Collaborative Testing Services, Inc.

Containerboard Interlaboratory Testing Program

Participant Summary Report #591 (N) - December 2018

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	CM92	January 2018-Current
	CM91	October 2016-December 2017
35 lb Linerboard	35E1	June 2017-Current
42 lb Linerboard	42D3	November 2017-Current
	42D2	August 2016-October 2017
56 lb Linerboard	56A2	January 2018-Current
	56A1	July 2016-November 2017

ABOUT CTS

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

For further information, contact:
Collaborative Testing Services, Inc
21331 Gentry Drive
Sterling, VA 20166 USA
Voice: 571-434-1925
Fax: 571-434-1937
containerboard@cts-interlab.com

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'.
Labs Incld	-	The number of laboratory Means included in the Grand Mean.

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

Flag	Explanation

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).

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV		SD	Mean	CPV	SD Months	Months	Inst
22XQKC	580.6	0.14		10.60	573.1	-0.10	10.57	4	ER
4336WB	589.2	0.40		12.77	585.6	0.27	12.26	4	EX
46NBWX	530.4	-1.40		6.49	569.6	-0.20	32.53	4	LL
4F6X6Y	574.7	-0.04		9.72	575.1	-0.04	9.39	4	TE
7KCZ8K	601.2	0.77		15.08	575.0	-0.04	20.44	4	LG
A4FZPV	576.0	0.00		37.29	577.2	0.02	2.84 L	4	LM
CABNDD	596.6	0.63		8.29	590.0	0.39	4.89	4	ET
CQKH32	573.0	-0.09		30.51	560.4	-0.46	12.71	4	ER
F7KNM8	564.0	-0.37		34.07	565.8	-0.31	5.83	4	LS
FMPXPT	547.0	-0.89		16.82	534.5	-1.22	13.95	4	LL
JTZHZU	571.1	-0.15		14.39	564.7	-0.34	20.35	4	LM
K79HDZ	618.3	1.29		18.54	634.9	1.70	14.01	4	TC
KTHLC2	642.5	2.03	*	21.05	590.0	0.39	47.89 H	4	ET
LFBZMG	565.2	-0.33		17.66	518.0	-1.70	34.63	4	LS
NB8YJP	551.3	-0.76		34.62	537.0	-1.14	16.84	4	ER
QZWK8E	654.2	2.39	*	15.77	659.7	2.42 *	10.67	4	ER
UGBXD2	712.8	4.18	X	20.08	650.6	2.15 *	44.40 H	4	LG
WPFRHE	539.3	-1.12		19.64	539.2	-1.08	3.61 L	4	LS
WPJ6AG	595.2	0.58		13.44	586.5	0.29	9.72	4	ES
Y3YBTL	533.9	-1.29		30.42	558.2	-0.53	16.44	4	LS
YDD9V4	540.0	-1.10		6.91	584.8	0.24	42.04	4	LS
YWCGX9	559.2	-0.52		19.69	551.2	-0.73	9.84	4	LG
ZP9W9J	570.8	-0.16		15.59	576.9	0.01	10.54	4	LG

Consensus (All Labs) Results

Month Mean	576.08	Grand Mean	576.42
Avg SD	20.67	Avg SD Months	21.94
SD btwn Labs	32.73	SD btwn Labs	34.46
Labs Incld	22	Labs Incld	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	557.71	13.31	18.37	5
Clip sealing	581.48	35.01	5.40	17

Key to Instrument Codes Reported by Participants

ER	Emerson 6200 Series	ES	Emerson 8510
ET	Emerson 7200	EX	Emerson Apparatus (Model not specified)
LG	TLS / L.A.B. Validator Series	LL	Lansmont 76-5K
LM	Lansmont 122-15k	LS	Lansmont Squeezer
TC	TMI Monitor/Compression Tester, Model 17-37	TE	Testometric M500 - 25 KN

Containerboard Interlaboratory Testing Program

Analysis 202

Edgewise Compressive Strength, by T811, Corrugated Board - EC11

TAPPI Official Test Method T811

Report #591 (N)
December 2018

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2MTWKM	42.3	0.35	1.66		42.5	0.35	0.34	4	LC
FUMKJE	49.4	1.70	2.47		49.4	1.82	0.00	1	TD
GTRLK7	38.9	-0.29	2.31		37.2	-0.75	1.16	4	XX
NB8YJP	40.8	0.06	3.37		39.7	-0.23	0.81	4	EN
RMPU67	36.2	-0.81	1.00	L	37.0	-0.79	1.14	2	WK
WPFRHE	42.6	0.40	2.25		43.7	0.60	0.81	4	LC
XM8UNW	43.8	0.64	1.77		42.7	0.40	2.28	4	LC
Y3YBTL	35.4	-0.97	3.80		39.7	-0.24	3.90	H 4	LD
YDD9V4	28.7	-2.25 *	2.84		30.3	-2.22 *	1.99	4	EM
YWCGX9	43.9	0.64	1.31		44.3	0.73	0.60	4	TH
YXQLW8	40.8	0.06	3.07		40.0	-0.17	1.08	2	LD
ZP9W9J	43.0	0.48	2.45		43.2	0.50	0.32	4	LE

Consensus (All Labs) Results

Month Mean	40.48	Grand Mean	40.81
Avg SD	2.49	Avg SD Months	1.65
SD btwn Labs	5.25	SD btwn Labs	4.74
Labs Incld	12	Labs Incld	12

Key to Instrument Codes Reported by Participants

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

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
22XQKC	43.5	-0.47	1.29		44.3	0.06	0.68	4	LD
2MTWKM	44.2	-0.19	0.92		43.4	-0.47	0.59	4	LC
4336WB	46.5	0.87	0.80	L	46.2	1.19	1.33	3	LD
43HNG9	45.8	0.55	3.68	H	43.9	-0.18	1.31	4	XX
46NBWX	89.0	20.07 X	2.19		55.2	6.41 X	22.59 H	4	BU
4F6X6Y	46.0	0.66	1.38		46.0	1.04	0.19 L	4	LD
6PVUQZ	43.2	-0.63	2.63		37.8	-3.72 X	10.83 H	4	LD
7KCZ8K	45.2	0.25	2.65		42.0	-1.28	4.29 H	4	TJ
84JPWM	49.0	1.99 *	1.75		45.9	0.98	4.43	2	EM
9EY4DV	55.7	5.00 X	0.46	L	51.7	4.41 X	5.73 H	4	LD
A4FZPV	43.5	-0.49	2.15		47.1	1.72	3.18	4	EM
C2ETDU	43.1	-0.67	1.98		73.9	17.36 X	20.85 H	4	LC
C89J6Y	42.1	-1.11	2.34		43.4	-0.47	1.19	4	LD
CABNDD	41.9	-1.22	1.01		42.7	-0.87	1.22	4	EM
E9TGZV	42.8	-0.82	2.35		43.5	-0.42	1.18	4	CT
F993AW	41.3	-1.48	1.07		42.0	-1.30	1.04	4	LD
FMPXPT	43.3	-0.56	1.90		43.4	-0.49	0.53	4	LC
FUMKJE	49.4	2.19 *	2.47		45.7	0.89	5.80 H	4	TD
G3CV6T	44.7	0.05	1.63		43.4	-0.48	1.04	4	EM
GGX6V6	45.0	0.17	1.93		45.4	0.71	0.81	4	LD
JTZHZU	46.7	0.97	0.78	L	45.9	1.00	1.69	4	TG
KTHLC2	43.9	-0.33	1.47		42.1	-1.21	1.18	4	TD
LFBZMG	49.1	2.04 *	2.02		44.2	0.02	3.42	4	TB
MTAL4W	44.2	-0.19	1.22		44.6	0.26	0.47	4	EM
NAX24M	45.0	0.19	1.65		44.1	-0.03	0.78	4	LD
NB8YJP	41.9	-1.20	2.24		42.0	-1.29	0.28 L	4	EN
QZWK8E	43.2	-0.63	1.65		42.8	-0.81	0.44	4	EM
RMPU67	42.4	-0.97	0.82		42.0	-1.29	0.63	2	WK
RZBA7K	45.6	0.46	2.31		44.4	0.14	0.87	4	TD
UGBXD2	43.8	-0.37	1.88		43.9	-0.15	0.59	4	EM
UH8GCH	47.8	1.47	2.04		48.1	2.29 *	1.05	4	TG
V2VGJ6	47.1	1.11	1.91		45.4	0.73	1.65	3	LC
WH3UWF	43.6	-0.45	1.15		44.4	0.12	0.71	4	LD
WPFRHE	43.8	-0.36	2.32		44.7	0.29	0.67	4	LC
WPJ6AG	45.6	0.46	1.59		44.7	0.28	1.72	4	LD
XM8UNW	47.1	1.13	1.25		46.1	1.09	0.97	4	LC
Y3YBTL	45.3	0.30	1.70		45.8	0.96	2.59	4	LD
YDD9V4	41.2	-1.55	1.40		41.0	-1.86	0.36	4	EM
YWCGX9	45.5	0.43	1.02		45.3	0.62	0.41	4	TH

	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
YXQLW8	40.2	-1.99 *	1.46	40.6	-2.12 *	1.39	4	LD
ZP9W9J	45.5	0.41	2.00	44.8	0.33	0.53	4	LY

Consensus (All Labs) Results

Month Mean	44.59	Grand Mean	44.19
Avg SD	1.84	Avg SD Months	1.87
SD btwn Labs	2.22	SD btwn Labs	1.71
Labs Incld	39	Labs Incld	37

Key to Instrument Codes Reported by Participants

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

	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
22XQKC	114.3	110.4	112.3	106.2	110.8	0.20	11.8	3.5	113.7	1.43	10.4	3.2	16	AH
2JXZ69	108.8	106.9 H	105.6	110.5 H	108.0	-0.55	15.0	2.1	106.7	-0.97	11.8	2.5	16	LC
379BYB	106.6	106.2	113.0	112.9	109.7	-0.09	10.9	3.8	109.1	-0.17	10.5	3.2	16	LJ
4336WB	116.9	111.6	112.4	109.2	112.5	0.65	12.3	3.2	110.6	0.36	11.0	3.0	16	AH
4FR7E3	111.2	106.4	113.2	113.4	111.1	0.27	9.7	3.2	110.7	0.40	11.0	2.8	16	LA
4PFXZA	107.3	107.6 L	109.6 L	107.3 L	108.0	-0.55	4.0	1.1	107.9	-0.58	4.1	1.4	16	LA
8RTU43	108.5	105.6	106.1	103.8	106.0	-1.06	8.7	2.0	105.9	-1.27	9.8	3.4	16	LA
99ALWX	106.8	108.4	105.7	107.9	107.2	-0.75	9.4	1.2	108.5	-0.37	11.4	2.2	16	LC
AMTKLY	108.5	109.0	104.8	108.5	107.7	-0.62	9.9	2.0	108.8	-0.27	10.3	2.4	16	LA
B4DK74	111.7	106.5 L	108.6 L	107.5	108.6	-0.39	4.8	2.2	110.7	0.40	6.8	2.5	16	LC
BCHRL4	109.4	108.2	109.7	117.5	111.2	0.31	12.0	4.3	111.3	0.59	11.7	3.0	16	LA
BTVZNT	102.6	No Data	108.2	107.0	105.9	-1.08	12.1	3.0	108.9	-0.22	13.0	4.7	10	LC
BU7TM2	115.7	118.1 *	116.3	120.7 *	117.7	2.01 *	11.4	2.2	116.1	2.23	*11.1	2.8	16	AH
BYE4VV	108.9	112.9	110.7	108.8	110.3	0.07	7.3	1.9	109.8	0.10	5.4	1.1	12	LA
C2ETDU	108.0	112.5	114.4	113.0 L	111.9	0.50	8.9	2.8	112.4	0.97	11.3	3.3	16	LA
C89J6Y	107.8	107.5	106.7	108.3	107.6	-0.65	11.3	0.7	107.1	-0.86	10.7	3.7	16	LC
CAE4RY	110.4	112.1	111.8	107.7	110.5	0.12	13.6	2.0	110.8	0.43	12.9	2.5	16	TB
CQKH32	107.3	113.3	108.2	100.9	107.4	-0.69	11.4	5.1	106.1	-1.17	11.7	3.1	16	LZ
CTBJ9P	111.0	109.6	111.0	111.2	110.7	0.17	6.0	0.7	111.8	0.75	5.8	2.4	16	RE
DLLH4W	109.9	104.6	106.2	107.9	107.1	-0.77	8.9	2.3	106.5	-1.04	9.7	3.0	10	LJ
E4YF8T	109.8	110.3	109.1	99.8 *	107.2	-0.74	11.3	5.0	107.8	-0.61	11.4	3.6	16	LC
E9TGZV	112.8	116.9	111.9 L	112.3	113.5	0.90	8.5	2.3	111.5	0.68	10.2	2.8	16	XX
EV6EKN	109.4	107.1	106.8	111.3	108.7	-0.37	8.7	2.1	109.0	-0.21	8.3	1.5	16	AH
EY938Q	103.5	109.0	115.1	103.5 L	107.8	-0.60	8.9	5.5	111.2	0.57	10.4	4.1	16	AX
FVLTMR	107.2	104.1	109.3 L	107.9	107.1	-0.77	7.3	2.2	100.9	-2.97 X	8.1	5.1	12	XX
G7GEDM	112.1 L	112.9 L	103.1 L	108.6 L	109.2	-0.23	3.6	4.4	108.2	-0.46	9.5	4.3	12	LC
GGX6V6	112.2	112.3	111.4	112.6	112.1	0.55	8.2	0.5 L	112.1	0.86	8.0	0.5 L	16	LA
GJJUDW	110.1 L	110.3 L	110.8 L	110.4 L	110.4	0.09	3.0	0.3 L	109.9	0.10	3.2	0.6 L	12	LJ
GPBWJH	108.9	108.4 L	110.7 L	No Data	109.3	-0.19	4.4	1.2	109.3	-0.10	4.3	0.8 L	11	XX
KNQAJQ	107.3	110.2	116.6	117.1	112.8	0.71	13.7	4.8	109.5	-0.04	12.8	4.4	16	LC
L2RF3N	116.2	114.5	120.1 *	115.4	116.6	1.71	10.5	2.5	110.7	0.40	10.6	6.1	10	AH
LUTQLJ	110.3	107.7	119.0 *	110.7	111.9	0.49	11.5	4.9	111.8	0.75	11.7	3.1	16	LZ
MZW8FP	104.9	103.1	105.6	105.4	104.8	-1.39	11.3	1.1	104.6	-1.69	11.6	2.7	16	LC
NAX24M	124.4 X	114.7	112.6 H	118.5	117.6	1.97 *	12.9	5.2	110.8	0.43	11.2	5.0	16	LC
NB4LRM	113.0	113.2	115.9	121.1 *	115.8	1.51	12.9	3.8	113.5	1.35	11.6	4.0	16	LC

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
PWM2TF	109.5	108.1	109.0	109.0	108.9	-0.30	11.7	0.6	109.0	-0.19	11.6	2.5	15	TB
R7LKZZ	112.6	109.6	108.2	108.3	109.7	-0.10	11.6	2.1	107.9	-0.58	11.1	3.1	16	XX
RLE6MF	113.9	117.7	112.7	112.5	114.2	1.09	9.4	2.4	113.9	1.49	8.9	4.0	16	TB
UERY4D	105.8	103.4	104.7	105.4	104.8	-1.37	10.0	1.1	105.3	-1.46	10.2	2.3	16	LB
UMGUW2	114.0	107.5	115.5	106.9	111.0	0.24	12.8	4.4	110.7	0.39	12.3	3.2	16	LC
UTTHWX	119.7 *	120.2 *H	119.4 *	120.4 *	119.9	2.60 *	14.1	0.4 L	111.9	0.80	13.2	7.3 H	16	LC
VJATAA	109.9	111.0	111.8	107.4 L	110.0	0.00	8.6	1.9	107.9	-0.56	9.8	2.4	16	LC
VRWFP9	117.7	126.8 X	114.8	111.9	117.8	2.04 *	15.0	6.4 H	115.1	1.90	12.3	7.5 H	16	LA
WPFRHE	105.0	101.7	101.1 *	102.8	102.7	-1.94 *	11.4	1.7	103.2	-2.20	*10.9	1.8	16	AH
WPJ6AG	104.1	105.4 H	104.7	105.1 H	104.8	-1.37	15.2	0.6	106.9	-0.91	13.2	2.7	16	LA
XU6LV7	107.8	106.7	110.8	108.5	108.5	-0.42	8.3	1.7	107.6	-0.67	8.3	1.5	16	TP
Y2N6Y7	108.3	105.7	109.2 L	109.1	108.1	-0.52	6.6	1.6	108.1	-0.51	8.3	1.6	16	LA
Y3YBTL	102.4	109.2	112.8	106.4	107.7	-0.61	9.0	4.4	104.6	-1.70	9.1	3.9	16	LA
YB9F26	101.9	108.1	112.8	104.3	106.8	-0.86	6.2	4.7	109.1	-0.15	7.5	4.8	16	AH
YXQLW8	108.0	104.8	104.2	109.3	106.6	-0.91	8.6	2.5	106.6	-1.01	9.1	3.6	16	LA
ZDYW27	119.0 *	119.7 *	112.8	114.4	116.5	1.69	13.6	3.4	115.7	2.11	*12.4	2.9	16	LZ
ZNV3V4	106.3	104.4	109.6	104.8	106.3	-0.99	12.2	2.4	106.6	-1.01	12.0	1.7	16	LC
ZP9W9J	114.1	114.5	111.1	115.4	113.8	0.98	11.6	1.9	113.8	1.47	12.5	3.3	16	LZ

Consensus (All Labs) Results

Wk Mean	109.79	109.60	110.51	109.74	Month Mean	110.04	Grand Mean	109.56
Avg SDr	10.59	10.42	10.88	9.94	Avg SD	10.46	Avg SD	10.42
SD btwn Labs	4.14	4.32	4.21	4.85	SD btwn Labs	3.81	SD btwn Labs	2.92
Labs Incld	52	51	53	52	SD btwn Wks	3.03	SD btwn Wks	3.38
Labs Excld	1	1	0	0	Labs Incld	53	Labs Incld	52
Labs not Rcvd	0	1	0	1				

Key to Instrument Codes Reported by Participants

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		

	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
22XQKC	96.3	91.0	92.5	98.5	94.6	0.59	8.9	3.4	92.8	0.15	8.9	3.1	12	AH
2JXZ69	89.1	94.3 H	96.0	102.0	95.4	0.81	9.6	5.3	91.9	-0.15	8.0	4.6	10	LA
379BYB	90.4	95.2	90.7	92.2	92.1	-0.11	8.3	2.2	91.0	-0.46	8.8	2.6	12	LJ
4336WB	96.7	92.0	94.0	93.6	94.1	0.45	8.7	2.0	93.5	0.36	7.9	2.5	12	AH
4FR7E3	89.7	90.7	93.2	91.2	91.2	-0.37	8.0	1.5	91.7	-0.21	8.8	2.6	12	LA
4PFXZA	93.9	92.0 L	92.0 L	90.8 L	92.2	-0.09	3.2	1.3	91.8	-0.20	3.5	1.7	12	LA
8RTU43	89.3	86.1	91.9	83.9	87.8	-1.34	6.7	3.5	88.8	-1.20	7.3	3.5	12	LA
99ALWX	91.2	84.4	94.2	85.4	88.8	-1.05	9.2	4.7	90.1	-0.75	8.1	3.7	12	LC
AMTKLY	93.5	96.0	90.2	95.9	93.9	0.39	8.2	2.7	91.7	-0.22	8.3	2.9	12	LA
BCHRL4	91.8	99.1	95.1	96.4	95.6	0.88	8.1	3.0	94.6	0.74	7.9	3.3	12	LA
BTVZNT	83.4 *	No Data	95.1	92.5	90.3	-0.62	5.3	6.2 H	91.9	-0.15	8.2	3.9	11	LC
BU7TM2	97.5	102.6 *	101.0 *	101.4	100.6	2.32 *	7.3	2.2	99.9	2.50 *	8.0	2.0	12	AH
BYE4VV	90.9	93.4	93.4	90.6	92.1	-0.11	7.8	1.5	92.3	-0.03	5.6	0.9	12	LA
C2ETDU	86.0	97.7	89.9	92.7	91.6	-0.26	9.2	4.9	93.7	0.44	8.6	3.3	12	LA
C89J6Y	87.2	94.8	90.1	91.8	91.0	-0.44	6.5	3.2	91.0	-0.47	6.8	2.7	12	LC
CAE4RY	93.9	92.4	92.1	93.5	93.0	0.13	7.1	0.8	93.0	0.21	8.4	2.9	12	TB
CQKH32	91.1	85.8	86.6	80.6 *	86.0	-1.84	9.2	4.3	87.4	-1.67	8.2	3.1	12	LA
CTBJ9P	95.8 L	95.6 L	93.8	93.2	94.6	0.60	4.1	1.3	95.7	1.12	4.9	2.1	12	RE
DLLH4W	88.4	90.8	89.9	86.7	88.9	-1.01	8.2	1.8	89.2	-1.06	7.7	1.8	6	LJ
E4YF8T	96.3	85.3	88.6	84.5	88.7	-1.10	10.0	5.4	90.0	-0.81	9.0	3.9	12	LA
E9TGZV	96.2	97.4	93.7	92.2	94.9	0.68	9.3	2.4	95.4	0.99	8.7	2.7	12	XX
EV6EKN	90.7	88.8	89.1	89.2	89.5	-0.87	6.5	0.9	89.8	-0.87	6.6	1.0	12	AH
EY938Q	92.3 L	96.2	92.6	96.3	94.3	0.53	5.2	2.2	94.4	0.67	7.0	3.7	12	AX
FVLTMR	95.8	93.4	93.3	95.7	94.6	0.59	7.0	1.4	90.3	-0.68	6.9	5.1	8	XX
G7GEDM	85.0	99.0 L	94.8	92.8	92.9	0.11	4.4	5.8	92.8	0.14	8.4	4.0	12	LC
GGX6V6	92.6	93.1	92.9 L	93.3 L	93.0	0.14	3.7	0.3 L	92.7	0.10	5.3	0.5 L	12	LA
GJJUDW	90.7 L	90.9 L	90.8 L	90.3 L	90.7	-0.52	2.7	0.2 L	91.7	-0.23	3.8	0.8 L	12	LJ
GPBWJH	89.0	90.5	91.7 L	No Data	90.4	-0.60	4.3	1.4	90.0	-0.78	4.5	0.9	8	XX
KNQAJQ	93.8	99.2	94.9	91.3 H	94.8	0.65	9.5	3.3	92.9	0.18	8.7	2.8	12	XX
L2RF3N	101.2 *	99.0	99.9 *	96.0	99.0	1.86	7.1	2.2	97.1	1.56	7.2	2.8	8	AH
LUTQLJ	95.7	91.2	95.3	91.7	93.4	0.27	7.8	2.4	93.7	0.42	8.4	2.3	12	LZ
MZW8FP	90.1	91.5	90.2	83.1	88.7	-1.07	8.5	3.8	89.7	-0.91	8.4	2.9	12	LC
NAX24M	98.5	98.8	97.7	98.8	98.5	1.70	8.7	0.5	94.4	0.68	7.7	3.2	12	LC
NB4LRM	91.2	96.2	99.6 *	99.6	96.7	1.19	9.3	4.0	94.8	0.81	8.8	3.2	12	LC
PWM2TF	93.7	90.9	89.1	92.3	91.5	-0.28	8.2	1.9	91.7	-0.23	9.1	3.7	12	TB

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

Report #591 (N)
December 2018

	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
R7LKZZ	94.3	92.5	91.4	93.4	92.9	0.11	8.6	1.2	91.6	-0.27	8.4	2.4	12	XX
RLE6MF	94.3	101.7	96.4	100.9	98.3	1.66	8.0	3.5	97.1	1.56	8.0	4.2	12	TB
UERY4D	89.3	88.2	90.6	89.4	89.4	-0.88	7.2	1.0	87.3	-1.69	6.5	1.9	12	LB
UMGUW2	90.4	90.2	96.6	95.5	93.2	0.19	9.3	3.4	93.7	0.45	8.7	3.1	12	LC
UTTHWX	109.3 X	101.4	104.7 X	105.8 *	105.3	3.65 X	8.9	3.3	96.8	1.48	8.8	7.1 H	12	LC
VJATAA	92.7	96.3	89.7	90.3	92.3	-0.07	8.2	3.0	93.3	0.32	7.8	3.9	8	LC
VRWFP9	105.2 X	101.9	95.5	94.8	99.3	1.95 *	9.2	5.0	99.6	2.39	*10.4	5.0	12	LA
WPFRHE	88.3	90.3	88.1	89.8	89.1	-0.96	7.4	1.1	88.5	-1.28	7.6	2.0	12	AH
WPJ6AG	86.1	90.9	87.6	88.3	88.2	-1.22	8.3	2.0	88.4	-1.32	7.9	1.7	12	LA
XU6LV7	88.6	89.5	86.5	87.6	88.1	-1.27	6.5	1.3	88.8	-1.19	6.8	1.2	12	TP
Y2N6Y7	87.4 L	89.0 L	88.1	87.1	87.9	-1.31	3.7	0.8	89.0	-1.12	5.3	2.4	11	LA
Y3YBTL	87.5	86.5	89.7	92.0	88.9	-1.01	9.3	2.4	90.3	-0.71	7.9	2.7	12	LA
YB9F26	94.3	94.7	90.4	92.6	93.0	0.14	6.6	1.9	93.7	0.45	7.0	2.8	12	AH
YXQLW8	91.9	86.6	85.3 *	87.9	87.9	-1.30	7.2	2.8	89.1	-1.10	6.0	3.1	12	LA
ZDYW27	100.0 *	95.2	97.5	97.0	97.4	1.41	9.8	2.0	97.3	1.66	9.4	2.2	12	LZ
ZNV3V4	89.7	89.6	88.8	87.8	89.0	-1.01	8.0	0.9	89.3	-1.04	8.7	1.8	12	LC
ZP9W9J	98.8	100.6	95.0	95.2	97.4	1.39	8.4	2.8	96.6	1.42	8.9	2.5	12	LZ

Consensus (All Labs) Results

Wk Mean	92.05	93.34	92.41	92.46	Month Mean	92.50	Grand Mean	92.38
Avg SDr	7.76	7.63	7.78	7.74	Avg SD	7.71	Avg SD	7.76
SD btwn Labs	3.97	4.71	3.55	5.03	SD btwn Labs	3.51	SD btwn Labs	3.00
Labs Incld	50	51	51	51	SD btwn Wks	2.93	SD btwn Wks	3.06
Labs Excld	2	0	1	0	Labs Incld	51	Labs Incld	52
Labs not Rcvd	0	1	0	1				

Key to Instrument Codes Reported by Participants

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 #591 (N)
December 2018

	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
22XQKC	86.9	85.3	85.4	86.9	86.1	-0.65	4.8	0.9	85.4	-1.03	4.2	1.7	16	LD
2JXZ69	88.0	87.0	87.9	85.1	87.0	-0.43	3.6	1.4	87.9	-0.26	3.6	1.6	16	LD
379BYB	91.9	90.2	90.7	90.6	90.9	0.56	3.7	0.8	90.7	0.63	3.9	1.4	16	LD
4F6X6Y	91.7	92.3	91.5 L	91.6	91.8	0.79	2.4	0.4 L	91.6	0.93	2.7	1.3	16	LD
4PFXZA	84.9	84.3	84.8 L	84.0 L	84.5	-1.06	1.9	0.4 L	84.7	-1.25	1.9	0.4 L	16	TU
6C6WP3	92.0	93.4	92.4	93.0	92.7	1.03	3.5	0.6	92.0	1.03	4.3	1.4	8	MB
8RTU43	87.9	88.6	88.4	88.5	88.3	-0.08	4.2	0.3 L	87.4	-0.39	4.3	3.8	16	LZ
976PW4	89.8	88.6	88.6	89.8	89.2	0.14	3.2	0.7	90.5	0.56	3.9	2.0	16	LD
9D6BHC	95.1	93.1	93.4	93.6	93.8	1.31	3.0	0.9	94.2	1.72	4.4	1.4	16	LD
ALCDEW	89.5	86.4	87.7	No Data	87.9	-0.20	4.4	1.5	85.7	-0.93	4.1	2.0	10	EX
AMTKLY	93.0	93.5	90.9	91.8	92.3	0.93	3.5	1.2	91.0	0.73	4.4	1.0	16	LD
BAGJJE	90.7	91.8	88.7	93.2	91.1	0.62	4.2	1.9	91.8	0.98	4.0	1.8	12	LD
BCHRL4	99.1 *	98.5 *	95.3 *	71.2 XH	91.0	0.60	5.9	13.4 H	85.5	-0.99	7.7	14.7 H	16	LC
BM6MPP	78.6 *	79.7 *	82.6 *	77.1 *	79.5	-2.34 *	3.8	2.3	75.7	-4.07 X	3.6	4.7	16	TH
BTVZNT	94.3	94.5	93.8	90.1	93.2	1.15	3.7	2.1	92.0	1.04	4.1	3.2	13	LD
BYE4VV	91.4	89.5	88.5	90.0	89.9	0.31	3.3	1.2	88.9	0.06	3.0	1.4	12	LZ
C2ETDU	87.9 H	86.2 H	85.3 H	89.4 H	87.2	-0.37	8.8	1.8	88.6	-0.02	7.5	4.4	16	LC
C89J6Y	86.0	88.4	89.7	88.4	88.1	-0.14	3.5	1.5	86.8	-0.59	4.1	1.8	16	LD
CAE4RY	91.2	No Data	85.2	99.8 *	92.1	0.87	5.5	7.3 H	90.6	0.59	4.6	3.9	15	LD
CQKH32	85.5	87.0	83.6 H	84.9	85.3	-0.87	6.3	1.4	85.6	-0.96	4.9	1.6	16	LD
CTBJ9P	93.9	94.9 L	93.0	94.5	94.1	1.38	3.0	0.9	90.1	0.43	2.9	2.9	16	LZ
DLLH4W	94.8	89.5	87.4	89.1	90.2	0.40	3.9	3.2	92.4	1.16	4.0	2.9	10	LD
E4YF8T	89.5 L	87.0	87.9	84.4	87.2	-0.37	3.4	2.1	84.7	-1.25	3.0	2.5	16	LC
EY938Q	80.5 *	80.6	73.0 X	82.9	79.2	-2.40 *	4.3	4.3	77.3	-3.56 X	5.5	3.6	16	LC
GGX6V6	90.9	91.2	91.1	91.7	91.2	0.65	3.6	0.3 L	91.5	0.88	3.5	0.4 L	16	LD
GJJUDW	89.7 L	89.7 L	89.3 L	89.4 L	89.5	0.22	1.2	0.2 L	65.8	-7.14 X	0.9	33.9 H	12	LD
GMLQZ7	No Data	No Data	93.3	No Data	93.3	1.20	2.0	0.0	98.6	3.11 X	4.1	11.3 H	11	XX
GPBWJH	72.9 X	77.3 *	87.8	No Data	79.3	-2.38 *	3.9	7.7 H	76.3	-3.88 X	3.6	6.1	14	LD
HLL8DV	75.0 X	73.5 X	71.6 XL	74.3 X	73.6	-3.84 X	2.4	1.5	72.3	-5.12 X	3.5	2.9	16	RS
L2RF3N	93.7	91.5 H	91.8	86.1	90.8	0.54	5.1	3.3	91.4	0.85	4.9	2.5	10	LC
MBB9TB	76.6 XH	87.6	90.3	77.3 *H	82.9	-1.46	6.3	7.0 H	83.9	-1.50	5.8	5.7	16	MB
MTAL4W	87.0	82.4	84.9	83.9	84.6	-1.05	4.0	1.9	83.2	-1.71	4.4	1.6	16	EM
MZW8FP	89.2	90.8	90.7	92.5	90.8	0.55	4.5	1.3	91.4	0.84	4.5	1.6	16	LD
NAX24M	85.3	85.5	86.3	86.6	85.9	-0.70	2.7	0.6	86.5	-0.70	7.2	2.3	16	LD
NB8YJP	81.8	82.4	85.1	84.2	83.4	-1.35	3.7	1.5	82.6	-1.92	3.9	1.6	16	EN

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

Report #591 (N)
December 2018

	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
RFR3XX	98.8 *	97.0	92.5	95.3	95.9	1.85	3.9	2.7	92.5	1.19	4.1	3.3	16	TH
RLE6MF	104.9 X	105.0 X	104.3 X	107.0 X	105.3	4.24 X	4.9	1.1	103.2	4.54 X	4.8	3.2	16	LX
RZBA7K	91.0 L	92.0 L	93.3 L	90.5 L	91.7	0.77	1.3	1.3	92.9	1.31	1.3	1.9	16	TD
UERY4D	89.9	90.5	93.3	91.9	91.4	0.70	4.6	1.5	91.9	1.02	4.4	1.2	16	LC
UGBXD2	87.4	84.9	84.7	83.7	85.2	-0.89	3.5	1.6	84.5	-1.31	3.5	2.6	16	EM
UH8GCH	90.9	91.0	89.9	90.1	90.5	0.46	3.5	0.5	88.8	0.03	3.6	1.3	16	TH
VRWFP9	90.5	92.7	93.5	91.3	92.0	0.85	4.0	1.3	91.7	0.94	4.6	3.8	16	LZ
WPFRHE	90.4	89.6	87.1	92.1	89.8	0.29	3.6	2.1	91.2	0.80	3.9	1.8	16	LC
XM8UNW	85.3	86.5	85.6	86.3	85.9	-0.70	3.8	0.6	85.4	-1.03	3.6	1.2	16	LC
XU6LV7	89.2	88.6 H	86.3	87.7	87.9	-0.18	6.5	1.2	89.3	0.19	4.7	2.4	16	TJ
Y2N6Y7	88.1	87.7	89.0 L	86.0	87.7	-0.24	2.6	1.3	87.3	-0.43	3.0	1.1	16	LD
Y3YBTL	92.9	91.3	89.6	91.4	91.3	0.67	3.4	1.4	88.8	0.04	3.5	2.1	16	LD
YB9F26	98.9 *	91.8	92.3 H	94.4	94.4	1.45	5.8	3.2	94.1	1.69	4.8	2.9	16	LZ
YXQLW8	81.9	84.7	85.3	83.6	83.9	-1.22	2.9	1.5	84.3	-1.37	3.1	2.2	16	LD
ZDYW27	90.1	89.0	87.4	87.6	88.5	-0.03	3.2	1.3	87.5	-0.38	3.7	2.3	16	LC
ZNV3V4	86.4	86.2	86.4	84.9	86.0	-0.68	3.8	0.7	86.1	-0.80	4.3	1.8	16	LD
ZP9W9J	90.8	86.5	85.7	84.2	86.8	-0.48	2.9	2.8	86.0	-0.85	3.6	2.7	16	LG

Consensus (All Labs) Results

Wk Mean	89.67	88.73	88.88	88.50	Month Mean	88.66	Grand Mean	88.68
Avg SDr	3.79	4.01	4.32	4.04	Avg SD	4.10	Avg SD	4.28
SD btwn Labs	4.38	4.30	3.19	4.50	SD btwn Labs	3.92	SD btwn Labs	3.20
Labs Incld	47	48	49	46	SD btwn Wks	3.11	SD btwn Wks	3.22
Labs Excld	4	2	3	3	Labs Incld	50	Labs Incld	45
Labs not Rcvd	1	2	0	3				

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
EX	Emerson (model not specified)	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LG	L&W 753
LX	L&W 506	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	RS	Regmed Digital Crush Tester CT-2000
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		

	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
22XQKC	77.8	75.1	77.7	74.4 L	76.3	-0.72	2.1	1.8	75.7	-0.99	2.8	1.3	12	LD
2JXZ69	78.8	79.5	79.3	79.6	79.3	0.04	2.8	0.4 L	80.2	0.37	2.5	1.3	12	LD
379BYB	81.4	80.9	78.5	80.7	80.4	0.32	3.0	1.3	81.1	0.66	2.9	1.3	12	LD
4F6X6Y	83.5	83.9	82.5	82.5	83.1	1.00	2.4	0.7	83.0	1.25	2.6	0.5 L	12	LD
4PFXZA	74.5	74.4	75.0 L	74.6 L	74.6	-1.13	1.6	0.3 L	74.2	-1.48	1.6	0.7 L	12	TU
6C6WP3	79.1	78.0	76.2	67.1 *H	75.1	-1.00	5.4	5.5 H	73.7	-1.62	5.4	9.0 H	12	MB
8RTU43	80.9	79.7	78.8	73.2	78.1	-0.25	3.0	3.4	76.6	-0.74	3.3	3.0	12	LZ
976PW4	80.2	78.3	79.3	78.2	79.0	-0.04	2.7	0.9	81.1	0.67	2.9	1.9	12	LD
9D6BHC	84.8	87.0	85.4	86.8	86.0	1.72	3.1	1.1	85.6	2.05 *	3.3	0.9 L	12	LD
ALCDEW	77.7	79.9	78.5	No Data	78.7	-0.10	2.8	1.1	77.3	-0.52	3.0	1.6	8	EX
AMTKLY	80.6	81.2	81.0	79.7	80.6	0.38	3.9	0.7	79.8	0.25	4.2	1.0 L	12	LD
BAGJJE	81.0	81.0	81.5	82.2	81.4	0.58	4.3	0.6	81.4	0.76	4.3	0.6 L	4	LD
BCHRL4	91.2 *	88.5 *	89.7 *	75.8 H	86.3	1.80	7.6	7.1 H	81.7	0.83	6.6	11.2 H	12	LC
BM6MPP	71.0	72.5	74.1	73.2	72.7	-1.62	3.7	1.3	68.2	-3.33 X	3.1	3.5	12	TH
BTVZNT	80.2	80.3	80.8	78.5	80.0	0.21	3.4	1.0	80.0	0.33	3.2	2.2	12	LD
C2ETDU	81.9 H	77.8 H	75.3 H	66.9 *	75.5	-0.92	6.9	6.3 H	74.1	-1.50	7.7	7.3	12	LC
C89J6Y	79.2	77.3	74.3	75.7	76.6	-0.63	3.3	2.1	76.1	-0.87	3.6	1.8	12	LD
CAE4RY	80.4	No Data	72.4	88.5 *	80.4	0.33	5.4	8.1 H	79.3	0.10	5.4	3.9	11	LC
CQKH32	78.1	77.4	78.3	79.3	78.3	-0.22	3.3	0.8	77.6	-0.43	3.6	1.2	12	LD
CTBJ9P	85.7	84.6	85.1	86.7	85.5	1.60	3.1	0.9	81.5	0.79	3.1	3.4	12	LZ
DLLH4W	84.3	88.1	82.1	84.7	84.8	1.42	2.9	2.5	85.0	1.85	3.0	2.2	6	LD
E4YF8T	77.6	75.0	79.1	77.7	77.4	-0.44	3.4	1.7	76.2	-0.86	3.1	1.9	12	LC
EY938Q	70.4 *	67.4 *	59.3 X	69.6	66.7	-3.12 X	3.2	5.1	66.0	-4.00 X	3.4	3.0	12	LC
GGX6V6	80.6	81.4	80.7	80.6	80.8	0.43	3.5	0.4 L	80.9	0.60	3.4	0.4 L	12	LD
GJJUDW	80.6 L	80.4 L	80.4 L	80.5 L	80.5	0.34	0.9	0.1 L	78.6	-0.11	2.7	1.4	12	LD
GMLQZ7	No Data	No Data	87.1	No Data	87.1	1.99 *	3.2	0.0	85.1	1.88	3.6	11.9 H	8	XX
GPBWJH	69.4 *	66.5 *	71.7	No Data	69.2	-2.49 *	3.1	2.6	67.1	-3.64 X	3.2	4.5	9	LD
HLL8DV	62.9 X	65.1 *	63.1 X	65.6 *	64.2	-3.75 X	2.8	1.4	63.7	-4.71 X	2.5	1.1	8	RS
L2RF3N	78.4 H	78.7 H	77.7 H	74.8	77.4	-0.42	7.2	1.8	78.7	-0.10	5.8	3.4	8	LC
MBB9TB	68.8 *	79.2	83.7	76.3	77.0	-0.54	5.7	6.2 H	76.9	-0.64	5.6	4.9	12	MB
MTAL4W	74.8	70.1	71.1 *	75.5	72.9	-1.57	3.8	2.7	71.6	-2.26 *	3.8	2.0	12	EM
MZW8FP	78.7 H	80.0	79.6	80.3	79.6	0.13	5.5	0.7	80.7	0.53	4.6	1.6	12	LD
NAX24M	76.4	75.9	76.2	77.6	76.5	-0.65	2.9	0.8	77.1	-0.57	2.9	1.2	12	LD
NB8YJP	76.0	75.0	74.5	75.2	75.2	-0.99	3.6	0.6	75.4	-1.09	3.6	1.2	12	EN
RFR3XX	83.2	84.6	84.5	85.7	84.5	1.35	2.9	1.0	80.4	0.45	3.3	4.4	8	TH

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
RLE6MF	88.1	95.0 X	92.6 X	95.7 X	92.8	3.44 X	4.6	3.4	90.6	3.57 X	4.9	4.3	12	LX
RZBA7K	71.0 L	71.8 L	77.1	76.0	74.0	-1.29	3.3	3.0	77.1	-0.58	2.2	3.3	12	TD
UERY4D	83.5	84.9	83.9	84.5	84.2	1.27	4.2	0.6	85.5	2.02 *	3.9	1.7	12	LC
UGBXD2	76.8	76.4	75.6	78.0	76.7	-0.61	3.5	1.0	76.3	-0.83	3.7	1.8	12	EM
UH8GCH	80.3	79.2	78.5	80.5	79.6	0.13	3.4	0.9	79.3	0.11	2.9	1.1	12	TH
VRWFP9	84.7	84.3	85.7	86.7	85.4	1.57	3.2	1.1	82.8	1.17	4.3	6.8	12	LZ
WPFRHE	80.7	81.4	83.2	79.7	81.2	0.53	3.6	1.5	81.9	0.89	3.4	1.3	12	LC
XM8UNW	78.3 L	77.5	77.8	77.5	77.7	-0.35	2.5	0.4 L	77.6	-0.42	2.5	0.4 L	12	LC
XU6LV7	75.3	73.3 H	73.0 H	75.2 H	74.2	-1.23	8.1	1.2	76.9	-0.63	5.4	2.2	12	TJ
Y2N6Y7	79.0	78.0	78.8	79.3	78.8	-0.08	2.6	0.5	79.0	0.00	3.0	0.5 L	12	LD
Y3YBTL	80.5	76.6	79.2	81.3	79.4	0.07	3.2	2.1	77.9	-0.31	3.1	2.6	12	LD
YB9F26	87.7	82.9 H	83.7	83.9	84.5	1.35	5.5	2.1	82.5	1.09	4.9	2.1	12	LZ
YXQLW8	76.1 L	74.9	74.6	75.1	75.2	-0.99	2.7	0.7	76.9	-0.64	2.8	1.6	12	LD
ZDYW27	78.3	75.9	78.3	79.5	78.0	-0.28	3.1	1.5	75.5	-1.06	3.6	2.5	12	LC
ZNV3V4	78.9	78.7	78.3	80.0	79.0	-0.04	2.8	0.7	78.7	-0.10	2.5	1.1	12	LD
ZP9W9J	80.0	79.0	81.6	76.8	79.3	0.05	3.6	2.0	78.0	-0.30	3.5	3.1	12	LG

Consensus (All Labs) Results

Wk Mean	79.31	78.32	79.19	78.33	Month Mean	79.12	Grand Mean	78.97
Avg SDr	3.92	3.64	3.85	4.43	Avg SD	3.99	Avg SD	3.86
SD btwn Labs	4.63	5.12	4.16	5.12	SD btwn Labs	3.99	SD btwn Labs	3.25
Labs Incld	49	48	48	47	SD btwn Wks	2.59	SD btwn Wks	3.73
Labs Excld	1	1	3	1	Labs Incld	48	Labs Incld	46
Labs not Rcvd	1	2	0	3				

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	EN	Emerson 2200
EX	Emerson (model not specified)	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	LG	L&W 753
LX	L&W 506	LZ	L&W Crush Tester (model not specified)
MB	Messmer Buchel K440	RS	Regmed Digital Crush Tester CT-2000
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		

	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
22XQKC	22.0	23.1	20.5	22.0	21.9	-0.72	2.0	1.1	21.4	-1.33	1.9	0.7	16	LU
2JXZ69	22.0	23.2	22.7 H	23.6	22.9	0.42	2.4	0.7	22.6	0.10	4.1	0.7	16	LA
379BYB	24.1	23.8	23.7	23.3	23.7	1.42	2.1	0.3	23.4	1.04	2.0	0.5	16	LA
4F6X6Y	22.5	22.8	22.6	22.7	22.6	0.17	1.6	0.1 L	21.9	-0.75	1.6	0.8	16	LY
4FR7E3	24.6	23.0	25.0 *	23.8	24.1	1.81	2.1	0.9	24.4	2.13 *	2.3	0.9	16	LU
6C6WP3	21.2	20.2 *	20.7	21.2	20.8	-1.95 *	1.8	0.5	21.5	-1.19	2.0	0.8	8	BK
6PVUQZ	22.1 H	24.7 *	24.4	19.3 XL	22.6	0.16	2.0	2.5 H	23.3	0.93	2.0	1.3	16	LH
8RTU43	21.9	22.6	20.9	20.5	21.5	-1.17	1.9	0.9	21.3	-1.51	1.6	0.9	16	LA
969FHT	23.0	23.2	21.4	23.1 H	22.7	0.20	2.3	0.9	22.0	-0.60	2.1	3.3 H	16	LY
976PW4	23.5	22.7	23.0	22.5	22.9	0.46	2.1	0.4	22.3	-0.32	1.9	0.6	16	LY
99ALWX	24.6	22.7	22.8	22.3	23.1	0.70	1.8	1.0	23.4	0.96	2.0	0.7	16	LA
9D6BHC	23.8	24.1	22.9	23.9	23.7	1.34	1.6	0.5	23.6	1.28	1.5	0.5	16	LH
ALCDEW	23.2 L	23.1 L	22.7 L	No Data	23.0	0.57	0.0	0.3	23.1	0.69	0.0	0.7	10	TT
AMTKLY	22.6	22.1	23.0	22.9	22.6	0.16	1.7	0.4	22.5	-0.02	1.8	0.6	16	LY
B4DK74	22.1	22.6 L	21.1 L	22.8	22.1	-0.46	1.7	0.8	23.0	0.53	1.8	1.2	16	LA
BM6MPP	22.7	21.3	21.7	21.4	21.8	-0.84	1.9	0.6	21.5	-1.20	1.8	0.9	16	LH
BTVZNT	24.8	21.9	22.1 H	20.5	22.4	-0.17	2.3	1.8 H	21.8	-0.93	2.0	1.3	13	LZ
BU7TM2	24.9 *L	25.0 *	24.4 H	23.3	24.4	2.20 *	2.0	0.8	24.3	2.03 *	2.0	1.1	16	LU
C2ETDU	23.7	23.9	22.7	23.9	23.5	1.19	2.1	0.6	23.8	1.45	2.1	0.6	16	LU
C89J6Y	22.8	22.7	22.6	22.6	22.7	0.20	1.8	0.1 L	22.8	0.23	1.8	0.6	16	LA
CAE4RY	24.0	23.9	24.2	No Data	24.0	1.78	2.0	0.2	23.8	1.48	2.1	0.6	15	LW
CKBALX	21.3	21.0	22.5	20.6	21.3	-1.37	1.8	0.8	21.7	-1.02	1.9	0.8	12	LW
CQKH32	23.7	22.5	22.9	21.8	22.7	0.23	2.1	0.8	22.3	-0.31	2.0	0.6	16	LY
DLLH4W	22.1	22.7	20.0 *	20.7	21.4	-1.32	2.0	1.2	21.9	-0.77	2.0	0.9	10	LY
DLN9CZ	21.9	21.0	24.5	21.8	22.3	-0.22	1.9	1.5	22.5	-0.10	1.7	1.1	16	LA
E4YF8T	24.0	23.3	22.7 L	22.7	23.2	0.78	1.3	0.6	22.3	-0.35	1.3	0.8	16	LA
EV6EKN	22.2 L	22.3 L	22.3 L	22.7 L	22.4	-0.15	1.1	0.2	22.4	-0.16	1.2	0.4	16	TT
EY938Q	22.1	23.0	24.0	23.9	23.2	0.86	1.8	0.9	23.6	1.22	1.8	1.0	16	LZ
G7GEDM	21.7 L	22.6 L	22.0 L	20.6 L	21.7	-0.88	0.6	0.8	22.7	0.12	1.5	1.0	12	LA
GGX6V6	22.7 L	22.9 L	22.8 L	22.7	22.8	0.30	1.2	0.1 L	22.8	0.24	1.4	0.2 L	16	LA
L2RF3N	23.5 H	23.9 H	22.0 H	20.5 H	22.5	-0.04	4.1	1.6	22.7	0.23	3.1	1.0	10	LH
LUTQLJ	23.4	23.3 H	22.8	23.3	23.2	0.79	2.4	0.3	24.1	1.83	2.4	1.0	16	LZ
MBB9TB	23.1	22.6	21.6	23.0	22.6	0.08	1.8	0.7	22.4	-0.18	1.8	0.7	16	LA
MZW8FP	22.4	22.2	23.4	22.2	22.5	0.03	1.6	0.6	23.1	0.65	1.9	1.0	16	LA
NAX24M	22.6	22.8	22.7	22.7	22.7	0.23	1.8	0.1 L	22.2	-0.39	1.8	0.8	16	LA

Containerboard Interlaboratory Testing Program

Analysis 223

STFI, 42 lb Linerboard - 42D3

TAPPI Official Test Method T826

	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
NB4LRM	23.0	21.5	22.4	22.7	22.4	-0.13	1.8	0.7	22.4	-0.14	1.9	0.7	16	LA
NB8YJP	21.0	21.2	20.5	21.6	21.1	-1.68	1.8	0.5	21.0	-1.88	1.7	0.5	16	LY
PWM2TF	20.8	21.3	22.7	21.4	21.5	-1.13	1.8	0.8	21.7	-0.98	1.9	0.6	15	LZ
R7LKZZ	21.3	22.4	23.4	22.8	22.5	-0.05	2.0	0.9	22.4	-0.13	2.0	1.0	16	LH
RFR3XX	20.9 H	20.1 *H	19.5 *H	21.2 H	20.4	-2.43 *	4.0	0.8	21.2	-1.62	2.8	0.9	16	LH
UERY4D	23.8	22.9	23.4	23.4	23.3	0.98	1.7	0.4	23.9	1.57	1.8	3.2 H	16	LW
UMGUW2	22.9	22.6	22.3	22.2	22.5	0.00	1.8	0.3	22.5	-0.02	1.8	0.4	16	LU
UTTHWX	22.4	22.6	22.1	22.7	22.4	-0.07	1.8	0.3	22.5	-0.04	1.9	0.5	16	LA
VJATAA	23.7	23.9	24.6	23.9	24.0	1.76	2.1	0.4	23.9	1.54	2.0	0.6	16	XX
VRWFP9	22.2	22.1	21.6	22.9	22.2	-0.39	1.7	0.5	22.0	-0.67	1.8	0.5	16	LW
WPFRHE	21.4	22.6	22.4	21.9	22.1	-0.46	2.2	0.5	22.4	-0.15	2.0	0.5	16	LU
XU6LV7	22.6	22.1	22.7 L	22.4 L	22.5	-0.06	1.3	0.3	22.3	-0.25	1.4	0.3	16	TT
Y2N6Y7	22.7	23.6	23.1	22.6	23.0	0.58	2.0	0.5	22.7	0.20	2.1	0.7	16	LA
Y3YBTL	19.9 *	21.1	21.7	23.6	21.6	-1.08	2.3	1.5	22.5	-0.08	2.0	1.3	16	LZ
YXQLW8	19.9 *L	21.6	20.7	21.4 L	20.9	-1.84	1.2	0.7	21.3	-1.51	1.3	0.7	16	BK
ZDYW27	22.5	21.3	21.9	21.8	21.9	-0.71	1.8	0.5	21.7	-1.04	1.8	0.7	16	LW
ZP9W9J	22.0	22.7	22.5	22.6	22.4	-0.06	1.7	0.3	21.9	-0.77	1.8	0.6	16	LU

Consensus (All Labs) Results

Wk Mean	22.60	22.57	22.47	22.37	Month Mean	22.50	Grand Mean	22.55
Avg SDr	2.02	2.01	1.97	2.00	Avg SD	1.99	Avg SD	1.97
SD btwn Labs	1.16	1.03	1.19	0.99	SD btwn Labs	0.86	SD btwn Labs	0.85
Labs Incld	52	52	52	49	SD btwn Wks	0.83	SD btwn Wks	1.01
Labs Excld	0	0	0	1	Labs Incld	52	Labs Incld	52
Labs not Rcvd	0	0	0	2				

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 225

STFI, 35 lb Linerboard - 35E1

TAPPI Official Test Method T826

Report #591 (N)
December 2018

	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
22XQKC	21.7	22.4	22.2	21.8 L	22.0	-0.44	1.3	0.3	21.5	-0.92	1.3	0.5	12	LU
2JXZ69	23.2	23.3	23.6	22.9	23.2	0.78	1.6	0.3	22.9	0.61	1.6	0.5	10	LW
379BYB	22.4	22.8	22.7	23.1	22.8	0.31	1.8	0.3	23.0	0.75	1.6	0.4	12	LU
4F6X6Y	22.4	22.2	22.3	22.4	22.3	-0.10	1.6	0.1 L	21.6	-0.82	1.5	1.2	12	LY
4FR7E3	24.6	23.5	24.6	24.2	24.2	1.78	2.0	0.5	24.2	2.00 *	1.8	0.6	12	LU
6C6WP3	20.6	20.1 *	21.6	21.1	20.9	-1.63	2.0	0.7	20.9	-1.59	1.9	1.2	12	BK
6PVUQZ	23.6 H	24.9 *	24.2	19.6 *	23.1	0.62	2.0	2.4 H	23.5	1.27	1.7	1.3	12	LH
8RTU43	22.1	20.9	20.1 *	20.3	20.8	-1.65	1.3	0.9	20.6	-1.86	1.5	0.6	12	LA
969FHT	23.3	22.9	22.2	23.0	22.9	0.41	1.7	0.5	22.3	-0.07	1.6	1.6	12	LY
976PW4	21.8	23.0	22.2	22.9	22.5	0.02	1.6	0.5	22.3	-0.07	1.7	0.5	12	LY
99ALWX	24.6	24.1	24.2	23.8	24.2	1.74	1.7	0.3	23.5	1.25	1.8	0.7	12	LA
9D6BHC	23.9	24.0	23.5	24.0	23.9	1.43	1.6	0.2	23.1	0.86	1.5	0.6	12	LH
ALCDEW	24.4 L	24.0 L	24.0 L	No Data	24.1	1.71	0.0	0.3	23.2	0.89	0.0	1.3	8	LZ
AMTKLY	22.6	22.9	22.9	22.9	22.8	0.38	1.7	0.2	22.7	0.36	1.8	0.5	12	LU
B4DK74	20.4	22.4	22.2 L	21.1	21.5	-0.96	1.3	1.0	22.1	-0.26	1.5	1.0	12	LA
BM6MPP	22.6	21.5	21.9	21.3	21.8	-0.63	1.4	0.6	21.1	-1.36	1.4	0.7	12	LH
BTVZNT	21.8	21.2	20.6	20.3	21.0	-1.48	1.8	0.7	21.5	-0.90	1.7	0.9	12	LZ
BU7TM2	26.7 X	26.0 X	25.3 *	24.0	25.5	3.08 X	2.2	1.1	24.5	2.41 *	2.0	1.1	12	LU
C2ETDU	25.6 *	24.0	24.0	26.7 X	25.1	2.67 *	1.9	1.3	24.0	1.78	1.7	1.2	12	LU
C89J6Y	22.3	22.2	22.5	23.2	22.6	0.11	1.6	0.4	22.1	-0.22	1.6	0.7	12	LA
CAE4RY	22.4	22.6	23.2	No Data	22.7	0.29	1.8	0.4	23.1	0.87	1.8	0.7	11	LW
CKBALX	22.0	21.4	21.4	22.5	21.8	-0.64	1.6	0.5	22.0	-0.38	1.7	0.6	6	LW
CQKH32	22.0	22.0	22.2	21.6	21.9	-0.54	1.6	0.3	22.0	-0.38	1.7	0.7	12	LY
DLLH4W	22.0	22.5	20.5	22.0	21.7	-0.73	2.0	0.9	22.0	-0.42	1.9	0.8	6	LY
DLN9CZ	21.8	22.5	24.1	20.9	22.3	-0.13	1.7	1.3	22.8	0.47	1.8	1.3	12	LA
E4YF8T	21.0	21.7	21.8	21.5	21.5	-0.97	1.2	0.4	21.3	-1.17	1.3	0.9	12	LA
EV6EKN	21.8	22.0 L	22.0	21.7	21.9	-0.59	1.0	0.2	21.8	-0.57	1.0	0.3	12	TT
EY938Q	21.5	22.8	23.4	23.6	22.8	0.40	1.7	0.9	23.6	1.35	1.7	1.1	12	XX
G7GEDM	22.9 L	22.4 L	23.1 L	21.7 L	22.5	0.08	0.4	0.7	22.7	0.36	1.4	0.5	12	LA
GGX6V6	22.1	22.2	22.3	22.6	22.3	-0.15	1.4	0.2	22.2	-0.10	1.5	0.2 L	12	LA
L2RF3N	23.5 H	23.2 H	22.0 H	21.6 H	22.6	0.11	3.5	0.9	22.9	0.57	3.4	0.8	8	LH
LUTQLJ	24.2	21.9	23.9	24.4	23.6	1.19	1.8	1.2	23.9	1.76	1.9	1.1	12	LZ
MBB9TB	22.6	22.9	22.7	22.0	22.5	0.09	1.9	0.4	21.5	-0.95	1.7	1.6	12	LA
MZW8FP	24.2	22.9	22.0	23.0	23.0	0.59	1.7	0.9	22.5	0.17	1.9	0.9	12	LA
NAX24M	23.3	21.6	22.5	22.2	22.4	-0.05	1.5	0.7	22.2	-0.16	1.5	0.5	12	LA

Containerboard Interlaboratory Testing Program

Analysis 225

STFI, 35 lb Linerboard - 35E1

TAPPI Official Test Method T826

	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
NB4LRM	21.7	21.6	22.4	23.3	22.3	-0.20	1.5	0.8	22.5	0.14	1.6	0.6	12	LA
NB8YJP	21.3	22.0	20.7	20.9	21.2	-1.23	1.5	0.6	21.2	-1.28	1.6	0.4	12	LY
PWM2TF	21.9	22.0	21.7	21.4	21.7	-0.72	1.5	0.3	21.5	-0.87	1.6	0.5	12	LZ
R7LKZZ	20.9 H	23.2	22.7	21.0	21.9	-0.53	2.0	1.2	22.5	0.22	1.9	0.8	12	LH
RFR3XX	23.2	22.6	23.8	23.5	23.3	0.86	1.6	0.5	21.3	-1.12	1.6	2.2 H	8	LH
UERY4D	23.2	23.1	23.5	23.2	23.2	0.79	1.9	0.2	22.9	0.64	1.6	0.4	12	LW
UMGUW2	22.5	22.5	21.7	21.2	22.0	-0.50	1.7	0.6	22.6	0.24	1.7	0.7	12	LA
UTTHWX	22.8	22.1	21.9	22.5	22.3	-0.13	1.5	0.4	22.2	-0.20	1.6	0.4	12	LA
VJATAA	25.6 *	24.0	24.0	26.7 X	25.1	2.67 *	1.9	1.3	24.0	1.79	1.7	1.3	12	XX
VRWFP9	21.9	21.3	21.3	22.1	21.7	-0.81	1.6	0.4	21.6	-0.83	1.5	0.4	12	LW
WPFRHE	22.6	22.1	21.7	21.9	22.1	-0.36	1.6	0.4	22.3	-0.02	1.7	0.3	12	LU
XU6LV7	21.9	21.9	21.8 L	21.6	21.8	-0.66	1.0	0.2	21.7	-0.71	1.2	0.2 L	12	TT
Y2N6Y7	22.9	23.7	22.0	22.9	22.9	0.43	1.7	0.7	22.3	0.00	1.8	0.6	12	LA
Y3YBTL	20.7	20.5	22.5	24.8 *	22.1	-0.33	1.6	2.0 H	22.0	-0.32	1.6	1.2	12	LZ
YXQLW8	20.3	20.7	21.7	21.0 L	20.9	-1.56	1.2	0.6	20.9	-1.53	1.3	0.5	12	BK
ZDYW27	21.7	20.9	21.1	21.9	21.4	-1.06	1.9	0.5	21.5	-0.87	1.9	0.6	12	LW
ZP9W9J	21.8	22.4	22.0	21.0	21.8	-0.66	1.6	0.6	21.6	-0.83	1.5	0.6	12	LW

Consensus (All Labs) Results

Wk Mean	22.51	22.42	22.51	22.24	Month Mean	22.45	Grand Mean	22.33
Avg SDr	1.74	1.63	1.76	1.63	Avg SD	1.69	Avg SD	1.69
SD btwn Labs	1.22	1.00	1.12	1.17	SD btwn Labs	0.98	SD btwn Labs	0.92
Labs Incld	51	51	52	48	SD btwn Wks	0.77	SD btwn Wks	0.88
Labs Excld	1	1	0	2	Labs Incld	51	Labs Incld	52
Labs not Rcvd	0	0	0	2				

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 (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 Official Test Method T575

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
22XQKC	174.7	1.12	15.64		172.5	0.73	2.46	4	EV
2JXZ69	172.5	0.88	16.18		172.2	0.71	0.39 L	3	LA
4FR7E3	143.9	-2.26 *	8.13		147.1	-1.43	5.71	4	EV
6C6WP3	239.7	8.26 X	45.40 H		225.2	5.20 X	20.53	2	EV
8RTU43	156.9	-0.83	12.90		170.5	0.56	9.43	4	EV
99ALWX	150.5	-1.54	11.67		153.0	-0.93	6.07	4	LA
BTVZNT	0.3	-18.04 X	0.01 L		123.8	-3.40 X	82.88 H	4	LA
C2ETDU	132.4	-3.53 X	5.91 L		135.5	-2.41 *	5.48	4	EV
CQKH32	173.5	0.99	12.79		180.4	1.40	5.20	4	EV
GGX6V6	162.6	-0.21	14.45		163.7	-0.02	0.86 L	4	XX
LUTQLJ	162.3	-0.24	25.16		166.4	0.21	3.82	4	XX
MBB9TB	174.9	1.14	22.13		177.3	1.13	7.07	4	LA
MZW8FP	158.4	-0.67	16.67		153.6	-0.88	3.46	4	LA
NB4LRM	172.1	0.84	20.26		170.4	0.55	7.35	4	LA
NB8YJP	167.1	0.28	12.53		171.2	0.62	7.16	4	EV
PWM2TF	166.5	0.22	20.31		162.4	-0.13	4.47	3	LA
VRWFP9	163.6	-0.10	13.43		159.8	-0.35	7.83	4	EV
ZDYW27	167.9	0.37	9.49		166.4	0.21	5.73	4	XX

Consensus (All Labs) Results

Month Mean	164.50	Grand Mean	163.90
Avg SD	16.12	Avg SD Months	5.69
SD btwn Labs	9.10	SD btwn Labs	11.79
Labs Incld	15	Labs Incld	16

BTVZNT () - Extreme Data

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		

Containerboard Interlaboratory Testing Program

Analysis 229

Roughness - Sheffield Method, 42 lb Linerboard - 42D3

TAPPI Official Test Method T538

	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3HH6T2	421.6	6.85 X	5.93	421.6	7.80 X	0.00	1	TS
B4DK74	368.8	0.49	8.79	365.7	0.10	2.68	4	XX
C89J6Y	359.0	-0.69	7.56	360.5	-0.61	2.20	4	LA
KNQAJQ	356.1	-1.04	6.95	356.9	-1.11	2.18	4	LA
WPFRHE	370.9	0.74	7.23	371.9	0.96	0.95	4	XX
Y2N6Y7	368.9	0.50	10.68	369.5	0.62	3.50	4	LA
Y3YBTL	375.6	1.30	7.26	374.1	1.26	1.33	4	XX
YB9F26	353.9	-1.31	7.25	356.1	-1.22	3.61	4	XX

Consensus (All Labs) Results

Month Mean	364.75	Grand Mean	364.96
Avg SD	8.06	Avg SD Months	2.53
SD btwn Labs	8.30	SD btwn Labs	7.26
Labs Incld	7	Labs Incld	7

Key to Instrument Codes Reported by Participants

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

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
22XQKC	164.6	-0.21	4.16		157.2	-0.69	6.77	4	TM
2JXZ69	212.0	1.64	14.53		203.2	1.79	7.14	4	HY
379BYB	183.4	0.52	4.45		188.4	1.00	5.29	4	HZ
4AGBBT	152.8	-0.67	4.60		162.8	-0.38	7.35	4	TM
4FR7E3	128.4	-1.62	6.73		145.3	-1.33	15.75	4	TM
8RTU43	178.2	0.32	16.39		167.4	-0.14	9.31	4	TM
B4DK74	140.2	-1.16	9.73		151.8	-0.98	16.22	4	SC
C2ETDU	160.6	-0.37	1.14	L	158.0	-0.65	6.59	4	TM
CQKH32	180.5	0.41	2.74	L	174.3	0.23	23.07	4	XX
DLLH4W	206.0	1.41	9.35		198.2	1.52	6.97	3	HY
E4YF8T	169.0	-0.04	9.30		159.1	-0.59	7.27	4	TM
EY938Q	142.9	-1.06	8.64		143.7	-1.41	2.24	L 4	SC
LUTQLJ	173.4	0.13	31.15	H	174.7	0.25	9.63	4	TM
NAX24M	177.6	0.30	8.88		166.1	-0.21	8.45	4	TM
UKWVMD	114.3	-2.17	* 20.67		145.2	-1.34	43.61	2	SC
UMGUW2	182.0	0.47	8.75		172.2	0.12	7.49	4	TM
WPFRHE	201.0	1.21	10.14		200.2	1.63	5.23	4	HY
Y2N6Y7	175.0	0.20	10.62		177.0	0.38	4.48	4	SC
ZNV3V4	188.1	0.71	9.37		184.3	0.78	8.35	4	SC

Consensus (All Labs) Results

Month Mean	170.00	Grand Mean	169.93
Avg SD	12.12	Avg SD Months	13.95
SD btwn Labs	25.61	SD btwn Labs	18.55
Labs Incld	19	Labs Incld	19

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	165.50	24.16	4.50	16
Modified Scott Bond Mechanics	206.49	7.79	36.49	2

Key to Instrument Codes Reported by Participants

HY	Huygen Digitized Scott Internal Bond Tester	HZ	Huygen Internal Bond Tester with AccuPress
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 #591 (N)
December 2018

	Monthly Results			Cumulative Results			
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months
22XQKC	26.0	-0.19	4.00	27.5	0.45	1.61	4
2JXZ69	26.0	-0.19	1.22	24.1	-1.05	1.57	4
4FR7E3	22.6	-1.55	4.88	26.2	-0.14	3.06	4
8RTU43	29.8	1.34	5.54	30.0	1.55	0.75	4
B4DK74	28.0	0.61	1.22	27.7	0.55	0.53	4
BCHRL4	27.6	0.45	5.32	27.9	0.64	3.11	4
C2ETDU	27.1	0.25	4.13	27.0	0.25	2.08	4
CAE4RY	29.0	1.02	5.79	28.4	0.86	1.34	4
CQKH32	22.7	-1.51	4.18	23.2	-1.45	3.93	4
DLLH4W	26.0	-0.19	3.18	25.9	-0.25	1.95	3
GGX6V6	26.2	-0.11	0.84	26.1	-0.16	0.12 L	4
LUTQLJ	25.2	-0.49	1.57	24.6	-0.84	1.16	4
NAX24M	27.5	0.41	2.48	26.6	0.07	1.49	4
NB4LRM	28.2	0.70	4.15	28.8	1.03	0.83	4
NB8YJP	23.8	-1.07	0.82	25.1	-0.62	2.97	4
PWM2TF	25.4	-0.43	0.89	23.6	-1.28	2.32	4
R7LKZZ	26.0	-0.19	2.74	27.5	0.46	1.76	4
UKWVMD	26.2	-0.11	1.30	25.4	-0.47	1.13	2
UTTHWX	30.4	1.58	2.97	29.4	1.31	1.77	4
VJATAA	23.5	-1.19	2.45	25.2	-0.59	1.85	4
VRWFP9	23.4	-1.23	2.30	22.0	-1.99 *	3.61	4
WPFRHE	26.2	-0.11	2.68	26.0	-0.21	1.04	4
WVLKCA	29.1	1.06	2.25	27.2	0.34	3.25	4
Y3YBTL	32.3	2.34 *	2.64	31.7	2.34 *	2.61	4
ZDYW27	23.4	-1.23	4.22	24.7	-0.81	1.25	4

Consensus (All Labs) Results

Month Mean	26.46	Grand Mean	26.46
Avg SD	3.31	Avg SD Months	2.12
SD btwn Labs	2.50	SD btwn Labs	2.24
Labs Incld	25	Labs Incld	25

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

Containerboard Interlaboratory Testing Program

Analysis 237

Air Resistance, 35 lb Linerboard - 35E

TAPPI Official Test Method T460

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2JXZ69	31.4	1.88	2.63		32.3	1.84	0.70	4	LP
4F6X6Y	27.0	-1.13	0.94	L	26.8	-0.81	0.21 L	4	LP
4FR7E3	29.7	0.69	2.26		29.6	0.54	0.60	4	LA
6C6WP3	29.5	0.56	1.38		40.7	5.99 X	15.92	2	XX
8RTU43	29.5	0.57	1.28		29.1	0.32	0.71	4	LP
9LYERZ	27.7	-0.63	1.19		28.0	-0.25	0.77	4	LP
BYE4VV	27.7	-0.65	2.21		28.9	0.22	1.50	3	XX
C2ETDU	29.8	0.76	1.24		29.6	0.56	1.15	4	LA
CAE4RY	26.1	-1.74	2.85		27.6	-0.43	1.37	4	LP
CQKH32	28.0	-0.42	1.75		29.6	0.53	1.17	4	LP
GGX6V6	29.1	0.32	1.00		29.3	0.40	0.50	4	LA
GPBWJH	28.9	0.17	2.77		27.9	-0.27	1.18	4	GG
LUTQLJ	27.4	-0.83	3.02		24.0	-2.19 *	3.51	4	TD
MZW8FP	28.5	-0.12	0.99	L	28.6	0.08	0.55	4	LA
NAX24M	28.6	-0.03	2.48		28.5	0.01	0.85	4	LA
NHMMAK	30.0	0.94	2.43		29.2	0.34	0.76	3	XX
PWM2TF	27.5	-0.80	2.30		33.0	2.22 *	6.87 H	4	LP
TLTRWG	25.0	-2.49 *	1.55		25.6	-1.38	0.90	2	LA
VJATAA	29.6	0.62	1.54		28.2	-0.15	0.95	4	LA
VRWFP9	22.9	-3.94 X	2.26		24.8	-1.81	1.41	4	XX
WPFRHE	29.8	0.79	3.24		28.9	0.19	0.68	4	TP
WVLKCA	10.5	-12.37 X	2.83		25.8	-1.31	10.19 H	4	GA
Y2N6Y7	29.3	0.47	2.69		29.5	0.49	0.64	4	LA
Y3YBTL	28.3	-0.21	3.38		29.5	0.52	0.98	4	GA
YWCGX9	30.5	1.28	3.08		29.2	0.34	1.03	4	TL

Consensus (All Labs) Results

Month Mean	28.65	Grand Mean	28.48
Avg SD	2.24	Avg SD Months	2.75
SD btwn Labs	1.46	SD btwn Labs	2.05
Labs Incld	23	Labs Incld	24

Key to Instrument Codes Reported by Participants

GA	Gurley Precision #4340 Automatic Densometer	GG	Gurley Precision #4320 Densometer
LA	L&W Autoline	LP	L&W Air Permeance Tester SE 166
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

	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
22XQKC	58.7	60.0	58.2	56.9	58.5	-0.75	2.7	1.3	59.8	-0.24	2.7	1.4	16	LD
2JXZ69	57.1	58.7	57.8	56.8	57.6	-1.13	2.2	0.8	58.4	-0.78	2.8	1.5	16	LD
379BYB	63.7	63.3	61.5	62.6	62.8	1.21	4.1	1.0	63.6	1.18	4.8	1.9	16	LC
4FR7E3	61.4	63.9	61.4	62.2	62.2	0.95	3.2	1.2	62.3	0.69	3.3	0.9	16	XX
4PFXZA	61.4	62.8	61.7	61.4	61.8	0.77	2.2	0.6	62.2	0.66	1.9	0.8	16	TU
6C6WP3	61.6	61.1	55.6	60.8	59.8	-0.16	4.0	2.8	56.6	-1.44	4.7	3.9 H	8	MB
6PVUQZ	61.2	59.9	63.3	60.8	61.3	0.53	3.3	1.4	61.9	0.54	3.6	1.7	16	LD
73XPGF	60.2	59.4	59.2	59.1	59.5	-0.29	2.3	0.5	59.0	-0.53	2.4	1.1	12	TH
976PW4	61.0	61.3	60.4	59.6	60.6	0.21	2.6	0.8	60.3	-0.04	3.0	1.4	16	LD
9D6BHC	62.0	64.6	62.8	60.7	62.5	1.10	3.3	1.6	61.7	0.49	3.2	1.5	16	LD
9LYERZ	60.1	61.1	60.8	60.6	60.6	0.24	2.4	0.4	60.4	-0.02	2.9	1.5	16	LD
9WWF66	60.6	61.0	59.8	59.4	60.2	0.04	3.1	0.7	60.3	-0.05	3.2	0.7	16	LD
ALCDEW	56.6	57.5	55.7	No Data	56.6	-1.58	2.7	0.9	57.0	-1.30	2.8	1.1	10	EM
AMTKLY	61.5	60.5 H	62.5	58.5	60.8	0.29	4.5	1.7	60.9	0.18	4.2	1.5	16	LD
BM6MPP	52.6 *	56.4 *	55.3	53.0 XL	54.3	-2.61 *	2.8	1.8	53.7	-2.57 *	2.7	1.7	16	TH
BTVZNT	56.8	61.0	56.5	56.6	57.7	-1.07	4.1	2.2	56.4	-1.54	3.6	2.4	13	LD
C2ETDU	61.4	63.9	61.4	59.5	61.6	0.65	3.3	1.8	61.4	0.36	3.5	1.7	16	LC
CAE4RY	64.5	65.9 *	64.2	66.7 X	65.4	2.37 *	3.5	1.2	65.4	1.88	3.8	2.2	16	LD
CQKH32	60.0	58.4	61.3	57.1	59.2	-0.41	3.1	1.8	59.1	-0.50	3.3	1.3	10	LZ
DLLH4W	62.6 H	64.6	63.4	59.8	62.6	1.12	4.0	2.0	62.2	0.68	3.7	2.3	10	LD
E4YF8T	58.1	59.0	59.7	59.8	59.2	-0.43	2.8	0.8	59.7	-0.27	2.8	1.8	16	LC
EAM89V	60.4 L	60.7	60.2 L	60.6 L	60.5	0.17	1.3	0.2 L	60.4	-0.02	1.4	0.2 L	16	LD
EV6EKN	59.5	59.1 H	58.1	60.6 H	59.3	-0.35	5.4	1.0	58.5	-0.74	5.1	1.1	16	TG
EY938Q	53.9 *	52.9 X	55.4	56.2	54.6	-2.48 *	2.6	1.5	56.2	-1.61	3.1	1.7	16	LC
G7GEDM	66.5 *	65.9 *	69.0 X	71.9 X	68.3	3.71 X	2.9	2.7	66.6	2.33 *	4.8	2.4	12	XX
GGX6V6	61.3	61.7	60.9	61.0	61.2	0.51	1.9	0.4	61.1	0.23	2.1	0.4 L	16	LD
GJJUDW	60.9 L	61.3 L	61.7 L	61.8 L	61.4	0.59	0.5	0.4	60.6	0.05	0.8	0.7	12	LD
GMLQZ7	No Data	No Data	59.8	No Data	59.8	-0.14	3.3	0.0	50.1	-3.93 X	3.7	10.7 H	11	XX
MBB9TB	55.6	58.7	57.6 H	55.8	56.9	-1.44	4.4	1.4	57.9	-0.97	3.1	1.6	16	MB
NB8YJP	57.9	60.2	59.9	59.5	59.4	-0.32	3.1	1.0	59.4	-0.41	2.9	1.3	16	EN
NHMMAK	59.5	60.4	58.4	59.1	59.3	-0.35	3.2	0.8	59.4	-0.40	2.8	1.2	13	LD
NJZDZG	67.7 *	65.6	68.0 X	67.0 X	67.1	3.14 X	2.7	1.1	66.8	2.40 *	3.1	0.8	16	LC
PDQF9N	63.6	63.8	64.2	63.4 *	63.7	1.64	3.5	0.3	63.7	1.25	3.5	0.3 L	4	LD
PWM2TF	58.2	59.4	66.2 *	57.6	60.3	0.10	3.4	4.0 H	60.9	0.18	3.4	3.5	16	LZ
RFR3XX	59.8	60.0	55.1	56.5	57.9	-1.01	3.2	2.4	57.2	-1.21	2.9	1.5	16	TH

Containerboard Interlaboratory Testing Program

Analysis 240

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

TAPPI Official Test Method T809

	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
RLE6MF	60.4	61.0	58.6	59.9	60.0	-0.06	3.6	1.0	59.6	-0.33	3.6	2.6	16	LD
RZBA7K	64.8	64.8 L	61.8	59.3 L	62.6	1.15	1.3	2.7	63.2	1.05	1.2	2.3	16	TD
RZC228	59.1	61.0	61.7	60.4	60.6	0.20	3.0	1.1	61.2	0.28	3.4	1.1	14	LC
TLTRWG	59.1	62.0	61.6	61.0	60.9	0.37	4.3	1.3	60.2	-0.08	3.7	1.4	8	LD
TM3YZA	61.2	60.6	60.0	59.7	60.4	0.12	2.6	0.7	60.4	-0.02	3.0	0.6	16	LC
UERY4D	62.3	62.8	60.1	60.7	61.5	0.62	2.0	1.3	63.7	1.23	2.3	4.3 H	16	LD
UKWVMD	57.4	56.9	56.5	54.7 *	56.4	-1.69	3.1	1.2	56.8	-1.36	3.3	1.1	8	LD
UMGUW2	59.4	61.0	60.7	58.2	59.8	-0.12	2.8	1.3	60.3	-0.07	2.8	1.4	16	LC
UTTHWX	63.1	61.7	62.2	62.1	62.3	0.98	2.1	0.6	63.5	1.15	2.7	1.2	16	LD
W6DU7D	61.0	60.2	59.3	60.6	60.3	0.08	2.8	0.7	60.7	0.09	2.8	0.8	16	EM
WPFRHE	62.2	61.8	61.1	61.7	61.7	0.72	3.5	0.5	62.3	0.70	3.1	1.7	11	LC
XU6LV7	63.7	64.2	61.1	59.8	62.2	0.94	3.3	2.1	60.5	0.00	3.5	2.6	8	TJ
Y3YBTL	62.3	59.3	57.7	59.4	59.7	-0.20	2.5	1.9	59.7	-0.28	2.5	1.1	16	LZ
ZP9W9J	56.8	57.4	59.2	57.5	57.7	-1.08	2.4	1.0	58.3	-0.82	2.8	1.1	16	LZ

Consensus (All Labs) Results

Wk Mean	60.43	61.18	60.03	59.51	Month Mean	60.11	Grand Mean	60.45
Avg SDr	3.20	3.01	3.36	2.89	Avg SD	3.13	Avg SD	3.21
SD btwn Labs	2.94	2.37	2.55	1.98	SD btwn Labs	2.22	SD btwn Labs	2.64
Labs Incld	48	47	47	43	SD btwn Wks	1.46	SD btwn Wks	1.76
Labs Excld	0	1	2	4	Labs Incld	47	Labs Incld	48
Labs not Rcvd	1	1	0	2				

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	EN	Emerson 2200 Series
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TD	TMI Digital Crush Tester, Model 17-09	TG	TMI Compression Tester, Model 17-10
TH	TMI Compression Tester, Model 17-76	TJ	TLS Compression Tester, Model CDM-5
TU	TMI Universal Crush Tester (TMI K440)	XX	Instrument make/model not specified by lab

Containerboard Interlaboratory Testing Program

Analysis 250

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

TAPPI Official Test Method T843

Report #591 (N)
December 2018

	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
2JXZ69	79.9 *H	79.3	79.0 *	79.6 *	79.4	2.14 *	2.6	0.4	78.9	1.75	2.8	1.1	16	LD
9LYERZ	77.0	76.1	73.7	75.6	75.6	0.57	2.3	1.4	75.4	0.65	2.5	1.0	16	LD
BYE4VV	73.1	73.2	70.7	73.3	72.6	-0.69	2.2	1.3	72.3	-0.33	1.8	1.3	12	LZ
C2ETDU	65.3 XH	67.3 *H	62.7 XH	65.1 X	65.1	-3.75 X	6.1	1.9 H	65.9	-2.36 *	7.0	3.7 H	16	XX
CAE4RY	78.9	79.6	76.8	77.6	78.2	1.64	2.5	1.3	77.9	1.41	3.1	1.6	16	LD
DLLH4W	75.3	76.2	76.1	76.0	75.9	0.68	2.4	0.4	74.1	0.22	2.2	1.8	10	LD
EAM89V	73.2	73.4 L	73.1 L	73.3	73.3	-0.39	1.1	0.1 L	73.4	0.00	1.3	0.2 L	16	LD
GGX6V6	73.0	73.9	72.6	72.8	73.1	-0.48	1.8	0.6	73.3	-0.02	2.2	0.4 L	16	LD
NHMMAK	71.4	72.5	74.1	71.7	72.4	-0.74	2.4	1.2	72.6	-0.25	2.4	1.0	13	XX
PWM2TF	74.2	73.0	73.4	73.1	73.4	-0.33	2.8	0.6	73.6	0.07	2.7	0.8	16	LZ
RZBA7K	71.7	72.3	70.8 L	73.1 L	72.0	-0.93	1.1	0.9	72.4	-0.29	1.0	1.3	16	TD
TM3YZA	72.9	73.2	73.6	72.5 H	73.1	-0.49	3.6	0.5	73.2	-0.05	3.4	0.6	16	LD
UERY4D	72.2	72.1	71.8	70.5	71.6	-1.06	1.7	0.8	68.7	-1.48	1.9	4.9 H	16	LD
WPFRHE	77.5	78.2	76.3	76.9	77.2	1.24	2.5	0.8	77.0	1.15	2.6	0.8	11	LC
YXQLW8	72.9	74.3	72.5	71.1	72.7	-0.64	2.0	1.3	72.8	-0.19	2.3	0.9	16	XX
ZP9W9J	73.4	73.6	71.7 H	73.1	72.9	-0.53	3.3	0.9	72.5	-0.28	2.9	0.8	16	LZ

Consensus (All Labs) Results

Wk Mean	74.45	74.26	73.75	74.01	Month Mean	74.23	Grand Mean	73.37
Avg SDr	2.20	2.80	2.60	2.38	Avg SD	2.37	Avg SD	2.93
SD btwn Labs	2.66	3.08	2.36	2.58	SD btwn Labs	2.43	SD btwn Labs	3.18
Labs Incld	15	16	15	15	SD btwn Wks	0.91	SD btwn Wks	1.83
Labs Excld	1	0	1	1	Labs Incld	15	Labs Incld	16
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)	TD	TMI Digital Crush Tester, Model 17-09
XX	Instrument make/model not specified by lab		

Containerboard Interlaboratory Testing Program

Analysis 255

Ring Crush (RCT), 26 lb Corrugating Medium - CM92

TAPPI Official Test Method T822

	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
379BYB	44.5	42.9	43.9	44.2	43.9	-0.52	1.5	0.7	45.4	0.28	2.3	1.2	16	LD
4PFXZA	42.4	41.9	41.5	41.3	41.8	-1.51	1.6	0.5	42.0	-1.16	1.6	0.5	16	TU
6PVUQZ	45.1	45.4 L	45.9 L	45.4	45.5	0.24	1.5	0.3	45.8	0.47	2.6	0.6	16	LD
73XPGF	39.8 *	40.5 L	41.3	41.6	40.8	-1.97 *	2.1	0.8	40.4	-1.87	2.2	1.1	12	TH
9D6BHC	47.1	49.2	47.4	49.0	48.2	1.53	2.4	1.1	47.0	0.99	2.2	1.3	12	LD
9LYERZ	44.8	44.2	45.1	44.0	44.5	-0.22	1.5	0.5	45.3	0.28	1.9	0.7	16	LD
ALCDEW	41.7	43.0	43.8	No Data	42.8	-1.01	2.7	1.1	42.8	-0.85	2.7	1.0	10	EM
B4TZ2W	42.8 H	44.1	42.3	45.8 H	43.8	-0.57	3.9	1.5	43.2	-0.65	4.6	1.3	12	TX
BTVZNT	45.9	43.0	43.1	44.0	44.0	-0.46	2.4	1.3	44.7	-0.01	2.9	1.6	13	LD
DLLH4W	46.7	50.6 *	46.0	45.3	47.1	1.04	2.6	2.4	47.6	1.24	2.6	2.0	10	LD
GGX6V6	44.5	44.5	43.7	44.1	44.2	-0.36	3.4	0.4	43.9	-0.35	3.2	0.6	16	LD
GJJUDW	45.6 L	45.7 L	45.9 L	45.8 L	45.8	0.38	0.6	0.1 L	45.0	0.12	0.7	0.7	12	LD
GMLQZ7	No Data	No Data	46.2	No Data	46.2	0.59	2.5	0.0	52.6	3.42 X	3.3	8.2 H	11	XX
NHMMAK	43.0	41.7 H	42.6 H	42.3	42.4	-1.22	3.7	0.5	41.9	-1.22	3.9	1.2	13	LD
NJZDZG	36.1 X	36.0 X	36.7 X	36.8 X	36.4	-4.07 X	3.4	0.4	34.1	-4.60 X	2.8	1.4	16	XX
PDQF9N	44.5	45.6	44.2	45.5	45.0	0.00	2.7	0.7	45.0	0.11	2.7	0.7	4	LD
RLE6MF	48.0	48.5	51.3 X	50.0 *	49.5	2.14 *	3.0	1.5	50.0	2.32 *	2.7	2.0	16	LZ
RMPU67	45.1	45.2	45.3	45.1 L	45.2	0.10	1.4	0.1 L	45.5	0.33	1.2	1.1	16	WK
RXMVJV	44.7	49.7	44.6	43.9	45.7	0.36	3.0	2.7 H	45.9	0.52	2.3	1.8	16	LZ
RZC228	45.9	46.7	46.8	47.3	46.6	0.81	2.0	0.6	46.7	0.85	2.5	1.0	14	LC
TLTRWG	49.3 *	46.7 H	47.1 H	48.3	47.9	1.38	3.8	1.2	47.3	1.14	3.4	3.3	8	LD
UH8GCH	42.5	42.0	40.6 *	41.2	41.5	-1.62	2.2	0.8	42.6	-0.92	2.2	1.1	16	TH
VACVNV	42.4	47.0	48.4	47.1	46.2	0.59	2.5	2.6 H	40.6	-1.80	2.8	5.2 H	16	LZ
W6DU7D	45.6	45.2	45.7	46.0	45.6	0.32	1.9	0.3	45.7	0.42	1.6	0.5	16	LC
WPFRHE	44.2	46.9	44.7	44.0 H	44.9	0.00	3.1	1.3	45.4	0.31	2.9	1.2	16	LC
Y3YBTL	45.7	43.6	45.2	45.1	44.9	-0.04	2.1	0.9	43.4	-0.57	2.6	1.5	16	LD

Consensus (All Labs) Results

Wk Mean	44.65	45.15	44.63	45.05	Month Mean	44.95	Grand Mean	44.71
Avg SDr	2.54	2.63	2.67	2.30	Avg SD	2.54	Avg SD	2.64
SD btwn Labs	2.12	2.65	2.01	2.31	SD btwn Labs	2.10	SD btwn Labs	2.30
Labs Incld	24	24	24	23	SD btwn Wks	1.23	SD btwn Wks	1.71
Labs Excld	1	1	2	1	Labs Incld	25	Labs Incld	24
Labs not Rcvd	1	1	0	2				

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)
TH	TMI Compression Tester, Model 17-76	TU	TMI Universal Crush Tester (TMI K440)
TX	TMI Digital Crush Tester (model not specified)	WK	Zwick Z005 Crush Tester
XX	Instrument make/model not specified by lab		

Containerboard Interlaboratory Testing Program

Analysis 261

STFI, 26 lb Corrugating Medium - CM92

TAPPI Official Test Method T826

Report #591 (N)
December 2018

	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
22XQKC	14.2	14.4 H	13.8	14.7	14.3	-0.81	1.1	0.4	14.0	-1.40	1.1	0.3	16	LU
6C6WP3	14.0	13.9	14.1	13.6	13.9	-2.29 *	1.2	0.2	14.0	-1.41	1.1	0.2	8	BK
9D6BHC	16.6 X	15.9 *	15.3	15.7	15.9	5.55 X	1.0	0.5	15.4	2.58 *	1.0	0.4	16	LH
9LYERZ	14.2	14.6	14.6	14.1	14.4	-0.42	0.9	0.3	14.4	-0.34	0.9	0.3	16	LZ
9WWF66	15.2 *	14.3	14.7	14.1 L	14.6	0.34	0.9	0.5	14.6	0.13	0.9	0.4	16	LB
B4TZ2W	14.0	14.0	14.4	14.0	14.1	-1.44	0.9	0.2	14.0	-1.61	1.0	0.2	12	TT
BM6MPP	14.5	14.7	14.5	14.2	14.4	-0.10	0.9	0.2	13.9	-1.64	0.9	0.6	16	LH
BTVZNT	14.6	14.2	14.2	14.5	14.4	-0.37	1.0	0.2	14.2	-1.00	1.0	0.4	13	LZ
C89J6Y	14.8	14.6	15.2	14.9 L	14.9	1.62	0.8	0.2	14.7	0.59	0.9	0.4	16	LA
CQKH32	14.6	14.9	14.1	14.7	14.6	0.47	1.0	0.3	14.6	0.22	1.0	0.4	16	LB
DLLH4W	14.3	14.6 L	14.0	13.4	14.1	-1.62	0.9	0.5	14.4	-0.28	1.0	0.4	10	LB
DLN9CZ	14.5	14.4 L	15.3	14.0	14.6	0.34	1.1	0.5	14.9	1.04	1.0	0.8	16	LA
EAM89V	14.3 H	14.6 H	14.5 H	14.3 H	14.4	-0.16	3.0	0.2	14.4	-0.18	1.6	0.1	16	LA
G7GEDM	14.8 L	14.9 L	14.8 L	14.4 L	14.7	1.06	0.2	0.2	14.8	0.81	0.7	0.3	12	LA
GGX6V6	14.7	14.6	14.7	14.8	14.7	0.95	1.0	0.1	14.8	0.76	1.0	0.1 L	16	LB
MBB9TB	14.6	15.0	14.6	14.0 H	14.6	0.36	2.0	0.4	14.4	-0.28	1.3	0.3	16	LA
RFR3XX	14.6	13.8 L	15.0	13.7	14.3	-0.77	0.8	0.6	14.5	-0.08	1.0	0.7	16	LH
RXMVJV	14.1	17.5 X	16.0 *	15.4	15.7	5.02 X	1.3	1.4 H	14.6	0.36	1.2	1.0 H	16	LA
TLTRWG	16.5 X	15.7 *	16.2 *	16.2 *	16.2	6.79 X	1.1	0.3	16.3	5.22 X	1.0	0.3	8	LA
TM3YZA	14.3	14.1	14.6	15.0	14.5	0.11	0.9	0.4	14.6	0.20	0.9	0.4	16	LB
UMGUW2	14.7	14.6	14.9	14.8	14.8	1.15	1.0	0.1	14.8	0.96	1.0	0.3	16	LU
UTTHWX	14.4	14.8	14.2	14.5	14.5	0.07	1.4	0.3	14.7	0.61	1.1	0.3	16	LA
W6DU7D	13.3 X	13.9	13.2 *L	13.4	13.4	-4.22 X	0.8	0.3	14.0	-1.40	1.0	0.6	16	LB
WPFRHE	14.7	14.8	14.5	14.9 L	14.7	0.95	0.9	0.2	14.6	0.37	0.9	0.2	16	LU
XU6LV7	15.1 *	14.8	14.7	14.6	14.8	1.25	1.0	0.2	14.7	0.49	0.9	0.3	16	TT
Y3YBTL	12.9 X	13.6	14.6 L	16.1 *	14.3	-0.68	0.9	1.4 H	14.7	0.52	1.0	0.7	16	LZ

Consensus (All Labs) Results

Wk Mean	14.50	14.55	14.64	14.54	Month Mean	14.47	Grand Mean	14.51
Avg SDr	1.13	1.12	1.20	1.30	Avg SD	1.20	Avg SD	1.03
SD btwn Labs	0.33	0.54	0.63	0.74	SD btwn Labs	0.25	SD btwn Labs	0.34
Labs Incld	22	25	26	26	SD btwn Wks	0.44	SD btwn Wks	0.46
Labs Excld	4	1	0	0	Labs Incld	22	Labs Incld	25
Labs not Rcvd	0	0	0	0				

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)	LZ	L&W (model not specified)
TT	TMI Short Span Compression, 17-34 (MB K455)		

End of Report