Containerboard Interlaboratory Testing Program

Participant Summary Report #578 (M) - November 2017

Introduction to the Containerboard Program

Explanation of Tables and Definitions of Terms

Analysis	Sample	Analysis Name
201	BX11	Box Compression Strength, Corrugated Boxes
202	EC10	Edgewise Compressive Strength, Wax (T811), Corrugated Board
203	EC10	Edgewise Compressive Strength by Clamp (T839), Corrugated Board
205	42D3	Mullen Burst of Linerboard, 42 lb Linerboard
206	56A1	Mullen Burst of Linerboard, 56 lb Linerboard
215	42D3	Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard
216	56A1	Ring Crush of Linerboard, Rigid Platen Type, 56 lb Linerboard
223	42D3	STFI of Linerboard, 42 lb Linerboard
224	56A1	STFI of Linerboard, 56 lb Linerboard
228	56A	Roughness - Stylus Method, 56 lb Linerboard
229	42D3	Roughness - Sheffield Method, 42 lb Linerboard
231	42D	Internal Bond Strength, Linerboard, 42 lb Linerboard
234	56A	Coefficient of Static Friction - Inclined Plane, 56 lb Linerboard
237	42D	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

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
35 lb Linerboard	35E1	June 2017-Current
42 lb Linerboard	42D3	November 2017-Current
	42D2	August 2016-October 2017
56 lb Linerboard	56A1	July 2016-Current

ABOUT CTS

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

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EXPLANATION OF TABLES

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

Definitions of Terms Used

Weekly Results

Laboratory Data

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

Consensus Data

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

Monthly Results

Laboratory Data

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

Consensus Data

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

Cumulative Results

Laboratory Data

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

Consensus Data

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

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>

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

Containerboard Interlaboratory Testing Program
Analysis 201
Top to Bottom Box Compression Strength, Corrugated Boxes - BX11
TAPPI Official Test Method T804

Report #578 (M)
November 2017

WebCode	Monthly Results Mean	CPV	SD		Cumulative Results Mean	CPV	SD Months	Months	Inst
2BWRCT	840.0	0.94	16.96		835.0	1.47	19.77	4	LH
49H7FN	723.6	-0.77	96.00		712.5	-0.58	24.78	4	LS
94D2PY	738.2	-0.55	60.21		720.6	-0.44	14.87	4	ER
9E7HEZ	758.4	-0.26	26.58		766.1	0.32	33.59	4	LM
BNAG28	748.2	-0.41	46.33		709.4	-0.63	26.80	4	LG
BYRP99	762.6	-0.19	19.83		750.0	0.05	16.05	4	LG
CEXH8V	743.2	-0.48	21.37		741.1	-0.10	15.99	4	EX
CUGZ47	727.3	-0.71	53.84		714.8	-0.54	14.30	4	TE
EM37XY	743.4	-0.48	74.17		753.2	0.10	36.48	4	ER
EWTR6H	876.9	1.48	84.75		831.4	1.41	41.58	3	EX
FCZA93	939.0	2.40 *	26.11		843.4	1.61	88.72	4	LG
JHW2D3	704.4	-1.05	51.69		724.8	-0.37	15.10	4	LS
M2YAGH	677.2	-1.45	14.65		668.9	-1.31	5.72 L	4	LL
NA4KLM	893.6	1.73	29.40		834.9	1.47	44.69	4	ER
PBUZFV	675.2	-1.48	18.85		684.4	-1.05	17.17	4	TB
RH9TH6	841.8	0.97	70.40		764.1	0.29	56.89	4	LG
RLPZXR	759.6	-0.24	10.94 L		714.9	-0.54	43.10	4	LG
T38GKK	809.2	0.49	62.13		763.9	0.28	44.54	4	ES
UHHE7W	795.4	0.29	102.38 H		622.4	-2.09 *	149.95 H	3	EX
UR82HM	720.0	-0.82	35.69		848.4	1.70	136.88 H	4	LM
VXQVNH	748.2	-0.41	67.03		684.7	-1.04	45.36	4	ER
XENR2Y	813.8	0.56	27.53		745.2	-0.03	72.92	3	LH
ZVPBRL	805.8	0.44	59.47		747.8	0.01	49.93	4	ET

Consensus (All Labs) Results

Month Mean	775.87	Grand Mean	747.04
Avg SD	53.84	Avg SD Months	57.27
SD btwn Labs	68.08	SD btwn Labs	59.73
Labs Incld	23	Labs Incld	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	762.46	58.75	13.41	8
Clip sealing	783.02	73.49	7.15	15

Containerboard Interlaboratory Testing Program
Analysis 201
Top to Bottom Box Compression Strength, Corrugated Boxes - BX11
TAPPI Official Test Method T804

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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 - EC10
TAPPI Official Test Method T811

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	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2BWRCT	35.5	-0.48	1.34		34.0	-0.78	1.19	4	TC
449Q9K	34.1	-0.98	3.59	H	32.0	-1.37	1.76	4	XX
49H7FN	37.8	0.33	1.27		37.7	0.35	0.34	4	LC
BNAG28	39.3	0.84	1.04		40.0	1.04	0.95	4	TH
BYRP99	40.3	1.21	1.53		40.5	1.18	0.38	4	LE
JEV6J2	40.2	1.16	1.32		40.2	1.10	0.00	1	XX
JHW2D3	37.6	0.24	1.02		37.2	0.19	1.90	4	EM
VTWTL4	31.5	-1.90 *	1.00		31.9	-1.42	1.15	4	WK
VXQVNH	34.9	-0.68	2.63		34.3	-0.69	0.90	4	EN
Y2VPXW	37.6	0.26	1.19		37.9	0.40	2.85	4	LC

Consensus (All Labs) Results

Month Mean	36.89	Grand Mean	36.56
Avg SD	1.78	Avg SD Months	1.47
SD btwn Labs	2.86	SD btwn Labs	3.30
Labs Incld	10	Labs Incld	10

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	EN	Emerson 2200
LC	L&W Crush Tester 48	LE	L&W Crush Tester 840
TC	TMI Monitor/Compression Tester, Model 17-37	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 - EC10

TAPPI Official Test Method T839

Report #578 (M)
November 2017

WebCode	Monthly Results				Cumulative Results				
	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
29Q8NT	39.7	-0.33	2.31		40.2	-0.17	0.39	4	TD
2BWRCT	39.5	-0.41	0.55 L		39.4	-0.65	1.84	4	TX
3FNLLY	36.5	-1.52	3.30 H		38.5	-1.19	3.76 H	4	LC
3LB9JP	42.1	0.56	1.38		41.4	0.53	0.59	4	LD
49H7FN	40.8	0.05	2.13		42.0	0.87	1.09	4	LC
67PHPF	47.7	2.60 *	1.82		47.2	3.95 X	1.13	4	LD
7RP34C	29.7	-4.00 X	0.55 L		29.7	-6.33 X	0.00	1	XX
8HZMWM	41.6	0.37	1.40		41.6	0.67	0.00	1	LC
9E7HEZ	45.8	1.89	0.92		44.4	2.27 *	2.67	4	TG
AP9X3J	44.7	1.48	1.63		43.9	2.01 *	1.59	4	TG
BNAG28	41.0	0.16	0.86		41.5	0.57	0.51	4	TH
BYRP99	41.1	0.19	2.09		40.5	0.00	0.70	4	LY
CEXH8V	40.8	0.08	1.15		41.2	0.40	1.24	4	LD
CUGZ47	42.4	0.64	1.13		42.6	1.22	0.37	4	LD
D8U3T8	41.1	0.18	1.57		41.5	0.59	0.71	4	EM
DWD7X3	41.3	0.25	1.23		39.6	-0.51	1.37	4	LC
EM37XY	38.6	-0.73	1.26		38.6	-1.10	0.19 L	4	LD
EWTR6H	43.3	0.96	0.88		43.4	1.69	0.35	4	TL
FCZA93	38.5	-0.78	1.10		40.3	-0.13	1.77	4	MK
JEV6J2	40.6	0.00	0.97		39.8	-0.38	1.00	3	TD
JHW2D3	41.0	0.15	1.41		42.7	1.30	1.62	4	EM
LDTATU	35.4	-1.91	1.57		38.4	-1.24	4.24	2	IM
M2YAGH	41.2	0.21	0.83		39.6	-0.50	1.15	4	LC
NA4KLM	38.9	-0.62	1.58		39.4	-0.63	0.61	4	EM
PBUZFV	48.9	3.02 X	0.82		46.4	3.48 X	4.11 H	4	LD
QF7DTM	39.3	-0.48	1.64		39.2	-0.77	1.43	4	LD
QUKHYU	38.1	-0.92	1.60		40.2	-0.17	1.50	4	TD
RH9TH6	40.3	-0.11	1.77		39.8	-0.43	0.49	4	EM
RLPZXR	41.3	0.25	0.84		40.1	-0.24	0.93	4	TJ
T38GKK	39.3	-0.48	1.42		38.7	-1.07	1.34	4	LD
T86ZLJ	38.4	-0.82	1.70		39.5	-0.56	1.89	4	LD
TB3EBT	41.1	0.19	1.75		40.6	0.06	0.87	4	LD
UHHE7W	46.4	2.10 *	1.64		41.5	0.58	3.71 H	4	CT
UR82HM	41.2	0.20	2.10		42.0	0.89	1.23	4	EM
VLY46Z	42.0	0.51	0.94		41.7	0.74	0.98	4	XX
VTWTL4	36.2	-1.60	0.77		36.2	-2.49 *	0.55	4	WK
VXQVNH	37.3	-1.20	2.44		38.1	-1.37	0.73	4	EN
W4PUFJ	38.9	-0.62	1.10		38.2	-1.36	1.14	4	TB
WA39PJ	38.9	-0.64	1.71		39.2	-0.72	0.61	4	LD

Containerboard Interlaboratory Testing Program
Analysis 203
Edgewise Compressive Strength by T839, Corrugated Board - EC10
TAPPI Official Test Method T839

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	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
X8P3KU	38.9	-0.64	1.35		38.8	-0.99	1.76	3	EM
X92468	35.6	-1.82	0.84		41.5	0.59	4.54 H	4	TK
XENR2Y	45.2	1.67	2.49		41.8	0.79	3.66 H	3	EM
Y2VPXW	41.1	0.17	1.18		41.3	0.49	1.03	4	LC
ZVPBRL	42.7	0.75	1.29		41.2	0.42	1.86	4	TD

Consensus (All Labs) Results

Month Mean	40.61		Grand Mean	40.48
Avg SD	1.57		Avg SD Months	1.82
SD btwn Labs	2.74		SD btwn Labs	1.71
Labs Incld	42		Labs Incld	41

Key to Instrument Codes Reported by Participants

CT	Con-Ten	EM	Emerson 1200 Series
EN	Emerson 2200	IM	Instron 5500 Series
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LY	L&W 830	MK	Mark-10 ESM303
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	TX	TMI (model not specified)
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

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
2BWRCT	114.5	107.5	114.3	110.8	111.8	0.57	11.0	3.3	111.8	0.57	11.0	3.3	4	AA
2VJLY9	104.9	109.1	107.2	113.9	108.8	-0.34	12.1	3.8	108.8	-0.34	12.1	3.8	4	LZ
3DEDJ7	112.6	114.3	116.0	119.6 *	115.6	1.75	11.2	3.0	115.6	1.75	11.2	3.0	4	LA
3FNLLY	114.1	114.1	111.8	111.3	112.8	0.90	11.9	1.5	112.8	0.90	11.9	1.5	4	LA
3LB9JP	107.1	105.6	108.3	117.1	109.5	-0.11	12.3	5.2	109.5	-0.11	12.3	5.2	4	AA
49H7FN	108.9	107.1	107.4	102.1	106.4	-1.07	10.0	3.0	106.4	-1.07	10.0	3.0	4	AH
6Y88H7	104.9	114.3	104.3	104.9	107.1	-0.85	13.1	4.8	107.1	-0.85	13.1	4.8	4	LC
742M87	112.6	107.4	111.5	106.9	109.6	-0.08	11.4	2.9	109.6	-0.08	11.4	2.9	4	TB
7HK73U	114.4 L	103.5	113.1	109.3 L	110.1	0.06	5.8	4.9	110.1	0.06	5.8	4.9	4	LA
88G7B9	115.0	118.2 *	111.5	108.7	113.3	1.05	11.4	4.1	113.3	1.05	11.4	4.1	4	AX
8AK2UB	104.5	109.2	102.4	109.2	106.3	-1.09	9.1	3.4	106.3	-1.09	9.1	3.4	4	LC
8DKGW8	104.9	105.0	110.8	106.9	106.9	-0.92	9.7	2.8	106.9	-0.92	9.7	2.8	4	LC
8LCWLB	104.1	106.5	110.9	109.9	107.9	-0.62	12.0	3.1	107.9	-0.62	12.0	3.1	4	LC
8RYKH3	114.4	109.1	108.1	109.1	110.2	0.08	11.6	2.9	110.2	0.08	11.6	2.9	4	LA
8WV7DB	102.7	94.3 X	99.0 *	99.8 *	99.0	-3.33 X	7.7	3.5	99.0	-3.33 X	7.7	3.5	4	TP
94D2PY	114.5 H	108.5	111.2	107.6	110.5	0.17	14.2	3.1	110.5	0.17	14.2	3.1	4	LZ
9HQCF8	119.2 *	115.1	NO DATA	109.5	114.6	1.44	11.9	4.9	114.6	1.44	11.9	4.9	3	LA
BYRP99	114.7	114.5	114.9	112.1	114.0	1.27	10.9	1.3	114.0	1.27	10.9	1.3	4	LZ
CBZWHE	110.6 L	115.1 L	111.8 L	111.4 L	112.2	0.71	3.7	2.0	112.2	0.71	3.7	2.0	4	XX
CEXH8V	114.0	107.5	115.0	111.0	111.9	0.61	11.5	3.4	111.9	0.61	11.5	3.4	4	AH
DCREUY	115.7	123.4 X	115.6	114.5	117.3	2.26 *	12.8	4.1	117.3	2.26 *	12.8	4.1	4	AH
EM37XY	107.8	114.8	109.2	110.2	110.5	0.19	12.3	3.0	110.5	0.19	12.3	3.0	4	AH
FNW8K3	106.3	111.8	114.9	112.3	111.3	0.44	8.2	3.6	111.3	0.44	8.2	3.6	4	TB
FNYWPZ	116.3	111.0	115.5	107.0	112.4	0.78	11.3	4.3	112.4	0.78	11.3	4.3	4	LZ
GHP8GQ	108.5 L	109.8	99.8 *	105.7	106.0	-1.20	6.4	4.4	106.0	-1.20	6.4	4.4	4	LJ
HGA4MY	108.6	105.8 L	104.2	104.4	105.8	-1.26	6.4	2.0	105.8	-1.26	6.4	2.0	4	RE
HNLLEW	106.8	105.6	109.0	104.9	106.6	-1.01	11.3	1.8	106.6	-1.01	11.3	1.8	4	LA
JHVAFU	103.8	107.0	101.7	109.8	105.6	-1.32	10.6	3.6	105.6	-1.32	10.6	3.6	4	LC
JHW2D3	104.4	112.0	105.6	104.7	106.7	-0.98	11.1	3.6	106.7	-0.98	11.1	3.6	4	LA
JR2BEZ	107.9	107.8	110.1	110.0	109.0	-0.29	11.8	1.3	109.0	-0.29	11.8	1.3	4	LA
KAZQEQ	104.3	105.9	106.2	106.5	105.7	-1.27	9.9	1.0	105.7	-1.27	9.9	1.0	4	LC
KZBTWX	110.1	112.3	106.0	107.6	109.0	-0.27	11.1	2.8	109.0	-0.27	11.1	2.8	4	LB
L3UC9F	102.4	110.7	113.5	108.8	108.8	-0.32	10.8	4.7	108.8	-0.32	10.8	4.7	4	LC
Q2QAAD	105.6	108.1	110.7	109.2	108.4	-0.45	11.4	2.1	108.4	-0.45	11.4	2.1	4	LC
QAJM8R	107.7	107.6	109.3	107.0	107.9	-0.61	12.4	1.0	107.9	-0.61	12.4	1.0	4	LA

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

Report #578 (M)
November 2017

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
QAK96T	111.8	111.3	112.7	110.0	111.4	0.47	10.5	1.1	111.4	0.47	10.5	1.1	4	LC
QM9HMR	98.6 *	95.4 X	96.9 *	100.6 *	97.9	-3.66 X	8.2	2.2	97.9	-3.66 X	8.2	2.2	4	AH
QND8NF	108.6	108.4	108.3	108.7	108.5	-0.42	9.1	0.2 L	108.5	-0.42	9.1	0.2 L	4	LJ
R3D92G	111.1	106.2	113.1	117.0	111.8	0.59	11.3	4.5	111.8	0.59	11.3	4.5	4	LC
T38GKK	104.6	106.5	102.8	104.7	104.7	-1.60	11.5	1.5	104.7	-1.60	11.5	1.5	4	LA
T86ZLJ	101.0	111.7	107.1	103.2	105.7	-1.27	9.3	4.7	105.7	-1.27	9.3	4.7	4	LC
TB3EBT	114.5	112.7	112.0	113.6	113.2	1.01	9.7	1.1	113.2	1.01	9.7	1.1	4	LA
TZ4L33	101.2	110.2	108.5	111.3	107.8	-0.64	8.2	4.6	107.8	-0.64	8.2	4.6	4	AH
U8LDPL	106.0	105.6	109.5	114.6	108.9	-0.30	14.4	4.2	108.9	-0.30	14.4	4.2	4	TB
UHHE7W	121.3 *	114.7	105.4	116.9	114.6	1.43	11.8	6.7	114.6	1.43	11.8	6.7	4	XX
V6LWLN	106.3	103.6	105.7	110.5	106.5	-1.02	10.1	2.9	106.5	-1.02	10.1	2.9	4	XX
WA39PJ	104.4	104.9 L	105.9	106.0	105.3	-1.39	6.6	0.8	105.3	-1.39	6.6	0.8	4	LA
WPVAYW	108.1	105.9	105.3	110.2	107.4	-0.77	11.8	2.2	107.4	-0.77	11.8	2.2	4	LC
XP777L	117.4	110.7	109.4	113.6	112.8	0.88	9.2	3.5	112.8	0.88	9.2	3.5	4	LC
Y7R8GH	113.0	113.0	112.7	105.9	111.2	0.39	14.3	3.5	111.2	0.39	14.3	3.5	4	LA
Z3PZ6J	109.4	109.7	109.2	109.5	109.5	-0.13	8.7	0.2 L	109.5	-0.13	8.7	0.2 L	4	LA
Z8DMVH	113.0	122.3 X	111.1	126.0 X	118.1	2.51 *	11.5	7.2 H	118.1	2.51 *	11.5	7.2 H	4	LA
ZRLHV2	111.6	112.6	109.6	114.7	112.1	0.68	13.0	2.1	112.1	0.68	13.0	2.1	4	LA
ZZK8C7	114.6	114.1	115.7	113.0	114.4	1.36	7.6	1.1	114.4	1.36	7.6	1.1	4	LA

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4						
Wk Mean	109.36	109.66	109.08	109.39	Month Mean	109.89		Grand Mean	109.89	
Avg SDr	11.21	10.63	10.43	10.76	Avg SD	10.83		Avg SD	10.83	
SD btwn Labs	5.08	3.59	4.49	4.19	SD btwn Labs	3.28		SD btwn Labs	3.28	
Labs Incld	54	50	53	53	SD btwn Wks	3.42		SD btwn Wks	3.42	
Labs Excld	0	4	0	1	Labs Incld	52		Labs Incld	52	
Labs not Rcvd	0	0	1	0						

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 206
Bursting Strength (Mullen), 56 lb Linerboard - 56A1
TAPPI Official Test Method T807

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
2BWRCT	118.0	117.5	111.5	114.8	115.4	0.39	10.1	3.0	114.0	0.03	10.5	3.9	12	AA
2VJLY9	115.2	110.7	115.4	113.8	113.8	-0.10	9.6	2.2	114.3	0.12	12.2	3.5	12	LZ
3DEDJ7	129.4 XH	117.9	119.0	116.6	120.7	1.90	16.5	5.9	117.0	1.02	13.4	5.9	12	LA
3FNLLY	120.7	113.7	115.1	119.5	117.3	0.91	11.6	3.4	115.4	0.50	10.9	5.1	12	LA
3LB9JP	116.8	118.9	116.9	118.5	117.8	1.06	9.5	1.1	115.6	0.55	8.9	3.5	12	AA
49H7FN	107.2	107.1	117.4	107.7	109.9	-1.23	9.3	5.0	109.4	-1.49	8.6	4.1	12	AH
6Y88H7	116.1	113.4	112.4	112.1	113.5	-0.17	10.4	1.8	111.5	-0.80	10.1	2.6	9	LC
742M87	113.1	112.0	117.5	115.1	114.4	0.10	9.6	2.4	111.6	-0.76	10.2	3.7	12	TB
7HK73U	113.6 L	114.0	113.6	113.8 L	113.8	-0.10	5.1	0.2 L	113.9	-0.01	4.4	0.9 L	8	LA
88G7B9	117.5	118.1	115.4	116.8	116.9	0.82	10.7	1.2	116.5	0.87	11.3	3.2	12	AX
8AK2UB	106.5	110.5	110.4	111.0	109.6	-1.30	10.9	2.1	113.1	-0.26	9.9	4.2	12	LC
8DKGW8	121.0	108.5	121.8 *	111.2	115.6	0.43	11.1	6.8	115.0	0.36	9.1	3.8	12	LC
8LCWLB	114.3	109.2	109.4	107.4	110.1	-1.16	9.8	3.0	112.5	-0.45	10.6	3.5	12	LC
8RYKH3	116.9	115.6	112.7	117.1	115.6	0.42	8.3	2.0	113.5	-0.12	10.9	6.7	12	LA
8WV7DB	112.5	111.2	110.4	111.9	111.5	-0.75	7.0	0.9	112.3	-0.52	6.7	0.9 L	12	TP
94D2PY	109.9	113.5	112.4	106.0	110.4	-1.06	8.6	3.3	108.6	-1.76	10.3	3.6	11	LZ
9HQCF8	112.8	118.2	No Data	125.3 *	118.8	1.35	8.3	6.3	119.9	1.98	*11.0	3.6	11	LA
BYRP99	113.5	119.7	112.6	116.3	115.5	0.42	13.7	3.2	116.3	0.79	12.4	4.9	11	LZ
CBZWHE	125.9 *	123.6 *L	126.7 X	124.9 *	125.3	3.23 X	5.0	1.3	124.6	3.53 X	5.4	3.1	12	XX
CEXH8V	111.5	120.0	118.0	113.5	115.8	0.48	9.2	3.9	119.8	1.95	* 9.3	4.6	11	AH
DCREUY	123.0	121.9	121.8 *	119.7	121.6	2.16	* 11.1	1.4	117.8	1.29	10.5	3.7	11	AH
EM37XY	108.7	121.1	118.3	114.4	115.6	0.44	12.2	5.4	114.1	0.08	9.9	4.2	12	AH
FNW8K3	125.8 *	116.1	117.4	120.8	120.0	1.70	10.0	4.3	120.6	2.22	*11.0	4.0	12	TB
FNYWPZ	120.2	122.6	113.7	114.6	117.8	1.06	11.2	4.3	118.0	1.35	12.0	3.9	12	LZ
GHP8GQ	116.7	112.7	111.7	110.5	112.9	-0.35	7.7	2.7	112.1	-0.61	11.4	3.8	12	LJ
HGA4MY	110.6 L	109.6 L	108.8 L	110.0 L	109.8	-1.26	3.9	0.8	113.7	-0.06	6.6	3.8	12	RE
HNLLEW	108.2	103.3 *	112.9	114.4	109.7	-1.27	10.8	5.0	114.8	0.29	8.4	5.0	12	LA
JHVAFU	114.0	105.8	118.4 L	115.0	113.3	-0.23	9.3	5.3	111.9	-0.66	9.6	3.7	12	LC
JHW2D3	110.0	117.4	111.7	106.9	111.5	-0.76	12.4	4.4	108.1	-1.91	11.2	6.0	12	LA
JR2BEZ	115.6	111.8	112.5	110.2	112.5	-0.46	9.0	2.3	113.5	-0.12	9.4	2.7	12	LA
KAZQEQ	111.1	109.8	112.4	108.6	110.5	-1.05	11.2	1.6	110.7	-1.06	10.5	1.4	12	LA
KZBTWX	113.2	118.3	116.9	119.9	117.1	0.86	10.1	2.8	118.3	1.46	8.2	2.2	12	LB
L3UC9F	118.8	114.1	114.1	124.9 *	118.0	1.11	12.5	5.1	116.6	0.88	12.2	4.7	12	XX
Q2QAAD	107.8	120.1	114.8	109.8	113.1	-0.28	10.6	5.5	111.8	-0.70	11.9	5.1	11	LC
QAJM8R	112.0	102.9 *	111.0	103.7 *	107.4	-1.94	* 12.7	4.8	109.9	-1.32	11.1	4.1	12	LA

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

Report #578 (M)
November 2017

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
QAK96T	116.5	120.8	123.5 *	116.4	119.3	1.50	10.4	3.5	118.3	1.46	11.5	2.8	12	LC
QM9HMR	114.0	111.2	110.6	113.1	112.2	-0.54	5.6	1.6	112.9	-0.34	5.7	1.1	12	AH
QND8NF	112.7	112.6	112.1	112.3	112.4	-0.49	9.0	0.3 L	113.3	-0.19	9.3	0.8 L	12	LJ
T38GKK	112.0	114.7	108.6	104.8	110.0	-1.18	10.4	4.3	110.2	-1.22	10.7	2.5	12	LA
T86ZLJ	113.0	106.7 H	111.4	112.3	110.8	-0.94	13.9	2.8	110.4	-1.16	12.6	3.8	12	LC
TB3EBT	115.3	116.7	116.3	115.8	116.0	0.55	10.4	0.6	117.1	1.04	9.5	1.1	12	LA
TZ4L33	112.7	113.2	111.1	111.1	112.0	-0.60	8.2	1.1	111.5	-0.80	9.0	1.6	8	AH
U8LDPL	118.1	117.9	119.0	109.7	116.2	0.60	11.3	4.3	115.1	0.39	12.1	3.4	11	TB
UHHE7W	119.2	119.6	117.0	114.3	117.5	0.99	11.3	2.4	114.3	0.13	12.2	5.0	12	XX
V6LWLN	107.7	109.7	111.1	112.8	110.3	-1.09	11.5	2.2	111.8	-0.68	10.2	4.0	12	XX
WA39PJ	109.8	110.6	112.8	115.5	112.2	-0.55	8.4	2.6	110.6	-1.08	8.6	2.8	12	LA
WPVAYW	114.2	109.4	118.3	114.6	114.1	0.01	11.5	3.7	113.2	-0.24	11.1	3.2	12	LC
XP777L	118.3	114.1	108.5	108.9	112.4	-0.48	11.3	4.7	113.1	-0.26	11.9	5.1	12	LC
Y7R8GH	107.9	107.8	114.2	110.9	110.2	-1.13	10.6	3.0	108.5	-1.79	11.3	3.7	12	LA
Z3PZ6J	113.7 L	114.1	113.2	112.0 H	113.3	-0.24	11.0	0.9	114.0	0.05	11.2	1.1	12	LA
Z8DMVH	109.4	116.4	107.6	114.0	111.9	-0.65	12.2	4.0	113.4	-0.15	11.9	3.7	12	LA
ZRLHV2	115.1	113.3	110.7	114.9	113.5	-0.17	9.1	2.0	115.2	0.44	10.5	3.7	12	LA
ZZK8C7	124.8 *	115.8 L	123.2 *	124.2 *	122.0	2.28 *	6.4	4.2	117.8	1.28	8.6	5.2	12	LA

Consensus (All Labs) Results

Wk Mean	114.48	114.06	114.27	113.85	Month Mean	114.10		Grand Mean	113.90
Avg SDr	10.91	9.97	10.06	9.76	Avg SD	10.36		Avg SD	10.39
SD btwn Labs	4.74	4.91	3.88	4.91	SD btwn Labs	3.46		SD btwn Labs	3.02
Labs Incld	52	53	51	53	SD btwn Wks	3.51		SD btwn Wks	3.81
Labs Excld	1	0	1	0	Labs Incld	52		Labs Incld	52
Labs not Rcvd	0	0	1	0					

Key to Instrument Codes Reported by Participants

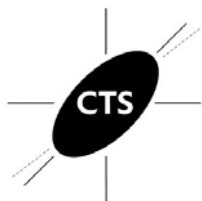|			
AA	Perkins Model A	AH	Perkins Model AH
AX	Perkins Mullen Tester (model not specified)	LA	L&W Bursting Strength Tester
LB	L&W Burst-O-Matic	LC	L&W Autoline
LJ	L&W Bursting Strength Tester J-Type	LZ	L&W (model not specified)
RE	Regmed/Mullen Tester	TB	TMI Monitor/Burst 1000
TP	Technidyne PROFILE/Plus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

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

Report #578 (M)
November 2017

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
	Weekly Means				Monthly Results				Cumulative Results					
29Q8NT	91.7 L	91.1 L	94.6 L	95.9 L	93.3	0.93	1.0	2.3	93.3	0.93	1.0	2.3	4	TD
3BE6FW	89.8	92.2	90.5	93.0	91.4	0.52	4.4	1.5	91.4	0.52	4.4	1.5	4	EM
3DEDJ7	98.0	100.3 *	102.3 *	100.2 *	100.2	2.41 *	3.7	1.8	100.2	2.41 *	3.7	1.8	4	LD
3FNLLY	84.8	88.4 H	84.5 H	85.1 H	85.7	-0.70	6.8	1.8	85.7	-0.70	6.8	1.8	4	LC
3LB9JP	88.0	87.8	86.5	87.2	87.4	-0.34	3.5	0.7 L	87.4	-0.34	3.5	0.7 L	4	LD
49H7FN	91.6	90.8	92.2	89.6	91.0	0.44	4.7	1.1	91.0	0.44	4.7	1.1	4	LC
6Y88H7	89.3	90.8	88.9	91.5	90.1	0.25	5.0	1.2	90.1	0.25	5.0	1.2	4	LC
742M87	93.0	91.2	91.1	93.6	92.2	0.70	4.2	1.3	92.2	0.70	4.2	1.3	4	LC
7HK73U	90.6 L	90.9	90.0	91.3	90.7	0.38	3.8	0.6 L	90.7	0.38	3.8	0.6 L	4	LZ
88G7B9	74.4 *	77.7 *	75.0 *	71.0 X	74.5	-3.11 X	4.3	2.7	74.5	-3.11 X	4.3	2.7	4	LC
8AK2UB	87.4 L	87.7	88.8	87.6	87.9	-0.24	2.9	0.6 L	87.9	-0.24	2.9	0.6 L	4	LC
8DKGW8	88.8	88.0	87.9	89.2	88.5	-0.11	4.2	0.6 L	88.5	-0.11	4.2	0.6 L	4	LD
8LCWLB	89.6	90.2	89.3	89.2	89.6	0.13	4.3	0.4 L	89.6	0.13	4.3	0.4 L	4	LD
8RYKH3	68.0 XH	97.2	98.2	70.2 XH	83.4	-1.19	8.3	16.5 H	83.4	-1.19	8.3	16.5 H	4	LC
8WV7DB	92.2	92.6	89.9	88.7	90.9	0.40	5.0	1.8	90.9	0.40	5.0	1.8	4	TH
94D2PY	85.2	87.2	87.5	83.0	85.7	-0.70	4.3	2.1	85.7	-0.70	4.3	2.1	4	LD
9HQCF8	92.8	93.2	No Data	93.4	93.1	0.89	4.6	0.3 L	93.1	0.89	4.6	0.3 L	3	LZ
AP9X3J	91.7 L	91.3	90.7	91.7	91.4	0.51	3.1	0.5 L	91.4	0.51	3.1	0.5 L	4	TH
BYRP99	88.0	87.7	90.0	83.6	87.3	-0.35	4.0	2.7	87.3	-0.35	4.0	2.7	4	LG
C4JHDM	84.8	80.8	87.6	86.0	84.8	-0.90	5.3	2.9	84.8	-0.90	5.3	2.9	4	LC
CBZWHE	85.8	75.3 *	93.1	83.3	84.4	-0.99	4.7	7.3	84.4	-0.99	4.7	7.3	4	LD
CUGZ47	90.3	91.7	91.7 L	90.2 L	91.0	0.44	2.3	0.8	91.0	0.44	2.3	0.8	4	LD
D8U3T8	78.9	79.6	84.2	82.0	81.2	-1.68	3.7	2.4	81.2	-1.68	3.7	2.4	4	EM
EM37XY	82.4	83.9	80.8	82.1	82.3	-1.43	2.9	1.3	82.3	-1.43	2.9	1.3	4	LD
FGFV82	93.7	92.9	95.3	94.7	94.2	1.11	5.6	1.1	94.2	1.11	5.6	1.1	4	MB
FNW8K3	97.3	98.9	97.8	100.3 *	98.6	2.06 *	5.2	1.3	98.6	2.06 *	5.2	1.3	4	LX
FNYWPZ	88.2	88.8	86.6	87.0	87.6	-0.29	4.6	1.0	87.6	-0.29	4.6	1.0	4	LC
GHP8GQ	89.3	92.2	88.3	90.2	90.0	0.22	4.4	1.6	90.0	0.22	4.4	1.6	4	LD
GY87LN	68.3 X	69.9 XH	67.8 X	69.7 X	68.9	-4.31 X	5.0	1.1	68.9	-4.31 X	5.0	1.1	4	LD
HGA4MY	93.8	91.0	91.1	89.6	91.4	0.52	4.3	1.7	91.4	0.52	4.3	1.7	4	LZ
HNLLEW	88.7	87.9	86.6	88.5	87.9	-0.23	3.7	1.0	87.9	-0.23	3.7	1.0	4	LD
JHVAFU	93.0	91.9	93.1	91.4	92.4	0.73	4.6	0.8	92.4	0.73	4.6	0.8	4	LC
JHW2D3	88.9	84.1	84.4	86.1	85.9	-0.67	4.0	2.2	85.9	-0.67	4.0	2.2	4	EM
JM8ETF	79.4	88.6	90.2	97.5	88.9	-0.01	5.3	7.4	88.9	-0.01	5.3	7.4	4	MB
JR2BEZ	93.0	91.2	91.7	90.5	91.6	0.56	3.4	1.1	91.6	0.56	3.4	1.1	4	LD

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

Report #578 (M)
November 2017

WebCode	Weekly Means Week 1	Week 2	Week 3	Week 4	Monthly Results Mean	CPV	SD	SD Wks	Cumulative Results Mean	CPV	SD	SD Wks	Wks	Inst
KAZQEQ	85.2	88.6	87.0	88.8	87.4	-0.34	4.0	1.7	87.4	-0.34	4.0	1.7	4	LD
KZBTWX	83.5	87.0	81.1	81.9	83.4	-1.21	4.7	2.6	83.4	-1.21	4.7	2.6	4	LC
LFL26Z	90.4	93.9	91.2	90.4	91.5	0.53	3.7	1.7	91.5	0.53	3.7	1.7	4	TH
MN7X2X	94.9	93.3	96.7 L	94.3	94.8	1.25	3.6	1.4	94.8	1.25	3.6	1.4	4	LD
NA4KLM	87.8	87.2	88.7	87.7	87.9	-0.24	4.1	0.6 L	87.9	-0.24	4.1	0.6 L	4	EM
QAJM8R	75.2 *H	82.1	88.8	91.6 H	84.4	-0.98	6.6	7.3	84.4	-0.98	6.6	7.3	4	LZ
QND8NF	87.7	87.8	87.3 H	87.1 H	87.5	-0.32	5.7	0.3 L	87.5	-0.32	5.7	0.3 L	4	LD
RH9TH6	80.3	82.7	82.8	86.6	83.1	-1.26	4.0	2.6	83.1	-1.26	4.0	2.6	4	EM
RLPZXR	97.5	91.4	92.4 L	93.8	93.8	1.03	2.5	2.7	93.8	1.03	2.5	2.7	4	TJ
T86ZLJ	82.8	84.9	85.3	84.6	84.4	-0.98	3.5	1.1	84.4	-0.98	3.5	1.1	4	LD
TB3EBT	90.9	91.1	91.5	91.5	91.3	0.49	3.1	0.3 L	91.3	0.49	3.1	0.3 L	4	LD
TJKPPU	88.8	90.6	NO DATA	86.8	88.7	-0.05	4.8	1.9	88.7	-0.05	4.8	1.9	3	XX
TZ4L33	97.5	101.8 *	100.1 *	94.2	98.4	2.02 *	4.1	3.3	98.4	2.02 *	4.1	3.3	4	LZ
U8LDPL	78.2	80.5	80.0	79.1 *	79.4	-2.05 *	4.1	1.0	79.4	-2.05 *	4.1	1.0	4	LZ
UGA82H	90.7	90.5	90.9	90.8	90.7	0.38	3.7	0.2 L	90.7	0.38	3.7	0.2 L	4	LD
UR82HM	89.3 L	91.9	91.5	90.5	90.8	0.40	3.5	1.1	90.8	0.40	3.5	1.1	4	EM
VXQVNH	78.7	83.3	82.7	83.1	82.0	-1.51	4.1	2.2	82.0	-1.51	4.1	2.2	4	EN
WA39PJ	89.2	86.7	90.3	88.2	88.6	-0.08	3.5	1.5	88.6	-0.08	3.5	1.5	4	LD
X92468	80.2	82.0	77.1 *	113.5 X	88.2	-0.17	4.3	17.0 H	88.2	-0.17	4.3	17.0 H	4	MB
XP777L	87.0	92.5	88.1	94.6	90.5	0.33	3.9	3.6	90.5	0.33	3.9	3.6	4	LD
Y2VPXW	82.9	81.3	85.0	84.5	83.4	-1.19	4.1	1.7	83.4	-1.19	4.1	1.7	4	LC
Y7R8GH	99.7 *	97.2	102.9 *	98.9 *	99.7	2.30 *	4.1	2.4	99.7	2.30 *	4.1	2.4	4	LC
ZZK8C7	81.8	79.8	81.4	80.9	81.0	-1.72	2.5	0.9	81.0	-1.72	2.5	0.9	4	TU

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4		Month		Grand	
Wk Mean	88.12	88.83	89.15	89.31	Month Mean	88.98		Grand Mean	88.98
Avg SDr	4.37	3.95	4.29	4.23	Avg SD	4.32		Avg SD	4.32
SD btwn Labs	5.74	5.45	5.62	4.87	SD btwn Labs	4.65		SD btwn Labs	4.65
Labs Incld	56	57	55	54	SD btwn Wks	3.94		SD btwn Wks	3.94
Labs Excld	2	1	1	4	Labs Incld	56		Labs Incld	56
Labs not Rcvd	0	0	2	0					

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

Report #578 (M)
November 2017

Key to Instrument Codes Reported by Participants

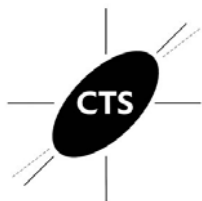|			
EM	Emerson 1200	**EN**	Emerson 2200
LC	L&W Crush Tester 48	**LD**	L&W Crush Tester 248
LG	L&W 753	**LX**	L&W 506
LZ	L&W Crush Tester (model not specified)	**MB**	Messmer Buchel K440
TD	TMI Digital Crush Tester, Model 17-09	**TH**	TMI Compression Tester, Model 17-76
TJ	TLS Compression Tester, Model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

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

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
29Q8NT	139.8 L	141.5 L	141.0 L	142.2 L	141.2	0.36	1.6	1.0	141.1	0.54	2.3	1.1 L	12	TD
3BE6FW	141.7	142.3	145.1	145.0	143.5	0.71	4.3	1.8	145.8	1.34	4.8	2.9	12	EM
3DEDJ7	154.1 *	152.7	153.5	155.8 *	154.0	2.27 *	6.3	1.3	152.7	2.52 *	5.6	2.1	12	LD
3FNLLY	132.9 H	134.3 H	146.9	134.3 H	137.1	-0.24	10.1	6.6	141.6	0.64	8.3	5.9	12	LC
3LB9JP	137.8	139.4	131.6	142.8	137.9	-0.12	4.4	4.7	135.4	-0.42	3.9	4.0	12	LD
49H7FN	145.7	143.7	144.8	143.6	144.4	0.85	4.6	1.0	143.7	0.99	4.1	2.2	12	LC
6Y88H7	135.4	140.0	141.3	140.6	139.3	0.09	4.7	2.7	140.0	0.37	4.4	2.9	9	LC
742M87	146.9	140.0	143.0	142.0	143.0	0.63	5.3	2.9	144.1	1.06	5.1	3.2	12	LC
7HK73U	139.1 H	141.2 L	137.9	138.0 L	139.1	0.05	5.7	1.5	140.8	0.50	4.5	2.5	8	LZ
88G7B9	124.7	129.5	116.0 XH	113.9 XH	121.0	-2.63 *	8.5	7.3	125.7	-2.06 *	8.3	6.4	12	LC
8AK2UB	140.2	138.2	136.9	133.0	137.1	-0.24	3.6	3.0	134.2	-0.62	4.4	3.8	12	LC
8DKGW8	140.3	136.8	137.4	137.4	138.0	-0.11	5.5	1.6	135.6	-0.38	4.6	2.7	12	LD
8LCWLB	141.7	142.0	140.9	138.8	140.8	0.31	3.2	1.4	142.0	0.71	4.0	1.5 L	12	LD
8RYKH3	99.7 XH	154.4	154.2	104.8 XH	128.3	-1.55	11.5	30.1 H	139.0	0.19	8.2	22.0 H	12	LC
8WV7DB	138.7	143.0	142.0 H	136.0	139.9	0.18	5.7	3.2	138.1	0.04	4.9	2.4	12	TH
94D2PY	136.5	138.8	137.5	133.6	136.6	-0.32	6.0	2.2	134.8	-0.51	5.1	3.2	12	LD
9HQCF8	141.3	144.2	NO DATA	145.9	143.8	0.75	4.9	2.3	141.7	0.65	4.8	4.9	11	LZ
AP9X3J	142.5	144.1	143.0	141.8 L	142.9	0.61	3.2	0.9 L	140.7	0.49	4.2	2.7	12	TH
BYRP99	136.5	140.4	140.3	127.1	136.1	-0.39	3.6	6.2	136.1	-0.30	3.7	3.9	11	LY
C4JHDM	136.0	127.0	127.3 H	138.1	132.1	-0.98	6.7	5.8	126.6	-1.91	6.0	6.3	12	LC
CBZWHE	137.9	126.3	148.4	126.3 *	134.7	-0.59	5.2	10.6	138.1	0.03	5.1	6.8	12	LD
CUGZ47	139.4	140.3	141.6 L	141.4	140.7	0.29	2.6	1.0	142.5	0.79	3.6	2.2	12	LD
D8U3T8	121.7 *	124.1 *	125.5	121.5 *	123.2	-2.30 *	4.0	1.9	125.0	-2.18 *	4.2	2.8	8	EM
EM37XY	134.0	132.7	131.9	133.7 L	133.1	-0.84	3.5	1.0	135.9	-0.33	4.0	3.0	12	LD
FGFV82	150.0	147.9 H	151.4	148.5 H	149.4	1.59	8.0	1.6	147.5	1.63	8.7	3.4	12	MB
FNW8K3	158.5 *	156.5 *	159.0 *	162.1 X	159.0	3.01 X	6.4	2.3	157.2	3.28 X	5.7	2.9	12	LY
FNYWPZ	135.7	134.7	135.1	137.3	135.7	-0.45	4.8	1.1	131.3	-1.11	4.5	4.9	12	LC
GHP8GQ	144.9	143.1	150.1	144.9	145.8	1.04	3.1	3.0	141.9	0.68	4.4	3.9	12	LD
GY87LN	113.9 X	113.3 X	112.1 X	112.9 X	113.0	-3.81 X	4.6	0.7 L	109.2	-4.86 X	5.5	4.3	8	LD
HGA4MY	141.6	141.9	140.2	140.5	141.0	0.34	3.8	0.8 L	136.5	-0.23	4.3	4.1	12	LZ
HNLLEW	141.5	140.6	137.4	140.2	139.9	0.18	4.0	1.8	136.0	-0.31	4.3	3.6	12	LD
JHVAFU	142.1	140.6	142.4	143.1	142.1	0.50	4.6	1.1	139.6	0.30	9.3	3.4	12	LC
JHW2D3	136.0	131.5	130.7	132.2	132.6	-0.91	4.6	2.4	138.2	0.06	4.5	5.2	12	EM
JM8ETF	125.4 H	144.5	135.7	142.6	137.1	-0.25	8.1	8.6	136.9	-0.16	8.2	8.3	11	MB
JR2BEZ	140.1 L	137.9	140.3	139.1	139.4	0.09	3.4	1.1	138.7	0.14	4.0	1.2 L	12	LD

Weekly Means — Monthly Results — Cumulative Results

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

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
KAZQEQ	135.6	140.3	136.0	138.4	137.6	-0.17	3.1	2.2	135.6	-0.38	3.4	3.1	12	LD
KZBTWX	134.1	131.8	132.3	134.4	133.1	-0.83	6.0	1.3	136.4	-0.25	5.4	3.9	12	LC
LFL26Z	143.6	146.5	144.1	143.4	144.4	0.85	4.2	1.4	136.8	-0.17	4.5	6.7	12	TH
MN7X2X	148.3	143.1	148.0	143.7	145.8	1.05	4.5	2.7	145.5	1.29	4.2	2.3	12	LD
NA4KLM	142.0	141.3 L	140.9	140.1	141.1	0.35	2.5	0.8 L	139.9	0.35	2.7	2.0	12	EM
QAJM8R	111.6 XH	135.2	148.7	135.9 H	132.9	-0.87	11.1	15.4 H	135.3	-0.44	8.2	9.8	12	LZ
QND8NF	137.5	137.3	137.2	137.5	137.4	-0.20	4.7	0.2 L	137.6	-0.04	5.2	0.4 L	12	LD
RH9TH6	129.3	130.9	131.3	139.0	132.6	-0.91	4.4	4.3	135.7	-0.37	4.6	4.2	12	EM
RLPZXR	152.4	152.5	149.6	149.3	150.9	1.81	4.0	1.7	140.1	0.37	3.7	8.7	12	TJ
T86ZLJ	131.1	130.8	135.0	129.4	131.6	-1.06	4.0	2.4	134.3	-0.60	4.2	3.8	12	LD
TB3EBT	142.8	142.8	142.9	143.0	142.9	0.62	3.1	0.1 L	143.5	0.96	3.7	0.9 L	12	LD
TJKPPU	137.2	146.7	NO DATA	139.9	141.3	0.38	4.4	4.9	140.9	0.52	4.8	4.7	7	XX
TZ4L33	151.0	156.4 *	147.7	150.2	151.3	1.87	6.2	3.7	146.5	1.47	5.8	6.5	8	LZ
U8LDPL	129.4	129.4	128.6	128.8	129.0	-1.44	5.0	0.4 L	126.1	-2.00 *	4.3	3.7	11	LZ
UGA82H	134.2	141.4	138.9	144.7	139.8	0.16	5.1	4.4	141.0	0.53	4.8	3.8	12	LD
UR82HM	137.9	138.1 L	143.4	143.4	140.7	0.29	3.9	3.1	138.5	0.10	3.8	3.0	12	EM
VXQVNH	124.5	129.5 L	129.4	136.3	129.9	-1.30	3.2	4.8	129.2	-1.47	3.7	3.1	12	EN
WA39PJ	143.2	137.5	139.5	140.8	140.3	0.23	4.3	2.4	138.9	0.18	4.2	3.7	12	LD
X92468	123.9	121.7 *	123.0 *	35.4 X	101.0	-5.59 X	5.3	43.7 H	125.7	-2.06 *	4.2	29.2 H	12	MB
XP777L	135.5	147.5	136.3	146.7	141.5	0.41	4.3	6.5	139.1	0.22	4.1	5.1	12	LD
Y2VPXW	131.5	135.2	134.0	132.5	133.3	-0.81	3.5	1.6	132.8	-0.87	3.6	1.5 L	8	LC
Y7R8GH	152.0	151.6	152.8	154.3 *	152.7	2.07 *	5.8	1.2	146.1	1.40	5.5	8.9	12	LC
ZZK8C7	128.3	126.6	130.6	130.4 L	129.0	-1.44	2.8	1.9	126.5	-1.92	3.7	3.0	12	TU

Consensus (All Labs) Results

Wk Mean	138.65	139.47	140.07	139.43	Month Mean	138.72		Grand Mean	137.86	
Avg SDr	5.32	4.94	4.62	5.16	Avg SD	5.28		Avg SD	5.10	
SD btwn Labs	7.83	7.87	7.77	6.75	SD btwn Labs	6.74		SD btwn Labs	5.90	
Labs Incld	55	57	54	53	SD btwn Wks	5.73		SD btwn Wks	6.52	
Labs Excld	3	1	2	5	Labs Incld	55		Labs Incld	56	
Labs not Rcvd	0	0	2	0						

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

Report #578 (M)
November 2017

Key to Instrument Codes Reported by Participants

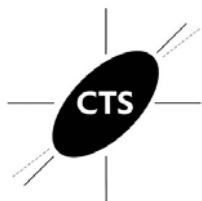|			
EM	Emerson 1200	EN	Emerson 2200
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LY	L&W Crush Tester 958	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	TD	TMI Digital Crush Tester, Model 17-09
TH	TMI Compression Tester, Model 17-76	TJ	TLS Compression Tester, Model CDM-5
TU	TMI Universal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

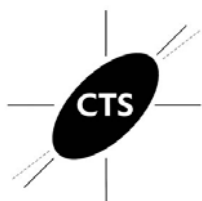Containerboard Interlaboratory Testing Program
Analysis 223
STFI, 42 lb Linerboard - 42D3
TAPPI Official Test Method T826

Report #578 (M)
November 2017

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
2VJLY9	23.8	24.9	24.6	23.5	24.2	1.61	1.8	0.7	24.2	1.61	1.8	0.7	4	LZ
3FNLLY	25.3 *	24.3	24.0	23.4	24.2	1.62	2.2	0.8	24.2	1.62	2.2	0.8	4	LU
3LB9JP	21.3	21.3	22.1	19.6 *H	21.1	-1.42	3.3	1.1	21.1	-1.42	3.3	1.1	4	LW
49H7FN	23.1	22.2	22.8	22.2	22.6	0.02	2.2	0.4	22.6	0.02	2.2	0.4	4	LU
67PHPF	25.8 *	26.1 *	24.0	22.8	24.7	2.06 *	2.1	1.5 H	24.7	2.06 *	2.1	1.5 H	4	LH
6Y88H7	20.3 L	20.6 L	20.2 *L	18.9 *L	20.0	-2.45 *	0.5	0.7	20.0	-2.45 *	0.5	0.7	4	LA
742M87	23.0	24.5	24.7 *	24.0	24.1	1.46	2.2	0.8	24.1	1.46	2.2	0.8	4	LW
88G7B9	23.8	23.6	23.6	23.0	23.5	0.93	1.7	0.3	23.5	0.93	1.7	0.3	4	XX
8AK2UB	24.7	24.5	23.7	23.8	24.2	1.57	1.8	0.5	24.2	1.57	1.8	0.5	4	LA
8LCWLB	23.0	22.9	23.1	22.6	22.9	0.31	1.5	0.2	22.9	0.31	1.5	0.2	4	LA
8WV7DB	22.5 L	21.7 L	22.2	21.4 L	22.0	-0.57	1.1	0.5	22.0	-0.57	1.1	0.5	4	TT
94D2PY	23.0	20.7	22.2	21.3	21.8	-0.70	1.5	1.0	21.8	-0.70	1.5	1.0	4	LY
9HQCF8	21.4	22.0	No Data	19.5 *	20.9	-1.54	1.6	1.3	20.9	-1.54	1.6	1.3	3	LW
BYRP99	20.8	21.7	21.5	20.5	21.1	-1.39	1.8	0.6	21.1	-1.39	1.8	0.6	4	LU
CUGZ47	21.6	20.9	20.9	21.2	21.2	-1.32	1.6	0.3	21.2	-1.32	1.6	0.3	4	LY
DAZH8Q	23.0	23.5	24.1	23.8	23.6	0.99	2.0	0.5	23.6	0.99	2.0	0.5	4	LU
DCREUY	22.8	21.5	20.9	21.9	21.8	-0.76	1.9	0.8	21.8	-0.76	1.9	0.8	4	LU
DLWG44	21.4 L	21.8 L	21.3 L	21.0 L	21.4	-1.12	0.0	0.3	21.4	-1.12	0.0	0.3	4	LW
EM37XY	21.9	21.7	20.8	21.3	21.4	-1.09	1.8	0.5	21.4	-1.09	1.8	0.5	4	LU
FGFV82	25.7 *L	26.2 *L	27.4 XL	23.7 L	25.7	3.08 X	0.5	1.5 H	25.7	3.08 X	0.5	1.5 H	4	BK
FNYWPZ	23.0	22.8	22.0	22.5	22.6	0.04	2.3	0.5	22.6	0.04	2.3	0.5	4	LW
GHP8GQ	23.1 L	24.0 L	22.9 L	23.1 L	23.3	0.72	0.0	0.5	23.3	0.72	0.0	0.5	4	LU
GNT2JY	24.0 H	24.1 H	23.6	22.8	23.6	1.04	2.5	0.6	23.6	1.04	2.5	0.6	4	LH
GY87LN	21.6	22.6	21.7	22.2	22.0	-0.49	2.1	0.5	22.0	-0.49	2.1	0.5	4	LY
HNLLEW	22.8	22.8	22.7	22.9	22.8	0.24	1.8	0.1 L	22.8	0.24	1.8	0.1 L	4	LA
JHVAFU	22.1	23.9	23.2	23.3	23.1	0.54	1.9	0.8	23.1	0.54	1.9	0.8	4	LA
JHW2D3	22.4	22.5 L	21.2	22.6 L	22.2	-0.36	1.3	0.7	22.2	-0.36	1.3	0.7	4	LZ
JM8ETF	22.6	22.7	22.3	22.6	22.5	-0.02	1.9	0.2	22.5	-0.02	1.9	0.2	4	LA
JR2BEZ	23.5	23.1	23.0	22.4	23.0	0.44	1.9	0.5	23.0	0.44	1.9	0.5	4	LY
KAZQEQ	21.3	23.0	22.6 L	21.7	22.1	-0.40	1.3	0.8	22.1	-0.40	1.3	0.8	4	LA
KZBTWX	23.2	23.0	22.9	23.8	23.2	0.64	1.9	0.4	23.2	0.64	1.9	0.4	4	XX
L3UC9F	23.8	24.9 H	23.7	22.6	23.7	1.15	2.2	0.9	23.7	1.15	2.2	0.9	4	XX
MN7X2X	23.3	23.0	22.9	22.6	23.0	0.39	1.3	0.3	23.0	0.39	1.3	0.3	4	LH
Q2QAAD	23.0	21.9	22.7	23.2	22.7	0.12	2.0	0.6	22.7	0.12	2.0	0.6	4	LA
QAJM8R	20.8	22.6	24.1	24.6	23.0	0.44	2.1	1.7 H	23.0	0.44	2.1	1.7 H	4	LA

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

Report #578 (M)
November 2017

WebCode	Weekly Means Week 1	Week 2	Week 3	Week 4	Monthly Results Mean	CPV	SD	SD Wks	Cumulative Results Mean	CPV	SD	SD Wks	Wks	Inst
QAK96T	24.3 H	24.0	24.6	24.7	24.4	1.80	2.1	0.3	24.4	1.80	2.1	0.3	4	LA
QM9HMR	23.0 L	21.9 L	22.0	21.6 L	22.1	-0.42	1.0	0.6	22.1	-0.42	1.0	0.6	4	TT
R3D92G	22.7	22.8 H	24.1 H	25.6 *	23.8	1.22	3.0	1.4	23.8	1.22	3.0	1.4	4	LA
RVT8JJ	21.3	22.0	22.1	21.7	21.8	-0.74	1.8	0.4	21.8	-0.74	1.8	0.4	4	LW
T86ZLJ	23.0	22.3	22.1	22.2	22.4	-0.16	2.1	0.4	22.4	-0.16	2.1	0.4	4	LA
TB3EBT	22.6	22.9	23.0	23.0	22.8	0.29	1.8	0.2	22.8	0.29	1.8	0.2	4	LA
TJKPPU	23.0 L	22.4 L	23.0 L	22.2 L	22.6	0.09	0.1	0.4	22.6	0.09	0.1	0.4	4	XX
U8LDPL	20.8	20.6	21.2	21.3	21.0	-1.52	1.8	0.3	21.0	-1.52	1.8	0.3	4	LZ
UGA82H	22.4	21.9	21.6 H	22.2	22.0	-0.49	2.3	0.3	22.0	-0.49	2.3	0.3	4	LY
V6LWLN	20.8	21.2	22.8	20.9	21.4	-1.10	1.9	0.9	21.4	-1.10	1.9	0.9	4	XX
VXQVNH	21.9	21.3	22.1	20.9	21.5	-0.98	1.9	0.6	21.5	-0.98	1.9	0.6	4	LY
WA39PJ	21.5	21.9	22.9	22.8 L	22.3	-0.26	1.5	0.7	22.3	-0.26	1.5	0.7	4	BK
WPVAYW	23.0	22.7	22.5	21.5	22.4	-0.13	1.7	0.7	22.4	-0.13	1.7	0.7	4	LA
XP777L	22.3	24.3	21.6	23.3	22.9	0.33	2.0	1.2	22.9	0.33	2.0	1.2	4	LZ
Y7R8GH	21.9 L	22.8 L	21.8 L	22.3 L	22.2	-0.33	0.0	0.5	22.2	-0.33	0.0	0.5	4	LW
Z3PZ6J	23.1	22.7	23.0	23.1	23.0	0.41	2.4	0.2	23.0	0.41	2.4	0.2	4	LW
Z8DMVH	21.9	21.4	21.7	21.6	21.7	-0.85	1.7	0.2	21.7	-0.85	1.7	0.2	4	XX
ZCX6LF	21.4	20.4	22.7	21.9	21.6	-0.89	2.3	1.0	21.6	-0.89	2.3	1.0	4	XX
ZRLHV2	23.2	23.9	22.5	24.8 H	23.6	1.04	2.3	1.0	23.6	1.04	2.3	1.0	4	LU

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4				Grand	
Wk Mean	22.64	22.73	22.60	22.40	Month Mean	22.55		Grand Mean	22.55
Avg SDr	1.81	1.89	1.81	1.95	Avg SD	1.88		Avg SD	1.88
SD btwn Labs	1.22	1.33	1.06	1.32	SD btwn Labs	1.04		SD btwn Labs	1.04
Labs Incld	54	54	52	54	SD btwn Wks	0.71		SD btwn Wks	0.71
Labs Excld	0	0	1	0	Labs Incld	53		Labs Incld	53
Labs not Rcvd	0	0	1	0					

Key to Instrument Codes Reported by Participants

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

Containerboard Interlaboratory Testing Program
Analysis 224
STFI, 56 lb Linerboard - 56A1
TAPPI Official Test Method T826

Report #578 (M)
November 2017

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
2VJLY9	39.6 *	39.9 X	38.9 *	35.8	38.5	2.44 *	3.2	1.9	37.6	2.42 *	3.1	1.5	12	LZ
3FNLLY	36.4	37.1 H	36.7	37.7	37.0	1.59	3.0	0.6	36.2	1.55	2.9	1.4	12	LU
3LB9JP	31.8	30.1	30.8	30.0 *	30.7	-1.87	2.8	0.8	30.8	-1.97 *	3.0	0.7	12	LW
49H7FN	33.9	34.4	34.5	32.4	33.8	-0.14	2.7	1.0	33.3	-0.31	2.5	0.9	12	LU
67PHPF	38.8 *	38.8 *L	37.3	38.9 *	38.5	2.39 *	2.5	0.8	37.7	2.51 *	2.6	1.3	12	LH
6Y88H7	31.6 L	31.6 L	30.3 *L	31.2 L	31.2	-1.59	0.8	0.6	32.2	-1.03	0.8	1.2	10	LA
742M87	34.8	35.7	35.7	35.5	35.4	0.74	3.1	0.5	34.8	0.63	2.7	0.9	12	LW
88G7B9	38.3	36.3	38.3 *	36.6	37.4	1.80	2.6	1.1	35.9	1.37	2.6	1.7	12	XX
8AK2UB	37.4 H	35.5	36.1 H	38.1 *H	36.8	1.47	4.1	1.2	33.5	-0.19	3.0	2.6	12	LA
8LCWLB	32.6	34.0	32.2	33.8	33.2	-0.51	2.7	0.9	33.6	-0.12	2.7	0.8	12	LA
8WV7DB	33.9 L	33.7 L	34.1 L	33.5 L	33.8	-0.17	1.2	0.3	33.5	-0.22	1.2	0.3 L	12	TT
94D2PY	33.6	33.4	33.9	35.0	34.0	-0.07	2.6	0.7	33.2	-0.39	2.5	1.0	11	LZ
9HQCF8	31.9	32.4	No Data	31.9	32.1	-1.10	2.7	0.3	31.9	-1.27	2.7	0.6	11	LW
BYRP99	33.6	32.4	32.1 L	32.1	32.5	-0.85	2.1	0.7	32.7	-0.70	2.2	0.6	11	LU
CUGZ47	32.2	31.3	32.1	30.8	31.6	-1.36	2.3	0.7	32.1	-1.11	2.5	0.7	12	LY
DAZH8Q	35.4	38.2 *	35.2	36.0	36.2	1.17	2.9	1.4	35.5	1.07	2.4	1.2	12	LU
DCREUY	34.8	33.2	33.5	32.6	33.5	-0.32	2.7	1.0	35.1	0.80	2.9	1.8	11	LU
DLWG44	33.8 L	32.9 L	32.2 L	32.0 L	32.7	-0.75	0.0	0.8	32.0	-1.17	0.0	1.6	12	LW
EM37XY	30.9	31.5	32.1	33.0	31.9	-1.22	2.9	0.9	32.4	-0.94	2.9	0.9	12	LU
FGFV82	29.3 *L	29.8 *L	30.3 *L	31.6 L	30.2	-2.11 *	0.6	1.0	32.8	-0.67	0.8	3.2 H	12	BK
FNYWPZ	34.6	34.8	34.1	34.2	34.4	0.18	2.9	0.3	34.1	0.20	3.0	1.3	12	LW
GHP8GQ	33.2 L	35.9 L	34.2 L	34.1 L	34.3	0.14	0.0	1.1	34.2	0.26	1.7	0.9	12	LU
GNT2JY	37.8 H	35.6	35.1	35.9	36.1	1.10	3.3	1.2	34.9	0.67	3.2	1.5	12	LH
GY87LN	34.5	33.8	34.3	34.2	34.2	0.08	2.8	0.3	33.4	-0.28	2.7	0.9	8	LY
HNLLEW	34.2	33.5	33.6	33.8	33.8	-0.17	3.1	0.3	33.2	-0.40	2.9	0.8	12	LA
JHVAFU	35.5	31.2	34.3	34.9	34.0	-0.06	2.9	1.9	33.4	-0.26	2.9	1.4	12	LA
JHW2D3	36.0	35.6 H	32.2	34.9	34.7	0.32	3.2	1.7	35.0	0.77	2.9	1.7	12	LZ
JM8ETF	33.5	33.3	33.5	33.3	33.4	-0.38	2.6	0.1 L	33.2	-0.38	2.3	0.9	11	LA
JR2BEZ	35.7	35.4	34.6	33.8	34.8	0.41	2.5	0.8	33.9	0.02	2.5	1.1	12	LU
KAZQEQ	34.7	32.9	34.2	33.9	33.9	-0.10	2.2	0.7	33.7	-0.11	2.6	0.9	12	LW
KZBTWX	34.7	34.0	34.1	34.7	34.4	0.16	2.2	0.4	33.8	0.00	2.1	0.5	12	XX
L3UC9F	37.3 H	35.8	37.9 *	37.7 H	37.2	1.70	3.7	0.9	36.8	1.94 *	3.5	1.4	12	LU
MN7X2X	34.7	34.3	35.1	34.9	34.7	0.36	1.9	0.4	35.0	0.75	2.2	0.4	12	LH
Q2QAAD	35.1	33.3	34.1	34.4	34.2	0.08	2.8	0.8	33.4	-0.29	2.9	1.6	11	LA
QAJM8R	30.4	32.7	36.3	34.8	33.5	-0.30	2.5	2.6 H	32.4	-0.91	2.5	1.9	12	LA

Containerboard Interlaboratory Testing Program
Analysis 224
STFI, 56 lb Linerboard - 56A1
TAPPI Official Test Method T826

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
	Weekly Means				Monthly Results				Cumulative Results					
QAK96T	36.8	37.3	39.0 *	38.0 *	37.8	2.01 *	2.8	1.0	37.6	2.44 * 3.3		1.2	12	LA
QM9HMR	33.8 L	33.9 L	33.9 L	33.8 L	33.9	-0.13	1.2	0.1 L	33.7	-0.06	1.1	0.2 L	12	TT
R3D92G	36.8 L	35.6	32.8	NO DATA	35.1	0.53	3.0	2.1 H	35.2	0.92	2.7	1.2	11	LA
RVT8JJ	34.5	32.8	33.7	33.6	33.7	-0.23	2.7	0.7	32.8	-0.64	2.9	1.2	12	LW
T86ZLJ	32.8	30.0	33.9	34.0	32.7	-0.79	2.4	1.8	34.1	0.19	2.8	1.7	12	LA
TB3EBT	34.6	34.3	34.7	34.3	34.5	0.21	2.3	0.2	34.2	0.27	2.5	0.4	12	LA
TJKPPU	32.8 L	33.0 L	32.4 L	31.8 L	32.5	-0.86	0.1	0.5	33.0	-0.50	1.3	0.9	8	XX
U8LDPL	33.5	32.7	32.1	32.2	32.7	-0.79	2.4	0.6	32.7	-0.73	2.4	0.6	11	LZ
UGA82H	35.1	34.9	34.5	35.7	35.1	0.53	2.7	0.5	34.5	0.42	2.8	0.9	12	LY
V6LWLN	33.1	31.7	36.1	32.8	33.4	-0.37	2.8	1.9	33.7	-0.09	2.7	1.7	12	XX
VXQVNH	31.6	31.9	32.8	31.8	32.0	-1.13	2.5	0.5	31.3	-1.60	4.2	0.8	12	LY
WA39PJ	33.4	33.1	33.2	31.4	32.8	-0.73	2.4	0.9	33.0	-0.52	2.4	1.0	12	BK
WPVAYW	33.1	33.5	34.4	34.3	33.8	-0.15	2.6	0.6	33.5	-0.21	2.9	1.4	12	LA
XP777L	31.1	35.5 H	33.5	34.4	33.6	-0.25	3.2	1.8	33.7	-0.10	3.0	1.5	12	LZ
Y7R8GH	33.8 L	33.7 L	33.2 L	32.9 L	33.4	-0.38	0.0	0.4	31.8	-1.33	0.0	2.6 H	12	LW
Z3PZ6J	34.0	33.4	34.1 H	34.0	33.9	-0.11	3.5	0.3	33.7	-0.05	3.2	0.4	12	LW
Z8DMVH	33.0	32.9	32.7	31.5	32.5	-0.86	2.5	0.7	31.6	-1.42	2.5	1.1	12	XX
ZCX6LF	35.7	31.8 H	34.5	33.8	34.0	-0.07	3.8	1.6	33.3	-0.33	3.3	1.2	12	XX
ZRLHV2	34.9	35.5	34.8	34.7	35.0	0.48	2.7	0.3	35.5	1.08	3.0	0.8	12	LU

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4		Monthly		Grand	
Wk Mean	34.27	33.81	34.15	34.02	Month Mean	34.09	Grand Mean	33.82	
Avg SDr	2.54	2.68	2.68	2.54	Avg SD	2.61	Avg SD	2.62	
SD btwn Labs	2.10	1.97	1.93	1.96	SD btwn Labs	1.82	SD btwn Labs	1.55	
Labs Incld	54	53	53	53	SD btwn Wks	1.03	SD btwn Wks	1.30	
Labs Excld	0	1	0	0	Labs Incld	54	Labs Incld	54	
Labs not Rcvd	0	0	1	1					

Key to Instrument Codes Reported by Participants

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

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

Report #578 (M)
November 2017

	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2VJLY9	166.1	-0.45	19.05	174.3	-0.08	9.31	3	XX
3DEDJ7	152.5	-1.07	19.10	150.7	-1.27	3.28	4	EV
3FNLLY	153.3	-1.03	12.29	147.6	-1.43	3.79	4	EV
6Y88H7	213.6	1.72	27.07	213.0	1.88	7.75	3	LA
94D2PY	179.3	0.15	15.30	178.1	0.11	3.04	4	EV
9HQCF8	188.8	0.59	19.13	182.9	0.35	10.38	4	EV
EM37XY	179.3	0.16	19.65	184.2	0.42	5.64	4	EV
FGFV82	213.2	1.70	18.19	205.8	1.51	8.69	4	EV
FNYWPZ	167.9	-0.37	14.28	174.6	-0.07	9.00	4	XX
JHVAFU	160.0	-0.73	15.65	172.1	-0.19	10.32	4	LA
JM8ETF	189.8	0.63	41.81 H	178.8	0.15	17.96 H	4	LA
KAZQEQ	216.5	1.86	26.26	203.3	1.38	9.88	4	LA
Q2QAAD	166.7	-0.42	18.81	172.9	-0.16	16.69	4	LA
QAJM8R	130.9	-2.05 *	18.22	126.2	-2.51 *	3.40	4	LA
TB3EBT	170.1	-0.26	17.60	168.6	-0.37	2.78	4	XX
TJKPPU	202.5	1.21	13.67	197.0	1.06	11.99	3	EV
U8LDPL	163.2	-0.58	15.10	159.8	-0.82	4.87	2	EV
VXQVNH	170.2	-0.26	14.00	178.0	0.11	5.52	4	EV
WAZPH9	158.9	-0.78	13.57	160.2	-0.79	6.84	4	EV
WPVAYW	187.3	0.52	21.66	189.3	0.68	4.23	4	LA
XP777L	158.6	-0.79	10.21	166.1	-0.50	5.23	4	LA
Y7R8GH	193.7	0.81	20.60	190.6	0.74	6.81	4	EV
ZRLHV2	163.2	-0.58	10.34	172.0	-0.20	7.33	4	EV

Consensus (All Labs) Results

Month Mean	175.89	Grand Mean	175.92
Avg SD	19.46	Avg SD Months	8.58
SD btwn Labs	21.90	SD btwn Labs	19.77
Labs Incld	23	Labs Incld	23

Key to Instrument Codes Reported by Participants

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

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
49H7FN	373.9	0.77	8.90		370.4	0.23	3.11	4	XX
8LCWLB	375.4	0.94	15.30 H		380.7	1.12	8.53	4	XX
DXNVD8	373.9	0.77	10.40		376.6	0.77	2.05	4	PP
HNLLEW	365.2	-0.25	6.84		365.5	-0.19	0.88	4	LA
HP2JB3	418.1	5.94 X	8.65		396.3	2.46 X	21.86 H	4	XX
JHW2D3	378.9	1.35	9.93		385.3	1.52	6.68	3	XX
KF7MXQ	353.6	-1.61	9.27		353.9	-1.18	4.02	4	LA
R3D92G	364.7	-0.31	6.27		366.5	-0.10	2.38	4	XX
T86ZLJ	360.5	-0.81	6.31		356.4	-0.97	3.23	4	LA
TZ4L33	360.1	-0.85	9.95		353.8	-1.19	6.56	3	TS

Consensus (All Labs) Results

Month Mean	367.35	Grand Mean	367.65
Avg SD	9.61	Avg SD Months	4.80
SD btwn Labs	8.54	SD btwn Labs	11.64
Labs Incld	9	Labs Incld	9

Key to Instrument Codes Reported by Participants

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

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

Report #578 (M)
November 2017

	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2VJLY9	103.4	0.16	2.30	103.2	-0.16	0.35 L	3	TM
3DEDJ7	116.4	0.85	8.08	117.2	0.67	3.58	4	HY
3FNLLY	89.4	-0.60	6.47	92.1	-0.81	2.48	4	TM
3LB9JP	111.8	0.61	5.76	114.0	0.48	2.56	4	TM
49H7FN	114.1	0.73	4.04	112.8	0.41	1.97	4	HY
6Y88H7	127.0	1.42	6.40	144.9	2.30 *	36.56 H	3	HY
88G7B9	54.4	-2.47 *	6.73	71.9	-2.01 *	11.73	4	SC
8AK2UB	98.6	-0.10	5.32	99.2	-0.39	3.01	4	TM
8LCWLB	53.1	-2.54 X	1.38 L	59.1	-2.76 X	6.13	4	LZ
94D2PY	85.5	-0.81	3.26	87.2	-1.10	1.34 L	4	XX
EM37XY	87.8	-0.68	9.15	88.1	-1.05	2.02	4	TM
GHP8GQ	106.0	0.29	5.66	119.7	0.82	12.97	3	HZ
HNLLEW	96.3	-0.22	3.63	103.3	-0.15	7.76	4	SC
KAZQEQ	128.6	1.51	8.99	128.4	1.33	1.32 L	4	HY
QAJM8R	101.4	0.05	6.19	106.5	0.04	4.61	4	TM
QECMM9	103.8	0.18	5.81	104.9	-0.06	8.44	4	TM
R3D92G	117.2	0.90	4.55	108.3	0.14	9.07	4	SC
XVYBZQ	95.7	-0.26	6.52	98.3	-0.45	2.55	4	TM
Y7R8GH	167.0	3.57 X	15.25 H	156.3	2.97 X	9.91	4	SC
ZRLHV2	71.6	-1.55	4.62	66.0	-2.35 *	4.09	4	TM

Consensus (All Labs) Results

Month Mean	100.51	Grand Mean	105.87
Avg SD	6.02	Avg SD Months	10.66
SD btwn Labs	18.63	SD btwn Labs	16.95
Labs Incld	18	Labs Incld	17

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	97.85	18.54	2.65	15
Modified Scott Bond Mechanics	121.36	10.24	20.85	2

Analysis Notes

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

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

Report #578 (M)
November 2017

Key to Instrument Codes Reported by Participants

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

Containerboard Interlaboratory Testing Program
Analysis 234
COF Inclined Plane (Slide Angle), 56 lb Linerboard - 56A
TAPPI Official Test Method T815

Report #578 (M)
November 2017

	Monthly Results				Cumulative Results			
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months
2VJLY9	32.2	1.62	1.92		27.6	0.49	4.04	3
3FNLLY	28.4	0.51	2.70		28.7	0.96	1.62	4
3LB9JP	21.5	-1.51	1.69		21.3	-2.29 *	1.08	4
49H7FN	21.0	-1.67	1.06		18.6	-3.53 X	2.11	3
6Y88H7	29.0	0.69	3.18		28.4	0.85	1.40	3
742M87	26.0	-0.19	3.16		28.2	0.74	1.53	4
8LCWLB	30.6	1.15	0.55 L		27.2	0.29	2.31	4
8RYKH3	25.8	-0.25	2.86		27.3	0.36	1.01	4
94D2PY	28.0	0.39	2.00		26.5	-0.02	1.93	4
9HQCF8	20.0	-1.95 *	4.74		22.8	-1.64	2.32	4
EM37XY	27.4	0.22	2.30		27.5	0.43	2.29	4
FNYWPZ	29.4	0.80	2.97		26.4	-0.04	2.30	4
JHW2D3	29.4	0.80	3.07		25.9	-0.26	3.85	4
KAZQEQ	26.2	-0.14	2.39		25.5	-0.44	0.95	4
L3UC9F	24.6	-0.60	1.95		23.7	-1.23	3.27	4
QAJM8R	29.6	0.86	5.64 H		28.5	0.87	1.43	4
R3D92G	25.0	-0.49	2.55		25.0	-0.68	2.45	4
TB3EBT	25.6	-0.31	1.14		25.1	-0.62	0.62	4
U8LDPL	23.4	-0.96	0.89		26.6	0.05	4.53	2
V6LWLN	26.0	-0.19	2.92		27.2	0.29	2.50	4
VVZN78	21.9	-1.40	1.52		21.4	-2.26 *	0.96	4
VXQVNH	24.4	-0.66	1.44		27.0	0.24	1.76	4
WPVAYW	31.3	1.35	2.11		29.7	1.42	2.14	4
Y7R8GH	25.0	-0.49	0.71		27.5	0.45	3.23	4
Z8DMVH	30.6	1.15	2.07		27.9	0.60	2.06	4
ZRLHV2	31.0	1.27	2.00		29.7	1.43	0.89	4

Consensus (All Labs) Results				
Month Mean	26.66		Grand Mean	26.49
Avg SD	2.55		Avg SD Months	2.33
SD btwn Labs	3.41		SD btwn Labs	2.25
Labs Incld	26		Labs Incld	25

Key to Instrument Codes Reported by Participants

ZZ   Instruments No Longer Tracked

Containerboard Interlaboratory Testing Program
Analysis 237
Air Resistance, 42 lb Linerboard - 42D
TAPPI Official Test Method T460

Report #578 (M)
November 2017

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2VJLY9	18.7	0.47	2.50		17.8	0.02	0.78	3	TD
3FNLLY	18.3	0.24	1.44		18.2	0.28	1.10	4	LA
3LB9JP	18.9	0.58	3.46 H		18.4	0.41	0.34	4	TP
49H7FN	18.8	0.51	2.54		18.4	0.39	0.39	4	TP
6Y88H7	18.0	0.06	0.93		14.5	-2.28 *	5.92 H	3	LA
742M87	16.5	-0.90	1.58		17.8	-0.02	1.00	4	LP
7HK73U	17.6	-0.22	1.43		18.0	0.15	0.64	4	XX
8LCWLB	19.8	1.16	1.90		20.1	1.60	0.29	4	LA
94D2PY	18.8	0.55	1.92		19.0	0.84	0.78	4	LP
9HQCF8	16.1	-1.15	0.74 L		16.4	-0.99	0.51	4	XX
BNAG28	18.5	0.33	0.72 L		17.4	-0.27	1.14	4	TL
CBZWHE	15.9	-1.28	1.37		17.7	-0.09	1.30	4	GG
CUGZ47	18.2	0.16	1.03		18.0	0.13	0.24	4	LP
EDG6F4	17.2	-0.49	1.44		17.4	-0.30	0.65	4	LP
FGDBAZ	17.6	-0.25	1.43		18.2	0.29	0.54	4	XX
FGFV82	22.2	2.62 *	1.96		21.4	2.46 *	0.90	4	XX
HNLLEW	20.0	1.30	2.28		18.5	0.47	1.28	4	LA
JHVAFU	18.3	0.21	1.84		18.0	0.12	0.30	4	LA
JHW2D3	19.7	1.06	1.94		18.2	0.29	1.65	3	XX
KAZQEQ	20.4	1.53	1.78		20.3	1.68	0.37	4	LP
L3UC9F	15.2	-1.74	1.13		15.3	-1.71	0.34	4	LA
QAJM8R	17.8	-0.12	1.33		18.3	0.32	0.35	4	LP
TB3EBT	17.6	-0.22	0.64 L		17.0	-0.56	0.55	3	LA
TJKPPU	17.0	-0.62	1.10		17.0	-0.55	0.05 L	3	LW
U8LDPL	16.6	-0.83	1.74		16.6	-0.80	0.04	2	LP
VVZN78	18.9	0.59	2.56		19.1	0.90	1.29	4	GA
Y7R8GH	16.5	-0.90	1.58		17.6	-0.14	1.07	4	HG
ZA7BHK	16.5	-0.93	0.82		15.9	-1.33	1.01	3	LA
ZRLHV2	15.2	-1.72	1.51		15.9	-1.33	0.63	4	LA

Consensus (All Labs) Results

Month Mean	17.95		Grand Mean	17.81
Avg SD	1.73		Avg SD Months	1.36
SD btwn Labs	1.61		SD btwn Labs	1.46
Labs Incld	29		Labs Incld	29

Containerboard Interlaboratory Testing Program
Analysis 237
Air Resistance, 42 lb Linerboard - 42D
TAPPI Official Test Method T460

Report #578 (M)
November 2017

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	**TL**	Teledyne Gurley Densometer #4110, Oil Flotation
TP	Technidyne Profile/ plus Roughness & Porosity	**XX**	Instrument make/model not specified by lab

Containerboard Interlaboratory Testing Program
Analysis 240
Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM91
TAPPI Official Test Method T809

Report #578 (M)
November 2017

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
					Weekly Means									
29Q8NT	63.5 L	63.9 L	61.3 L	60.5 L	62.3	0.77	1.0	1.6	63.6	1.54	1.3	1.4	16	TD
3FNLLY	53.0 X	56.0 *	57.7	70.9 XH	59.4	-0.69	4.7	7.9 H	61.2	0.24	4.6	4.2 H	16	LC
49H7FN	62.0	61.2	59.8	59.8	60.7	-0.04	2.9	1.1	60.5	-0.12	3.8	1.5	16	LC
742M87	61.4	61.3	61.9	61.2	61.4	0.34	3.1	0.3 L	61.1	0.19	3.3	1.2	16	LC
7FEKEU	68.2 X	67.1 X	66.9 *	68.0 X	67.6	3.43 X	3.5	0.6	64.0	1.79	6.7	3.5	16	LC
88G7B9	58.6	54.4 X	58.0	55.6 *	56.6	-2.09 *	3.6	2.0	58.1	-1.43	3.5	2.3	16	LC
89979J	59.7	60.8	59.8	58.0	59.6	-0.60	3.0	1.2	59.1	-0.90	3.1	1.3	15	LC
8AK2UB	56.8 *	56.1 *	59.1	63.3	58.8	-0.98	3.5	3.2	59.5	-0.70	3.1	1.9	16	LC
8LCWLB	51.2 X	51.2 X	50.4 X	51.0 X	50.9	-4.97 X	2.6	0.4 L	54.1	-3.65 X	2.9	2.1	16	LD
8WV7DB	61.3	59.3	57.5	58.2	59.1	-0.85	3.3	1.7	59.4	-0.74	3.0	1.4	16	TH
94D2PY	59.8	61.4	61.9	61.7	61.2	0.22	3.5	1.0	59.9	-0.46	3.3	1.9	15	LZ
9WT4X7	60.7	60.4	59.9	61.1	60.5	-0.13	2.2	0.5	60.4	-0.18	2.5	0.5 L	16	LC
BL4WD7	60.6 L	60.7	60.3	60.4 L	60.5	-0.13	1.5	0.2 L	61.4	0.33	1.7	1.6	16	LD
BYRP99	58.0	60.1	62.6	60.0	60.2	-0.30	3.0	1.9	61.8	0.58	2.9	2.7	14	LZ
EDG6F4	60.3	60.9	57.2	61.7	60.0	-0.38	3.1	2.0	60.3	-0.23	2.9	1.1	16	LD
EM37XY	58.7	60.0	58.6	58.9	59.0	-0.89	3.6	0.7	58.8	-1.09	3.2	1.7	16	LD
FGDBAZ	63.2	61.2	63.0	60.0 L	61.9	0.55	2.7	1.5	61.6	0.46	2.8	1.4	16	LD
FGFV82	65.6 *	68.9 XH	64.2	63.2	65.5	2.37 *	3.7	2.5	66.3	3.00 X	5.3	4.7 H	16	MB
FNW8K3	59.0	58.0	62.4	59.6	59.7	-0.52	3.5	1.9	59.7	-0.56	2.7	1.1	16	LD
G2ZU76	61.7	61.8	57.1	60.1	60.2	-0.30	2.6	2.2	60.1	-0.34	2.5	2.2	16	TH
GHP8GQ	59.9 H	64.1 H	63.9 H	67.3 XH	63.8	1.53	6.8	3.0	62.4	0.89	4.5	2.8	16	LC
GNT2JY	61.7	60.1	60.7	61.2	60.9	0.07	4.2	0.7	61.6	0.47	3.8	1.8	16	LD
HGA4MY	58.9	59.4	58.9	59.1	59.1	-0.85	2.0	0.2 L	59.3	-0.79	2.1	0.6	16	XX
JHW2D3	56.5 *	58.5	57.6	59.6	58.0	-1.39	3.0	1.3	57.7	-1.68	3.2	1.5	16	LZ
JM8ETF	51.6 X	58.8	58.5	55.6 *	56.1	-2.34 *	3.3	3.4	56.6	-2.25 *	3.5	2.6	15	MB
JR2BEZ	60.4	60.4	59.9	58.4	59.8	-0.50	3.0	0.9	59.7	-0.59	3.0	1.5	12	LD
KZBTWX	62.9	60.4	62.3	61.2	61.7	0.46	3.3	1.1	61.7	0.51	3.1	0.7	16	LD
LFL26Z	61.1	62.7	61.3	62.3	61.9	0.55	2.5	0.8	61.5	0.42	2.1	1.4	16	MB
LQ2VGT	61.2	59.7 L	60.6	60.2	60.4	-0.18	2.0	0.6	60.4	-0.17	2.7	0.5 L	16	LD
MN7X2X	62.6	60.8	63.5	61.7	62.2	0.70	2.9	1.2	61.9	0.63	3.2	1.2	16	LD
QAK96T	63.9	60.0	63.7	62.2	62.5	0.85	3.1	1.8	60.3	-0.24	3.4	2.3	16	LD
QM9HMR	61.8 H	58.2	57.3	58.2	58.9	-0.95	4.9	2.0	58.5	-1.22	4.4	1.5	16	TG
QND8NF	60.1	60.3	60.5	60.4	60.3	-0.23	2.8	0.2 L	60.3	-0.24	2.7	0.1 L	16	LD
TB3EBT	61.7	60.8	61.5	61.8	61.5	0.35	2.0	0.5	61.1	0.20	2.2	0.5	16	LD
TJKPPU	49.2 XH	47.2 XH No Data		46.7 X	47.7	-6.60 X	5.4	1.4	51.0	-5.30 X	4.5	2.9	11	XX

Containerboard Interlaboratory Testing Program
Analysis 240
Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM91
TAPPI Official Test Method T809

Report #578 (M)
November 2017

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
U8LDPL	58.6	58.0	57.8	61.5 H	59.0	-0.91	4.3	1.7	59.1	-0.90	3.7	1.3	15	LZ
UGA82H	64.8	63.8 H	65.0	62.1	63.9	1.58	4.1	1.3	64.3	1.94 * 3.2		1.0	16	LD
V4HZJ9	46.7 X	45.0 XH	45.9 X	48.8 X	46.6	-7.16 X	4.1	1.6	48.3	-6.78 X 3.8		1.8	16	TC
VXQVNH	58.6	60.8	58.8	62.1	60.1	-0.36	2.7	1.7	59.6	-0.65	2.8	1.8	16	EN
WBV9MV	63.1	61.0	66.2 *	62.3	63.1	1.19	3.5	2.2	61.8	0.56	3.2	2.2	8	LD
X92468	81.7 X	71.5 XH	75.6 XH	76.4 XH	76.3	7.84 X	6.8	4.2	68.5	4.26 X 4.6		9.0 H	16	MB
XP777L	62.1	59.6	58.7	58.4	59.7	-0.56	2.7	1.7	59.5	-0.70	2.7	1.4	16	LD
Z3PZ6J	60.5	60.2	60.6	60.0	60.3	-0.24	3.1	0.3 L	60.1	-0.37	2.9	0.8	16	LC
Z8DMVH	62.0	64.3 *	69.8 XH	61.8	64.5	1.87	6.3	3.7	63.9	1.74	4.1	2.8	16	XX
ZA7BHK	63.8	62.6	65.9	63.8	64.0	1.65	4.1	1.4	65.3	2.50 * 3.9		1.8	12	LC
ZRLHV2	57.6	57.0 H	58.9	73.6 XH	61.8	0.51	4.9	7.9 H	62.4	0.91	4.5	4.5 H	16	XX
ZZK8C7	60.4	62.6	64.2	62.8	62.5	0.87	2.8	1.6	61.9	0.62	3.0	1.3	16	TU

			Consensus (All Labs) Results								
Wk Mean	60.87	60.43	60.84	60.51	Month Mean		60.77		Grand Mean		60.75
Avg SDr	3.45	3.36	3.11	3.14	Avg SD		3.48		Avg SD		3.33
SD btwn Labs	2.11	1.96	2.68	1.90	SD btwn Labs		1.98		SD btwn Labs		1.83
Labs Incld	40	40	42	39	SD btwn Wks		2.40		SD btwn Wks		1.92
Labs Excld	7	7	4	8	Labs Incld		42		Labs Incld		42
Labs not Rcvd	0	0	1	0							

Key to Instrument Codes Reported by Participants

EN	Emerson 2200 Series		LC	L&W Crush Tester 48
LD	L&W Crush Tester 248		LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440		TC	TMI Monitor/Compression Tester, 17-37
TD	TMI Digital Crush Tester, Model 17-09		TG	TMI Compression Tester, Model 17-10
TH	TMI Compression Tester, Model 17-76		TU	TMI Universal Crush Tester (TMI K440)
XX	Instrument make/model not specified by lab			

Containerboard Interlaboratory Testing Program
Analysis 250
Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium - CM91
TAPPI Official Test Method T843

Report #578 (M)
November 2017

WebCode	Weekly Means Week 1	Week 2	Week 3	Week 4	Monthly Results Mean	CPV	SD	SD Wks	Cumulative Results Mean	CPV	SD	SD Wks	Wks	Inst
29Q8NT	73.7 L	73.1 L	70.7 L	74.6 L	73.0	-0.46	0.8	1.7	73.2	-0.44	1.0	1.4	16	TD
3FNLLY	71.8 H	71.4 H	73.1 H	61.8 *	69.5	-2.31 *	6.9	5.2 H	74.1	0.32	5.2	4.5 H	16	XX
49H7FN	78.3	75.5	77.9 *	78.2	77.5	1.90 *	2.6	1.3	77.5	3.49 X	2.3	0.9	16	LC
742M87	72.9	73.3	72.2	73.2	72.9	-0.52	2.8	0.5	74.1	0.30	3.2	1.9	16	XX
7HK73U	74.2	74.1 L	74.2	74.2	74.2	0.15	1.7	0.0 L	73.7	-0.05	1.6	0.8	16	XX
8LCWLB	74.0	74.4	73.8	74.1	74.1	0.09	1.8	0.3 L	74.2	0.42	2.2	1.4	16	LD
9WT4X7	72.4	73.3	75.1	73.0 H	73.7	-0.10	4.0	1.2	73.7	-0.02	4.0	1.2	4	LD
BL4WD7	73.4 L	73.6 L	74.1	73.6 L	73.7	-0.11	1.1	0.3	73.1	-0.59	1.6	0.6	16	LD
BYRP99	78.3	72.5	74.2	73.9	74.7	0.45	3.1	2.5	72.6	-1.03	2.5	2.0	14	LZ
EDG6F4	78.4 L	75.9	77.1	74.0	76.4	1.30	2.1	1.9	76.3	2.33 *	2.5	1.0	16	LD
FGDBAZ	73.3	74.1	72.7	74.9	73.7	-0.08	3.0	0.9	72.8	-0.81	2.4	1.3	16	XX
KZBTWX	72.1	71.6	72.1 L	71.7	71.9	-1.07	1.8	0.3 L	72.7	-0.94	1.9	0.7	16	LD
TB3EBT	73.7	72.1	72.8	72.9	72.9	-0.54	2.1	0.6	72.3	-1.31	2.2	0.8	16	LD
U8LDPL	75.2	76.2	74.1	77.9	75.9	1.05	2.4	1.6	75.4	1.50	2.6	1.6	15	LZ
WBV9MV	75.4	73.9	74.0	74.3	74.4	0.26	2.3	0.7	74.1	0.32	2.2	1.0	8	LD
X92468	57.4 X	59.9 X	59.4 X	61.2 *	59.5	-7.62 X	2.8	1.6	65.9	-7.23 X	3.0	6.6 H	16	MB

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4							
Wk Mean	74.47	73.74	73.87	72.71	Month Mean		73.89	Grand Mean		73.73
Avg SDr	3.01	2.93	3.23	2.53	Avg SD		2.92	Avg SD		2.70
SD btwn Labs	2.23	1.47	1.84	4.69	SD btwn Labs		1.89	SD btwn Labs		1.08
Labs Incld	15	15	15	16	SD btwn Wks		1.78	SD btwn Wks		1.72
Labs Excld	1	1	1	0	Labs Incld		15	Labs Incld		14
Labs not Rcvd	0	0	0	0						

Key to Instrument Codes Reported by Participants

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

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

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
			Weekly Means			Monthly Results				Cumulative Results				
49H7FN	46.2	45.8	46.7	44.8	45.9	0.60	3.0	0.8 L	45.8	0.76	2.9	1.0	16	LC
7FEKEU	33.8 *	33.8 *L	34.6 *	33.5 X	33.9	-3.42 X	1.8	0.5 L	33.1	-3.24 X	2.7	2.2	16	XX
89979J	46.7	44.9	47.0	45.5	46.0	0.65	3.1	1.0	46.0	0.82	3.0	1.5	15	LC
8LCWLB	44.6	46.4	46.0	46.2	45.8	0.57	2.9	0.8 L	45.4	0.62	3.0	0.8	16	LD
AP9X3J	42.1 L	43.4 L	42.3	42.6 L	42.6	-0.50	1.6	0.6 L	42.1	-0.40	2.2	0.6 L	16	TH
BB3B88	35.5	40.9	39.7 L	40.9	39.2	-1.63	2.7	2.6	38.3	-1.61	2.7	2.2	15	LZ
EDG6F4	46.8	46.0	45.9 L	46.4	46.3	0.74	1.6	0.4 L	46.2	0.88	2.1	0.6 L	16	LD
FGDBAZ	43.0	42.7	44.1	42.0	42.9	-0.39	3.2	0.9	42.6	-0.25	3.4	0.8	16	LD
FNW8K3	42.6	43.9	45.1	42.4	43.5	-0.20	2.4	1.3	44.4	0.31	2.1	1.1	16	LZ
G2ZU76	40.5	41.3	38.5	38.7	39.7	-1.46	2.4	1.4	38.9	-1.41	2.1	1.6	16	TH
GHP8GQ	45.9	44.9	46.1	44.4	45.3	0.41	2.8	0.8 L	44.8	0.44	2.9	1.2	16	LD
GNT2JY	46.3	46.4	45.5	46.0	46.1	0.66	2.2	0.4 L	45.6	0.69	2.1	1.1	16	LD
JHW2D3	44.3	44.4	42.4	43.0	43.5	-0.19	2.1	1.0	43.7	0.10	2.3	0.8	16	EM
K69JX4	46.3	47.1	49.0	48.1	47.6	1.19	2.6	1.2	46.3	0.91	2.6	1.3	16	LZ
MN7X2X	44.1	42.7	45.8	45.7	44.6	0.18	3.0	1.5	44.4	0.30	2.5	2.1	16	LD
QND8NF	43.5 H	43.4 H	43.2 H	43.2 H	43.3	-0.26	5.5	0.1 L	43.4	0.00	6.6	0.2 L	16	LD
TB3EBT	42.5	41.9	43.1	42.9	42.6	-0.50	2.3	0.5 L	42.9	-0.16	2.4	0.5 L	16	LD
TJKPPU	47.5	46.2	No Data	46.6	46.8	0.90	3.0	0.6 L	46.2	0.89	2.6	1.2	11	XX
V4HZJ9	38.2 H	37.1 H	39.1 H	37.5 *H	38.0	-2.04 *	6.1	0.9	36.6	-2.15 *	4.8	4.0	16	TC
VTWTL4	42.7 L	44.2 L	44.0	43.3 L	43.5	-0.18	1.1	0.7 L	42.3	-0.34	1.3	1.0	16	WK
X92468	33.1 *	35.1 *	35.3 *	82.1 X	46.4	0.77	3.1	23.8 H	40.0	-1.07	2.7	11.8 H	16	MB
XP777L	44.6	46.0	41.5	45.4	44.4	0.09	2.7	2.0	43.9	0.15	2.2	1.6	16	LD
ZA7BHK	49.8	50.1	51.3 *L	50.8 *	50.5	2.16 *	1.5	0.7 L	49.8	2.03 *	1.8	1.1	12	LD
ZZK8C7	39.7	38.4	39.6	40.0	39.4	-1.56	1.8	0.7 L	38.7	-1.49	2.2	1.0	16	TU

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4		Monthly		Cumulative
Wk Mean	42.92	43.20	43.29	43.92	Month Mean	44.08	Grand Mean	43.42
Avg SDr	2.87	2.85	2.98	2.95	Avg SD	2.95	Avg SD	2.92
SD btwn Labs	4.30	3.89	4.11	3.09	SD btwn Labs	2.98	SD btwn Labs	3.17
Labs Incld	24	24	23	22	SD btwn Wks	5.07	SD btwn Wks	2.85
Labs Excld	0	0	0	2	Labs Incld	23	Labs Incld	23
Labs not Rcvd	0	0	1	0				

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

Report #578 (M)
November 2017

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	**TU**	TMI Universal Crush Tester (TMI K440)
WK	Zwick Z005 Crush Tester	**XX**	Instrument make/model not specified by lab

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

Report #578 (M)
November 2017

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
49H7FN	14.8	14.7	14.8	15.0	14.8	0.45	1.0	0.1	14.7	0.32	1.0	0.2	16	LU
67PHPF	15.9 *	16.3 *H	16.1 XH	16.1 X	16.1	3.82 X	1.2	0.2	15.7	2.39 * 1.4		0.4	16	LH
8LCWLB	14.8	15.2 L	15.1	14.9 L	15.0	1.00	0.8	0.2	15.0	1.06	1.0	0.3	16	LA
8WV7DB	14.4	14.7	14.9 L	14.5 L	14.6	0.04	0.6	0.2	14.5	-0.01	0.7	0.2	16	TT
94D2PY	14.5	14.5	14.7	14.2	14.5	-0.39	1.0	0.2	14.4	-0.22	0.9	0.3	15	LB
9WT4X7	14.5	14.2	14.4	14.6	14.4	-0.54	0.9	0.2	14.5	-0.10	0.9	0.3	16	LB
BL4WD7	14.3 L	14.6 L	14.7 L	14.5 L	14.5	-0.30	0.4	0.1	14.4	-0.24	0.5	0.2	16	LA
EDG6F4	14.3	14.0	14.1	14.3	14.2	-1.17	1.0	0.1	14.4	-0.36	0.9	0.3	16	LZ
EM37XY	14.5	14.1	14.0 H	14.6	14.3	-0.85	1.1	0.3	14.3	-0.45	1.0	0.2	16	LU
FGFV82	14.0 L	12.7 *L	13.5 *L	12.9 XL	13.3	-3.55 X	0.2	0.6 H	13.4	-2.40 * 0.1		0.5	16	BK
JHW2D3	14.6	14.0	13.7	14.6	14.2	-1.06	1.0	0.5	14.4	-0.20	1.0	0.5	16	LZ
JM8ETF	14.2	14.2	14.5	14.7	14.4	-0.66	1.0	0.3	14.2	-0.79	1.0	0.4	15	LA
K69JX4	15.5	15.3	14.6	14.8	15.0	1.06	1.1	0.4	14.5	-0.05	1.1	0.6	16	LA
LQ2VGT	14.4	14.7	14.9	14.3	14.6	-0.11	0.8	0.3	14.5	-0.11	0.8	0.3	16	LB
MN7X2X	15.4	15.0	15.2	15.1	15.2	1.44	0.8	0.2	15.1	1.16	0.9	0.2	16	LH
T86ZLJ	14.9	14.7 H	14.7 H	15.0	14.8	0.46	1.1	0.2	14.7	0.36	0.9	0.6	16	LA
TB3EBT	14.6	14.5	14.4	14.4	14.5	-0.43	0.9	0.1	14.3	-0.45	1.0	0.2	16	LB
TJKPPU	14.6 L	14.0 L	14.3 L	14.2 L	14.3	-0.92	0.0	0.3	14.2	-0.66	0.5	0.3	12	XX
V4HZJ9	14.2 H	14.1	14.1	14.5	14.2	-0.99	1.1	0.2	14.2	-0.68	1.1	0.2	16	TS
WBV9MV	14.5	14.2	14.3	14.4	14.4	-0.71	0.9	0.2	14.4	-0.33	0.8	0.1	8	LB
XP777L	14.7	15.8	14.6	15.4 *	15.1	1.24	1.1	0.6 H	14.6	0.20	1.0	0.6	16	LZ
Z3PZ6J	15.2	14.9	14.8	15.0	15.0	0.88	1.0	0.2	15.1	1.27	1.1	0.3	15	LW
Z8DMVH	14.0	14.4	14.3	14.3	14.3	-0.98	0.8	0.2	13.9	-1.41	1.0	0.4	16	XX
ZA7BHK	15.4	15.8 L	15.4 *	15.7 X	15.6	2.53 *	0.6	0.2	15.3	1.68	0.8	0.4	12	LA

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4		Monthly		Grand	
Wk Mean	14.68	14.60	14.52	14.63	Month Mean	14.63	Grand Mean	14.54	
Avg SDr	0.86	0.91	0.94	0.91	Avg SD	0.91	Avg SD	0.92	
SD btwn Labs	0.49	0.74	0.46	0.32	SD btwn Labs	0.38	SD btwn Labs	0.47	
Labs Incld	24	24	23	21	SD btwn Wks	0.26	SD btwn Wks	0.36	
Labs Excld	0	0	1	3	Labs Incld	22	Labs Incld	24	
Labs not Rcvd	0	0	0	0					

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

Report #578 (M)
November 2017

Key to Instrument Codes Reported by Participants

BK	Buchel Strip Compression Tester BK-155	LA	L&W Autoline
LB	L&W Model 152	LH	L&W 282
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