

Containerboard Interlaboratory Testing Program

Participant Summary Report #567 (N) - December 2016

Revision Notice:

CTS discovered that some flags on the Monthly Results CPV and SD Wks were incorrectly assigned for this cycle. The statistical calculations are correct, only the flag was displayed in error. CTS notified all affected laboratories. If you have any questions, please do not hesitate to contact Kyle Kruger at containerboard@cts-interlab.com or (571) 434-1925 (ext. 115)

[Introduction to the Containerboard Program](#)

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

Analysis	Sample	Analysis Name
201	BX10	Box Compression Strength, Corrugated Boxes
202	ECT9	Edgewise Compressive Strength, Wax (T811), Corrugated board
203	ECT9	Edgewise Compressive Strength by Clamp (T839), Corrugated board
205	42D2	Mullen Burst of Linerboard, 42 lb Linerboard
207	36Z3	Mullen Burst of Linerboard, 36 lb Linerboard
215	42D2	Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard
217	36Z3	Ring Crush of Linerboard, Rigid Platen Type, 36 lb Linerboard
223	42D2	STFI of Linerboard, 42 lb Linerboard
225	36Z3	STFI of Linerboard, 36 lb Linerboard
228	56A	Roughness - Stylus Method, 56 lb Linerboard
229	42D2	Roughness - Sheffield Method, 42 lb Linerboard
231	42B	Internal Bond Strength, Linerboard, 42 lb Linerboard
234	42B	Coefficient of Static Friction - Inclined Plane, 42 lb Linerboard
237	42B	Air Resistance - Gurley Method, Linerboard, 42 lb Linerboard
240	CM91	Flat Crush Strength (CMT) of Medium, 26 lb Corrugating Medium
250	CM91	Fluted Crush of Medium, 26 lb Corrugating Medium
255	CM91	Ring Crush of Medium, 26 lb Corrugating Medium
261	CM91	STFI of Medium, 26 lb Corrugating Medium

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.

Material	Lot Code	Dates in Use
26 lb Corrugating Medium	CM91	October 2016-Current
	CM81	October 2015-September 2016
36 lb Linerboard	36Z3	December 2014-Current
	36Z2	February 2012-October 2014
42 lb Linerboard	42D2	August 2016-Current
	42D1	April 2015-July 2016
56 lb Linerboard	56A1	July 2016-Current

ABOUT CTS

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

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EXPLANATION OF TABLES

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

Definitions of Terms Used

Weekly Results

Laboratory Data

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

Consensus Data

- Wk Mean - For each week, the average of the Means for all the participants, excluding those laboratories flagged with an 'X'.
- Avg SDr - For each week, the average of the within-laboratory standard deviations (SDr's) for all the participants, excluding those laboratories flagged with an 'X'. The Avg SDr 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.
- SDr - For each laboratory, the average of the weekly within-lab standard deviations (SDr'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 SDr - For the current month, the average of the within-laboratory standard deviations (SDr'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.

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 (SDr'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 SDr	- For the cumulative period, the average of the within-laboratory standard deviations (SDr'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.

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 SDr for each week is not shown, but laboratory average SDr and consensus average SDr values are shown. |
| L | Indicates low within-laboratory standard deviation. The laboratory SDr for each week is not shown, but laboratory monthly average SDr and consensus average SDr 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 #567 (N)
December 2016

Top to Bottom Box Compression Strength, Corrugated Boxes - BX10

TAPPI Official Test Method T804

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
8JQEVN	729.6	0.11	56.5	640.6	-0.80	135.8	4	EX
AAX3DR	750.5	0.49	78.1	670.8	-0.38	58.6	4	LS
ARW3LR	725.2	0.03	55.2	638.3	-0.83	43.4	4	LL
B2JHPL	698.2	-0.47	46.4	675.0	-0.32	35.7	4	ER
CMCPXA	748.4	0.45	87.1	705.9	0.11	56.7	4	ER
DBTUVF	755.4	0.58	11.3	764.2	0.92	24.3	4	ER
DBXCXK	816.8	1.71	40.0	837.0	1.94	42.7	4	TB
FADA4G	764.5	0.75	31.9	764.5	0.93	31.9	1	LS
FGF88M	535.8	-3.44 X	25.4	557.8	-1.95	37.2	4	LG
FX4E87	667.0	-1.04	60.1	663.7	-0.48	47.8	4	ER
G2ZHDJ	690.4	-0.61	46.4	658.1	-0.55	36.9	4	LS
GU2YCN	724.0	0.01	13.9	764.0	0.92	33.5	4	LH
KTDU6K	825.9	1.87	45.1	782.8	1.18	42.3	4	LG
LNYPNB	678.8	-0.82	38.4	693.9	-0.05	48.0	4	LM
QYGNNU	689.0	-0.63	88.9	685.8	-0.17	58.3	4	ES
RJMG99	676.5	-0.86	42.1	650.3	-0.66	45.1	4	ET
RZCN77	685.8	-0.69	44.2	759.5	0.86	48.4	4	LL
U3Q3LC	755.2	0.58	42.5	716.5	0.26	45.5	4	LH
VQPYVM	717.8	-0.11	65.3	698.9	0.01	46.3	4	LM
YRTT64	592.0	-2.41 *	136.5	554.1	-2.00	93.6	3	EX
ZTL4FW	780.7	1.05	39.2	773.9	1.06	35.0	4	TE

Consensus (All Labs) Results			
Month Mean	723.59	Grand Mean	697.88
Avg SDr	60.06	Avg SDr	55.16
SD btwn Labs	54.59	SD btwn Labs	71.88
Labs Incl	20	Labs Incl	21

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	762.20	44.13	38.61	4
Clip sealing	710.27	33.21	13.32	13
Tape sealing	729.82	120.72	6.24	3



Containerboard Interlaboratory Testing Program
Analysis 201

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Top to Bottom Box Compression Strength, Corrugated Boxes - BX10

TAPPI Official Test Method T804

Key to Instrument Codes Reported by Participants

ER	Emerson 6200 Series	ES	Emerson 8510
ET	Emerson 7200	EX	Emerson Apparatus (Model not specified)
LG	TLS / L.A.B. Validator Series	LH	L.A.B. Compression Tester Model #10610
LL	Lansmont 76-5K	LM	Lansmont 122-15k
LS	Lansmont Squeezer	TB	TMI Monitor/Compression Tester, Model 17-70
TE	Testometric M500 - 25 KN		



Containerboard Interlaboratory Testing Program
 Analysis 202
Edgewise Compressive Strength, by T811, Corrugated board - ECT9
 TAPPI T811

Report #567 (N)
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WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
8V79BM	45.1	1.15	1.4	44.8	1.17	1.1	4	TB
AAX3DR	44.8	1.08	1.6	44.9	1.20	1.6	4	LC
CFGPL3	34.5	-1.74	0.7	35.8	-1.54	0.9	3	XX
FADA4G	39.4	-0.41	2.0	39.4	-0.46	2.0	1	EM
G2ZHDJ	40.9	0.01	1.7	41.3	0.14	2.1	4	EM
GDCQEP	39.3	-0.44	1.2	38.5	-0.72	1.2	4	WK
GU2YCN	42.2	0.35	0.8	41.6	0.22	0.9	4	TC

Consensus (All Labs) Results				
Month Mean		40.85	Grand Mean	40.89
Avg SDr		1.42	Avg SDr	1.48
SD btwn Labs		3.67	SD btwn Labs	3.32
Labs Incd		7	Labs Incd	7

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	LC	L&W Crush Tester 48
TB	TMI Monitor/Compression Tester, Model 17-70	TC	TMI Monitor/Compression Tester, Model 17-37
WK	Zwick Z005 Crush Tester	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
 Analysis 203
Edgewise Compressive Strength by T839, Corrugated board - ECT9
 TAPPI T839

Report #567 (N)
December 2016

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
33HT6W	42.6	-1.25	1.5	43.5	-1.15	1.5	4	LD
643KAY	43.7	-0.86	2.5	44.5	-0.68	1.9	3	LC
7HH2F8	46.0	-0.03	1.3	48.1	1.12	1.6	4	EM
7VRHLC	45.2	-0.33	2.1	45.2	-0.32	1.7	4	LD
8CVCVX	39.7	-2.30 *	2.0	41.2	-2.29 *	1.7	4	TD
8JQEVN	45.3	-0.29	1.8	43.5	-1.14	1.8	4	LD
8K39EU	44.0	-0.75	1.3	44.2	-0.82	1.4	3	EM
8V79BM	45.1	-0.34	0.7	45.6	-0.13	0.9	4	TG
AAX3DR	47.7	0.56	2.1	47.2	0.67	1.9	4	LC
ARW3LR	50.6	1.62	2.6	48.4	1.22	2.6	4	LC
B2JHPL	43.2	-1.05	1.6	42.6	-1.59	2.4	4	TB
B9FDMK	46.7	0.20	2.1	46.7	0.39	2.1	1	XX
BH6YXP	46.3	0.07	1.9	46.7	0.40	1.8	4	LD
CFGPL3	36.3	-3.49 X	5.1	36.7	-4.50 X	3.0	3	XX
CMCPXA	43.6	-0.88	1.7	41.2	-2.28 *	3.4	4	EX
DBTUVF	44.8	-0.47	2.0	43.7	-1.08	1.6	4	EM
DBXCXK	49.3	1.13	0.5	49.6	1.83	1.8	4	LD
E64E6M	46.3	0.07	1.2	45.3	-0.28	1.4	4	TM
FADA4G	47.3	0.42	2.1	47.3	0.69	2.1	1	EM
FX4E87	44.8	-0.46	1.4	46.1	0.13	1.2	4	LD
G2ZHDJ	46.1	0.01	1.9	46.7	0.40	1.8	4	EM
GDCQEP	39.0	-2.53 *	1.7	38.4	-3.67 X	1.4	2	WK
GU2YCN	46.6	0.20	0.9	45.3	-0.27	0.7	4	TC
KTDU6K	45.2	-0.31	4.6	45.7	-0.06	3.3	4	EM
LJGH7A	47.4	0.47	2.6	45.0	-0.40	1.8	4	TK
LNYPNB	47.9	0.65	0.9	47.5	0.83	1.4	4	TG
PU89JD	45.6	-0.19	2.3	45.7	-0.06	1.7	4	LD
QYGNNU	44.1	-0.73	1.5	45.2	-0.33	1.4	4	LD
RJMG99	55.0	3.18 X	1.2	52.2	3.10 X	1.5	4	TD
RZCN77	47.1	0.35	1.5	45.9	0.01	1.2	4	BU
U3Q3LC	43.7	-0.84	5.2	46.2	0.18	2.9	4	EM
V77X39	50.8	1.70	1.5	48.8	1.42	1.7	4	TG
VF8H62	51.5	1.93	0.5	47.3	0.70	1.5	4	TB
VQPYVM	49.9	1.36	2.0	48.9	1.47	1.8	4	EM
WLRZVH	47.7	0.57	1.7	45.1	-0.37	2.4	3	TD
WRFMN3	44.7	-0.51	1.7	45.3	-0.27	1.4	4	LD
XATJL8	50.3	1.49	1.2	49.7	1.86	1.3	3	LC
YCHCX2	47.2	0.38	2.3	45.8	-0.02	2.0	4	LC
YRTT64	48.6	0.90	3.1	46.3	0.22	2.9	4	CT



Containerboard Interlaboratory Testing Program
Analysis 203
Edgewise Compressive Strength by T839, Corrugated board - ECT9
TAPPI T839

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Consensus (All Labs) Results			
Month Mean	46.09	Grand Mean	45.85
Avg SDr	2.09	Avg SDr	1.93
SD btwn Labs	2.80	SD btwn Labs	2.04
Labs Incl	37	Labs Incl	36

Key to Instrument Codes Reported by Participants

BU	Buchel Digital Crush Tester	CT	Con-Ten
EM	Emerson 1200 Series	EX	Emerson (model not specified)
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
TB	TMI Monitor/Compression Tester, Model 17-70	TC	TMI Monitor/Compression Tester, Model 17-37
TD	TMI Digital Crush Tester, Model 17-09	TG	TMI Digital Crush Tester, 17-76
TK	TLS Compression Tester, Model 5184	TM	TMI/Hinde & Dausch
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 - 42D2
 TAPPI Official Test Method T807

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2VP2KX	105.0	104.4	107.1	107.2	105.9	-0.68	10.1	1.4	107.0	-0.49	11.8	2.6	16	AH
33HT6W	108.6	107.4	108.1	103.9	107.0	-0.43	11.9	2.1	107.1	-0.45	11.6	3.2	16	LC
3WB6RV	103.8	106.0	100.7	110.4	105.2	-0.83	10.6	4.1	106.7	-0.57	11.9	3.1	16	LC
4E8ADV	106.1	106.1	111.7	109.9	108.5	-0.11	7.3	2.8	108.9	0.08	7.4	1.5	16	AH
6ENQ6G	115.3	116.4	118.4	121.9 X	118.0	2.05 *	11.5	2.9	116.8	2.33 *	11.2	2.7	16	LA
7RNPRES	104.7	108.1	106.9	102.7	105.6	-0.75	10.0	2.4	107.1	-0.44	11.8	4.8	16	LA
7VRHLC	102.1	103.0	102.7	105.9	103.4	-1.24	8.1	1.7	104.8	-1.12	7.8	1.5	16	LA
89TF8N	115.3	114.4	114.3	112.4	114.1	1.17	10.5	1.2	113.6	1.41	9.6	3.1	16	LJ
8JQEVN	112.5	108.5	109.0	108.5	109.6	0.16	10.4	1.9	111.0	0.67	10.7	2.7	16	AH
8XQDMQ	104.4	107.5	110.0	109.8	107.9	-0.22	7.8	2.6	107.8	-0.24	7.0	2.7	16	TP
AAX3DR	105.0	111.9	105.3	109.7	108.0	-0.21	11.5	3.4	107.6	-0.32	10.1	3.4	16	AH
B2JHPL	107.1	106.4	99.4	94.3 X	101.8	-1.61	11.3	6.1	102.8	-1.69	11.8	3.8	16	XX
BH6YXP	110.7	112.7	111.7	111.3	111.6	0.61	11.8	0.8	109.5	0.23	11.1	2.2	16	LA
BZ4WFK	99.8	103.7	100.2	104.3	102.0	-1.56	9.9	2.3	104.5	-1.19	10.6	4.4	16	LC
C7NE9L	105.5	103.1	103.6	105.5	104.4	-1.02	8.8	1.3	103.4	-1.51	10.7	2.0	16	LA
CKNFLM	109.4	106.1	110.5	111.0	109.2	0.07	10.6	2.2	109.5	0.24	11.7	3.1	16	TB
E2LFP8	108.2	110.6	111.1	115.1	111.3	0.53	9.8	2.9	110.3	0.46	11.9	3.0	16	TB
EN2ZL8	108.5	108.0	104.8	109.5	107.7	-0.28	9.3	2.0	109.1	0.12	9.5	3.8	16	LA
EWUAUH	99.4	89.7 X	No DATA	No DATA	94.6	-3.24 X	6.6	6.9 H	101.9	-1.94	9.2	6.0 H	12	LA
FGF88M	111.6	107.1	109.4	106.4	108.6	-0.07	9.9	2.4	109.8	0.32	10.8	2.8	16	AH
FX4E87	106.9	115.9	105.2	109.4	109.4	0.10	9.8	4.7	110.1	0.40	11.7	2.7	16	AH
G2ZHDJ	101.0	97.4 *	103.2	98.7 *	100.0	-2.01 *	12.2	2.6	100.9	-2.23 *	11.5	2.2	16	RE
GRCRMK	106.8	111.3	103.5	108.0	107.4	-0.34	11.9	3.2	109.1	0.12	11.7	2.9	16	LA
GU2YCN	115.8	109.8	108.8	105.3	109.9	0.22	12.1	4.4	110.7	0.58	11.3	3.7	16	AA
HAAAE2	103.4	108.9	113.0	110.4	108.9	0.00	9.0	4.1	109.8	0.33	11.8	2.5	14	LA
HG73PF	111.4	106.8	106.4	106.8	107.9	-0.24	6.4	2.4	105.8	-0.83	5.6	2.0	16	RE
JUQ9VF	105.2	111.5	104.6	108.0	107.3	-0.36	11.2	3.1	109.4	0.21	11.4	4.1	16	LC
KGVEXC	107.7	113.5	105.3	107.4	108.5	-0.09	10.2	3.5	111.2	0.74	9.1	3.0	16	LC
KHEZU9	114.4	119.5	111.7	110.7 L	114.0	1.16	6.6	3.9	111.6	0.85	6.5	3.4	12	LA
LNBEFT	104.4	106.3	104.7	106.1	105.4	-0.80	10.2	1.0	107.2	-0.42	10.5	2.5	16	LC
MNTQ8E	107.1	105.9	106.5	105.2	106.2	-0.62	11.3	0.8	106.6	-0.59	11.3	2.4	16	LA
NDNT3B	102.5	108.9	No DATA	102.3	104.5	-0.99	9.7	3.8	109.1	0.12	9.7	5.5	15	LC
NKR26X	119.2	114.3	119.4 *	110.4	115.8	1.56	13.7	4.3	112.0	0.94	11.8	8.4 H	16	LZ
NMG9PU	105.8	104.8	108.8	106.0	106.3	-0.58	9.9	1.7	105.7	-0.87	9.3	2.1	16	LB
NR9DJY	116.2	107.4	116.0 H	115.0	113.6	1.07	13.4	4.2	113.0	1.24	11.6	3.8	16	AX



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

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
NXZMTW	113.5	117.7	116.2	113.0	115.1	1.40	10.1	2.2	113.7	1.45	9.6	4.0	16	LC
PU89JD	115.0	115.1	110.9	104.2	111.3	0.54	10.3	5.1	109.6	0.26	9.4	3.1	16	AA
QLUGRU	114.7	No DATA	No DATA	No DATA	114.7	1.31	12.5	0.0 L	113.6	1.42	12.2	2.4	13	LZ
QYGNNU	111.3	111.7	108.0	106.6	109.4	0.11	13.1	2.5	110.7	0.57	11.3	2.5	16	LA
RW9XYQ	109.6	109.4	110.4 L	109.3	109.7	0.17	7.6	0.5 L	107.7	-0.27	8.4	2.5	16	TB
TBNHU4	110.0	115.7	110.1	113.7	112.4	0.78	11.8	2.8	113.4	1.36	12.6	2.9	8	LA
TN9XX4	106.6	104.7	116.1	107.2	108.7	-0.05	10.3	5.1	109.2	0.16	11.7	3.0	16	LZ
UFCHPB	111.4	109.3	113.4	110.9	111.3	0.53	10.8	1.7	111.9	0.92	12.7	3.6	16	XX
VLYPMA	96.0 *	101.3	105.5	104.1	101.7	-1.63	8.5	4.2	103.1	-1.59	8.0	4.7	16	AX
VQPYVM	116.6	116.3 L	116.1 L	115.1 L	116.0	1.60	5.2	0.6	107.2	-0.43	9.3	5.9 H	16	AH
XU4F2W	108.7	108.8 L	108.8 L	108.7	108.8	-0.04	5.7	0.0 L	109.4	0.20	6.8	0.5 L	16	LJ
YRTT64	101.8	103.3	99.6	102.8	101.9	-1.59	10.3	1.6	101.3	-2.13 *	12.0	2.4	14	XX
YWLXU2	122.5 *	122.7 *	106.5	126.4 X	119.5	2.40 *	12.3	8.9 H	111.7	0.88	11.0	7.2 H	16	AH
Z36MT2	105.5	102.3	103.0	106.5 H	104.3	-1.04	12.6	2.0	105.4	-0.95	10.8	3.4	16	LA
ZBLWL6	110.4	114.1	114.9	117.9 *L	114.3	1.22	5.8	3.1	111.3	0.76	7.3	3.6	16	LC
ZCUA47	110.7	110.7 L	111.5 L	114.4 L	111.8	0.66	4.1	1.8	111.8	0.89	4.3	1.2	16	XX

Consensus (All Labs) Results														
Wk Mean	108.53	109.32	108.60	108.42	Month Mean	108.92			Grand Mean	108.67				
Avg SDr	9.96	10.48	10.15	10.01	Avg SDr	10.22			Avg SDr	10.39				
SD btwn Labs	5.40	5.11	4.98	3.96	SD btwn Labs	4.43			SD btwn Labs	3.48				
Labs Incl	51	49	48	46	SD btwn Wks	3.20			SD btwn Wks	3.56				
Labs Excl	0	1	0	3	Labs Incl	50			Labs Incl	51				
Labs not Rcvd	0	1	3	2										

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program
 Analysis 207
Bursting Strength (Mullen), 36 lb Linerboard - 36Z3
 TAPPI Official Test Method T807

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2VP2KX	78.4	82.6	77.5	77.3	79.0	-0.21	5.7	2.5	78.7	-0.28	5.9	2.4	12	AH
33HT6W	78.7	78.1	80.3	77.6	78.7	-0.30	6.1	1.2	78.6	-0.30	5.7	1.1	12	LC
3WB6RV	75.9	75.7	73.9	74.2	74.9	-1.56	5.9	1.0	76.4	-1.24	5.7	2.1	12	LC
4E8ADV	75.3	77.6	77.3	78.2	77.1	-0.83	3.8	1.3	78.4	-0.38	4.0	1.5	12	AH
6ENQ6G	82.1	81.9	82.6	84.7	82.8	1.10	5.3	1.3	82.3	1.23	5.0	1.7	12	LA
7RNPRES	77.9	77.2	78.4	76.5	77.5	-0.70	5.1	0.8	77.1	-0.94	5.1	2.3	12	LA
7VRHLC	74.7	76.9	76.9	75.5	76.0	-1.20	4.4	1.1	76.7	-1.09	4.3	1.5	12	LA
89TF8N	78.7	79.5	80.7	78.6	79.4	-0.06	4.7	1.0	79.0	-0.16	4.1	2.3	12	LJ
8JQEVN	80.5	77.5	83.5	81.5	80.8	0.40	6.0	2.5	80.7	0.55	5.6	2.7	12	AH
8XQDMQ	77.2	78.0	78.1	77.6	77.7	-0.62	4.8	0.4	77.0	-1.00	4.7	1.8	12	TP
AAX3DR	74.1	79.4	73.9	76.7	76.0	-1.19	5.9	2.6	76.9	-1.04	5.2	2.0	12	AH
B2JHPL	70.6 *	74.4	72.2 *	75.9	73.3	-2.11 *	5.4	2.3	73.6	-2.38 *	4.8	2.1	12	LA
BH6YXP	79.0	79.4	79.5	78.7	79.2	-0.13	4.6	0.4	78.5	-0.36	4.1	1.3	12	LA
BZ4WFK	77.2	75.6	75.5	72.9	75.3	-1.44	4.8	1.8	77.0	-0.99	4.6	2.4	12	LC
C7NE9L	77.0	73.9 *	77.5	75.4	76.0	-1.22	4.0	1.6	75.7	-1.53	4.0	1.7	12	LA
CKNFLM	78.3	83.1	78.6	78.1	79.5	-0.01	6.1	2.4	79.7	0.14	5.8	2.1	12	TB
E2LFP8	81.0	82.2	77.2	78.9	79.8	0.09	5.7	2.2	80.4	0.44	5.4	1.7	12	TB
EN2ZL8	82.9	80.5	82.0	79.4	81.2	0.55	5.7	1.6	80.2	0.38	5.1	1.5	12	LA
EWUAUH	84.2	82.3	No DATA	No DATA	83.3	1.25	5.2	1.3	82.0	1.11	5.6	2.2	4	LA
FGF88M	78.9	82.5	78.9	78.2	79.6	0.02	5.6	1.9	80.4	0.45	5.5	2.0	12	AH
FX4E87	79.3	80.9	80.5	79.6	80.1	0.17	5.1	0.8	79.9	0.25	5.4	1.6	12	AH
G2ZHDJ	74.5	75.4	73.9	71.2 *	73.8	-1.95	4.6	1.8	77.3	-0.84	4.9	4.3 H	12	LA
GRCRMK	80.3	78.9	78.7	81.0	79.8	0.07	6.1	1.1	80.3	0.42	6.0	1.3	12	LA
GU2YCN	83.0	83.3	80.5	81.0	81.9	0.80	7.0	1.4	82.1	1.17	6.2	1.7	12	AA
HAAAE2	76.0	78.0	76.5	79.0	77.4	-0.74	4.8	1.4	79.0	-0.15	5.6	3.2	12	LA
HG73PF	80.0	81.6	82.6	81.4	81.4	0.62	4.9	1.1	81.5	0.90	4.0	1.5	12	RE
JUQ9VF	80.7	79.8	80.3	76.6	79.3	-0.07	5.8	1.8	78.1	-0.51	5.6	1.9	12	LC
KHEZU9	80.5	389.4 X	81.0	79.6	157.6	26.36 X	3.8	154.5H	108.1	12.01X	4.7	88.6 H	12	LA
LNBFET	75.2	78.3	77.0	77.7	77.1	-0.85	7.5	1.3	76.1	-1.34	6.1	1.4	12	LC
MNTQ8E	80.3	79.7	78.2	79.5	79.4	-0.05	5.5	0.9	78.9	-0.20	5.7	1.4	12	LA
NDNT3B	79.1	78.5	No DATA	77.4	78.3	-0.42	4.0	0.9	78.6	-0.33	4.9	2.0	11	LC
NKR26X	82.5	83.8	80.2	82.8	82.3	0.94	5.5	1.5	81.2	0.79	5.7	3.0	12	LZ
NMG9PU	77.2	76.0	77.0	75.2	76.4	-1.08	4.0	0.9	76.6	-1.14	4.0	1.2	12	LB
NR9DJY	83.2	80.8	82.2	79.4	81.4	0.62	5.7	1.6	80.6	0.51	5.0	2.0	12	AX
NXZMTW	85.0	85.3	85.1	84.9	85.1	1.86	4.9	0.2 L	84.7	2.23 *	5.1	1.8	12	LC



Containerboard Interlaboratory Testing Program
 Analysis 207
Bursting Strength (Mullen), 36 lb Linerboard - 36Z3
 TAPPI Official Test Method T807

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
PU89JD	82.6	80.7	83.1	79.6	81.5	0.66	6.4	1.6	80.2	0.35	6.1	2.0	12	AA
QLUGRU	85.2	No DATA	No DATA	No DATA	85.2	1.89	6.9	0.0 L	89.6	4.28 X	7.4	10.6 H	8	LZ
QYGNNU	79.2 H	78.4	78.4	79.3	78.8	-0.25	6.4	0.5	79.4	0.04	6.2	1.0	12	LA
RW9XYQ	84.3	86.5 *	86.5	87.3 *	86.1	2.21 *	5.2	1.3	84.9	2.31 *	5.5	1.3	12	TB
TBNHU4	83.3	82.1	81.5	81.1	82.0	0.84	5.9	1.0	82.0	1.13	5.9	1.0	4	LA
TN9XX4	78.1	78.2	78.8	78.7	78.5	-0.36	6.1	0.4	78.7	-0.29	5.7	1.2	12	LZ
UFCHPB	78.6	79.3	81.9	79.7	79.9	0.10	5.1	1.4	79.4	0.03	5.4	2.3	12	XX
VLYPMA	80.5	80.3	88.5 *	78.5	81.9	0.80	4.1	4.5 H	82.5	1.31	4.9	6.7 H	12	AX
VQPYVM	79.3	81.0	81.9	80.3	80.6	0.36	3.8	1.1	78.4	-0.41	5.0	2.3	12	AH
XU4F2W	79.1	79.1	79.0	79.1	79.1	-0.17	4.7	0.0 L	79.0	-0.13	4.5	0.5	12	LJ
YRTT64	56.7 XH	63.0 X	65.6 X	63.9 X	62.3	-5.83 X	5.4	3.9 H	65.9	-5.60 X	6.0	4.1 H	12	XX
YWLXU2	89.0 X	83.4	73.0	85.0	82.6	1.03	5.0	6.8 H	78.6	-0.32	4.8	4.9 H	12	AH
Z36MT2	73.8	77.1	75.8	76.0	75.7	-1.31	5.9	1.4	76.7	-1.11	5.6	1.8	12	LA
ZBLWL6	81.1	81.5	83.5	83.0	82.3	0.92	4.4	1.2	80.9	0.65	4.6	2.7	12	LC
ZCUA47	83.6	84.1	83.9	84.6	84.1	1.52	4.0	0.4	84.3	2.07 *	4.2	0.8	12	XX

Consensus (All Labs) Results									
Wk Mean	79.33	79.79	79.44	79.04	Month Mean	79.56	Grand Mean	79.34	
Avg SDr	5.18	5.42	5.24	5.42	Avg SDr	5.35	Avg SDr	5.21	
SD btwn Labs	3.23	2.87	3.51	3.20	SD btwn Labs	2.96	SD btwn Labs	2.39	
Labs Incl	48	47	46	47	SD btwn Wks	1.84	SD btwn Wks	2.28	
Labs Excl	2	2	1	1	Labs Incl	48	Labs Incl	47	
Labs not Rcvd	0	1	3	2					

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program

Analysis 215

Ring Crush, 42 lb Linerboard - 42D2

TAPPI Official Test Method T822

Report #567 (N)

December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2CTT7Z	91.3	93.1	93.2	92.6	92.5	0.75	4.0	0.9	91.7	1.03	4.3	1.8	16	XX
33HT6W	86.4	87.7	84.6 H	87.4	86.5	-0.57	4.5	1.4	86.4	-0.46	4.3	1.6	16	LD
3WB6RV	86.4	91.1 L	86.6	88.1	88.1	-0.24	3.6	2.2	89.2	0.34	3.7	1.8	16	LC
3YL8FF	86.4	87.5	86.6	87.7	87.0	-0.46	2.6	0.6	85.8	-0.62	3.1	1.5	16	MB
4AZJ94	78.8 *	93.6	87.7 H	90.5	87.7	-0.32	5.7	6.4 H	90.6	0.73	6.1	5.6 H	14	MB
6ENQ6G	90.7	95.8	96.0	93.1	93.9	1.05	3.7	2.5	91.4	0.95	3.7	2.3	16	LZ
6GDV2V	91.2	94.5	92.5	91.4 L	92.4	0.72	3.6	1.5	90.0	0.56	3.5	2.8	16	MB
7RNPRE	87.6	84.7	91.8	90.3	88.6	-0.11	3.5	3.1	89.0	0.28	3.8	2.3	16	LC
7VRHLC	90.8	88.0	90.8	89.7 L	89.8	0.15	2.8	1.3	89.9	0.54	3.2	1.0	16	LD
89TF8N	80.0	81.5 *L	77.6 *	83.5	80.7	-1.86	2.9	2.5	80.1	-2.21 *	3.2	2.2	16	TU
8CVCVX	90.7 L	91.9 L	90.0 L	92.4 L	91.2	0.47	1.2	1.1	92.0	1.13	1.2	1.7	16	TD
8XQDMQ	87.1	87.6 L	86.9	88.2	87.5	-0.36	2.7	0.6	87.1	-0.25	3.1	1.1	16	TH
A3WNRQ	92.0 L	91.8 L	92.8 L	92.5 L	92.3	0.69	1.3	0.5	91.3	0.92	2.0	1.7	16	WK
AAX3DR	90.5	90.4	90.2	89.8	90.2	0.24	3.8	0.3 L	89.6	0.45	4.0	1.0	16	LC
AC3BZQ	89.1	86.6	92.1 L	89.0	89.2	0.02	4.0	2.3	90.4	0.68	3.8	2.1	16	LD
B2JHPL	88.0	90.5	88.2	88.2	88.7	-0.09	4.1	1.2	85.8	-0.63	4.1	3.4	16	LD
BH6YXP	92.3	93.3	93.2	93.1	93.0	0.85	2.9	0.5	92.8	1.34	3.1	0.9	16	LD
C7NE9L	85.3	84.4	85.6	88.1	85.9	-0.72	3.8	1.6	85.4	-0.72	3.6	1.5	16	LD
CFGPL3	56.0 XL	55.7 X	55.1 X	56.0 XL	55.7	-7.35 X	1.9	0.4 L	54.6	-9.40 X	1.8	0.9	12	XX
CKNFLM	89.7	93.5	91.0	91.5	91.4	0.51	4.4	1.6	89.6	0.46	3.9	2.3	16	LC
CMCPXA	83.4	85.5	83.0	82.4	83.6	-1.22	4.1	1.3	82.7	-1.49	4.1	1.6	16	EN
DBTUVF	84.9 L	84.7 L	85.5	86.7 L	85.4	-0.81	1.8	0.9	82.1	-1.67	2.8	2.4	16	EM
DDMFQR	93.9	92.1	93.0	92.8	93.0	0.84	4.4	0.7	91.1	0.87	4.1	2.2	16	EM
E2LFP8	82.6	83.4	75.3 *	78.3 *	79.9	-2.03 *	3.0	3.8	81.3	-1.88	3.5	2.6	16	LZ
EN2ZL8	86.0	89.0	90.8	92.4	89.6	0.10	2.7	2.7	89.2	0.32	3.6	2.0	16	LD
EWUAUH	90.8	89.6	No DATA	No DATA	90.2	0.23	3.4	0.9	90.5	0.70	4.6	8.0 H	12	LC
FJ2BFK	76.1 *	76.9 X	79.2	75.0 X	76.8	-2.71 *	4.9	1.8	81.2	-1.90	4.0	3.1	16	LD
FX4E87	86.9	89.3	86.8	87.3	87.6	-0.34	3.1	1.2	87.0	-0.27	3.7	2.1	16	LD
G2ZHDI	87.7	90.6	88.6	89.7	89.2	0.01	3.6	1.2	87.8	-0.05	3.5	2.3	16	EM
HAAAE2	100.0 *	95.1	91.3	93.6	95.0	1.29	4.1	3.7	94.9	1.93	6.4	5.0	14	LC
HG73PF	90.8	89.0	88.1	88.1	89.0	-0.03	3.6	1.3	86.6	-0.39	3.3	2.2	16	LZ
JUQ9VF	95.1	89.0	91.3	90.7	91.5	0.53	4.1	2.6	92.4	1.23	5.8	3.7	16	LC
KHEZU9	94.3	95.3 L	89.8	88.4	92.0	0.62	2.3	3.4	90.1	0.59	2.3	2.6	12	LZ
KTDU6K	86.7	88.8	85.7	86.9	87.0	-0.46	3.8	1.3	84.9	-0.88	3.8	1.9	16	EM
LJGH7A	84.5	85.8	85.7 L	85.0	85.2	-0.86	2.4	0.6	83.5	-1.26	3.2	4.0	16	MB



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

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
LNBFET	91.4	88.7	89.1	88.8	89.5	0.08	3.7	1.3	88.3	0.09	4.1	1.6	16	LD
MNTQ8E	94.2	94.0	95.2	95.7	94.8	1.24	3.7	0.8	91.6	1.00	3.7	7.0 H	16	LD
NDNT3B	90.4	92.7	No DATA	93.1	92.1	0.65	5.1	1.5	89.9	0.52	4.2	2.2	15	LD
NKR26X	87.3	83.6	89.2	83.5	85.9	-0.71	3.8	2.8	89.3	0.37	5.4	7.6 H	16	LC
NMG9PU	87.9	90.2	93.9	89.3	90.3	0.26	4.9	2.5	88.5	0.14	4.8	3.0	16	LC
NR9DJY	83.4	80.2 *	83.0	82.4	82.2	-1.51	5.1	1.4	80.0	-2.26 *	5.7	6.3 H	16	LC
PU89JD	87.3	89.8	86.4	86.7	87.6	-0.34	3.4	1.6	85.4	-0.74	3.2	2.5	15	LD
QLUGRU	89.4	No DATA	No DATA	No DATA	89.4	0.05	2.6	0.0 L	87.7	-0.09	3.3	2.1	13	LC
RW9XYQ	98.4	95.5	99.4	99.1 *	98.1	1.97	4.9	1.8	99.7	3.30 X	5.0	1.8	16	LX
RWNGG3	86.6	87.3	90.4	88.3	88.1	-0.22	4.6	1.6	87.6	-0.13	4.6	2.4	12	LD
TBNHU4	96.4	103.7 X	100.4 *	99.5 *H	100.0	2.39 *	6.0	3.0	98.8	3.04 X	4.9	3.1	8	LD
U3Q3LC	74.1 XH	90.4 H	77.5 *H	88.4	82.6	-1.43	8.7	8.0 H	85.7	-0.65	5.6	5.2	16	EM
UFCHPB	80.5	83.8 H	85.1	82.6	83.0	-1.35	5.8	1.9	83.0	-1.41	5.9	1.9	16	LC
V77X39	92.9	93.1	93.1 L	92.3	92.8	0.81	3.3	0.4 L	89.7	0.47	3.2	2.0	16	TH
VLYPMA	101.8 *	102.1 X	99.6	97.5	100.3	2.45 *	4.7	2.1	94.7	1.87	4.8	7.1 H	16	LZ
VQPYVM	90.7	91.5	93.7	91.3	91.8	0.58	5.1	1.3	91.2	0.89	4.0	1.8	16	EM
XU4F2W	88.1 H	88.1 H	88.0 H	88.1 H	88.1	-0.23	8.5	0.0 L	87.1	-0.26	6.7	0.7	16	LD
YWLXU2	90.8	87.7	92.6	88.4	89.8	0.16	4.6	2.2	88.3	0.09	4.8	4.9	16	LC
Z36MT2	89.0	87.4	88.8	87.1	88.1	-0.23	3.9	1.0	87.2	-0.23	5.1	3.5	16	LZ
ZCUA47	83.8	85.6	80.5	84.9	83.7	-1.19	4.2	2.3	84.8	-0.91	4.4	3.5	16	LD
ZTL4FW	91.8	94.3	91.9	90.8	92.2	0.68	3.1	1.5	91.1	0.87	3.3	1.2	16	LD

Consensus (All Labs) Results														
Wk Mean	88.89	89.38	89.02	89.36	Month Mean	89.12			Grand Mean	88.00				
Avg SDr	3.92	4.22	4.13	4.09	Avg SDr	4.16			Avg SDr	4.16				
SD btwn Labs	4.95	3.83	5.32	4.12	SD btwn Labs	4.55			SD btwn Labs	3.56				
Labs Incl	54	51	52	52	SD btwn Wks	2.29			SD btwn Wks	3.35				
Labs Excl	2	4	1	2	Labs Incl	55			Labs Incl	53				
Labs not Rcvd	0	1	3	2										



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

Report #567 (N)
December 2016

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LX	L&W 506	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	TD	TMI Digital Crush Tester, Model 17-09
TH	TMI Compression Tester, Model 17-76	TU	L&W Crush Tester 48
WK	Zwick Z005 Crush Tester	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program

Analysis 217

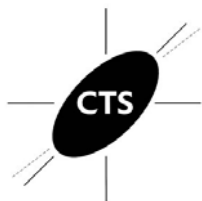
Report #567 (N)

December 2016

Ring Crush, 36 lb Linerboard - 36Z3

TAPPI Official Test Method T822

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks						
2CTT7Z	87.8	86.7	86.9	84.9	86.6	1.22	3.2	1.2	82.2	0.52	4.1	8.3	H	12	XX				
33HT6W	79.5	80.5	79.0	80.6	79.9	-0.39	3.3	0.8	80.9	0.15	3.2	1.4		12	LC				
3WB6RV	81.3	81.0	81.8	82.8	L	81.7	0.05	2.8	0.8	83.7	0.92	2.9	2.1	12	LC				
3YL8FF	80.8	83.1	82.1	81.1		81.8	0.06	3.6	1.0	80.5	0.05	3.0	3.7	12	MB				
4AZJ94	70.2	*H	85.6	L	81.9	70.7	*H	77.1	-1.07	5.3	7.8	H	11	MB					
6ENQ6G	81.0	86.9	88.5	81.9	84.6	0.74	3.2	3.7	84.0	0.99	3.0	2.4	12	LZ					
6GDV2V	81.0	79.7	81.5	83.6	81.4	-0.02	2.6	1.6	81.4	0.30	2.8	1.8	12	MB					
7RNPPE	79.2	79.4	82.0	80.7	80.3	-0.29	2.5	1.3	80.1	-0.08	2.5	1.3	12	LC					
7VRHLC	81.3	82.2	80.6	82.9	81.7	0.05	3.0	1.0	81.9	0.42	2.9	1.1	12	LD					
89TF8N	76.0	76.2	72.6	75.4	75.0	-1.56	2.7	1.7	74.2	-1.67	2.3	1.4	12	TU					
8CVCVX	79.9	L	79.1	78.3	L	75.7	78.2	-0.80	2.2	1.8	79.9	-0.11	2.0	2.5	12	TD			
8XQDMQ	81.9	80.4	80.9	80.5	80.9	-0.15	3.6	0.7	80.1	-0.05	3.2	0.9	12	TH					
A3WNRQ	87.9	L	86.4	86.0	85.8	L	86.5	1.20	1.5	0.9	84.0	0.99	2.1	2.1	12	WK			
AAX3DR	84.0	82.4	83.6	84.2	83.5	0.48	2.6	0.8	83.0	0.73	2.8	1.1	12	LC					
AC3BZQ	82.5	81.4	83.6	83.5	82.8	0.30	2.9	1.0	82.3	0.55	3.0	1.0	12	LD					
B2JHPL	79.6	80.2	81.5	81.6	80.7	-0.19	3.6	1.0	78.9	-0.38	4.5	2.4	12	LD					
BH6YXP	85.3	85.7	84.7	85.6	85.3	0.91	2.3	0.5	86.7	1.74	2.6	1.8	12	LD					
C7NE9L	80.7	80.8	80.2	80.3	80.5	-0.25	3.5	0.3	L	80.0	-0.08	3.0	0.7	8	LD				
CFGPL3	54.2	X	53.6	X	53.7	XL	53.9	X	53.9	-6.67	X	1.9	0.3	L	8	XX			
CKNFLM	79.5	84.4	82.0	84.7	82.7	0.27	3.3	2.4	81.4	0.29	3.4	2.2	12	LC					
CMCPXA	76.5	78.8	78.6	77.4	77.8	-0.89	2.9	1.1	77.7	-0.73	2.5	1.1	12	EN					
DBTUVF	78.0	77.9	78.4	77.0	77.8	-0.89	2.2	0.6	75.9	-1.22	2.6	1.6	12	EX					
DDMFQR	85.3	84.4	87.6	84.7	85.5	0.96	3.3	1.4	83.1	0.75	3.3	2.5	12	EM					
E2LFP8	76.4	74.8	71.5	*	69.6	*	73.1	-2.04	*	4.1	3.1	72.1	-2.24	*	4.8	4.2	12	LZ	
EN2ZL8	77.0	80.5	81.0	80.2	79.6	-0.45	3.3	1.8	80.0	-0.10	3.5	1.3	12	LD					
EWUAUH	78.2	82.3	No DATA	No DATA	80.2	-0.31	4.4	2.9	82.6	0.62	3.8	3.4	4	LC					
FJ2BFK	75.2	H	71.7	*	72.4	H	69.9	*	72.3	-2.23	*	5.9	2.2	75.2	-1.41	4.0	2.5	12	LD
FX4E87	79.8	80.1	79.5	81.2	80.2	-0.33	2.6	0.7	79.3	-0.27	2.6	1.2	12	LD					
G2ZHDI	78.6	81.4	80.2	82.3	80.6	-0.22	2.7	1.6	78.8	-0.42	2.9	2.3	12	EM					
HAAAE2	89.4	83.9	83.1	83.0	84.9	0.80	2.9	3.1	84.0	1.01	5.3	4.9	12	LC					
HG73PF	82.8	82.9	83.4	83.4	83.1	0.38	3.0	0.3	L	77.4	-0.81	2.5	4.5	12	LZ				
JUQ9VF	86.1	82.6	89.7	84.0	85.6	0.98	3.7	3.1	85.5	1.40	3.3	2.1	12	LC					
KHEZU9	87.2	L	87.5	L	86.5	L	84.6	86.4	1.18	1.3	1.3	84.0	0.99	2.3	2.9	12	LZ		
KTDU6K	80.6	83.6	83.8	82.4	82.6	0.26	2.5	1.5	80.7	0.09	2.5	1.9	12	EM					
LJGH7A	80.6	80.5	79.8	80.2	L	80.3	-0.30	1.9	0.3	L	76.1	-1.15	2.9	6.4	H	12	MB		



Containerboard Interlaboratory Testing Program
 Analysis 217
Ring Crush, 36 lb Linerboard - 36Z3
 TAPPI Official Test Method T822

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
LNBEF	83.3	82.6	82.7	82.6	82.8	0.31	2.6	0.4 L	82.3	0.54	2.9	1.0	12	LD
MNTQ8E	84.9	86.1	86.2	85.4	85.7	0.99	3.2	0.6	81.9	0.44	3.0	6.3 H	12	LD
NDNT3B	81.7	87.1	No DATA	87.7	85.5	0.95	2.2	3.3	82.0	0.46	2.5	3.0	11	LD
NKR26X	77.5	73.1 *	79.3	74.6	76.1	-1.30	3.3	2.8	76.0	-1.17	3.5	4.7	12	LC
NMG9PU	84.6	82.2	83.1	82.7	83.1	0.39	3.1	1.1	81.0	0.18	3.2	2.9	12	LC
NR9DJY	75.4	76.8	73.8	76.6	75.7	-1.41	4.1	1.4	75.8	-1.22	4.1	5.3	12	LC
PU89JD	81.1	81.6	83.0	81.5	81.8	0.07	2.4	0.8	78.3	-0.55	2.0	3.4	11	LD
QLUGRU	83.1	No DATA	No DATA	No DATA	83.1	0.38	2.2	0.0 L	81.5	0.31	2.3	1.8	8	LC
RW9XYQ	87.7	90.1 *H	91.7 *H	90.2 H	89.9	2.02 *	6.1	1.7	89.7	2.56 *	5.6	2.0	12	LX
RWNGG3	83.3	82.3	82.0	80.9	82.1	0.14	3.2	1.0	80.8	0.12	3.8	2.4	12	LD
TBNHU4	88.9	93.5 X	93.6 *	88.9 L	91.2	2.34 *	2.5	2.7	91.2	2.97 X	2.5	2.7	4	LD
U3Q3LC	73.3 H	65.8 XH	66.2 XH	64.7 XH	67.5	-3.38 X	9.6	3.9	73.2	-1.95	6.2	6.1 H	12	EM
UFCHPB	70.2 *H	71.6 *H	72.5 H	73.3 H	71.9	-2.33 *	7.9	1.3	73.0	-2.01 *	7.9	2.5	12	LC
V77X39	83.1	82.5	82.5	82.6	82.7	0.28	2.9	0.3 L	80.9	0.14	2.5	1.8	12	TH
VLYPMA	89.6	86.2	88.5	89.9	88.6	1.70	2.9	1.7	86.5	1.69	2.8	3.8	12	LZ
VQPYVM	84.1	85.2	86.9	82.4	84.6	0.75	3.6	1.9	83.3	0.81	3.1	2.5	12	EM
XU4F2W	80.3 H	80.4 H	80.3 H	80.4 H	80.4	-0.28	7.7	0.0 L	80.4	0.01	5.2	0.5 L	12	LD
YWLXU2	80.0	78.2	No DATA	No DATA	79.1	-0.59	2.7	1.3	79.1	-0.34	3.1	4.4	10	LC
Z36MT2	84.6	81.5	80.5	67.5 XH	78.5	-0.72	5.7	7.6 H	76.2	-1.13	5.3	8.0 H	12	LZ
ZCUA47	74.3	75.1	72.3	77.5	74.8	-1.62	3.1	2.2	74.9	-1.48	3.5	2.2	12	LD
ZTL4FW	84.4	83.7	82.9	83.7	83.7	0.51	2.2	0.6	84.0	0.99	2.2	0.6 L	12	LD

Consensus (All Labs) Results														
Wk Mean	81.20	81.56	81.89	81.34	Month Mean	81.53	Grand Mean	80.33						
Avg SDr	3.87	3.51	3.40	3.42	Avg SDr	3.54	Avg SDr	3.57						
SD btwn Labs	4.46	3.99	4.85	4.61	SD btwn Labs	4.15	SD btwn Labs	3.67						
Labs Incd	55	52	50	50	SD btwn Wks	2.22	SD btwn Wks	3.54						
Labs Exclcd	1	3	2	3	Labs Incd	54	Labs Incd	54						
Labs not Rcvd	0	1	4	3										

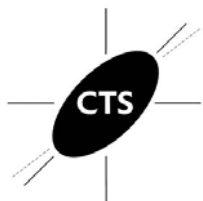


Containerboard Interlaboratory Testing Program
Analysis 217
Ring Crush, 36 lb Linerboard - 36Z3
TAPPI Official Test Method T822

Report #567 (N)
December 2016

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	LX	L&W 506
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TD	TMI Digital Crush Tester, Model 17-09	TH	TMI Compression Tester, Model 17-76
TU	L&W Crush Tester 48	WK	Zwick Z005 Crush Tester
XX	Instrument make/model not specified by lab		



Containerboard Interlaboratory Testing Program

Analysis 223

Report #567 (N)

December 2016

STFI, 42 lb Linerboard - 42D2

TAPPI Provisional Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2CTT7Z	21.5 L	22.4 L	22.6 L	20.9 L	21.9	-0.45	0.0	0.8	22.7	0.46	0.1	1.0	16	XX
2VP2KX	23.8	23.8	22.0	21.7	22.8	0.41	1.6	1.1	22.6	0.39	1.8	0.9	16	LU
33HT6W	24.2	21.4	22.5	21.2	22.3	-0.03	1.9	1.4	22.6	0.35	1.7	1.1	16	LA
3WB6RV	21.8 L	21.2 L	21.8 L	21.8 L	21.6	-0.64	0.4	0.3	21.9	-0.41	0.4	0.7	15	LA
3YL8FF	25.8 *L	24.5 L	24.8 *L	24.6 *L	24.9	2.30 *	0.5	0.6	23.9	1.75	0.4	1.2	16	BK
4AZJ94	22.2 L	22.9 L	21.4 L	22.7 L	22.3	-0.06	0.1	0.7	22.4	0.21	0.1	0.5	14	LA
4E8ADV	23.0	22.5	23.3	22.3	22.8	0.37	1.1	0.5	22.5	0.32	1.1	0.3	16	TT
6ENQ6G	21.4	22.2	22.5	21.4	21.9	-0.44	1.7	0.6	21.7	-0.61	1.8	0.5	16	LW
7RNPPE	21.5	19.9	22.5	21.1	21.3	-0.99	1.8	1.1	20.9	-1.42	1.5	0.8	16	LA
7VRHLC	21.6	22.7	21.6	22.3	22.1	-0.26	1.8	0.5	21.8	-0.44	1.5	0.5	16	BK
8XQDMQ	22.3	22.4	22.7	22.0	22.3	-0.01	1.2	0.3	22.2	0.00	1.1	0.2	16	TT
A3WNRQ	24.9	24.4	24.6	25.1 *	24.8	2.16 *	1.2	0.3	24.0	1.86	1.1	0.7	16	LZ
AAX3DR	22.2	22.2	22.6	22.0	22.2	-0.10	2.0	0.2	22.1	-0.18	1.9	0.5	16	LU
AC3BZQ	22.4	21.8	22.3	22.1	22.2	-0.17	2.2	0.3	22.5	0.23	1.9	0.6	16	LY
B2JHPL	21.7	22.3	22.1	23.0	22.3	-0.05	1.7	0.5	22.1	-0.18	1.8	0.8	16	LY
BH6YXP	24.2	24.9	24.0	23.4	24.1	1.60	1.6	0.6	23.2	1.08	1.6	0.8	16	LA
BZ4WFK	23.0	22.6	22.3	23.2	22.7	0.34	1.6	0.4	22.6	0.36	2.0	0.7	16	LA
C7NE9L	21.8	22.7	22.5	22.1	22.3	-0.07	2.2	0.4	21.8	-0.46	1.8	0.6	16	LW
CKNFLM	22.5	23.2	22.6	22.8	22.7	0.35	1.6	0.3	22.9	0.76	2.1	0.3	16	LW
CMCPXA	20.9	21.5	20.4	20.9	20.9	-1.28	1.6	0.5	20.6	-1.80	1.9	0.5	16	LY
E2LFP8	21.3	21.1	22.1	22.3	21.7	-0.57	2.1	0.6	21.7	-0.61	1.9	0.5	16	LZ
EQQ776	20.7 L	20.0 L	20.1 *L	22.3 L	20.7	-1.46	0.6	1.1	20.8	-1.59	0.3	0.8	14	LW
FGF88M	21.5	22.3	22.9	22.5	22.3	-0.06	1.9	0.6	22.6	0.42	1.8	1.6 H	16	LU
FJ2BFK	20.7	20.9	21.5	21.9	21.2	-1.00	1.4	0.5	21.7	-0.54	1.8	0.6	16	LY
FX4E87	21.2	21.7	21.8	21.9	21.7	-0.63	1.8	0.3	21.8	-0.46	1.9	0.5	16	LU
G2ZHDJ	23.1	21.4	21.7	22.3	22.1	-0.21	1.7	0.8	22.2	-0.06	2.0	0.7	16	LZ
GRCRMK	22.8	23.3	24.5	23.3	23.5	1.01	2.0	0.7	23.7	1.56	2.4	0.7	16	LW
HAAAE2	20.3 L	22.0 L	21.3 L	21.6 L	21.3	-0.96	0.0	0.7	21.2	-1.14	0.0	1.3	13	LW
JUQ9VF	24.4 L	22.9 L	23.7 L	22.2 L	23.3	0.83	0.4	1.0	28.6	6.86 X	1.8	10.0 H	15	LA
KGVEXC	23.4 L	21.0 L	21.0 L	20.0 *L	21.4	-0.90	0.4	1.4	22.7	0.48	0.5	1.4	16	LA
LNBFTE	22.5	23.0	22.9	23.3	22.9	0.51	1.5	0.3	22.6	0.41	1.7	0.5	16	LA
MNTQ8E	23.2	25.9 *	23.5	23.6	24.0	1.52	1.5	1.2	23.0	0.78	1.9	2.1 H	16	LY
NDNT3B	22.3	22.7	NO DATA	22.8	22.6	0.21	2.0	0.3	21.9	-0.39	1.8	0.8	15	LZ
NKR26X	22.2	19.9	21.8	21.7	21.4	-0.88	2.0	1.0	22.5	0.26	2.1	1.2	16	LW
NMG9PU	23.3	23.9	22.6	23.1	23.2	0.76	1.6	0.5	22.7	0.54	1.8	0.5	16	LU



Containerboard Interlaboratory Testing Program
 Analysis 223
STFI, 42 lb Linerboard - 42D2
 TAPPI Provisional Test Method T826

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
NR9DJY	19.9 L	22.1	20.6	20.2	20.7	-1.50	1.2	1.0	20.5	-1.90	1.6	1.0	16	XX
NXZMTW	25.3 *	25.2 *	24.4	24.6 *	24.9	2.26 *	1.9	0.5	24.4	2.31 *	1.9	0.8	16	LA
PU89JD	21.2	21.5	22.8	22.0	21.9	-0.41	2.1	0.7	20.7	-1.64	2.4	0.9	16	LW
QLUGRU	23.4	No DATA	No DATA	No DATA	23.4	0.92	1.5	0.0 L	22.2	0.00	1.9	0.7	13	LW
RC2QH7	21.8	20.3	22.3	21.4	21.5	-0.80	1.7	0.9	21.7	-0.61	1.8	0.6	16	LW
TN9XX4	25.7 *	24.9	24.8 *	23.6	24.7	2.14 *	2.6	0.9	24.4	2.36 *	2.3	1.2	16	LZ
UFCHPB	20.6	22.3	21.4	21.9	21.5	-0.73	1.8	0.7	21.8	-0.49	1.8	0.8	16	LU
WWBCB2	20.5	20.8	21.7	21.3	21.1	-1.16	2.3	0.5	21.2	-1.07	2.0	1.1	16	XX
YWLXU2	22.7	23.6	22.8	21.6 L	22.7	0.27	0.8	0.8	22.9	0.70	0.9	0.7	16	LY
Z36MT2	23.5 L	21.8 L	22.0 L	22.4 L	22.4	0.07	0.4	0.7	22.3	0.03	0.4	0.8	16	LA
ZBLWL6	20.4 L	21.4 L	20.6 L	20.9 L	20.8	-1.39	0.3	0.4	21.3	-0.96	0.3	1.0	16	LA
ZTL4FW	21.0	21.9	21.3	21.7	21.5	-0.79	2.0	0.4	21.6	-0.67	2.0	0.5	16	LY

Consensus (All Labs) Results									
Wk Mean	22.37	22.37	22.37	22.24	Month Mean	22.36	Grand Mean	22.24	
Avg SDr	1.60	1.64	1.53	1.56	Avg SDr	1.58	Avg SDr	1.64	
SD btwn Labs	1.45	1.40	1.15	1.07	SD btwn Labs	1.11	SD btwn Labs	0.93	
Labs Incl	47	46	45	46	SD btwn Wks	0.72	SD btwn Wks	0.87	
Labs Excl	0	0	0	0	Labs Incl	47	Labs Incl	46	
Labs not Rcvd	0	1	2	1					

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program

Analysis 225

Report #567 (N)

December 2016

STFI, 36 lb Linerboard - 36Z3

TAPPI Provisional Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2CTT7Z	21.6 L	22.4 L	22.3 L	21.5 L	21.9	0.49	0.0	0.5	21.8	0.38	0.0	0.4	12	XX
2VP2KX	23.0	22.3	21.4	19.5	21.6	0.08	1.3	1.5 H	21.7	0.36	1.3	0.9	12	LU
33HT6W	22.3	22.4	20.2	23.3	22.0	0.62	0.9	1.3 H	22.2	0.85	1.2	0.9	12	LA
3WB6RV	21.6 L	21.0 L	21.0 L	21.6 L	21.3	-0.21	0.2	0.3	21.6	0.22	0.2	0.6	12	LA
3YL8FF	24.4 *	24.1 *L	24.3 XL	24.8 *L	24.4	3.20 X	0.4	0.3	23.3	2.18 *	0.3	1.1	12	BK
4AZJ94	21.0 L	22.4 L	22.2 L	22.1 L	21.9	0.49	0.1	0.6	21.4	-0.02	0.0	0.7	11	LA
4E8ADV	22.1	21.7	22.3	21.9	22.0	0.56	0.9	0.2	21.8	0.41	0.8	0.3	12	TT
6ENQ6G	20.2	20.7	21.3	21.3	20.9	-0.64	1.4	0.5	20.9	-0.60	1.2	0.5	12	LW
7RNPPE	20.5	20.9	20.8	21.4	20.9	-0.64	1.2	0.4	20.5	-1.08	1.1	0.5	12	LA
7VRHLC	20.6	20.6	20.3	20.7	20.5	-1.05	0.9	0.2	20.7	-0.92	0.9	0.2	12	BK
8XQDMQ	21.3	21.3	21.7	21.4	21.4	-0.07	0.9	0.2	21.4	-0.03	0.9	0.2	12	TT
A3WNRQ	23.0	22.4	22.7	23.4	22.9	1.52	0.9	0.4	23.1	1.91	1.0	0.4	12	LZ
AAX3DR	21.7	21.6	21.6	20.6	21.4	-0.11	1.2	0.5	21.4	-0.01	1.0	0.4	12	LU
AC3BZQ	21.5	20.9	21.5	22.5	21.6	0.13	1.3	0.7	21.6	0.23	1.2	0.5	12	LY
B2JHPL	21.5	21.3	20.9	21.8	21.4	-0.12	1.2	0.4	21.3	-0.17	1.3	0.4	12	LY
BH6YXP	22.3	22.5	21.9	21.6	22.1	0.65	1.3	0.4	22.1	0.81	1.3	0.3	12	LA
BZ4WFK	22.7	22.5	21.3	22.6	22.3	0.84	1.4	0.7	22.0	0.71	1.4	0.5	12	LA
C7NE9L	21.0	20.5	20.9	20.6	20.7	-0.82	1.1	0.2	21.0	-0.48	1.0	0.3	12	LW
CKNFLM	21.8	22.3	22.4	22.8	22.3	0.92	1.2	0.4	22.1	0.80	1.3	0.4	12	LW
CMCPXA	20.4	20.3	20.3	20.3	20.3	-1.26	1.2	0.0 L	20.0	-1.73	1.2	0.4	12	LY
E2LFP8	21.2	21.1	21.4	20.8	21.1	-0.42	1.2	0.3	21.0	-0.51	1.2	0.4	12	LZ
EQQ776	20.2	18.7 *L	19.5 *L	20.8	19.8	-1.85	0.6	0.9	20.1	-1.52	0.3	0.9	12	LW
FGF88M	21.3	21.2	21.5	20.7	21.2	-0.33	1.3	0.4	21.6	0.15	1.4	0.5	12	LU
FJ2BFK	19.4	20.9	20.3	20.2	20.2	-1.39	1.5	0.6	20.8	-0.76	1.4	0.6	12	LY
FX4E87	20.8	21.2	20.8	22.2	21.3	-0.23	1.1	0.6	21.3	-0.22	1.1	0.4	12	LU
G2ZHDJ	20.7	20.7	20.7	20.8	20.7	-0.83	1.2	0.1 L	20.7	-0.82	1.2	0.5	12	LZ
GRCRMK	23.3	23.5	22.6	22.9	23.1	1.73	1.5	0.4	22.7	1.43	1.5	0.8	12	LW
HAAAE2	20.4 L	19.9 L	20.2 L	21.3 L	20.4	-1.17	0.0	0.6	20.7	-0.89	0.0	1.0	12	LW
JUQ9VF	22.0 L	22.2 L	22.8 L	23.4 L	22.6	1.24	0.3	0.6	25.0	4.21 X	0.8	5.2 H	12	LA
KGVEXC	23.6 L	21.4 L	21.1 L	20.4 L	21.6	0.16	0.2	1.4 H	22.0	0.71	0.3	1.0	12	LA
LNBFTE	22.8	21.4	21.9	21.7	21.9	0.51	1.3	0.6	22.0	0.72	1.3	0.5	12	LA
MNTQ8E	22.2	23.2	22.9	23.1	22.8	1.48	1.2	0.4	21.3	-0.18	1.3	2.3 H	12	XX
NDNT3B	22.0	22.7	NO DATA	23.5	22.7	1.38	1.1	0.8	21.7	0.30	1.3	1.0	11	LZ
NKR26X	20.6	19.9	21.4	21.6	20.9	-0.67	1.3	0.8	21.4	-0.09	1.3	1.3 H	12	LW
NMG9PU	22.4	22.6	21.8	22.0	22.2	0.79	1.3	0.4	21.9	0.59	1.4	0.6	12	LU



Containerboard Interlaboratory Testing Program
 Analysis 225
STFI, 36 lb Linerboard - 36Z3
 TAPPI Provisional Test Method T826

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
NR9DJY	19.9	19.5	19.7	19.9	19.8	-1.87	1.0	0.2	20.0	-1.74	1.3	0.8	12	XX
NXZMTW	24.0 *	24.3 *	20.6	24.1 *	23.2	1.92	1.2	1.7 H	23.5	2.45 *	1.3	1.0	12	LA
PU89JD	21.2	20.5	21.0	21.4	21.0	-0.49	1.3	0.4	20.3	-1.38	1.2	0.7	11	LW
QLUGRU	22.5	No DATA	No DATA	No DATA	22.5	1.07	1.3	0.0 L	21.1	-0.38	1.2	0.6	8	LW
RC2QH7	21.1	21.2	20.8	21.4	21.2	-0.36	1.1	0.3	21.2	-0.27	1.1	0.2	8	LW
TN9XX4	23.0	23.4	23.1 *	22.8	23.1	1.75	1.3	0.3	23.4	2.31 *	1.3	0.5	12	LZ
UFCHPB	22.1	21.2	22.1	21.7	21.8	0.30	1.2	0.4	21.4	-0.02	1.2	0.5	12	LU
WWBCB2	19.5	21.4	21.7	20.1	20.7	-0.91	1.4	1.1	20.9	-0.59	1.7	0.7	12	LY
YWLXU2	21.2	21.0 L	21.3 L	20.6	21.0	-0.51	0.6	0.3	21.1	-0.41	0.6	0.4	12	LY
Z36MT2	21.9 L	21.9 L	21.5 L	20.9 L	21.5	0.05	0.3	0.5	21.0	-0.48	0.3	0.7	12	LA
ZBLWL6	19.6 L	19.6 L	19.6 L	19.7 L	19.7	-2.00	0.2	0.1 L	20.3	-1.28	0.2	0.7	12	LA
ZTL4FW	20.8	20.9	20.9	20.7	20.8	-0.74	1.0	0.1 L	20.7	-0.90	1.2	0.4	12	LY

Consensus (All Labs) Results														
Wk Mean	21.58	21.51	21.31	21.61	Month Mean	21.48			Grand Mean	21.43				
Avg SDr	1.12	1.05	1.05	1.06	Avg SDr	1.08			Avg SDr	1.10				
SD btwn Labs	1.17	1.18	0.89	1.20	SD btwn Labs	0.91			SD btwn Labs	0.85				
Labs Incl	47	46	44	46	SD btwn Wks	0.65			SD btwn Wks	0.72				
Labs Excl	0	0	1	0	Labs Incl	46			Labs Incl	46				
Labs not Rcvd	0	1	2	1										

Key to Instrument Codes Reported by Participants

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



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

Report #567 (N)
December 2016

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
2CTT7Z	201.2	1.07	11.6	212.7	1.73	23.6	4	EV
3WB6RV	212.4	1.62	32.0	202.3	1.14	26.8	4	LA
4AZJ94	224.3	2.21 *	43.6	191.9	0.55	32.4	4	LA
6AR2LP	158.8	-1.04	13.0	162.9	-1.09	18.1	4	EV
6ENQ6G	175.6	-0.20	16.7	184.8	0.15	17.6	4	EV
BH6YXP	163.7	-0.79	17.6	162.8	-1.10	15.5	4	XX
BZ4WFK	155.3	-1.21	16.7	160.2	-1.25	16.3	4	LA
C7NE9L	193.9	0.71	12.6	200.0	1.01	21.3	4	EV
CMCPXA	168.3	-0.57	12.9	176.4	-0.32	15.7	4	EV
FX4E87	188.9	0.45	20.4	192.8	0.60	20.1	4	EV
HAAAE2	188.9	0.46	14.2	183.4	0.07	17.1	4	EV
JUQ9VF	183.3	0.18	14.5	187.0	0.28	19.2	4	LA
NDNT3B	163.7	-0.79	12.3	179.9	-0.13	17.9	4	LA
NKR26X	187.1	0.37	14.3	180.2	-0.11	14.1	4	EV
TBNHU4	155.9	-1.18	19.6	154.7	-1.56	17.1	2	EV
TN9XX4	167.8	-0.59	13.6	166.9	-0.87	16.7	4	XX
YWLXU2	104.6	-3.72 X	9.1	123.7	-3.31 X	13.7	4	EV
Z36MT2	188.0	0.41	30.1	212.5	1.72	30.6	4	EV
ZBLWL6	157.6	-1.10	12.0	167.4	-0.84	50.8	4	EV

Consensus (All Labs) Results			
Month Mean	179.70	Grand Mean	182.14
Avg SDr	20.04	Avg SDr	23.39
SD btwn Labs	20.17	SD btwn Labs	17.65
Labs Incl	18	Labs Incl	18

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program
 Analysis 229
Roughness - Sheffield Method, 42 lb Linerboard - 42D2
 TAPPI Provisional Test Method T538

Report #567 (N)
December 2016

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
33HT6W	360.5	-0.52	10.9	361.9	-0.18	8.8	4	XX
AAX3DR	368.8	-0.24	6.4	367.5	1.22	8.5	4	XX
KGVEXC	355.8	-0.67	6.3	356.5	-1.49	8.1	4	XX
LNBTBF	436.9	2.01 X	1.3	436.0	18.13 X	0.9	4	XX
LQZLDC	364.5	-0.39	8.8	364.6	0.50	9.3	4	XX
VLYPMA	370.3	-0.19	4.1	362.4	-0.05	6.8	4	XX

Consensus (All Labs) Results				
Month Mean	376.13		Grand Mean	362.57
Avg SDr	7.03		Avg SDr	8.36
SD btwn Labs	30.25		SD btwn Labs	4.05
Labs Incd	6		Labs Incd	5

Key to Instrument Codes Reported by Participants

XX Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
Analysis 231

Report #567 (N)
December 2016

Internal Bond, 42 lb Linerboard - 42B

TAPPI Provisional Test Method T569

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
3WB6RV	182.8	1.89	12.6	166.4	1.42	9.6	2	HY
7RNPRE	119.2	-0.91	6.4	119.9	-1.01	6.4	2	TM
AAX3DR	144.2	0.19	10.8	142.7	0.18	7.8	2	HY
B2JHPL	124.0	-0.70	6.5	124.0	-0.80	6.5	1	SC
C7NE9L	160.0	0.89	10.0	170.5	1.63	11.0	2	HY
EN2ZL8	140.3	0.02	2.7	134.1	-0.27	6.1	2	SC
FX4E87	116.8	-1.01	9.6	118.7	-1.08	8.1	2	TM
HAAAE2	184.0	1.94	52.2	159.0	1.03	38.9	2	SC
KGVEXC	126.2	-0.60	10.6	139.2	0.00	10.8	2	SC
LNBF6F	64.8	-3.30 X	1.1	66.2	-3.82 X	1.3	2	LZ
NR9DJY	109.5	-1.33	20.1	110.1	-1.52	16.4	2	SC
PU89JD	147.0	0.32	6.8	161.7	1.17	6.3	2	TM
TBNHU4	148.8	0.40	10.2	143.2	0.21	9.8	2	HY
TN9XX4	126.6	-0.58	9.7	133.9	-0.28	9.5	2	TM
YWLXX9	121.0	-0.83	3.2	117.5	-1.14	4.8	2	TM
Z36MT2	146.6	0.30	4.4	148.2	0.47	6.1	2	TM

Consensus (All Labs) Results			
Month Mean	139.81	Grand Mean	139.27
Avg SDr	16.49	Avg SDr	13.28
SD btwn Labs	22.74	SD btwn Labs	19.13
Labs Incl	15	Labs Incl	15

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	139.48	24.09	0.33	12
Modified Scott Bond Mechanics	152.08	11.20	12.27	2

Key to Instrument Codes Reported by Participants

HY	Huygen Digitized Scott Internal Bond Tester	LZ	L&W (model not specified)
SC	Scott Internal Bond Tester (Manual)	TM	TMI Monitor/Internal Bond Tester



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

Report #567 (N)
December 2016

WebCode	Monthly Results			Cumulative Results			
	Mean	CPV	SDr	Mean	CPV	SDr	Months
2BGYLT	23.6	-1.55	4.3	25.8	-0.62	3.5	2
3WB6RV	29.7	1.18	3.6	28.6	0.60	2.9	2
AAX3DR	25.8	-0.57	1.3	26.2	-0.43	1.6	2
B2JHPL	23.0	-1.81	0.7	23.0	-1.79	3.1	2
BH6YXP	25.2	-0.83	2.2	25.0	-0.94	1.6	2
C7NE9L	27.8	0.32	1.5	26.8	-0.18	1.7	2
CKNFLM	29.0	0.86	2.1	30.8	1.52	2.2	2
CMCPXA	28.8	0.75	2.0	26.1	-0.49	2.0	2
EWUAUH	25.2	-0.83	3.6	26.8	-0.18	2.8	2
FGF88M	26.6	-0.21	0.5	27.5	0.12	0.9	2
FX4E87	28.4	0.59	2.7	29.5	0.97	2.6	2
G2ZHDJ	29.2	0.95	2.2	25.9	-0.58	1.8	2
HAAAE2	28.4	0.59	4.5	29.2	0.84	3.4	2
KGVEXC	28.8	0.77	1.3	29.4	0.93	1.6	2
LNBTBF	31.0	1.75	0.7	30.4	1.35	1.0	2
NKR26X	24.2	-1.28	1.3	24.5	-1.15	1.9	2
PU89JD	26.6	-0.23	4.8	26.8	-0.18	4.5	2
TN9XX4	25.2	-0.83	1.6	24.0	-1.36	1.9	2
Z36MT2	28.0	0.41	2.9	30.9	1.57	3.4	2

Consensus (All Labs) Results			
Month Mean	27.08	Grand Mean	27.21
Avg SDr	2.65	Avg SDr	2.52
SD btwn Labs	2.25	SD btwn Labs	2.36
Labs Incl	19	Labs Incl	19

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked



Containerboard Interlaboratory Testing Program
Analysis 237

Report #567 (N)
December 2016

Air Resistance, 42 lb Linerboard - 42B

TAPPI Official Test Method T460

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SDr	Mean	CPV	SDr	Months	Inst
2BGYLT	31.4	1.27	2.7	30.9	1.26	2.9	2	GA
2CTT7Z	28.7	-0.27	2.8	27.4	-1.09	2.1	2	LW
3WB6RV	26.5	-1.46	1.6	28.1	-0.62	1.8	2	LA
3YL8FF	33.5	2.40 *	2.6	32.7	2.49 *	2.2	2	XX
8HVXHQ	20.1	-5.01 X	1.6	23.4	-3.75 X	1.4	2	LA
AAX3DR	29.4	0.15	3.6	29.0	-0.02	3.1	2	TP
B2JHPL	28.2	-0.50	1.3	29.0	-0.04	1.6	2	LP
BH6YXP	27.6	-0.87	1.0	27.8	-0.79	1.2	2	LA
C7NE9L	30.4	0.70	1.6	30.3	0.86	1.6	2	LP
CKNFLM	27.4	-0.99	1.2	27.6	-0.97	2.2	2	LP
EN2ZL8	28.2	-0.54	1.8	27.7	-0.87	1.6	2	LP
HAAAE2	30.4	0.70	4.5	29.2	0.12	3.4	2	HG
JUQ9VF	28.2	-0.50	2.5	28.2	-0.56	2.2	2	LA
KHEZU9	30.2	0.59	4.8	30.2	0.79	4.8	1	XX
LNBFET	29.4	0.14	1.4	29.4	0.23	1.4	2	LA
PU89JD	27.0	-1.20	2.7	27.0	-1.37	2.7	2	HG
TN9XX4	28.0	-0.65	3.5	28.6	-0.29	4.1	2	TD
Z36MT2	27.4	-0.98	1.4	27.9	-0.76	1.1	2	LP
ZCUA47	30.4	0.70	4.4	28.5	-0.38	4.1	2	GG
ZP6LGZ	28.9	-0.12	2.4	29.6	0.35	2.5	2	XX
ZTL4FW	31.8	1.47	1.6	31.5	1.66	1.6	2	LP

Consensus (All Labs) Results			
Month Mean	29.14	Grand Mean	29.02
Avg SDr	2.71	Avg SDr	2.62
SD btwn Labs	1.80	SD btwn Labs	1.49
Labs Incl	20	Labs Incl	20

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program
Analysis 240

Report #567 (N)
December 2016

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

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results				Inst	
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks		Wks
2CTT7Z	56.5	53.2 *	51.7 X	57.5	54.7	-2.53 *	3.1	2.7 H	55.4	-2.25 *	3.1	2.5	12	XX
33KJEZ	60.6	60.7	60.8	No DATA	60.7	0.60	2.0	0.1 L	60.4	0.32	1.7	0.8	11	LC
3YL8FF	60.0	59.7	59.4 L	60.1 L	59.8	0.14	1.6	0.3	60.0	0.09	1.8	0.7	12	MB
4AZJ94	57.8	58.7	59.2	57.8	58.4	-0.61	3.4	0.7	57.1	-1.39	3.6	4.8 H	10	MB
4E8ADV	60.8 H	60.0 H	57.5 H	60.2	59.6	0.05	6.0	1.5	58.6	-0.59	5.5	1.5	12	TG
6GDV2V	60.8	60.4	61.7	61.8 L	61.2	0.86	2.2	0.7	60.4	0.30	2.6	1.5	12	MB
7RNPPE	53.6 XL	55.5	56.3	54.7 *	55.0	-2.37 *	2.7	1.2	57.0	-1.42	2.8	1.9	12	LC
7VPRFU	60.4	59.8	60.2	61.2	60.4	0.45	2.7	0.6	59.0	-0.39	2.3	1.1	12	LD
89TF8N	59.9	60.3	60.2	56.3	59.2	-0.20	3.1	1.9	59.3	-0.26	2.5	2.1	12	TU
8CVCVX	63.7 L	64.0 L	61.9	60.5 L	62.5	1.55	1.7	1.6	62.3	1.30	1.2	1.5	12	TD
8HVXHQ	63.0	62.8	62.4	60.8	62.3	1.43	2.9	1.0	63.2	1.74	2.9	1.9	12	LC
8XQDMQ	60.3	58.4	58.7	54.2 *	57.9	-0.86	2.9	2.6 H	58.1	-0.86	3.0	1.7	12	TH
A3WNRQ	59.9	57.9	59.6 L	58.6	59.0	-0.28	2.6	0.9	58.9	-0.42	2.3	1.3	12	LC
AAX3DR	60.7	58.5	59.7	61.1	60.0	0.24	2.8	1.2	60.6	0.42	3.3	2.0	12	LC
AC3BZQ	59.5	61.5	60.8	59.7	60.4	0.44	2.9	0.9	60.9	0.56	2.9	0.8	12	LD
B2JHPL	59.7	62.4	58.6	59.4	60.0	0.23	3.1	1.6	59.4	-0.20	3.6	1.1	12	LZ
BE6TCR	62.3	61.8	62.0	60.7	61.7	1.12	3.7	0.7	62.3	1.30	3.6	1.2	12	LD
BH6YXP	58.1	60.0	60.6	60.2	59.7	0.09	2.7	1.1	60.9	0.57	2.8	1.2	12	LD
CKNFLM	60.9	62.0	59.3	62.1	61.1	0.80	3.1	1.3	62.3	1.30	2.9	1.5	12	LC
E2LFP8	56.1	59.2 L	59.5	58.9	58.4	-0.58	2.4	1.6	57.9	-0.96	3.1	1.5	12	LZ
EC8G9M	61.7	62.2	58.5	59.1	60.4	0.43	3.5	1.9	60.1	0.18	3.2	1.9	12	MB
F7ZEJD	58.0	57.9 H	58.6	57.7	58.1	-0.78	3.5	0.3	59.9	0.05	3.5	2.3	8	LC
FGF88M	58.8 L	58.8	58.3	58.6 L	58.6	-0.48	1.5	0.2	59.3	-0.26	1.8	0.7	12	LZ
FX4E87	58.4	58.3	59.0	59.9	58.9	-0.34	3.1	0.7	58.6	-0.62	3.1	1.0	12	LD
G2ZHDJ	59.6	57.5	59.0	59.7	58.9	-0.32	3.3	1.0	58.1	-0.88	3.2	1.7	12	LZ
GRCRMK	56.7 H	56.3	54.9 *	58.8	56.7	-1.51	3.7	1.6	58.2	-0.79	5.3	2.7	12	LC
HG73PF	58.0 L	58.2	56.8	57.2	57.6	-1.04	2.5	0.7	58.7	-0.53	3.0	1.9	12	XX
KFL68Z	60.7	59.9	59.6	60.2	60.1	0.29	2.6	0.5	60.5	0.36	2.6	0.8	12	LC
L8DRTH	61.1	60.9	61.9	61.7	61.4	0.98	4.3	0.5	60.6	0.41	4.0	1.7	12	LD
LJGH7A	58.8 L	58.5	59.9	59.1 L	59.1	-0.26	1.6	0.6	58.9	-0.43	3.0	1.6	12	MB
LNBEF	57.4	53.5 *	54.9 *	55.4 *	55.3	-2.23 *	2.7	1.6	55.3	-2.28 *	2.8	1.2	12	LD
MNTQ8E	61.3	60.2	60.2	60.3 H	60.5	0.50	3.9	0.5	60.9	0.57	3.5	1.1	12	LD
NDNT3B	60.5	58.6	No DATA	58.1	59.0	-0.26	2.9	1.3	59.2	-0.27	2.6	2.5	11	LD
NMG9PU	62.9	62.2	62.2	61.8	62.3	1.44	2.4	0.4	61.8	1.02	2.4	0.8	12	LD
NR9DJY	61.0	61.8	60.5	57.9	60.3	0.39	3.1	1.7	59.6	-0.11	3.4	2.0	12	LC



Containerboard Interlaboratory Testing Program
Analysis 240

Report #567 (N)
December 2016

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

TAPPI Official Test Method T809

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
NXZMTW	58.3	55.8	57.2	57.5	57.2	-1.24	2.9	1.0	57.5	-1.17	3.1	0.9	8	LD
QLUGRU	65.6 *	No DATA	No DATA	No DATA	65.6	3.15	X 1.7	0.0 L	65.1	2.69 *	2.4	3.8 H	9	LE
RAV6U7	60.9	59.8	59.6	59.7	60.0	0.23	2.9	0.6	59.2	-0.29	2.4	1.1	12	EM
RW9XYQ	60.2	60.1	59.1	58.7	59.5	-0.02	2.3	0.8	59.8	0.02	2.6	1.5	12	LD
RWNGG3	74.0 XH	71.8 XH	69.0 X	66.9 X	70.4	5.71	X 6.4	3.1 H	69.0	4.72 X	6.3	4.9 H	8	LC
TW4VMR	60.2	60.5	60.8	59.5	60.3	0.37	2.8	0.6	60.7	0.46	2.6	0.9	12	LD
UFCHPB	61.5	65.4 *	61.3	60.8	62.2	1.41	3.4	2.1	61.2	0.74	3.2	1.9	12	LC
VD2Z3Y	48.6 X	48.1 X	46.8 X	48.7 X	48.1	-6.03	X 3.1	0.9	46.8	-6.63 X	3.3	1.2	11	TC
VQPYVM	64.7 *	62.0	62.7	62.9	63.1	1.85	3.0	1.1	63.5	1.92	2.9	1.1	12	EM
XU4F2W	59.8 H	59.9 H	59.9 H	59.8 H	59.9	0.16	7.5	0.0 L	60.0	0.09	5.3	1.0	12	LD
ZP6LGZ	60.0	59.6	59.5	58.4	59.4	-0.09	3.4	0.7	59.7	-0.05	3.2	1.0	12	LD

Consensus (All Labs) Results														
Wk Mean	60.16	59.64	59.58	59.25	Month Mean	59.55			Grand Mean	59.78				
Avg SDr	3.34	3.15	3.23	3.11	Avg SDr	3.20			Avg SDr	3.12				
SD btwn Labs	2.02	2.46	1.85	1.93	SD btwn Labs	1.91			SD btwn Labs	1.96				
Labs Incl	43	43	41	42	SD btwn Wks	1.21			SD btwn Wks	1.77				
Labs Excl	3	2	3	2	Labs Incl	43			Labs Incl	44				
Labs not Rcvd	0	1	2	2										

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LE	L&W CRUSH TESTER 275
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TC	TMI Monitor/Compression Tester, 17-37	TD	TMI Digital Crush Tester, Model 17-09
TG	TMI Compression Tester, Model 17-10	TH	TMI Compression Tester, Model 17-76
TU	L&W Crush Tester 48	XX	Instrument make/model not specified by lab



Containerboard Interlaboratory Testing Program
Analysis 250

Report #567 (N)
December 2016

Fluted Edge Crush Strength (FCF), 26 lb Corrugating Medium - CM91

TAPPI Official Method T824

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	Inst
7VPRFU	70.9	70.2	71.3	70.9	70.8	-0.86	2.0	0.4	69.6	-1.53	2.1	1.2	12	LD
8CVCVX	72.8	73.3 L	72.1	70.4 L	72.2	-0.33	1.5	1.3	72.8	-0.11	1.2	1.4	12	TD
AAX3DR	79.9 *	78.5	77.9	77.4	78.5	2.11 *	2.0	1.1	77.3	1.88	2.2	1.1	12	LC
BE6TCR	76.6	75.6	76.9	76.0	76.3	1.26	2.6	0.6	76.7	1.63	2.9	0.8	12	LD
BH6YXP	68.0	67.8	68.0	68.0	67.9	-1.97	2.1	0.1 L	69.5	-1.55	2.6	1.3	12	LD
CKNFLM	75.9	73.3	74.1	72.9	74.1	0.40	2.7	1.3	74.5	0.65	2.8	1.1	12	XX
E2LFP8	75.8	64.2 *	74.9	75.3	72.5	-0.18	2.4	5.6 H	71.6	-0.62	4.2	5.4 H	12	LZ
KFL68Z	71.7	72.1	72.8	72.4	72.3	-0.30	2.8	0.5	71.8	-0.53	3.1	0.8	12	XX
KHEZU9	77.4	78.1	70.9	73.6	75.0	0.77	2.4	3.4	73.1	0.05	1.8	3.0	8	XX
L8DRTH	75.3	76.7	76.0	75.7	75.9	1.12	2.1	0.6	75.1	0.93	2.2	1.0	12	LD
LJGH7A	69.8	69.8	69.4	70.1	69.8	-1.26	2.6	0.3 L	70.3	-1.18	2.4	1.2	12	MB
LNBFET	73.1	75.3	73.7	73.2	73.8	0.32	2.6	1.0	74.5	0.67	2.7	1.8	12	LD
NMG9PU	71.3	72.3	73.3	73.2	72.5	-0.20	1.9	0.9	72.6	-0.19	2.0	1.0	12	LD
QLUGRU	71.5	No DATA	No DATA	No DATA	71.5	-0.59	3.3	0.0 L	73.0	0.01	2.6	3.4 H	9	LE
TW4VMR	72.3	72.8	72.0 H	73.0 H	72.5	-0.19	3.3	0.5	72.2	-0.37	3.3	0.6	12	XX
ZP6LGZ	71.7	73.9	74.2	71.2	72.7	-0.11	2.1	1.5	73.6	0.27	2.4	1.3	12	XX

Consensus (All Labs) Results														
Wk Mean	73.36	72.93	73.17	72.88	Month Mean	73.02			Grand Mean	73.01				
Avg SDr	2.64	2.48	2.08	2.35	Avg SDr	2.45			Avg SDr	2.62				
SD btwn Labs	3.15	3.85	2.71	2.53	SD btwn Labs	2.58			SD btwn Labs	2.27				
Labs Incl	16	15	15	15	SD btwn Wks	1.87			SD btwn Wks	2.06				
Labs Excl	0	0	0	0	Labs Incl	16			Labs Incl	16				
Labs not Rcvd	0	1	1	1										

Key to Instrument Codes Reported by Participants

LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LE	L&W CRUSH TESTER 275	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	TD	TMI Digital Crush Tester, Model 17-09
XX	Instrument make/model not specified by lab		



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

Report #567 (N)
December 2016

WebCode	Weekly Means				Monthly Results				Cumulative Results				Inst	
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks		Wks
2CTT7Z	49.5 X	50.2 X	47.7	45.4	48.2	2.35 *	2.7	2.2	48.0	2.12 *	2.7	1.7	12	XX
33KJEZ	43.8	43.1	43.6	No DATA	43.5	0.09	2.0	0.4	44.5	0.54	1.8	1.6	11	LC
89TF8N	41.0	40.6	39.4	39.2 *	40.1	-1.55	2.3	0.9	39.5	-1.74	2.3	1.0	12	LC
8HVXHQ	41.7	43.6	43.6	44.4	43.3	0.01	2.5	1.2	46.0	1.22	2.4	3.0 H	12	LD
A3WNRQ	44.9	44.6	43.0	41.9	43.6	0.15	1.8	1.4	43.4	0.04	1.7	1.0	12	WK
AAX3DR	43.3	43.3	41.7	43.4	42.9	-0.19	2.9	0.8	44.2	0.40	2.6	1.2	12	LC
BE6TCR	45.0	44.8	44.7	45.8	45.1	0.85	2.0	0.5	45.6	1.04	1.9	0.6	12	LD
BH6YXP	44.1	44.7	44.3	45.1	44.5	0.60	3.0	0.4	45.3	0.92	2.6	1.0	12	LD
CKNFLM	44.3	45.2	45.0	46.7 L	45.3	0.96	2.9	1.0	44.0	0.30	2.7	2.6 H	12	LC
F7ZEJD	30.7 X	29.7 X	29.9 X	29.0 X	29.8	-6.48 X	2.2	0.7	30.3	-5.95 X	2.6	0.9	8	XX
G2ZHDJ	41.8	43.9	43.7	43.5	43.2	-0.04	2.3	1.0	42.5	-0.37	2.7	1.2	12	EM
GDCQEP	42.3	42.6	42.7	42.3	42.5	-0.40	1.4	0.2	42.8	-0.23	1.2	0.6	12	WK
LJGH7A	38.5 X	39.1 *	39.1	39.1 *	39.0	-2.08 *	1.3	0.3	38.2	-2.34 *	2.5	1.0	12	MB
LNBFET	43.6	39.7	41.5	42.4	41.8	-0.72	2.3	1.6	42.8	-0.22	3.0	1.7	12	LD
NDNT3B	44.4	46.6	No DATA	45.4	45.5	1.04	2.3	1.1	43.5	0.10	2.2	1.5	11	LD
PP2DZD	41.4	42.5	34.4 *	41.0	39.8	-1.67	3.7	3.7 H	41.2	-0.96	4.0	2.3	12	LZ
RAV6U7	44.1	43.3	43.5	44.4	43.8	0.26	3.0	0.5	43.2	-0.05	2.9	1.1	12	LC
RW9XYQ	43.8	41.3	43.8	44.1	43.3	-0.03	1.8	1.3	43.8	0.22	2.1	1.4	12	LZ
RWNGG3	45.5	46.7	43.9	45.1	45.3	0.94	2.5	1.1	44.8	0.69	3.0	1.4	8	LD
V77X39	41.8	42.5	42.5	42.6	42.4	-0.46	2.1	0.4	42.3	-0.44	2.2	0.6	12	TH
VD2Z3Y	35.9 X	34.6 X	35.1 *	36.1 X	35.4	-3.77 X	1.6	0.7	34.3	-4.11 X	1.8	5.8 H	11	TC
XU4F2W	43.1	43.1	43.1	43.1	43.1	-0.11	3.0	0.0 L	41.0	-1.04	3.2	1.8	12	LD
ZP6LGZ	43.5	43.3	42.7	43.8	43.3	0.01	3.4	0.4	42.9	-0.19	3.6	0.8	12	LD

Consensus (All Labs) Results														
Wk Mean	43.33	43.22	42.33	43.43	Month Mean	43.30			Grand Mean	43.30				
Avg SDr	2.58	2.32	2.56	2.65	Avg SDr	2.52			Avg SDr	2.60				
SD btwn Labs	1.32	1.99	3.11	2.05	SD btwn Labs	2.09			SD btwn Labs	2.19				
Labs Inclcd	19	20	21	20	SD btwn Wks	1.26			SD btwn Wks	1.54				
Labs Exclcd	4	3	1	2	Labs Inclcd	21			Labs Inclcd	21				
Labs not Rcvd	0	0	1	1										

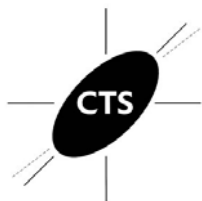


Containerboard Interlaboratory Testing Program
Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM91
TAPPI Official Test Method T822

Report #567 (N)
December 2016

Key to Instrument Codes Reported by Participants

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



Containerboard Interlaboratory Testing Program

Analysis 261

Report #567 (N)

December 2016

STFI, 26 lb Corrugating Medium - CM91

TAPPI Provisional Test Method T826

WebCode	Weekly Means				Monthly Results				Cumulative Results					Inst
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SDr	SD Wks	Mean	CPV	SDr	SD Wks	Wks	
2CTT7Z	15.2 L	14.4 L	15.4 L	15.3 L	15.1	0.84	0.0	0.5	14.9	0.91	0.0	0.4	12	XX
33HT6W	15.3	15.0	16.1 X	14.2	15.1	0.99	1.2	0.8	14.7	0.66	1.1	0.8 H	12	LA
33KJEZ	13.3	13.6	13.7	NO DATA	13.5	-1.86	0.6	0.2	13.5	-1.63	0.6	0.4	11	XX
3YL8FF	17.1 XL	17.0 *L	16.5 XL	17.0 XL	16.9	4.09 X	0.2	0.3	16.3	3.67 X	0.2	0.5	12	BK
4AZJ94	NO DATA	16.6 L	14.4 L	14.3 L	15.1	0.93	0.0	1.3 H	14.5	0.16	0.0	0.8 H	9	LA
7VPRFU	14.3	14.6	14.0	14.3	14.3	-0.54	0.6	0.2	13.8	-1.18	0.6	0.6	12	LA
8HVXHQ	16.3 *	15.9	15.6 *	15.2	15.7	2.06 *	0.8	0.5	15.5	2.13 *	0.8	0.4	12	LA
8XQDMQ	14.0	14.6	14.3	14.1	14.3	-0.56	0.8	0.3	13.8	-1.04	0.7	0.6	12	TT
A3WNRQ	15.7	14.8	15.1	15.7 *	15.3	1.32	0.8	0.5	15.1	1.34	0.7	0.5	12	LZ
AAX3DR	14.7	14.1	14.6	14.1	14.4	-0.40	1.0	0.3	14.4	-0.05	1.0	0.2	12	LU
B2JHPL	14.4	14.4	14.2	14.3	14.3	-0.44	0.8	0.1	14.3	-0.20	1.0	0.4	12	LB
BH6YXP	14.3	14.2	14.3	14.5	14.3	-0.48	0.6	0.2	14.3	-0.11	0.8	0.2	12	LB
FGF88M	14.3	14.3	14.1	14.6	14.3	-0.45	1.1	0.2	14.3	-0.15	1.1	0.3	12	LU
FX4E87	14.3	14.1	14.3	14.1	14.2	-0.69	1.0	0.1	14.0	-0.75	1.0	0.2	12	LU
G2ZH DJ	14.4	14.5	14.1	13.9	14.2	-0.64	1.1	0.3	13.7	-1.29	1.0	0.5	12	LZ
GRCRMK	16.1 *	15.5	15.3	15.2	15.5	1.70	1.0	0.4	15.4	1.97	1.1	0.4	12	LW
KFL68Z	14.2	13.8	14.1	14.8	14.2	-0.65	0.9	0.4	13.9	-0.98	0.8	0.6	12	LB
L8DRTH	13.9	14.5	14.3	13.9	14.2	-0.74	1.0	0.3	14.7	0.58	0.9	0.5	12	LB
LN BETF	14.9	14.3	14.7	14.3	14.6	-0.06	0.8	0.3	14.4	0.04	1.0	0.3	12	LA
NDNT3B	14.9	16.1	NO DATA	15.2	15.4	1.44	1.1	0.6	14.5	0.20	1.2	0.7	11	LZ
PP2DZD	14.6	16.4	14.1	14.6	14.9	0.59	1.3	1.0 H	14.7	0.56	1.1	0.6	12	LA
RAV6U7	13.9	14.0	14.3	14.3	14.1	-0.84	0.9	0.2	14.5	0.18	1.1	0.5	8	LB
TW4VMR	13.6	14.0	14.3	14.6	14.1	-0.84	0.8	0.4	13.8	-1.06	0.8	0.5	12	LB
VD2Z3Y	13.5 L	14.4 L	14.4 L	13.9 L	14.0	-0.97	0.0	0.4	13.9	-0.90	0.0	0.3	11	TS
YMJHBN	14.5 L	15.0 L	14.8 L	14.6 L	14.7	0.25	0.0	0.2	14.7	0.65	0.0	0.2	4	LZ

Consensus (All Labs) Results									
Wk Mean	14.55	14.80	14.48	14.52	Month Mean	14.59	Grand Mean	14.39	
Avg SDr	0.78	0.86	0.79	0.93	Avg SDr	0.84	Avg SDr	0.85	
SD btwn Labs	0.78	0.92	0.48	0.50	SD btwn Labs	0.56	SD btwn Labs	0.52	
Labs Incl	23	25	22	23	SD btwn Wks	0.48	SD btwn Wks	0.48	
Labs Excl	1	0	2	1	Labs Incl	24	Labs Incl	24	
Labs not Rcvd	1	0	1	1					



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

Report #567 (N)
December 2016

Key to Instrument Codes Reported by Participants

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