
2JTGCH	41.2 L	41.2 L	41.2	41.2	41.2	-1.30	1.3	0.0 L	41.0	-1.31	2.0	0.5	16	TU
2UWMBQ	47.5	45.8	47.4	47.6	47.1	1.21	2.7	0.8	46.6	1.08	2.7	1.0	16	LD
3K7HHG	46.5 L	46.7	46.9 L	47.0 L	46.8	1.10	1.3	0.2 L	45.6	0.64	1.4	0.8	16	LC
3LVWYE	33.6 *	46.0	44.8 H	43.7	42.0	-0.95	3.8	5.7 H	43.6	-0.24	3.2	5.5 H	12	XX
3TD8CF	42.9	43.7	45.2	46.2	44.5	0.11	2.2	1.5	45.1	0.41	2.4	1.1	12	LZ
8HHPPA	40.9 L	41.2	41.6	39.5 *	40.8	-1.46	2.3	0.9	40.6	-1.48	1.9	1.0	16	TH
AXNJFA	44.9 L	46.8	45.1	44.9	45.4	0.51	1.9	0.9	45.3	0.50	2.1	0.7	16	LD
CW3WN6	43.2	43.8	43.8	43.6	43.6	-0.27	3.0	0.3	43.8	-0.13	2.6	0.3 L	16	LD
DFVY47	32.9 *	33.8 X	37.0 X	34.9 X	34.7	-4.08 X	1.9	1.8	33.4	-4.60 X	2.5	3.1	16	MB
DLZVN7	43.8 H	43.7	43.9	43.7	43.8	-0.18	3.7	0.1 L	44.4	0.12	3.2	1.2	16	LD
EBDA39	41.8	40.6	No DATA	No DATA	41.2	-1.30	2.1	0.9	41.2	-1.26	2.1	0.9	2	EM
F3XXEA	43.7 L	44.1	43.8 L	44.1	43.9	-0.12	1.1	0.2 L	45.4	0.54	1.2	0.9	16	WK
GBM6C6	33.1 *	31.0 X	31.7 X	33.4 X	32.3	-5.09 X	2.5	1.1	32.5	-4.99 X	2.5	1.3	16	XX
JMXALX	42.7 H	44.2	42.5	No DATA	43.1	-0.47	3.9	0.9	41.4	-1.17	3.4	1.3	15	LD
KKHE96	46.0	47.6	47.0	49.0	47.4	1.35	2.7	1.2	46.7	1.09	2.4	2.1	16	LC
QFPF9K	42.4	44.7	45.8	42.0	43.7	-0.22	2.4	1.8	44.5	0.18	2.4	1.6	13	LD
UE4QPL	47.7	46.7	46.9	46.6	47.0	1.17	2.6	0.5	47.3	1.34	2.0	0.8	12	LD
WHBY4V	46.8 L	45.2	43.9	43.8	44.9	0.29	1.8	1.4	44.1	-0.03	2.1	1.3	16	TH
X3M2NL	49.1	47.9	50.0 *	46.7	48.4	1.79	2.8	1.4	47.7	1.55	2.8	1.5	16	LD
XZDZGT	47.6	44.5	45.7	45.9	45.9	0.72	2.9	1.3	45.9	0.76	3.0	0.9	16	LC
Y7WL2K	45.3	45.8	45.1	46.1	45.6	0.57	2.6	0.5	45.0	0.37	2.9	1.7	16	LD
YCMVD4	35.5	41.3	41.3	39.6 *	39.4	-2.05 *	2.2	2.7	38.8	-2.26 *	2.6	1.6	16	LZ
YGBTLR	42.1 H	43.2 H	44.1 H	43.9 H	43.3	-0.39	5.0	0.9	43.2	-0.41	5.1	1.3	16	TX
YJKMHR	44.4	44.2	47.0	45.9	45.4	0.49	2.5	1.3	45.6	0.64	2.4	1.0	8	LD
ZK8LBF	42.3	41.5	43.4	44.4	42.9	-0.58	2.2	1.3	41.9	-0.96	2.5	1.3	16	LD

Consensus (All Labs) Results									
Wk Mean	42.71	44.36	44.84	44.54	Month Mean	44.23		Grand Mean	44.12
Avg SDr	2.64	2.77	2.78	2.62	Avg SD	2.71		Avg SD	2.65
SD btwn Labs	4.57	2.16	2.19	2.49	SD btwn Labs	2.34		SD btwn Labs	2.34
Labs Incl	25	23	22	21	SD btwn Wks	1.63		SD btwn Wks	1.64
Labs Excl	0	2	2	2	Labs Incl	23		Labs Incl	23
Labs not Rcvd	0	0	1	2					



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

**Report #587 (J)**  
**August 2018**

**Key to Instrument Codes Reported by Participants**

<b>EM</b>	Emerson 1200 Series	<b>LC</b>	L&W Crush Tester 48
<b>LD</b>	L&W Crush Tester 248	<b>LZ</b>	L&W Crush Tester (model not specified)
<b>MB</b>	Messmer Buchel K440	<b>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>WK</b>	Zwick Z005 Crush Tester	<b>XX</b>	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 261

Report #587 (J)

August 2018

STFI, 26 lb Corrugating Medium - CM92

TAPPI Official Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
3K32HX	14.8	14.3	14.9	14.1	14.5	-0.15	1.0	0.4	14.5	-0.08	0.9	0.4	16	LB
3K7HHG	14.3	14.2	14.2	13.5	14.0	-1.04	0.9	0.3	14.3	-0.56	1.0	0.3	16	LB
3LVWYE	14.9 H	15.2	14.0	13.8	14.5	-0.30	1.1	0.7	14.6	-0.04	1.0	0.4	12	XX
3TD8CF	13.6	14.2	14.1	13.9	14.0	-1.19	1.1	0.3	14.2	-0.77	1.1	0.4	12	LA
8R7GB2	13.4	13.6	14.2	13.0	13.5	-1.98 *	0.8	0.5	13.5	-1.91 * 0.8	0.5	4	LH	
9ETZH2	13.9	14.0	14.6	14.2	14.2	-0.86	0.9	0.3	14.6	0.05	0.8	0.4	16	TT
AXNJFA	14.5	14.1	14.5	14.2	14.3	-0.55	0.8	0.2	14.4	-0.38	0.9	0.2	16	LZ
BRV2CH	12.6 *L	12.2 X	12.3 X	13.1	12.6	-3.70 X	1.0	0.4	13.7	-1.55	0.9	0.9 H	16	BK
CW3WN6	14.5	14.3	14.8	14.6	14.6	-0.14	0.9	0.2	14.7	0.19	0.8	0.2	16	LB
FN2L66	14.1	13.9	14.5	15.0	14.4	-0.42	1.0	0.5	14.2	-0.65	0.9	0.4	16	LB
FZWMQL	14.9 H	15.5	15.2	14.6	15.0	0.73	1.1	0.4	14.9	0.61	1.1	0.4	16	LA
HKU4K7	14.0	14.3	14.4	14.1	14.2	-0.76	1.0	0.2	14.2	-0.77	0.9	0.7	14	LA
LBFCRE	14.5	14.4	14.8	15.2	14.7	0.14	0.9	0.4	14.6	0.12	0.9	0.4	16	LB
LNWCFR	14.6 L	14.6	15.4	14.8	14.9	0.41	0.8	0.4	14.8	0.42	0.9	0.3	16	LA
MFZW7E	14.8	15.4	15.0	15.8	15.2	1.06	1.0	0.4	15.2	1.16	1.0	0.4	4	XX
QFP9K	14.0	14.2	14.2	14.0	14.1	-1.00	0.9	0.1	14.0	-0.96	1.0	0.5	13	LZ
RJKHZW	15.2	15.4	14.6	15.4	15.1	0.92	0.9	0.4	15.1	0.95	1.0	0.3	16	LA
TCK9FP	14.7	14.5	14.6	14.5	14.6	-0.12	1.0	0.1	14.5	-0.06	1.8	0.1 L	16	LA
UE4QPL	15.8	15.5	15.6	15.1	15.5	1.60	1.0	0.3	15.6	1.93 *	1.0	0.7	12	LH
X3HJN2	14.6 L	14.3	13.9	14.4	14.3	-0.59	0.9	0.3	14.1	-0.93	1.0	0.4	16	LU
X3JCJN	15.0	15.0	15.2	14.4	14.9	0.51	0.9	0.3	14.7	0.20	0.9	0.3	16	LA
X3M2NL	15.7 H	14.5 H	16.0 *L	16.5 *	15.7	1.87	1.2	0.9 H	15.2	1.18	1.0	0.6	16	LA
XZDZGT	14.7	14.9	15.0	14.3	14.7	0.15	0.8	0.3	14.7	0.18	0.9	0.3	16	LU
YC3C7C	15.6	16.0 *	15.3	15.9	15.7	1.99 *	0.9	0.3	15.9	2.35 *	1.0	0.3	8	LA
YGBTLR	13.5	13.8	14.3	14.0	13.9	-1.32	0.9	0.3	13.8	-1.48	1.0	0.3	16	TT
YJKMHR	15.4	14.5	15.3	14.7	15.0	0.60	1.1	0.5	14.8	0.36	1.0	0.4	8	LB
ZK8LBF	15.0 L	14.8	15.1	14.6	14.9	0.45	0.8	0.2	14.8	0.44	0.9	0.4	16	LZ

Consensus (All Labs) Results														
Wk Mean	14.54	14.58	14.75	14.51	Month Mean	14.63			Grand Mean	14.58				
Avg SDr	1.00	0.94	0.97	0.87	Avg SD	0.95			Avg SD	0.99				
SD btwn Labs	0.75	0.61	0.54	0.80	SD btwn Labs	0.56			SD btwn Labs	0.55				
Labs Incl	27	26	26	27	SD btwn Wks	0.39			SD btwn Wks	0.42				
Labs Excl	0	1	1	0	Labs Incl	26			Labs Incl	27				
Labs not Rcvd	0	0	0	0										



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

**Report #587 (J)**  
**August 2018**

**Key to Instrument Codes Reported by Participants**

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

End of Report