Collaborative Testing Services, Inc.

Containerboard Interlaboratory Testing Program

Participant Summary Report #590 (M) - November 2018

Introduction to the Containerboard Program

Explanation of Tables and Definitions of Terms

Analysis	Sample	Analysis Name
201	BX12	Box Compression Strength, Corrugated Boxes
202	EC11	Edgewise Compressive Strength, Wax (T811), Corrugated Board
203	EC11	Edgewise Compressive Strength by Clamp (T839), Corrugated Board
205	42D3	Mullen Burst of Linerboard, 42 lb Linerboard
206	56A2	Mullen Burst of Linerboard, 56 lb Linerboard
215	42D3	Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard
216	56A2	Ring Crush of Linerboard, Rigid Platen Type, 56 lb Linerboard
223	42D3	STFI of Linerboard, 42 lb Linerboard
224	56A2	STFI of Linerboard, 56 lb Linerboard
228	56A	Roughness - Stylus Method, 56 lb Linerboard
229	42D3	Roughness - Sheffield Method, 42 lb Linerboard
231	35E	Internal Bond Strength, Linerboard, 35 lb Linerboard
234	56A	Coefficient of Static Friction - Inclined Plane, 56 lb Linerboard
237	35E	Air Resistance - Gurley Method, Linerboard, 35 lb Linerboard
240	CM92	Flat Crush Strength (CMT) of Medium, 26 lb Corrugating Medium
250	CM92	Fluted Crush of Medium, 26 lb Corrugating Medium
255	CM92	Ring Crush of Medium, 26 lb Corrugating Medium
261	CM92	STFI of Medium, 26 lb Corrugating Medium

Collaborative Testing Services, Inc.
CONTAINERBOARD INTERLABORATORY TESTING PROGRAM

INTRODUCTION

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

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

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

USE OF AVERAGE MEAN AS A COLLABORATIVE REFERENCE VALUE

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

Material	Lot Code	Dates in Use
26 lb Corrugating Medium	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
32U9TC	568.4	-0.18	19.40		583.5	0.19	12.16	4	EX
3BZ6QN	630.9	1.42	10.78		640.5	1.83	10.48	3	TC
6GLPVF	523.5	-1.33	10.72		539.9	-1.07	20.71	4	ER
6PRNAH	585.2	0.25	9.68		584.6	0.22	6.84	4	ET
99NLYF	581.0	0.14	17.75		565.5	-0.33	10.70	4	LG
9FGA9T	586.0	0.27	24.19		583.8	0.20	13.68	4	LG
9LHT3C	488.4	-2.23 *	20.68		509.4	-1.96 *	20.24	4	LS
BPUK4N	644.3	1.76	31.40		628.2	1.48	16.11	4	LG
F822MJ	573.7	-0.05	50.05		569.6	-0.21	16.12	4	LM
JVAQH9	569.2	-0.16	29.47		567.5	-0.28	3.71 L	4	LS
NEAALX	598.8	0.60	29.28		595.8	0.54	30.62	4	LS
P2G8JV	583.0	0.19	14.80		569.9	-0.21	14.12	4	TE
PJG9GN	558.6	-0.43	20.23		548.5	-0.83	8.25	4	LG
Q2DVLR	658.4	2.12 *	23.37		654.9	2.25 *	16.53	4	ER
RG3NLJ	524.4	-1.31	36.48		533.3	-1.27	12.62	4	LL
VBNXMU	717.9	3.65 X	48.05		631.5	1.58	81.59 H	3	LH
XAHMKL	569.7	-0.15	15.20		582.7	0.16	23.70	3	LL
XCQQGJ	572.9	-0.07	10.87		564.9	-0.35	20.45	4	LM
XEYTGV	558.6	-0.43	29.86		555.5	-0.62	22.50	4	LS
XFCBLM	591.0	0.40	20.71		590.4	0.39	15.78	4	ES
XN283U	613.0	0.96	63.88 H		561.8	-0.44	38.99	4	ET
XY4JJH	543.1	-0.83	19.68		564.7	-0.36	19.49	4	ER
Z3DDCK	580.2	0.12	19.24		578.4	0.04	18.17	4	ER
ZDC2HV	534.4	-1.05	35.92		543.7	-0.96	9.83	4	LS

Consensus (All Labs) Results

Month Mean	575.51	Grand Mean	577.01
Avg SD	27.62	Avg SD Months	24.44
SD btwn Labs	39.04	SD btwn Labs	34.58
Labs Incld	23	Labs Incld	24

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	567.07	43.20	8.44	6
Clip sealing	578.49	38.42	2.98	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	LH	L.A.B. Compression Tester Model #10610
LL	Lansmont 76-5K	LM	Lansmont 122-15k
LS	Lansmont Squeezer	TC	TMI Monitor/Compression Tester, Model 17-37
TE	Testometric M500 - 25 KN		

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
6GLPVF	39.8	-0.44	2.78		39.0	-1.07	0.73	4	EN
7QP6ET	39.3	-0.58	3.30		39.3	-1.00	0.00	1	LD
9FGA9T	43.0	0.34	1.54		43.0	0.25	0.55	4	LE
DZ2AWA	39.3	-0.56	4.06	H	42.6	0.10	2.19	4	LC
DZ3T2D	41.0	-0.15	0.94	L	40.6	-0.56	0.43	4	TD
JVAQH9	43.5	0.46	1.56		40.9	-0.46	2.69	4	LD
MEBUQZ	42.4	0.19	1.95		42.3	0.00	0.59	4	LC
NEAALX	32.7	-2.20 *	5.34	H	30.8	-3.82 X	1.68	4	EM
PJG9GN	45.1	0.86	1.22		44.2	0.65	0.68	4	TH
R8VXV2	37.0	-1.13	1.54		37.6	-1.55	1.89	4	XX
VBNXMU	48.0	1.58	1.85		48.0	1.92 *	0.00	1	EM
XY4JJH	45.9	1.05	1.83		45.9	1.20	0.00	1	TB
ZDC2HV	44.0	0.58	1.23		43.9	0.54	0.45	4	LC

Consensus (All Labs) Results

Month Mean	41.60	Grand Mean	42.27
Avg SD	2.56	Avg SD Months	1.40
SD btwn Labs	4.07	SD btwn Labs	3.00
Labs Incld	13	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	TB	TMI Monitor/Compression Tester, Model 17-70
TD	TMI Digital Crush Tester, Model 17-09	TH	TMI Monitor/Compression Tester, Model 17-76
XX	Instrument make/model not specified by lab		

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
32CCER	45.5	0.97	1.75		44.5	0.56	0.93	3	LC
6GLPVF	42.2	-1.42	2.40		42.1	-1.07	0.36	4	EN
6PRNAH	43.4	-0.56	1.30		42.6	-0.72	1.31	4	EM
7QP6ET	39.0	-3.80 X	1.49		40.9	-1.93 *	1.42	4	LD
7VUAJX	45.0	0.62	1.53		44.4	0.50	1.70	4	CT
82Y9UM	42.4	-1.32	1.11		42.9	-0.51	0.56	4	EM
99NLYF	46.2	1.51	2.23		41.2	-1.73	3.78 H	4	TJ
9FGA9T	44.3	0.11	2.44		44.2	0.38	0.65	4	LY
9G6VVN	44.5	0.21	2.18		43.4	-0.20	1.42	4	TD
9LHT3C	43.9	-0.20	1.45		42.1	-1.09	1.46	4	TB
AAGPCM	43.4	-0.53	1.51		43.4	-0.18	0.39	4	XX
BPUK4N	43.4	-0.58	2.40		44.6	0.66	1.33	4	EM
BTPBCL	49.0	3.54 X	1.44		48.4	3.36 X	1.13	4	TG
DPNPXM	44.2	0.03	0.61 L		44.0	0.22	0.24 L	3	TL
DZ2AWA	44.8	0.48	2.77		45.4	1.24	0.92	4	LC
DZ3T2D	42.7	-1.08	0.67 L		42.5	-0.79	0.39	4	TD
E87YKA	43.4	-0.58	2.04		32.7	-7.70 X	12.21 H	4	LD
F822MJ	45.5	0.99	3.19 H		49.0	3.73 X	2.39	4	EM
GNYP9E	43.2	-0.72	1.34		44.0	0.23	0.57	4	LD
JTNZJP	88.2	32.27 X	2.35		74.0	21.36 X	20.54 H	4	LC
JVAQH9	47.8	2.62 *	1.72		46.1	1.70	2.56	4	LD
KHHLP3	54.6	7.61 X	0.35 L		50.8	5.05 X	5.16 H	4	LD
KLHUUC	43.0	-0.87	1.04		42.0	-1.17	1.04	4	LD
MEBUQZ	43.3	-0.63	1.24		43.0	-0.44	0.36	4	LC
NEAALX	41.4	-2.01 *	0.96		41.1	-1.80	0.43	4	EM
P2G8JV	45.8	1.22	0.80		45.6	1.36	0.77	4	LD
PJG9GN	44.9	0.55	0.56 L		44.9	0.91	0.57	4	TH
Q2DVLR	43.1	-0.78	2.09		42.4	-0.90	0.74	4	EM
RG3NLJ	42.6	-1.13	1.55		43.5	-0.10	0.59	4	LC
UDAHTX	45.0	0.61	1.57		45.6	1.40	0.77	4	LD
WNQYKV	44.9	0.53	1.91		43.1	-0.40	1.70	4	LD
XAHMKL	44.1	-0.09	1.02		43.9	0.15	0.20 L	3	BU
XCQQGJ	45.1	0.64	1.67		45.8	1.48	1.62	4	TG
XFCBLM	45.0	0.61	1.83		44.5	0.61	1.64	4	LD
XN283U	41.7	-1.82	1.41		41.5	-1.49	0.27	4	TD
XYKJFR	51.7	5.52 X	1.81		43.8	0.09	5.43 H	4	TD
YYEPAR	45.2	0.75	1.30		44.9	0.86	0.37	4	EM
Z3DDCK	44.6	0.31	1.35		44.2	0.40	0.78	4	LD
ZDC2HV	45.3	0.86	2.52		45.1	1.03	0.39	4	LC

	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
ZW9HTK	45.1	0.68	1.66	44.7	0.74	0.46	4	LD

Consensus (All Labs) Results

Month Mean	44.17	Grand Mean	43.65
Avg SD	1.75	Avg SD Months	1.51
SD btwn Labs	1.36	SD btwn Labs	1.42
Labs Incld	35	Labs Incld	35

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
TL	Tech-Lab Systems Compression	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
27RBHL	111.9	117.1 *	108.8	117.2	113.8	1.26	10.3	4.1	112.1	1.00	11.0	2.8	16	AX
2B7X8K	110.4	110.4	107.0	110.4	109.6	0.02	7.9	1.7	108.7	-0.25	8.0	1.4	16	AH
32U9TC	112.4	105.2	115.2	107.2	110.0	0.15	8.3	4.6	110.0	0.24	10.3	2.8	16	AH
3G8KK7	108.1	113.4	107.2	111.6	110.1	0.17	13.5	2.9	111.0	0.59	11.2	3.2	16	LA
3NTFKN	109.2	110.0	111.9	103.4	108.6	-0.26	13.0	3.7	107.8	-0.59	12.2	3.5	16	LC
4UDXFC	109.8	107.5	110.8	111.1	109.8	0.10	11.0	1.6	109.3	-0.01	11.5	3.1	16	LJ
66QEM9	102.0	109.3	108.6	103.7	105.9	-1.06	9.5	3.6	105.6	-1.41	10.1	3.4	16	LA
6BX8EJ	105.1	105.6	108.6	105.1	106.1	-1.00	11.3	1.7	107.4	-0.72	10.9	2.6	16	LC
7QP6ET	108.8	114.1	108.3	105.6	109.2	-0.09	10.3	3.6	106.5	-1.07	9.2	3.6	16	LA
7VUAJX	107.1	112.9	113.7	112.5	111.6	0.60	9.8	3.0	112.0	0.97	11.3	3.2	16	XX
849A2F	116.5	110.9	114.0	117.9 *	114.9	1.58	12.2	3.1	115.5	2.26	*12.5	3.5	16	LZ
8PGYXG	111.0	106.8	106.6	104.1	107.1	-0.70	10.4	2.9	107.5	-0.70	10.7	3.3	16	XX
9FGA9T	120.4 *	115.0	115.7	111.9	115.7	1.84	11.5	3.5	113.4	1.48	12.7	3.3	16	LZ
9RCKL7	108.8 L	105.6	106.7 L	107.3 L	107.1	-0.71	4.4	1.3	107.4	-0.72	4.2	1.5	16	LA
A2Q7VT	109.3 L	110.0 L	110.4 L	No Data	109.9	0.12	4.1	0.6	109.3	-0.04	4.1	0.9 L	10	XX
C6G9Z6	109.8	110.0	113.0	111.1	111.0	0.44	11.4	1.5	111.2	0.68	11.6	3.2	16	LZ
C88EHG	110.0	107.5	108.9	113.6	110.0	0.15	12.6	2.6	111.1	0.64	12.8	2.7	16	TB
CNG29X	109.7	110.5	107.5	109.5	109.3	-0.06	10.7	1.3	108.8	-0.20	12.0	2.2	16	LC
CVCA4N	111.3	106.8	109.3	112.3	109.9	0.12	13.2	2.4	110.3	0.34	11.9	2.9	16	LC
DZ3T2D	108.8	104.0	107.0	108.6	107.1	-0.71	15.1	2.2	109.5	0.03	14.0	4.0	16	XX
ETN7W3	114.1	110.3	110.7	110.7	111.4	0.57	11.9	1.8	110.8	0.53	11.1	3.7	16	LA
FBHDHE	112.2	110.6	110.0	109.6 L	110.6	0.33	5.9	1.1	111.3	0.72	5.6	2.7	16	RE
FDRDN8	113.8	110.5	115.1	111.2	112.7	0.93	9.9	2.2	114.2	1.79	11.8	7.2 H	16	LA
GLC4LJ	103.8	103.6	104.5	109.7	105.4	-1.21	10.6	2.9	105.8	-1.34	10.4	2.4	16	LB
GNYP9E	106.6	109.2	108.3	107.2	107.8	-0.49	11.1	1.2	108.8	-0.22	10.6	2.2	16	LC
J2Y9Y6	100.0 *	109.9	112.0	111.8	108.4	-0.32	7.2	5.7 H	111.6	0.83	7.9	5.3	16	AH
JTNZJP	111.6	109.3	114.9	114.3	112.5	0.89	10.3	2.6	111.8	0.89	11.8	3.4	16	LA
JVAQH9	98.6 *	103.8	98.3 *L	104.2 L	101.2	-2.44 *	5.5	3.2	105.1	-1.59	9.1	4.7	16	LA
KHXXCD	109.4	107.6	111.7	107.8	109.1	-0.11	11.8	1.9	106.3	-1.14	11.9	3.6	16	LC
KW2YEV	109.8 L	109.0 L	110.7 L	109.2 L	109.7	0.06	2.5	0.8	109.5	0.04	5.4	0.5 L	12	LJ
L2P9QZ	118.4	113.7	No Data	No Data	116.1	1.94 *	13.1	3.3	111.0	0.59	12.3	4.6	11	LC
M2PLXT	112.4	119.7 X	115.8	115.4	115.8	1.87	12.8	3.0	117.5	3.02	X13.6	3.2	16	LA
MTTQZV	109.2 L	109.9 L	109.3 L	110.0	109.6	0.03	4.0	0.4 L	109.5	0.05	4.2	0.4 L	12	LA
MVYBNV	106.3	106.0	109.1	108.5	107.5	-0.60	9.0	1.5	107.2	-0.80	10.2	2.2	12	LC
MYKVTY	106.9	108.7	110.4	107.6	108.4	-0.33	9.4	1.5	108.5	-0.34	8.4	1.7	16	LA

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
P9ZQKB	106.1	112.5	106.3	106.3	107.8	-0.50	11.7	3.1	107.3	-0.75	11.3	3.2	16	LC
PJFFL2	109.1	107.0	107.8	110.9	108.7	-0.23	12.9	1.7	106.1	-1.22	10.3	2.5	14	LC
Q7CCXL	111.2	104.8	101.0	112.0	107.3	-0.66	11.2	5.3	108.4	-0.35	10.8	4.5	10	AH
QVTXTX	109.3	105.1	110.0	107.7	108.0	-0.43	10.6	2.2	109.1	-0.10	10.7	2.3	16	LA
RCTA2Y	110.6	108.6	105.8	106.9	108.0	-0.45	8.8	2.1	107.5	-0.68	12.0	3.9	16	LC
T68TRW	112.2	108.2	102.2	104.1	106.7	-0.83	11.8	4.4	111.5	0.79	12.8	7.8 H	16	LC
UDAHTX	111.1	112.8	112.3	112.4	112.2	0.79	7.5	0.7	111.9	0.93	7.7	0.7 L	16	LA
UH9Y6R	106.8	108.9	109.5	107.2	108.1	-0.41	9.5	1.3	107.4	-0.74	8.1	1.3	16	TP
UMH33L	113.8	107.8 L	109.6	112.5	110.9	0.42	6.1	2.8	111.8	0.89	7.3	2.0	16	LC
UNY3JP	117.0	113.6	118.4 *	112.3	115.3	1.72	11.6	2.9	115.3	2.20	*10.7	2.6	16	AH
UQ6M8P	106.3	104.6	98.4 *	102.9	103.1	-1.90	10.8	3.4	105.3	-1.52	11.1	3.9	16	LC
WNQYKV	107.6	105.7	106.5	106.2	106.5	-0.88	11.0	0.8	107.2	-0.79	10.5	4.0	16	LC
XFCBLM	109.1	106.0	104.4 H	106.4	106.5	-0.89	13.7	2.0	107.7	-0.61	11.9	2.8	16	LA
XPETYB	98.6 *	97.7 X	96.5 X	99.1 *	98.0	-3.38 X	8.5	1.1	97.8	-4.30 X	8.5	2.5	8	XX
XY4JJH	106.3	102.5	108.8	107.8	106.3	-0.93	12.8	2.8	105.4	-1.49	11.7	2.6	16	LZ
YCAWDN	113.8	106.9	106.5	No Data	109.1	-0.13	12.2	4.1	109.2	-0.06	12.0	2.9	15	TB
YPTNRW	108.0	110.0	110.1	114.9	110.8	0.37	11.7	2.9	112.6	1.20	11.1	3.5	16	LC
Z3DDCK	117.9	117.6 *	117.5	114.4	116.9	2.17 *	8.4	1.6	113.4	1.49	10.2	3.3	16	AH
ZCPFVZ	119.9 *	114.4	114.5	118.2 *L	116.8	2.14 *	10.1	2.8	112.2	1.05	9.7	5.1	16	TB
ZDC2HV	101.8	108.2	102.8	101.8	103.7	-1.72	12.6	3.1	104.4	-1.85	11.1	2.6	16	AH
ZPBMVL	107.3	106.1	108.8	106.3	107.1	-0.70	11.8	1.2	106.8	-0.95	12.6	2.1	16	LC

Consensus (All Labs) Results

Wk Mean	109.60	109.00	109.28	109.27
Avg SDr	10.72	10.44	10.63	10.20
SD btwn Labs	4.66	3.46	4.29	4.15
Labs Incld	56	54	54	53
Labs Excld	0	2	1	0
Labs not Rcvd	0	0	1	3

Month Mean	109.50
Avg SD	10.57
SD btwn Labs	3.40
SD btwn Wks	2.74
Labs Incld	55

Grand Mean	109.37
Avg SD	10.55
SD btwn Labs	2.69
SD btwn Wks	3.36
Labs Incld	54

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 206

Bursting Strength (Mullen), 56 lb Linerboard - 56A2

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
27RBHL	119.4 H	114.4	115.8	116.5	116.5	1.14	11.9	2.1	115.2	0.81	10.7	4.8	12	AX
2B7X8K	111.7	113.0	112.9	111.3	112.2	-0.09	7.7	0.9	112.4	-0.03	7.5	1.1 L	12	AH
32U9TC	108.4	107.2	108.0	109.6	108.3	-1.22	12.5	1.0	110.0	-0.76	11.0	3.6	12	AH
3G8KK7	115.8	108.1	114.2	110.9	112.3	-0.08	9.4	3.4	113.1	0.16	11.1	5.3	12	LA
3NTFKN	117.6	113.2	118.9	116.1	116.5	1.12	11.4	2.5	114.6	0.62	12.4	3.2	8	XX
4UDXFC	114.9	108.0	111.3	116.4	112.6	0.03	11.5	3.8	110.9	-0.48	11.3	3.9	12	LJ
66QEM9	111.2	105.5	106.9	109.3	108.2	-1.24	10.4	2.5	107.2	-1.59	10.5	3.5	12	LA
7QP6ET	111.6	117.0	112.4 L	109.7	112.7	0.05	6.9	3.1	110.5	-0.63	7.7	3.8	12	LA
7VUAJX	118.6	106.7	117.6	111.6	113.6	0.31	12.1	5.6	115.3	0.84	10.5	4.2	12	XX
849A2F	114.6	118.9	118.3	122.1 *	118.5	1.71	10.5	3.1	118.9	1.92	12.0	3.5	12	LZ
8PGYXG	113.4	110.2	113.8	114.7 H	113.0	0.14	12.8	2.0	110.9	-0.49	11.6	3.7	12	XX
9FGA9T	114.3	115.4	109.5	116.3	113.9	0.39	10.3	3.0	114.2	0.49	10.3	4.2	12	LZ
9RCKL7	118.8 L	217.0 XH	117.5 L	116.8 L	142.5	8.61	X 156.9	49.7 H	126.4	4.17	X90.6	28.6 H	12	LA
A2Q7VT	122.1 *	123.7 *L	118.3 L	No Data	121.4	2.54	* 5.3	2.8	121.3	2.65	* 5.2	2.3	7	XX
C6G9Z6	113.1	111.5	115.7	110.6	112.7	0.05	9.8	2.2	111.3	-0.36	11.0	3.6	9	LZ
C88EHG	111.9	112.3	114.5	105.9	111.1	-0.40	11.2	3.7	112.6	0.02	12.4	3.1	12	TB
CNG29X	106.2	114.7	102.6 *	114.6	109.5	-0.86	9.0	6.1	109.5	-0.91	9.4	3.5	12	LC
CVCA4N	115.6	117.3	113.0	111.7	114.4	0.53	11.0	2.5	114.5	0.59	11.4	5.7	12	LC
DZ3T2D	114.2	113.2	114.4	113.8	113.9	0.39	12.4	0.5 L	113.0	0.14	13.5	4.3	8	XX
ETN7W3	109.2	117.0	120.1	113.0	114.8	0.66	9.1	4.7	112.5	-0.01	9.4	8.0 H	12	LA
FBHDHE	112.2	112.2	112.2	112.4 L	112.3	-0.08	5.8	0.1 L	112.8	0.08	6.1	2.3	12	RE
FDRDN8	118.1	125.2 *	121.4	117.8	120.6	2.32	* 10.1	3.5	119.5	2.10	*12.8	4.7	12	LA
GLC4LJ	114.9 L	110.8	109.5	108.9 L	111.0	-0.44	7.9	2.7	110.8	-0.53	7.6	3.5	12	LB
GNYP9E	112.7	119.6	116.0	110.6	114.7	0.63	10.1	3.9	114.4	0.56	10.5	2.9	12	LC
J2Y9Y6	114.1	103.1 *	111.9	112.8	110.5	-0.59	7.9	5.0	112.3	-0.08	8.4	4.2	12	AH
JTNZJP	112.7	116.2	116.9	109.8	113.9	0.39	11.1	3.3	114.1	0.47	10.5	4.3	12	LA
JVAQH9	110.2	109.9	118.4	104.8 *	110.8	-0.49	10.1	5.6	110.3	-0.69	10.7	4.1	12	LA
KHXXCD	109.7	115.5	118.5	113.8	114.4	0.53	11.2	3.7	111.1	-0.43	11.9	4.1	12	LC
KW2YEV	113.7 L	114.3 L	113.3 L	114.4 L	113.9	0.39	2.7	0.5 L	113.2	0.20	4.1	0.8 L	8	LJ
L2P9QZ	110.2	114.6	No Data	No Data	112.4	-0.04	11.4	3.2	114.1	0.47	11.4	5.6	8	LC
M2PLXT	114.6	124.2 *	112.7	115.0	116.6	1.18	11.9	5.1	114.5	0.58	11.9	5.1	12	LA
MTTQZV	112.4 L	112.2 L	112.4 L	112.5 L	112.4	-0.05	3.5	0.1 L	112.4	-0.05	3.5	0.1 L	4	LA
MVYBNV	108.5	116.7	114.6	118.7	114.6	0.60	10.4	4.4	113.5	0.30	10.2	4.5	8	XX
MYKVTY	117.9	113.3	111.7	114.8 L	114.4	0.54	7.8	2.7	115.6	0.92	7.6	2.6	12	LA
P9ZQKB	108.1 H	109.9	108.8	111.0	109.5	-0.88	14.1	1.3	108.1	-1.34	12.3	4.3	12	LC

Containerboard Interlaboratory Testing Program
Analysis 206
Bursting Strength (Mullen), 56 lb Linerboard - 56A2
TAPPI Official Test Method T807

Report #590 (M)
November 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
PJFFL2	111.5	108.3	113.0	112.7	111.4	-0.33	10.2	2.2	110.6	-0.58	9.8	2.1	12	LA
Q7CCXL	108.8	113.0	112.5	107.0	110.3	-0.63	10.3	2.9	113.7	0.36	9.1	3.9	10	AH
QVTXTX	108.5	110.6	117.2	113.5	112.5	-0.02	11.5	3.8	110.8	-0.51	11.2	3.2	12	LA
RCTA2Y	100.0 *	113.1	110.5 H	108.7	108.1	-1.27	15.0	5.7	109.1	-1.05	12.8	3.9	12	LC
T68TRW	113.9	109.0	111.2	115.0	112.3	-0.07	11.2	2.7	113.3	0.23	13.3	4.9	12	LC
UDAHTX	115.1	114.2	114.3	113.4	114.2	0.48	9.8	0.7	114.5	0.60	8.8	0.7 L	12	LA
UH9Y6R	110.5	112.1	113.3	111.1	111.8	-0.23	8.4	1.2	111.7	-0.25	8.7	1.1	12	TP
UNY3JP	116.6	119.0	112.2	118.5	116.6	1.16	12.6	3.1	116.4	1.15	10.9	3.1	12	AH
UQ6M8P	102.7 *	105.2	111.0	106.8	106.4	-1.75	8.8	3.5	106.8	-1.72	9.3	4.4	12	LC
WNQYKV	105.9	116.8	104.7	118.2	111.4	-0.33	8.5	7.1 H	111.3	-0.36	10.5	4.5	12	LC
XFCBLM	103.6	108.1	107.4	110.0	107.3	-1.51	9.0	2.7	109.0	-1.07	9.5	4.3	12	LA
XPETYB	107.8	107.5	103.3 *	109.3	107.0	-1.60	10.7	2.6	107.0	-1.68	10.7	2.6	4	XX
XY4JJH	110.7	104.9	106.3	111.0	108.2	-1.23	10.4	3.1	108.9	-1.10	11.4	3.2	12	LZ
YCAWDN	106.4	111.1	106.6	No Data	108.0	-1.29	9.6	2.7	111.1	-0.43	10.9	3.9	11	TB
YPTNRW	118.2	112.7	117.6	111.4	115.0	0.70	10.7	3.4	113.4	0.27	11.3	3.7	12	LC
Z3DDCK	117.6	121.5	116.6	118.5	118.6	1.73	12.8	2.1	116.4	1.17	11.3	4.7	12	AH
ZCPFVZ	127.9 X	116.6	122.1 *	127.4 X	123.5	3.14 X	10.3	5.3	120.7	2.45 *	9.3	6.1	12	TB
ZDC2HV	98.1 X	104.1	107.7	109.0	104.7	-2.24 *	11.0	4.9	105.7	-2.07 *	10.6	2.8	12	AH
ZPBMVL	105.2	113.3	107.9	113.3	109.9	-0.75	9.5	4.0	109.3	-0.97	10.0	3.7	12	LC

Consensus (All Labs) Results

Wk Mean	112.22	112.94	113.01	112.72	Month Mean	112.53	Grand Mean	112.53
Avg SDr	10.34	10.05	10.13	10.56	Avg SD	10.29	Avg SD	10.37
SD btwn Labs	4.61	5.03	4.53	3.65	SD btwn Labs	3.48	SD btwn Labs	3.32
Labs Incld	52	53	53	50	SD btwn Wks	3.42	SD btwn Wks	3.93
Labs Excld	2	1	0	1	Labs Incld	52	Labs Incld	53
Labs not Rcvd	0	0	1	3				

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 #590 (M)
November 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
27RBHL	73.5 XH	75.9 X	73.4 *	79.8 *	75.7	-3.56 X	5.6	3.0	77.1	-3.26 X	5.7	3.4	16	LC
36GTXG	87.3	91.4	88.9	86.7	88.5	-0.08	4.3	2.1	91.5	0.73	3.9	2.3	16	LD
3UAA7K	91.9	94.6	92.7	88.5	91.9	0.83	3.9	2.6	92.2	0.92	3.9	1.8	8	LD
4UDXFC	92.3	90.8	91.9	91.7	91.7	0.77	3.6	0.6	90.5	0.47	4.2	1.8	16	LD
66QEM9	89.6	89.4	79.1	81.9	85.0	-1.03	3.6	5.3	87.4	-0.40	4.3	4.1	16	LZ
6BX8EJ	88.8	89.4	88.1	85.9	88.0	-0.22	4.5	1.5	89.1	0.05	4.4	1.8	16	LD
6GLPVF	84.2	84.6	81.5	83.6	83.5	-1.45	3.9	1.4	82.1	-1.87	3.9	1.5	16	EN
7QP6ET	89.2	86.6	82.9	80.5 L	84.8	-1.10	3.2	3.8	84.6	-1.18	3.2	2.5	16	LD
849A2F	85.2	89.5	91.0	89.1	88.7	-0.03	4.3	2.5	87.1	-0.50	4.0	2.2	16	LC
8EN7WL	111.9 X	91.6	98.7	No Data	100.7	3.21 X	3.6	10.3 H	95.1	1.73	4.1	11.9 H	14	XX
9FGA9T	86.7	88.5	87.4	88.7	87.8	-0.28	3.8	0.9	85.9	-0.81	3.7	2.5	16	LG
9G6VVN	97.2	91.5 L	91.9 L	93.7 L	93.6	1.29	1.6	2.6	93.1	1.17	1.3	1.9	16	TD
9KAKZJ	95.6	96.3	93.6	95.2	95.2	1.71	4.6	1.2	94.6	1.59	4.5	1.4	16	LD
9RCKL7	85.0 L	84.6	84.4 L	84.4	84.6	-1.14	2.2	0.3 L	84.5	-1.20	1.9	0.5 L	16	TU
A2Q7VT	70.3 X	83.1	76.6	78.8 *	77.2	-3.15 X	3.3	5.3	76.7	-3.36 X	3.6	6.0	14	LD
ABWVQC	67.4 XL	72.3 X	76.1 *	72.3 XL	72.0	-4.55 X	3.7	3.6	71.9	-4.71 X	3.8	3.2	12	TJ
BPUK4N	88.0	87.1	88.1	82.8	86.5	-0.63	3.6	2.5	84.2	-1.29	3.7	2.7	16	EM
BTPBCL	89.4	88.0	88.0	87.1	88.1	-0.19	3.8	1.0	89.4	0.16	3.5	2.3	16	TH
C2JRPW	85.4	86.8	No Data	No Data	86.1	-0.75	3.9	1.0	85.0	-1.08	3.9	1.3	9	EX
C88EHG	94.8	87.4	93.0	90.9	91.5	0.73	5.3	3.2	90.2	0.38	4.3	3.2	16	LD
DZ2AWA	87.7	84.5	84.1	82.9	84.8	-1.09	4.4	2.0	85.3	-0.99	3.3	1.2	16	LC
ETN7W3	100.5 *	99.8 *	73.1 *H	70.8 XH	86.1	-0.74	9.0	16.3 H	84.6	-1.18	7.7	14.2 H	16	LD
FBHDHE	90.7	89.9	89.6	90.9	90.3	0.39	2.5	0.6	88.4	-0.13	2.8	1.8	16	LZ
FDRDN8	90.4	95.4	93.8	92.7	93.1	1.15	4.1	2.1	91.8	0.82	4.5	3.8	16	LZ
GLC4LJ	91.9	91.9	93.6	91.1	92.2	0.90	4.4	1.0	92.7	1.07	4.5	1.8	16	LC
GNYP9E	86.5	88.4	86.1	86.8	86.9	-0.51	3.6	1.0	86.8	-0.57	7.3	2.3	16	LD
J2Y9Y6	99.1 *	95.2	92.6	91.9	94.7	1.58	4.4	3.2	93.8	1.37	4.6	2.9	16	LZ
JTNZJP	86.7	81.4 H	84.7	85.9 H	84.7	-1.12	7.4	2.3	87.9	-0.28	6.9	7.6 H	16	LC
JVAQH9	88.3	88.0	85.2 L	89.0	87.6	-0.33	2.5	1.7	88.5	-0.11	3.6	1.6	16	LD
KHXXCD	96.6 H	95.0	93.6	90.2 H	93.9	1.36	7.8	2.7	92.1	0.90	8.2	4.8	12	LC
KW2YEV	19.9 XL	19.9 XL	19.9 XL	20.0 XL	19.9	-18.64 X	0.1	0.1 L	65.2	-6.56 X	2.6	33.4 H	12	LD
L2P9QZ	90.2	92.4	No Data	No Data	91.3	0.67	3.8	1.5	91.1	0.63	4.0	3.2	13	LD
LTGJBG	76.3 XH	86.5	87.8	88.5	84.8	-1.09	5.4	5.7	83.7	-1.44	8.1	5.5	16	MB
M2PLXT	97.5	96.4	94.6	96.9 *	96.4	2.04 *	4.2	1.3	98.3	2.61 *	4.3	1.9	16	LD
MTTQZV	87.3	90.8	87.2	89.4 L	88.7	-0.04	2.9	1.7	88.4	-0.12	2.6	1.0 L	12	LZ

Containerboard Interlaboratory Testing Program

Analysis 215

Ring Crush, 42 lb Linerboard - 42D3

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
MYKVTY	87.7	87.4	87.8	86.8	87.4	-0.38	3.4	0.5 L	87.1	-0.48	3.0	1.0	16	LD
N6KJZ6	95.1	96.2	95.4	91.0	94.4	1.51	4.1	2.3	91.3	0.69	4.2	2.6	12	TH
P2G8JV	91.9	91.8	94.7	94.4	93.2	1.18	2.9	1.6	91.6	0.76	2.8	1.4	16	LD
P9ZQKB	85.8	83.9	83.5	84.4	84.4	-1.20	2.7	1.0	84.3	-1.27	3.0	2.0	16	LC
PJFFL2	87.9	91.3	87.6	85.6	88.1	-0.20	4.0	2.3	88.6	-0.07	3.6	1.8	16	LD
Q7CCXL	89.3	92.5	92.3	89.7	91.0	0.57	5.0	1.7	91.8	0.82	4.4	2.1	10	LC
QVTXTX	90.7	90.4	90.5	91.1	90.7	0.50	4.8	0.3 L	90.7	0.50	4.6	0.5 L	16	LD
RCTA2Y	88.3	87.8	91.7	89.8	89.4	0.15	4.5	1.8	90.5	0.45	4.5	1.7	16	LC
UDAHTX	91.2	91.7	91.8	91.3	91.5	0.72	3.4	0.3 L	91.7	0.78	3.5	0.5 L	16	LD
UGBLHY	72.8 X	80.3 *	82.9	81.5	79.4	-2.56 *	3.1	4.5	73.9	-4.17 X	3.4	4.1	16	TH
UH9Y6R	92.3	89.2	91.4	93.1	91.5	0.72	4.5	1.7	89.1	0.06	3.7	2.6	16	TJ
UQ6M8P	91.7	91.6	89.2	92.5	91.2	0.65	4.3	1.4	91.3	0.67	4.6	2.1	16	LD
WNQYKV	86.9	86.0	86.9	84.9	86.2	-0.71	3.8	1.0	86.2	-0.74	4.2	1.8	16	LD
XY4JJH	86.1	86.4	84.3	86.3	85.8	-0.83	5.0	1.0	85.9	-0.83	4.1	1.7	16	LD
YYEPAR	84.0	81.9	82.3	85.8	83.5	-1.45	5.0	1.8	82.7	-1.72	4.3	1.7	16	EM
Z3DDCK	86.1	86.2	85.4	88.0	86.5	-0.64	3.7	1.1	85.1	-1.06	3.8	1.7	16	LD
ZCPFVZ	108.6 X	104.7 X	102.0 *	103.0 X	104.6	4.26 X	5.0	2.9	101.9	3.61 X	4.6	3.7	16	LX
ZDC2HV	90.4	90.7	91.5	91.3	91.0	0.57	4.0	0.5 L	91.4	0.71	4.1	1.5	16	LC
ZPBMVL	87.1	88.0	88.3	89.0	88.1	-0.20	2.9	0.8	86.1	-0.76	4.2	1.9	16	LD

Consensus (All Labs) Results

Wk Mean	89.92	89.40	88.09	88.13	Month Mean	88.83	Grand Mean	88.86
Avg SDr	4.12	4.08	4.23	4.38	Avg SD	4.32	Avg SD	4.41
SD btwn Labs	4.04	4.20	5.96	4.19	SD btwn Labs	3.70	SD btwn Labs	3.60
Labs Incld	46	50	51	47	SD btwn Wks	3.19	SD btwn Wks	3.65
Labs Excld	8	4	1	4	Labs Incld	48	Labs Incld	48
Labs not Rcvd	0	0	2	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	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
27RBHL	113.8 *	115.0 XH	114.6 XH	127.5 H	117.7	-3.10 X	10.8	6.5	120.0	-2.43 *	8.6	4.4	12	LC
36GTXG	145.6	144.2	142.2	141.7	143.4	0.57	4.5	1.8	143.9	0.67	4.9	1.8	12	LD
3UAA7K	149.5	142.6	146.8	146.8	146.4	0.99	5.5	2.9	144.2	0.71	5.2	2.7	12	LD
4UDXFC	152.4	147.0	146.8	142.0	147.0	1.09	4.9	4.3	146.0	0.94	5.8	3.1	12	LD
66QEM9	144.3	138.7	115.5 XH	114.4 XH	128.2	-1.60	10.1	15.5 H	133.3	-0.70	7.8	10.9	12	LZ
6GLPVF	127.7	129.4	129.8	132.1	129.7	-1.39	3.6	1.8	128.8	-1.29	4.0	1.8	12	EN
7QP6ET	131.9	134.5	133.1 L	133.3	133.2	-0.89	3.4	1.1	134.5	-0.55	3.5	1.8	12	LD
849A2F	133.9	138.3	138.6	134.8	136.4	-0.43	4.5	2.4	135.8	-0.38	4.6	2.5	12	LC
8EN7WL	183.4 X	No Data	160.1 X	No Data	171.7	4.62 X	6.5	16.5	154.1	1.99 *	5.6	18.0 H	8	XX
9FGA9T	137.4	138.0	141.3	137.7	138.6	-0.12	4.8	1.8	138.9	0.02	4.0	2.9	12	LY
9G6VVN	147.0	141.8 L	143.7	138.9 L	142.9	0.49	2.2	3.4	141.6	0.37	1.6	2.5	12	TD
9KAKZJ	149.0	151.0	146.0	148.5	148.6	1.31	5.0	2.0	149.8	1.43	5.1	4.4	12	LD
9RCKL7	135.1	129.2	129.7	132.1	131.5	-1.13	3.0	2.7	131.0	-1.01	2.8	2.5	12	TU
A2Q7VT	118.2 *	133.7	119.5 X	130.2	125.4	-2.01 *	4.6	7.7	123.4	-1.99 *	4.8	6.2	10	LD
ABWVQC	118.2 *	119.6 XL	121.8 X	123.0 *	120.6	-2.69 *	3.3	2.2	120.8	-2.33 *	5.0	3.1	8	TJ
BPUK4N	141.8	139.2	138.1	133.7	138.2	-0.18	5.2	3.4	136.0	-0.35	4.6	3.8	12	EM
BTPBCL	143.1	143.7	144.4	144.2	143.8	0.63	4.0	0.6 L	141.3	0.34	4.5	3.3	12	TH
C2JRPW	139.8	141.4	No Data	No Data	140.6	0.17	4.7	1.2	138.1	-0.08	5.8	3.7	4	EX
C88EHG	147.8	147.4	151.9	138.2	146.3	0.99	4.0	5.8	145.8	0.91	5.1	4.9	12	LD
DZ2AWA	138.7 L	138.6	138.8	136.3	138.1	-0.19	3.4	1.2	137.6	-0.15	3.8	0.9 L	12	LC
ETN7W3	156.6	157.4 *	106.5 XH	111.4 XH	132.9	-0.93	13.5	27.8 H	136.0	-0.36	10.6	21.7 H	12	LC
FBHDHE	140.4	141.5	141.0	140.0 L	140.7	0.18	2.8	0.7 L	135.9	-0.37	3.9	6.1	12	LZ
FDRDN8	143.8	146.7	141.5	145.8	144.4	0.72	4.2	2.3	143.2	0.58	4.2	2.2	12	LZ
GLC4LJ	147.6	150.3	143.2	145.4	146.6	1.03	5.1	3.0	144.9	0.80	4.1	2.5	12	LC
GNYP9E	132.8	133.1	134.6	135.7	134.0	-0.77	3.9	1.3	132.6	-0.80	3.7	2.6	12	LD
J2Y9Y6	153.8	156.3 *	142.4	144.7	149.3	1.41	5.2	6.8	146.7	1.03	5.5	6.0	11	LZ
JTNZJP	142.7 H	131.1 H	138.7 H	130.1 H	135.7	-0.54	15.0	6.1	137.5	-0.16	11.1	13.6 H	12	LC
JVAQH9	137.9	138.7	137.7	139.7	138.5	-0.13	4.6	0.9 L	135.5	-0.43	4.8	3.2	12	LD
KHXXCD	159.1	147.5	154.3 *H	150.0 H	152.7	1.90	10.2	5.1	148.8	1.30	10.0	7.1	12	LC
KW2YEV	139.9 L	140.1 L	140.5 L	140.3 L	140.2	0.11	0.6	0.3 L	139.9	0.14	5.5	0.4 L	8	LD
L2P9QZ	141.6	144.5	No Data	No Data	143.0	0.52	5.2	2.1	143.5	0.62	4.4	2.7	9	LD
LTGJBG	122.0 H	143.3	147.3	142.1 L	138.7	-0.11	7.6	11.3 H	135.2	-0.46	8.8	11.4	11	MB
M2PLXT	153.5	151.3	151.6	152.4 *	152.2	1.82	5.7	1.0	152.3	1.76	4.9	1.2 L	12	LD
MTTQZV	144.4	147.8 L	142.1	143.1	144.3	0.70	3.9	2.5	144.3	0.73	3.9	2.5	4	LZ
MYKVTY	135.2	138.7	138.7	138.8	137.9	-0.23	4.5	1.8	137.6	-0.15	4.4	2.1	12	LD

Containerboard Interlaboratory Testing Program

Analysis 216

Ring Crush, 56 lb Linerboard - 56A2

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
N6KJZ6	145.0	142.7	143.4	143.9	143.8	0.62	4.1	1.0	146.4	0.99	5.2	2.8	12	TH
P2G8JV	144.6 L	143.8	144.8	142.4	143.9	0.64	3.1	1.1	143.3	0.59	3.2	0.9 L	12	LD
P9ZQKB	132.9	133.9	134.5	133.5	133.7	-0.82	3.4	0.7 L	133.7	-0.66	3.5	2.3	12	LC
PJFFL2	139.0	136.3	143.3	139.3	139.5	0.00	5.1	2.9	139.1	0.04	4.6	2.1	12	LD
Q7CCXL	141.3	142.4	143.0	141.3	142.0	0.36	5.6	0.8 L	141.3	0.33	7.5	3.7	10	LC
QVTXTX	143.5	143.3	142.0	144.7	143.4	0.56	5.6	1.1	143.2	0.58	5.2	1.3 L	12	LD
RCTA2Y	141.3	145.3	140.7	144.6	143.0	0.51	4.1	2.3	143.4	0.60	4.7	1.7	12	LC
UDAHTX	143.5	142.6	142.7	142.6	142.9	0.49	3.3	0.4 L	143.1	0.56	3.2	0.5 L	12	LD
UGBLHY	118.1 *	123.5 *	126.9 *	124.7 *	123.3	-2.30 *	4.6	3.7	118.2	-2.67 *	4.8	6.1	8	TH
UH9Y6R	142.0 H	140.9	139.8	142.8	141.4	0.27	10.8	1.3	139.2	0.05	7.2	2.2	12	TJ
UQ6M8P	142.4	137.7 H	144.4 L	144.5	142.2	0.40	10.4	3.2	145.1	0.82	7.5	3.2	12	LD
WNQYKV	134.5	139.1	141.3	138.5	138.4	-0.15	5.3	2.9	138.0	-0.09	4.5	2.3	12	LD
XY4JJH	139.1	139.0	138.8	140.0	139.2	-0.03	4.7	0.5 L	136.9	-0.24	5.0	2.2	12	LD
YYEPAR	125.9	126.2 *	127.3 *	128.7	127.0	-1.78	4.9	1.3	126.9	-1.53	5.2	1.9	12	EM
Z3DDCK	135.5	135.5	133.9	135.9	135.2	-0.60	4.4	0.9 L	135.8	-0.38	4.1	1.7	12	LD
ZCPFVZ	166.0 *	168.7 X	168.5 X	168.8 X	168.0	4.08 X	5.9	1.3	163.3	3.18 X	5.6	4.2	12	LY
ZDC2HV	143.0	146.1	142.1	144.9	144.0	0.66	4.3	1.8	144.8	0.79	4.4	1.9	12	LC
ZPBMVL	138.4	136.9	141.4 L	138.1	138.7	-0.11	4.9	1.9	137.8	-0.12	4.5	2.2	12	LD

Consensus (All Labs) Results

Wk Mean	140.04	140.86	140.79	139.13	Month Mean	139.43	Grand Mean	138.75
Avg SDr	5.92	5.74	5.29	5.17	Avg SD	5.87	Avg SD	5.55
SD btwn Labs	10.37	6.97	5.90	6.48	SD btwn Labs	7.00	SD btwn Labs	7.71
Labs Incld	52	49	44	47	SD btwn Wks	5.52	SD btwn Wks	5.75
Labs Excld	1	3	7	3	Labs Incld	50	Labs Incld	52
Labs not Rcvd	0	1	2	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	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		

	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
27RBHL	23.1	24.1	22.8	23.5	23.4	0.81	1.6	0.6	23.9	1.34	1.7	1.1	16	LZ
2B7X8K	22.7	22.7	22.8	22.2 L	22.6	-0.05	1.3	0.3	22.4	-0.27	1.2	0.4	16	TT
36GTXG	21.1	22.8 L	22.0	22.3	22.0	-0.70	1.6	0.7	22.2	-0.52	1.8	0.7	16	LY
3G8KK7	23.4	23.7	24.2	23.9	23.8	1.33	2.4	0.3	24.2	1.70	2.3	1.0	16	LU
3N4DMK	22.3	23.2	22.3 L	21.7 L	22.4	-0.29	1.5	0.6	22.8	0.15	1.7	1.0	16	LA
4UDXFC	22.5	23.8	23.4	22.9	23.2	0.61	1.9	0.6	23.2	0.58	2.0	0.7	16	LA
66QEM9	21.8	22.6	20.6	22.1	21.8	-1.01	1.6	0.8	21.2	-1.62	1.5	0.8	16	LA
6BX8EJ	21.9	22.4	23.6	22.7	22.7	0.01	1.8	0.7	22.8	0.12	2.0	0.5	16	LA
6GLPVF	20.8	20.9 *	22.0	20.8 *	21.1	-1.77	1.5	0.6	21.0	-1.75	1.7	0.6	16	LY
7QP6ET	22.1	21.3 L	20.7 L	22.2	21.6	-1.24	1.3	0.7	21.4	-1.34	1.3	0.5	16	BK
849A2F	21.8	22.8	21.9	21.0	21.9	-0.89	2.2	0.8	21.7	-1.10	1.9	0.7	16	LW
8EN7WL	44.0 X	22.7	22.2	No Data	29.6	8.02 X	2.3	12.4 H	28.7	6.47 X	2.5	10.1 H	14	XX
8PGYXG	21.8	22.0	21.8	21.4	21.7	-1.03	1.9	0.2	22.7	-0.02	2.0	1.1	16	LH
9FGA9T	22.1	22.8	21.9	21.7	22.1	-0.59	1.6	0.5	21.6	-1.11	1.8	0.6	16	LU
9KAKZJ	23.9	23.4	24.7 *	24.0	24.0	1.53	1.6	0.5	23.5	0.93	1.5	0.4	16	LH
C2JRPW	24.0 L	22.1 L	No Data	No Data	23.1	0.47	0.0	1.4	23.1	0.43	0.0	1.1	9	TT
C6G9Z6	24.3	24.8 *	24.8 *	23.4	24.3	1.93	2.1	0.7	24.5	1.93	2.3	1.0	16	LZ
C88EHG	24.4	24.1 H	25.0 *	24.7 *	24.5	2.16 *	2.3	0.4	23.6	1.05	2.0	0.6	16	LW
CNG29X	23.0	23.6	23.2	23.2 H	23.3	0.72	2.3	0.2	23.6	0.98	2.2	0.6	16	LA
CVCA4N	21.8	22.5	22.5	22.4	22.3	-0.40	1.8	0.4	22.8	0.11	1.8	0.6	16	LU
E87YKA	22.9	24.4	22.7	22.9	23.2	0.65	1.7	0.8	23.7	1.14	2.1	1.0	16	LH
FDRDN8	22.1	21.6	21.5	22.6	21.9	-0.82	1.8	0.5	21.8	-0.90	1.8	0.5	16	LW
GLC4LJ	22.6	22.4	23.0	22.9	22.7	0.09	1.7	0.2	23.9	1.27	1.9	3.2 H	16	LW
GNYP9E	22.4	22.8	22.3	22.6	22.5	-0.14	1.8	0.2	22.1	-0.62	1.8	0.8	16	LA
JTNZJP	23.8	23.2	24.7 *	23.3	23.8	1.27	2.0	0.7	23.9	1.34	2.1	0.7	16	LU
JVAQH9	23.1	22.1	21.1 L	22.7	22.3	-0.45	1.9	0.9	22.8	0.10	1.8	1.2	16	LZ
KHXXCD	24.8 *H	24.5	24.3	24.5 *	24.5	2.15 *	2.6	0.2	23.7	1.08	2.1	1.6	16	LA
L2P9QZ	20.7 L	21.4	No Data	No Data	21.0	-1.88	1.6	0.5	21.4	-1.38	1.9	1.0	13	LZ
LTGJBG	22.0	21.1	22.2	22.2	21.9	-0.89	1.8	0.5	22.6	-0.04	1.8	0.9	16	LA
MVYBNV	23.8	23.7	24.7 *	23.3	23.9	1.42	2.1	0.6	23.8	1.24	2.0	0.5	16	XX
MYKVTY	22.2 L	23.9 H	23.0	22.6	22.9	0.32	2.4	0.7	22.6	-0.11	2.0	0.7	16	LA
N6KJZ6	21.2	22.0	21.9	22.3 H	21.8	-0.94	2.5	0.5	21.4	-1.34	2.2	0.8	12	LH
P2G8JV	22.2	21.8	22.5	22.7	22.3	-0.39	1.6	0.4	21.4	-1.40	1.6	1.0	16	LY
P9ZQKB	23.0	21.9 L	21.7	21.7 L	22.1	-0.65	1.4	0.6	22.1	-0.66	1.4	0.6	16	LA
PEKV96	32.3 X	22.6	23.0	17.9 X	23.9	1.48	2.1	6.0 H	22.1	-0.64	2.1	3.4 H	16	LY

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

Report #590 (M)
November 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
PJFFL2	23.0	23.7	21.8	21.4	22.5	-0.18	2.2	1.0	22.6	-0.11	4.3	0.6	14	LA
Q7CCXL	23.8 L	22.9 L	23.1 L	21.9 L	22.9	0.33	1.0	0.8	23.0	0.34	2.9	0.7	10	LH
QVTXTX	22.6	22.8	23.2	22.3	22.7	0.09	1.8	0.4	22.7	-0.01	1.8	0.7	16	LY
RCTA2Y	22.4	21.5	22.2	19.9 X	21.5	-1.32	2.1	1.1	22.6	-0.12	2.1	2.9 H	16	LA
T68TRW	23.2	22.2	21.8	22.6	22.4	-0.25	2.0	0.6	22.5	-0.14	2.0	0.6	16	LA
TVZW3X	22.7	21.7	21.7	22.2	22.0	-0.70	1.9	0.5	22.1	-0.60	1.7	0.9	10	LW
UDAHTX	22.9 L	22.6	23.2	23.0	22.9	0.32	1.5	0.2	22.7	0.05	1.4	0.2 L	16	LA
UGBLHY	19.5 X	22.0	23.3	22.4	21.8	-0.99	1.9	1.6	21.3	-1.50	1.8	1.0	16	LH
UH9Y6R	22.0	22.7	22.1	21.9	22.2	-0.54	1.5	0.4	22.3	-0.43	1.4	0.3 L	16	TT
UMH33L	23.5	24.7	21.5 H	23.0	23.2	0.64	1.9	1.3	23.0	0.36	1.8	1.1	16	LA
UNY3JP	25.1 *	24.0	22.3	23.8	23.8	1.31	1.5	1.1	24.4	1.88	2.0	1.1	16	LU
UQ6M8P	23.5	24.3	23.3	24.4 *	23.9	1.44	2.1	0.6	23.3	0.68	1.9	1.0	16	LA
URB8T6	22.3 H	22.7	21.6	22.4	22.3	-0.44	2.6	0.4	24.3	1.80	2.2	2.9 H	12	LU
WNQYKV	21.4	24.2	22.7	22.9	22.8	0.18	1.8	1.1	22.6	-0.08	1.8	0.7	16	LA
XY4JJH	22.8	22.3	22.0	22.3	22.4	-0.30	2.1	0.3	22.2	-0.51	1.9	0.5	16	LY
YCAWDN	22.2	21.5	22.8	No Data	22.2	-0.56	1.8	0.6	21.7	-1.04	1.8	0.5	15	LZ
YPTNRW	22.3	23.4	22.5	21.8	22.5	-0.15	1.8	0.6	22.3	-0.36	2.0	0.7	16	LA
YXQA7B	22.8	23.2	23.0	23.4	23.1	0.53	2.0	0.3	23.7	1.08	2.1	0.7	8	LU
Z3DDCK	20.2 *	21.5	21.2	21.4	21.1	-1.79	2.1	0.6	21.2	-1.58	1.7	0.7	16	LU
ZDC2HV	22.0	22.4	21.7	22.9	22.3	-0.43	1.9	0.5	22.3	-0.39	2.0	0.6	16	LU

Consensus (All Labs) Results

Wk Mean	22.62	22.80	22.60	22.62	Month Mean	22.65	Grand Mean	22.67
Avg SDr	1.85	1.97	1.86	1.92	Avg SD	1.89	Avg SD	1.97
SD btwn Labs	1.03	1.00	1.05	0.87	SD btwn Labs	0.87	SD btwn Labs	0.93
Labs Incld	52	55	53	49	SD btwn Wks	1.06	SD btwn Wks	1.14
Labs Excld	3	0	0	2	Labs Incld	54	Labs Incld	54
Labs not Rcvd	0	0	2	4				

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		

	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
27RBHL	35.7	35.8 L	34.4	34.0	35.0	0.23	2.4	0.9	34.7	0.21	2.3	1.7	12	XX
2B7X8K	33.8	33.3 L	33.3	34.2 L	33.6	-0.55	1.7	0.4	33.7	-0.48	1.6	0.3 L	12	TT
36GTXG	35.3	35.0	33.5	33.9	34.4	-0.09	3.0	0.9	34.6	0.16	2.7	0.8	12	LY
3G8KK7	36.7	35.1	36.0	37.7 *H	36.4	1.04	3.1	1.1	36.6	1.49	3.0	1.4	12	LU
3N4DMK	34.8	34.2 L	33.1	32.8	33.7	-0.49	2.4	0.9	33.8	-0.39	2.7	1.2	8	LA
4UDXFC	36.0	36.0	35.8	35.1	35.7	0.66	3.0	0.4	35.3	0.65	3.0	1.5	12	LU
66QEM9	33.6	31.3	30.9 *L	34.1	32.5	-1.21	2.2	1.6	32.1	-1.57	2.6	1.1	12	LA
6GLPVF	31.5	31.2 *	31.9	33.0	31.9	-1.58	2.6	0.8	31.7	-1.79	2.5	0.9	12	LY
7QP6ET	32.7 L	31.7	32.2	32.3	32.2	-1.38	2.1	0.4	32.3	-1.40	2.1	1.0	12	BK
849A2F	34.2	35.2	33.9	31.7	33.8	-0.47	3.0	1.5	33.6	-0.51	3.1	1.3	12	LW
8EN7WL	48.9 X	33.3	32.9	No Data	38.4	2.21 *	2.9	9.1 H	37.6	2.18 *	3.5	7.2 H	9	XX
8PGYXG	32.2	33.7	33.6	34.5	33.5	-0.64	2.8	1.0	34.6	0.15	3.0	1.3	12	LH
9FGA9T	33.6	33.5 L	32.9	33.0	33.2	-0.78	2.0	0.3	33.3	-0.70	2.1	1.1	12	LU
9KAKZJ	36.7	36.1	36.5	36.3	36.4	1.07	2.4	0.3 L	36.3	1.28	2.5	1.2	12	LH
C2JRPW	33.3 L	34.8 L	No Data	No Data	34.1	-0.29	0.0	1.1	33.5	-0.57	0.0	1.1	4	LZ
C6G9Z6	38.6 *	38.8 *	38.6 *H	36.1	38.0	2.02 *	4.0	1.3	36.9	1.72	3.4	3.8 H	9	LZ
C88EHG	33.9	36.2	35.6	35.1	35.2	0.34	2.7	1.0	35.4	0.67	2.6	0.7	12	LW
CNG29X	35.5	36.7 H	36.6	37.0	36.4	1.08	3.3	0.7	36.0	1.08	3.2	0.8	12	LA
CVCA4N	33.7	34.8	34.0	32.8	33.8	-0.44	2.6	0.8	34.8	0.29	2.9	1.0	12	LU
E87YKA	36.3 H	36.0	36.2	36.0	36.1	0.92	3.4	0.1 L	35.7	0.89	3.0	0.8	12	LH
FDRDN8	34.6	34.8	34.8	34.7	34.7	0.08	2.6	0.1 L	33.9	-0.34	2.7	0.9	12	LW
GLC4LJ	34.9	34.8	35.5	34.7	35.0	0.24	2.2	0.4	35.2	0.57	2.5	0.5	12	ID
GNYP9E	35.2 L	33.6	35.6	35.1	34.9	0.18	2.7	0.9	33.7	-0.49	2.2	1.3	12	LA
JTNZJP	37.2	38.5 *	35.7	36.8	37.1	1.45	3.2	1.2	36.4	1.38	3.0	1.2	12	LU
JVAQH9	37.1	34.9	34.9	34.2	35.3	0.41	3.1	1.3	35.3	0.59	3.1	1.0	12	LZ
KHXXCD	37.1	37.8	38.0	37.4	37.6	1.75	3.1	0.4	36.7	1.54	3.1	2.0	12	LA
L2P9QZ	34.3	31.5	No Data	No Data	32.9	-0.98	3.0	2.0	32.2	-1.49	2.7	1.0	9	LZ
LTGJBG	35.2	36.8	32.7	34.9	34.9	0.20	2.8	1.7	34.5	0.06	2.7	1.3	11	LA
MVYBNV	37.2	38.5 *	35.7	36.8	37.1	1.45	3.2	1.2	36.5	1.42	3.1	1.0	12	LU
MYKVTY	33.7	33.5	33.9	33.3	33.6	-0.57	2.6	0.3 L	33.8	-0.36	2.6	0.9	12	LA
N6KJZ6	29.9 *	32.3	32.3	31.4 *	31.5	-1.80	2.6	1.2	31.1	-2.21 *	2.6	1.5	12	LU
P2G8JV	34.7	35.5	35.3	34.4	35.0	0.24	2.4	0.5	32.5	-1.29	2.2	1.9	12	LY
P9ZQKB	33.0	32.9	33.4 L	34.0 L	33.3	-0.73	1.8	0.5	33.8	-0.36	2.1	1.4	12	LA
PEKV96	22.2 X	36.0	34.8	27.7 X	30.2	-2.55 *	2.6	6.4 H	32.4	-1.36	2.7	4.5 H	12	XX
PJFFL2	36.0	33.8	34.4	33.1	34.3	-0.16	3.0	1.2	34.7	0.20	2.8	1.0	12	LW

Containerboard Interlaboratory Testing Program
Analysis 224
STFI, 56 lb Linerboard - 56A2
TAPPI Official Test Method T826

Report #590 (M)
November 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
Q7CCXL	36.0	36.3	35.5	32.7 L	35.1	0.33	2.0	1.7	34.3	-0.08	3.5	1.5	10	LH
QVTXTX	33.3	35.1	34.8	35.3	34.6	0.03	2.6	0.9	34.8	0.27	2.4	0.9	12	LU
RCTA2Y	32.0	33.5	31.3 L	31.8	32.1	-1.43	2.4	1.0	33.2	-0.79	2.7	1.3	12	LA
T68TRW	34.5	33.3	35.3	35.5	34.7	0.05	3.0	1.0	34.4	0.01	2.9	0.9	12	LA
TVZW3X	33.9	33.7	33.6	33.3	33.6	-0.57	2.4	0.2 L	33.2	-0.79	2.9	0.6	8	LW
UDAHTX	34.2	34.3	34.5	34.0	34.2	-0.19	2.2	0.2 L	34.4	0.00	2.4	0.2 L	12	LA
UGBLHY	30.9 *	34.5	33.7	33.1	33.1	-0.89	2.7	1.5	32.5	-1.27	2.6	1.4	8	LH
UH9Y6R	33.1	33.5	33.6	33.7	33.5	-0.65	1.9	0.3 L	33.5	-0.63	1.8	0.3 L	12	TT
UMH33L	37.4	34.9	37.4	37.4 L	36.8	1.27	2.2	1.2	35.5	0.77	2.8	1.6	12	LA
UNY3JP	36.1 H	35.5	35.8	36.6	36.0	0.82	3.5	0.5	36.3	1.31	3.2	1.1	12	LU
UQ6M8P	35.2	36.1	38.0	36.4	36.4	1.07	3.1	1.2	35.5	0.73	2.8	1.4	12	LA
URB8T6	34.2	35.6 H	35.4	35.0 H	35.0	0.27	3.8	0.7	34.7	0.22	4.2	1.8	12	LU
WNQYKV	33.7	34.6	35.4	33.9	34.4	-0.10	2.6	0.8	34.5	0.11	2.5	0.8	12	LA
XY4JJH	33.1	33.6	33.6	36.1	34.1	-0.28	2.1	1.3	34.2	-0.10	2.3	0.9	12	LZ
YCAWDN	32.3	33.3	32.1	No Data	32.6	-1.17	2.8	0.7	32.9	-0.99	2.5	0.7	11	LZ
YPTNRW	35.3	36.3	37.1	34.0	35.7	0.64	2.8	1.4	34.1	-0.16	2.6	1.5	12	LA
YXQA7B	35.4	37.2	37.7	36.2	36.6	1.21	2.6	1.0	36.6	1.54	2.6	1.0	4	LU
Z3DDCK	31.8	32.8	32.2	33.1	32.5	-1.23	2.9	0.6	32.6	-1.22	3.0	0.7	12	LU
ZDC2HV	34.9	34.5	34.6	34.1	34.5	-0.03	2.4	0.3 L	34.1	-0.17	2.5	0.5	12	LU

Consensus (All Labs) Results

Wk Mean	34.52	34.75	34.63	34.53	Month Mean	34.57	Grand Mean	34.38
Avg SDr	2.70	2.75	2.79	2.66	Avg SD	2.73	Avg SD	2.76
SD btwn Labs	1.81	1.77	1.80	1.60	SD btwn Labs	1.71	SD btwn Labs	1.48
Labs Incld	52	54	52	49	SD btwn Wks	1.79	SD btwn Wks	1.69
Labs Excld	2	0	0	1	Labs Incld	54	Labs Incld	54
Labs not Rcvd	0	0	2	4				

Key to Instrument Codes Reported by Participants

BK	Buchel Strip Compression Tester BK-155	ID	IDM Compression Tester
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 with moisture correction	LZ	L&W (model not specified)
TT	TMI Short Span Compression, 17-34 (MB K455)	XX	Instrument make/model not specified by lab

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3G8KK7	140.9	-1.50	14.02		150.7	-0.93	7.40	4	EV
66QEM9	174.0	0.88	9.66		174.5	0.89	2.80	4	EV
6GLPVF	168.7	0.50	11.93		172.7	0.75	6.62	4	EV
849A2F	171.5	0.70	10.38		166.2	0.25	5.66	4	XX
8EN7WL	217.6	4.01 X	40.51 H		221.5	4.47 X	9.38	4	EV
C2496Y	147.6	-1.01	19.46		146.8	-1.23	0.98 L	3	EV
C6G9Z6	171.4	0.69	16.32		168.4	0.42	2.93	4	XX
CNG29X	149.0	-0.91	12.65		154.8	-0.62	6.18	4	LA
FDRDN8	167.2	0.40	16.34		164.8	0.15	14.50 H	4	EV
JTNZJP	138.6	-1.66	5.23 L		138.1	-1.89 *	5.98	4	EV
KHXXCD	144.1	-1.26	14.21		143.3	-1.49	7.20	4	LA
L2P9QZ	159.4	-0.17	15.38		163.3	0.03	10.05	4	LA
LTGJBG	174.3	0.90	28.45 H		178.4	1.18	6.91	4	LA
M2PLXT	151.2	-0.75	18.53		148.7	-1.08	3.23	4	EV
Q7CCXL	113.2	-3.48 X	7.84		113.7	-3.75 X	4.23	3	EV
RCTA2Y	191.4	2.13 *	42.53 H		184.9	1.68	7.21	4	LA
UDAHTX	164.4	0.19	12.55		164.7	0.14	1.53	4	XX
UQ6M8P	153.7	-0.58	12.26		155.3	-0.58	6.73	4	LA
XY4JJH	180.0	1.31	13.67		182.4	1.49	2.51	4	EV
YCAWDN	157.7	-0.29	12.62		158.5	-0.33	4.17	3	LA
YPTNRW	160.2	-0.11	17.57		168.3	0.42	7.89	4	LA
Z3DDCK	169.0	0.52	11.40		172.9	0.76	2.97	4	EV

Consensus (All Labs) Results

Month Mean	161.72	Grand Mean	162.87
Avg SD	17.51	Avg SD Months	6.47
SD btwn Labs	13.94	SD btwn Labs	13.12
Labs Incld	20	Labs Incld	20

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
3NTFKN	354.2	-1.49	7.80	356.5	-0.90	2.55	4	LA
6BX8EJ	374.9	1.23	13.61	371.7	0.84	2.16	4	LA
J2Y9Y6	361.1	-0.59	12.27	348.5	-1.81 *	16.86 H	4	XX
JVAQH9	373.9	1.10	9.47	371.1	0.77	5.25	4	XX
MYKVTY	367.8	0.30	10.25	371.0	0.76	4.36	4	LA
UMH33L	362.3	-0.43	9.46	364.6	0.02	1.69	4	XX
WNQYKV	358.6	-0.91	7.99	359.6	-0.55	3.54	4	LA
ZDC2HV	371.5	0.78	10.17	371.9	0.87	0.98 L	4	XX

Consensus (All Labs) Results

Month Mean	365.54	Grand Mean	364.34
Avg SD	10.30	Avg SD Months	6.69
SD btwn Labs	7.60	SD btwn Labs	8.74
Labs Incld	8	Labs Incld	8

Key to Instrument Codes Reported by Participants

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

Containerboard Interlaboratory Testing Program
Analysis 231
Internal Bond, 35 lb Linerboard - 35E
TAPPI Official Test Method T569

Report #590 (M)
November 2018

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
27RBHL	143.7	-1.41	8.90		144.0	-1.62	2.67	3	SC
3G8KK7	140.0	-1.59	15.02		150.9	-1.23	13.48	3	TM
4UDXFC	195.8	1.19	3.90		190.1	0.94	5.03	3	HZ
66QEM9	166.4	-0.28	12.42		163.7	-0.52	7.18	3	TM
6BX8EJ	54.7	-5.84 X	1.50	L	55.4	-6.53 X	0.61	L 3	LZ
C6G9Z6	185.6	0.68	12.22		175.1	0.11	11.75	3	TM
CVCA4N	168.6	-0.17	10.11		168.9	-0.24	4.41	3	TM
GNYP9E	157.4	-0.73	7.77		162.2	-0.61	4.28	3	TM
JTNZJP	150.0	-1.09	7.31		157.1	-0.89	7.78	3	TM
K792BF	176.0	0.20	23.87		176.0	0.16	0.00	1	SC
KHXXCD	179.0	0.35	36.98	H	178.5	0.30	0.71	2	SC
M2PLXT	192.8	1.04	4.66		196.0	1.27	7.71	3	HY
MFNG8E	164.8	-0.36	5.97		166.2	-0.39	3.73	3	TM
MYKVTY	171.7	-0.01	26.00		177.7	0.25	5.23	3	SC
P9ZQKB	158.4	-0.68	8.38		155.7	-0.97	3.63	3	TM
PJFFL2	196.6	1.23	15.71		200.2	1.50	4.92	3	HY
RCTA2Y	196.8	1.24	13.16		208.6	1.97 *	16.15	3	SC
UMH33L	135.8	-1.80	7.33		155.7	-0.97	17.46	3	SC
XY4JJH	192.5	1.02	12.12		172.2	-0.06	27.79	H 3	XX
Z3DDCK	155.8	-0.81	6.26		154.7	-1.02	5.68	3	TM
ZDC2HV	192.9	1.04	14.19		200.0	1.49	6.37	3	HY
ZPBMVL	190.9	0.94	12.90		183.1	0.55	9.76	3	SC

Consensus (All Labs) Results

Month Mean	171.98	Grand Mean	173.16
Avg SD	14.81	Avg SD Months	10.36
SD btwn Labs	20.07	SD btwn Labs	18.03
Labs Incld	21	Labs Incld	21

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	170.20	19.96	1.78	18
Modified Scott Bond Mechanics	194.77	2.60	22.79	2

Analysis Notes

6BX8EJ - Method used is not covered in this test. Data excluded from consensus calculation.

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

	Monthly Results				Cumulative Results			
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months
3G8KK7	25.2	-0.47	3.19		27.4	0.30	1.95	4
66QEM9	30.8	1.42	6.42	H	29.2	1.00	1.77	4
6BX8EJ	29.6	1.02	1.14		27.6	0.36	2.22	4
6GLPVF	25.0	-0.54	0.92		26.0	-0.24	3.04	4
849A2F	26.0	-0.20	2.55		25.5	-0.45	1.27	4
8PGYXG	29.4	0.95	2.41		28.1	0.55	1.45	4
C6G9Z6	25.7	-0.29	0.78		24.2	-0.97	1.16	4
C88EHG	26.4	-0.06	2.70		28.9	0.88	1.89	4
ETN7W3	23.8	-0.94	1.15		28.0	0.53	3.80	3
FDRDN8	26.4	-0.06	1.14		22.9	-1.46	4.43	4
GNYP9E	26.3	-0.10	2.84		26.0	-0.24	1.51	4
JTNZJP	24.5	-0.70	2.00		27.3	0.27	2.18	4
JVAQH9	32.5	2.00 *	1.87		31.6	1.95 *	2.59	4
K792BF	24.6	-0.67	1.82		24.6	-0.80	0.00	1
KHXXCD	21.4	-1.75	1.14		21.5	-2.01 *	0.26 L	4
MVYBNV	27.8	0.41	2.17		25.8	-0.32	1.51	4
PJFFL2	22.2	-1.48	2.05		23.9	-1.09	1.20	4
QUXFTH	25.5	-0.37	2.55		27.7	0.42	3.75	4
RCTA2Y	30.8	1.42	3.83		31.1	1.74	0.26 L	4
T68TRW	29.8	1.08	2.77		29.6	1.14	1.90	4
UDAHTX	26.0	-0.20	1.58		26.1	-0.21	0.12 L	4
UMH33L	28.2	0.54	1.64		27.7	0.39	0.50	4
XY4JJH	28.5	0.65	2.06		22.3	-1.69	4.44 H	4
YCAWDN	20.4	-2.09 *	1.34		23.4	-1.27	2.14	4
YPTNRW	30.0	1.15	4.05		29.0	0.92	0.75	4
Z3DDCK	26.3	-0.10	3.65		27.7	0.40	1.40	4
ZDC2HV	24.7	-0.62	3.56		26.3	-0.13	1.30	4

Consensus (All Labs) Results

Month Mean	26.59	Grand Mean	26.64
Avg SD	2.64	Avg SD Months	2.22
SD btwn Labs	2.96	SD btwn Labs	2.56
Labs Incld	27	Labs Incld	27

Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3G8KK7	29.7	0.34	1.65		29.6	0.55	0.73	3	LA
3MV6NL	28.6	-0.15	1.86		28.0	-0.34	0.92	3	LP
4QRDA8	28.9	-0.04	1.32		28.7	0.07	0.20	2	XX
66QEM9	30.0	0.47	1.69		29.0	0.23	0.82	3	LP
6BX8EJ	31.9	1.40	2.09		30.9	1.37	1.42	3	LA
86FLJG	26.3	-1.26	1.26		26.3	-1.38	0.00	1	LA
8EN7WL	27.1	-0.89	2.47		27.4	-0.73	0.29	3	LW
A2Q7VT	28.3	-0.31	4.83	H	27.6	-0.60	1.21	3	GG
C6G9Z6	19.1	-4.63 X	2.11		22.9	-3.40 X	3.26 H	3	TD
C88EHG	28.2	-0.36	2.74		28.1	-0.31	1.15	3	LP
FDRDN8	25.9	-1.44	2.23		25.4	-1.90	0.78	3	XX
GNYP9E	29.6	0.29	2.39		28.5	-0.09	1.04	3	LA
JTNZJP	31.1	1.00	2.07		29.6	0.56	1.40	3	LA
JVAQH9	30.0	0.51	3.29		30.0	0.79	0.69	3	GA
KHXXCD	24.2	-2.24 *	2.62		24.9	-2.20 *	1.13	3	LA
MTTQZV	28.5	-0.22	1.72		29.6	0.55	1.48	2	XX
MVYBNV	27.7	-0.59	1.13		27.7	-0.53	0.30	3	LA
MYKVTY	29.2	0.12	0.80	L	29.5	0.53	0.78	3	LA
P2G8JV	27.0	-0.92	0.94	L	26.8	-1.10	0.21	3	LP
PJFFL2	33.1	1.95 *	1.85		32.5	2.31 *	0.51	3	LP
PJG9GN	29.2	0.13	1.48		28.7	0.06	0.62	3	TL
QUXFTH	30.5	0.71	2.23		30.9	1.34	0.82	3	GA
RCTA2Y	27.7	-0.59	1.91		27.8	-0.47	0.19	3	LA
UDAHTX	28.8	-0.07	1.33		29.4	0.43	0.59	3	LA
UQ6M8P	28.0	-0.44	1.28		28.7	0.04	0.66	3	LA
XY4JJH	29.9	0.42	1.57		30.1	0.86	0.71	3	LP
YCAWDN	34.3	2.50 *	2.50		34.9	3.69 X	7.10 H	3	LP
ZDC2HV	28.3	-0.33	3.65	H	28.6	-0.03	0.32	3	TP

Consensus (All Labs) Results

Month Mean	28.96	Grand Mean	28.62
Avg SD	2.21	Avg SD Months	0.85
SD btwn Labs	2.13	SD btwn Labs	1.69
Labs Incld	27	Labs Incld	26

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
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		

	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
27RBHL	53.9 *	55.4	56.4 H	56.0	55.4	-1.89	3.9	1.1	57.1	-1.20	3.2	1.4	16	LC
2B7X8K	59.0	57.5	56.8	57.6 H	57.7	-1.00	4.6	0.9	58.7	-0.58	4.9	1.4	16	TG
33RJNF	67.3 *	66.2 *	66.5 *	66.9 *	66.7	2.53 *	3.0	0.5	66.2	2.39 *	3.5	1.1	16	LC
36GTXG	57.9	56.7	61.7	60.7	59.2	-0.40	3.0	2.3	60.3	0.07	3.1	1.4	16	LD
3G8KK7	62.6	62.3	62.4	62.7	62.5	0.88	3.1	0.2 L	61.7	0.61	3.4	2.3	16	XX
3MV6NL	60.5	59.9	62.7	61.7	61.2	0.37	3.4	1.2	60.5	0.15	3.0	1.6	16	LD
4QRDA8	59.7	58.0	58.0	62.2	59.5	-0.31	2.6	2.0	60.0	-0.03	2.8	1.8	12	LD
4UDXFC	63.9 H	65.9 *H	66.6 *	64.4	65.2	1.93 *	4.6	1.2	63.4	1.28	5.3	2.3	16	LC
6BX8EJ	53.5 *L	54.2 *	53.8 *	54.4 *	54.0	-2.47 *	2.8	0.4	54.6	-2.16 *	2.8	1.6	16	LD
6GLPVF	60.2	57.0	58.2	59.1	58.6	-0.64	2.9	1.4	59.5	-0.27	3.0	1.6	16	EN
6W9FKG	60.9	61.5	60.6	61.2	61.1	0.31	2.7	0.4	60.6	0.17	2.2	0.7	12	TM
86FLJG	61.0	59.9	57.6	59.8	59.6	-0.27	3.0	1.4	59.6	-0.22	3.0	1.4	4	LD
8C2FW3	54.6 H	49.6 X	50.6 XH	49.4 X	51.1	-3.60 X	4.9	2.4	50.0	-3.97 X	4.1	2.1	8	TC
8EN7WL	34.0 XL	56.5	58.1	No Data	49.5	-4.21 X	2.0	13.5 H	48.2	-4.68 X	3.7	10.3 H	14	XX
9FGA9T	59.6	57.6	60.1	57.7	58.7	-0.60	3.1	1.3	58.9	-0.49	3.1	1.3	16	LZ
9G6VVN	63.7 L	60.2 L	65.6 L	64.4 L	63.5	1.26	1.1	2.3	63.2	1.22	1.2	2.2	16	TD
9KAKZJ	58.1	62.7	62.5	61.0	61.1	0.32	3.6	2.1	61.3	0.44	3.1	1.4	16	LD
9RCKL7	62.9	62.0	61.5	62.2	62.1	0.74	1.9	0.6	62.4	0.88	1.9	0.7	16	TU
C2JRPW	58.0	58.2	No Data	No Data	58.1	-0.84	2.9	0.1	56.7	-1.36	3.0	1.5	9	EM
C88EHG	67.0 *	64.6	61.4	66.8	65.0	1.84	3.4	2.6	64.9	1.87	3.7	2.3	16	LD
CVCA4N	57.9	61.5	61.2	61.2	60.4	0.06	3.3	1.7	60.5	0.16	2.9	1.5	16	LC
E87YKA	61.1	62.9	60.7	64.5	62.3	0.80	3.7	1.7	62.0	0.74	3.7	1.6	16	LD
F36C9X	60.3 L	60.4 L	60.4 L	60.5	60.4	0.04	1.3	0.1 L	60.4	0.09	1.4	0.2 L	16	LD
GLC4LJ	61.8	60.7	59.7 L	61.0	60.8	0.21	2.8	0.8	64.1	1.54	2.8	4.1 H	16	LD
GR49G9	59.1	59.8	60.6	60.8	60.1	-0.07	3.0	0.8	60.7	0.23	2.8	1.0	16	EM
JTNZJP	62.6	62.3	62.4	62.7	62.5	0.88	3.1	0.2 L	61.2	0.41	3.4	2.9	16	LC
JVAQH9	61.2	59.5	58.8	59.1	59.6	-0.25	2.1	1.1	59.6	-0.23	2.6	0.9	16	LZ
K792BF	57.3	56.8	56.6	58.6	57.3	-1.15	3.6	0.9	57.3	-1.09	3.6	0.9	4	LZ
KW2YEV	59.9 L	59.9 L	59.6 L	60.0 L	59.9	-0.16	0.7	0.2 L	60.3	0.06	2.2	0.4 L	12	LD
L2P9QZ	57.9	57.5	No Data	No Data	57.7	-1.02	3.9	0.3	55.6	-1.78	3.5	2.2	13	LD
LTGJBG	58.7	57.4	60.3	57.7	58.5	-0.68	2.8	1.3	57.6	-0.99	2.5	1.9	16	MB
N6KJZ6	58.6	58.3	58.5	58.3	58.4	-0.73	3.1	0.1 L	57.0	-1.21	2.7	1.1	12	TH
P9ZQKB	59.9	56.6	59.3	56.2	58.0	-0.89	3.3	1.9	59.9	-0.08	2.8	1.9	16	LC
PJFFL2	60.6	59.8	59.6	59.5	59.9	-0.16	3.0	0.5	58.5	-0.63	3.0	1.4	16	LD
QVTXTX	61.6	59.9	63.5	63.5	62.1	0.73	3.8	1.7	61.2	0.42	4.0	1.4	16	LD

	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
RAK4DC	59.7	61.0	60.8	61.6	60.8	0.20	2.7	0.8	61.6	0.59	3.4	1.1	14	LC
T68TRW	63.2	63.1	62.8	64.2	63.3	1.20	2.8	0.6	63.9	1.46	2.7	1.2	16	LD
UDAHTX	61.1	61.4	60.9	61.9	61.3	0.42	2.2	0.4	61.1	0.37	2.2	0.4 L	16	LD
UGBLHY	54.7	54.2 *	53.6 *	56.4	54.7	-2.17 *	2.3	1.2	53.4	-2.66 *	2.6	1.5	16	TH
UH9Y6R	56.3	58.4	59.4 H	60.8	58.7	-0.60	3.7	1.9	58.7	-0.55	3.7	1.9	4	TJ
V6FP7P	61.2	59.2	59.8	60.3	60.1	-0.05	3.0	0.8	60.3	0.08	3.2	0.6	16	LD
VDW2KQ	59.6	60.7	61.4	59.4	60.3	0.00	3.0	0.9	60.5	0.12	3.3	0.6	16	LC
XY4JJH	59.9	58.6	58.7	57.4	58.7	-0.63	3.0	1.0	59.1	-0.40	3.4	0.9	9	LZ
YCAWDN	58.5	62.2	62.3	65.1	62.0	0.69	3.0	2.7	60.8	0.27	3.4	3.1	16	LZ
Z3DDCK	61.1	60.9	62.1	60.0	61.0	0.30	2.7	0.9	59.7	-0.19	2.9	1.5	16	LD
ZCPFVZ	58.2	58.6	62.2 H	67.5 *H	61.6	0.53	5.0	4.3 H	59.4	-0.27	3.6	3.0	12	LD
ZDC2HV	60.7	63.2	60.7	64.4	62.2	0.77	2.8	1.9	62.1	0.77	3.1	1.9	10	LC

Consensus (All Labs) Results

Wk Mean	59.93	59.80	60.38	60.96	Month Mean	60.26	Grand Mean	60.13
Avg SDr	3.08	3.11	3.16	3.10	Avg SD	3.11	Avg SD	3.14
SD btwn Labs	2.86	2.76	2.74	3.04	SD btwn Labs	2.55	SD btwn Labs	2.55
Labs Incld	46	46	44	43	SD btwn Wks	1.45	SD btwn Wks	1.71
Labs Excld	1	1	1	1	Labs Incld	45	Labs Incld	45
Labs not Rcvd	0	0	2	3				

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
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
TJ	TLS Compression Tester, Model CDM-5	TM	TMI/Hinde & Dauch
TU	TMI Universal Crush Tester (TMI K440)	XX	Instrument make/model not specified by lab

Containerboard Interlaboratory Testing Program

Analysis 250

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

TAPPI Official Test Method T843

	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
3MV6NL	75.7	75.5	74.7	73.8	74.9	0.38	2.7	0.9	75.6	0.74	2.5	1.1	16	LD
4QRDA8	71.7	72.4	74.3	72.4	72.7	-0.58	2.6	1.1	72.5	-0.28	2.6	0.9	12	XX
6BX8EJ	73.2	74.7	73.3	73.8	73.8	-0.12	2.4	0.7	73.7	0.10	2.4	1.2	16	LD
7QP6ET	73.3	71.6	73.8 L	72.7	72.8	-0.51	2.5	0.9	72.4	-0.33	2.5	1.4	16	XX
9FGA9T	71.7	71.5	71.8	72.5	71.9	-0.93	3.1	0.4	72.9	-0.17	2.6	1.5	16	LZ
9G6VVN	71.0 L	74.4 L	72.5 L	74.5	73.1	-0.39	1.2	1.7	72.9	-0.16	1.0	1.6	16	TD
C88EHG	77.6	79.0 H	77.9	76.1	77.7	1.57	4.3	1.2	77.5	1.39	3.2	1.6	16	LD
F36C9X	73.2 L	73.2 L	73.3 L	73.5	73.3	-0.32	1.3	0.2	73.4	-0.01	1.2	0.2 L	16	LD
GLC4LJ	71.6	70.9 L	70.3	70.4 *	70.8	-1.39	1.8	0.6	68.6	-1.61	1.9	4.8 H	16	LD
JTNZJP	66.8 *H	66.0 *H	67.1 *H	64.2 XH	66.0	-3.46 X	7.9	1.3	66.8	-2.18 *	7.2	4.9 H	16	XX
MTTQZV	72.8	73.0	72.8 L	73.0 L	72.9	-0.48	1.5	0.1 L	71.9	-0.50	1.5	1.5	12	LZ
PJFFL2	79.6 *	80.2 *	78.5	80.3 X	79.6	2.43 *	2.8	0.8	78.7	1.76	2.9	1.1	16	LD
UDAHTX	73.1	73.4	73.9	73.8	73.5	-0.22	2.6	0.4	73.2	-0.04	2.4	0.4 L	16	LD
VDW2KQ	72.3	73.0	73.7	72.8	73.0	-0.46	3.2	0.6	73.1	-0.09	3.4	0.6	16	LD
YCAWDN	74.4	72.2	73.6	74.9 H	73.8	-0.12	3.0	1.2	73.7	0.11	2.7	1.0	16	LZ
ZDC2HV	77.3	77.8	75.7	75.7	76.6	1.13	2.7	1.1	77.1	1.24	2.5	1.2	10	LC

Consensus (All Labs) Results

Wk Mean	73.46	73.67	73.57	73.56	Month Mean	74.02	Grand Mean	73.37
Avg SDr	3.18	3.37	3.16	2.36	Avg SD	2.63	Avg SD	2.97
SD btwn Labs	3.03	3.40	2.67	1.47	SD btwn Labs	2.31	SD btwn Labs	2.99
Labs Incld	16	16	16	14	SD btwn Wks	0.89	SD btwn Wks	2.04
Labs Excld	0	0	0	2	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

Report #590 (M)
November 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
33RJNF	33.6 X	32.3 X	33.4 X	32.3 X	32.9	-7.12 X	2.3	0.7	33.1	-4.30 X	2.6	0.8	16	XX
3MV6NL	45.8	45.1 L	46.1	45.3	45.6	0.30	2.0	0.5	45.6	0.27	1.9	0.6 L	16	LD
4QRDA8	40.7 *	43.8	40.2	42.7 H	41.8	-1.89	4.1	1.7	42.0	-1.03	3.9	1.4	12	LD
4UDXFC	46.2	46.2	45.4	45.1	45.7	0.38	2.7	0.6	45.8	0.35	2.6	0.7	16	LD
6BX8EJ	46.1	45.6	46.3	48.4	46.6	0.90	3.0	1.2	46.7	0.66	2.9	1.5	16	LD
86FLJG	53.8 X	46.2	44.3	42.8	46.8	1.00	3.1	4.9 H	46.8	0.71	3.1	4.9	4	LD
8C2FW3	37.9 XH	41.0 *H	37.9 *H	39.9 *H	39.2	-3.45 X	6.2	1.6	40.1	-1.73	5.7	1.6	8	TC
8EN7WL	64.3 XH	47.9	52.4	* No Data	54.9	5.73 X	3.5	8.5 H	50.0	1.89	3.5	9.1 H	14	XX
9KAKZJ	46.2	46.6	46.3	47.2	46.6	0.87	2.2	0.5	46.6	0.64	2.3	0.8	12	LD
9RCKL7	42.5	42.2	42.2	41.7	42.1	-1.71	1.8	0.3	41.9	-1.08	1.6	0.6 L	16	TU
BTPBCL	41.5	44.4	42.7	44.5	43.3	-1.05	2.2	1.4	43.4	-0.51	2.1	1.4	16	TH
C2JRPW	43.9	43.5	No Data	No Data	43.7	-0.81	2.8	0.3	42.4	-0.90	2.6	1.2	9	EM
E87YKA	46.7	46.2	45.1	45.4	45.9	0.45	3.0	0.7	46.2	0.49	2.9	0.8	16	LD
GR49G9	45.5	45.7 L	45.5 L	45.5 L	45.6	0.29	1.2	0.1 L	46.0	0.41	1.4	0.7 L	16	LC
JVAQH9	44.6	42.4	44.0	41.9	43.2	-1.10	3.1	1.3	42.9	-0.71	2.6	1.3	16	LD
KW2YEV	44.7 L	45.1 L	45.2 L	44.6 L	44.9	-0.10	0.6	0.3	44.3	-0.19	2.2	0.5 L	12	LD
L2P9QZ	44.2	43.4	No Data	No Data	43.8	-0.76	2.2	0.6	44.6	-0.09	2.9	1.7	13	LD
R4CMXW	43.8	44.8	43.5	42.9	43.8	-0.77	3.4	0.8	38.9	-2.19 *	2.7	4.0	16	LZ
R6PD82	46.3	46.8 L	48.6	46.3	47.0	1.14	2.1	1.1	45.6	0.27	2.1	1.6	16	LZ
RAK4DC	46.3	45.8	44.9	48.8	46.5	0.82	3.0	1.7	46.9	0.74	2.7	1.2	14	LC
UDAHTX	44.5	43.6	43.9	43.9	44.0	-0.63	3.4	0.4	43.8	-0.40	3.1	0.5 L	16	LD
W3NXL7	46.3 L	46.6	46.3 L	46.7 L	46.5	0.82	1.2	0.2 L	45.2	0.12	1.1	1.3	16	WK
ZCPFVZ	49.9 *	47.1	48.2	47.4	48.2	1.80	3.4	1.3	50.2	1.98 *	2.6	2.2	12	LZ
ZDC2HV	45.1	44.6	46.9	44.1	45.2	0.06	3.0	1.2	45.7	0.30	2.9	1.2	16	LC

Consensus (All Labs) Results

Wk Mean	45.05	44.98	45.05	44.75	Month Mean	45.07	Grand Mean	44.84
Avg SDr	2.72	2.87	2.89	2.98	Avg SD	2.67	Avg SD	2.81
SD btwn Labs	2.02	1.74	3.01	2.34	SD btwn Labs	1.71	SD btwn Labs	2.73
Labs Incld	20	23	21	20	SD btwn Wks	1.41	SD btwn Wks	2.58
Labs Excld	4	1	1	1	Labs Incld	21	Labs Incld	23
Labs not Rcvd	0	0	2	3				

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)
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		

	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
3MV6NL	14.0	14.2	14.8	14.2	14.3	-0.99	0.9	0.3	14.4	-0.51	0.9	0.2	16	LZ
3N4DMK	16.2 *	15.0	14.7	14.7	15.1	1.24	0.9	0.7	15.0	1.06	1.0	0.8	16	LA
6BX8EJ	33.7 XH	35.6 XH	32.8 XH	34.5 XH	34.2	53.23 X	2.7	1.2 H	20.1	13.40 X	1.6	8.4 H	16	LA
6W9FKG	15.9 *	14.4	16.1 *	15.3	15.4	2.05 *	1.1	0.7	15.5	2.29 *	0.9	0.5	12	LA
86FLJG	16.7 X	16.5 X	16.1 *	16.5 X	16.4	4.83 X	0.8	0.3	16.4	4.44 X	0.8	0.3	4	LA
8C2FW3	14.3	14.8	15.3 H	15.2	14.9	0.65	1.2	0.5	14.9	0.74	1.1	0.3	8	TS
8EN7WL	23.7 XH	14.4	81.7 XH	No Data	39.9	68.92 X	4.3	36.4 H	22.1	18.02 X	2.8	18.4 H	13	XX
9KAKZJ	15.3	15.2	15.4	15.3	15.3	1.79	1.0	0.1 L	15.3	1.73	1.0	0.2	16	LH
CVCA4N	14.6	15.0	14.7	14.6	14.7	0.18	0.9	0.2	14.9	0.83	1.0	0.3	16	LU
F36C9X	14.4 L	14.3 L	14.4 L	14.5 L	14.4	-0.76	0.6	0.1 L	14.5	-0.27	0.7	0.1	16	LA
GR49G9	14.0	14.1	14.7	14.9	14.4	-0.65	1.1	0.4	14.2	-0.98	1.0	0.5	16	LB
JVAQH9	15.0	14.8	14.9	14.4	14.8	0.31	0.9	0.3	14.8	0.57	1.0	0.3	16	LZ
L2P9QZ	14.5	13.7 *	No Data	No Data	14.1	-1.51	1.1	0.6	14.1	-1.25	1.0	0.4	13	LZ
LTGJBG	14.1	14.6	14.2	13.9	14.2	-1.21	1.1	0.3	14.3	-0.65	1.0	0.3	16	LA
N6KJZ6	14.3	15.2	15.4	15.4	15.1	1.15	1.0	0.5	14.6	-0.10	1.0	0.7	12	LH
R6PD82	14.8	14.2	15.0	14.4 H	14.6	-0.15	1.2	0.4	14.2	-0.97	1.1	0.4	16	LA
T68TRW	14.9	14.5	15.0	15.1	14.9	0.60	1.1	0.3	14.8	0.53	1.0	0.3	16	LA
UDAHTX	14.8	14.7	14.9	14.7	14.8	0.27	1.1	0.1	14.7	0.33	0.9	0.2	16	LB
UGBLHY	13.2 *	14.5	14.8	15.1	14.4	-0.76	0.9	0.9	13.7	-2.12 *	0.8	0.6	16	LH
UH9Y6R	14.4	14.9	14.7	14.9	14.7	0.21	0.8	0.2	14.5	-0.17	0.9	0.3	16	TT
V6FP7P	15.1	14.7	14.5	14.0	14.6	-0.28	0.8	0.5	14.6	0.00	0.9	0.4	16	LB
VDW2KQ	14.8	15.0	14.4	14.1 L	14.6	-0.25	0.8	0.4	14.6	0.00	0.9	0.4	16	LB
WNQYKV	14.5	14.9	15.3	14.8	14.9	0.52	1.0	0.3	14.7	0.31	0.9	0.4	16	LA
XY4JJH	14.6	14.3	15.0	14.1	14.5	-0.45	1.0	0.4	14.5	-0.14	1.0	0.4	16	LB
Z3DDCK	13.8	14.0	14.4	13.6 *	13.9	-1.95 *	1.3	0.3	14.0	-1.34	1.1	0.3	16	LU
ZDC2HV	14.4	14.5	15.0	14.9	14.7	0.01	0.9	0.3	14.6	0.11	0.9	0.3	16	LU

Consensus (All Labs) Results

Wk Mean	14.60	14.58	14.93	14.63	Month Mean	14.66	Grand Mean	14.59
Avg SDr	1.00	1.00	1.00	0.97	Avg SD	1.00	Avg SD	0.96
SD btwn Labs	0.65	0.39	0.48	0.50	SD btwn Labs	0.37	SD btwn Labs	0.41
Labs Incld	23	24	23	22	SD btwn Wks	0.43	SD btwn Wks	0.41
Labs Excld	3	2	2	2	Labs Incld	23	Labs Incld	23
Labs not Rcvd	0	0	1	2				

Key to Instrument Codes Reported by Participants

LA	L&W Autoline	LB	L&W Model 152
LH	L&W 282	LU	L&W 52 without moisture correction (was 53)
LZ	L&W (model not specified)	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

End of Report