Collaborative Testing Services, Inc.

Containerboard Interlaboratory Testing Program

Participant Summary Report #603 (N) - December 2019

Introduction to the Containerboard Program

Explanation of Tables and Definitions of Terms

Analysis	Sample	Analysis Name
201	BX13	Box Compression Strength, Corrugated Boxes
202	EC12	Edgewise Compressive Strength, Wax (T811), Corrugated Board
203	EC12	Edgewise Compressive Strength by Clamp (T839), Corrugated Board
205	42F1	Mullen Burst of Linerboard, 42 lb Linerboard
207	35E1	Mullen Burst of Linerboard, 35 lb Linerboard
215	42F1	Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard
217	35E1	Ring Crush of Linerboard, Rigid Platen Type, 35 lb Linerboard
223	42F1	STFI of Linerboard, 42 lb Linerboard
225	35E1	STFI of Linerboard, 35 lb Linerboard
228	42F	Roughness - Stylus Method, 42 lb Linerboard
229	42F1	Roughness - Sheffield Method, 42 lb Linerboard
231	42F	Internal Bond Strength, Linerboard, 42 lb Linerboard
234	42F	Coefficient of Static Friction - Inclined Plane, 42 lb Linerboard
237	42F	Air Resistance - Gurley Method, Linerboard, 42 lb Linerboard
240	CM11	Flat Crush Strength (CMT) of Medium, 26 lb Corrugating Medium
250	CM11	Fluted Crush of Medium, 26 lb Corrugating Medium
255	CM11	Ring Crush of Medium, 26 lb Corrugating Medium
261	CM11	STFI of Medium, 26 lb Corrugating Medium

INTRODUCTION

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

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

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

USE OF AVERAGE MEAN AS A COLLABORATIVE REFERENCE VALUE

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

Material	Lot Code	Dates in Use
26 lb Corrugating Medium	CM11	April 2019-Current
	CM92	January 2018-March 2019
35 lb Linerboard	35E1	June 2017-Current
42 lb Linerboard	42F1	January 2019-Current
	42D3	November 2017-December 2018
56 lb Linerboard	56A2	January 2018-Current
	56A1	July 2016-November 2017

ABOUT CTS

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

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EXPLANATION OF TABLES

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

Definitions of Terms Used

Weekly Results

Laboratory Data

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

Consensus Data

Wk Mean	-	For each week, the average of the Means for all the participants, excluding those laboratories flagged with an 'X'.
Avg SD	-	For each week, the average of the within-laboratory standard deviations (SD's) for all the participants, excluding those laboratories flagged with an 'X'. The Avg SD is an indication of the variation of measurements within an average laboratory.
SD btwn Labs	-	For each week, the standard deviation of the laboratory Means about the Wk Mean, excluding those laboratories flagged with an 'X'. The SD LABS is an indication of the precision of measurement between the laboratories.
Labs 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'.

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).

Containerboard Interlaboratory Testing Program
Analysis 201
Top to Bottom Box Compression Strength, Corrugated Boxes - BX13
TAPPI Official Test Method T804

Report #603 (N)
December 2019

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
28QWBZ	811.8	-1.25	52.35		783.5	-1.19	32.93	4	LL
2KVRDF	828.2	-0.95	108.10 H		856.1	0.02	24.98	4	ER
4JAEPN	868.2	-0.24	23.56		864.8	0.17	4.81	2	ET
677GBF	897.4	0.28	31.61		896.0	0.69	68.87	4	LL
6DPKHH	1,016.2	2.40 *	70.42		944.2	1.50	83.40	4	LS
6EJBLC	873.6	-0.14	87.73		860.9	0.10	18.26	3	EX
7Q3CG9	964.6	1.48	46.85		952.7	1.64	9.37	4	ER
ARNPHV	836.4	-0.81	74.47		850.2	-0.08	21.26	4	LG
BZDELW	779.6	-1.82	68.48		785.9	-1.15	99.55 H	4	ET
CQMVYB	849.4	-0.58	65.81		850.0	-0.08	11.68	4	LS
DQ6FAZ	905.6	0.43	22.88		907.9	0.89	3.67 L	4	EX
ET49KA	546.8	-5.98 X	47.54		727.0	-2.14 *	128.01 H	4	TB
GK9PJ8	877.1	-0.08	29.80		873.1	0.31	8.54	4	TE
K3VGRU	854.2	-0.49	37.03		852.0	-0.05	3.73 L	4	LM
LCUNU8	836.8	-0.80	73.56		827.7	-0.45	56.77	4	EX
LQF23Z	700.0	-3.24 X	54.76		741.4	-1.90	28.25	4	LS
MK7LDP	897.2	0.28	18.60		896.2	0.69	4.33 L	4	LM
N3YBZP	907.6	0.46	49.70		895.7	0.69	27.23	4	ER
NDG2AV	852.8	-0.51	42.32		846.7	-0.13	25.83	4	LG
NJ4BVR	897.8	0.29	53.92		848.8	-0.10	36.93	4	ES
NYZPVK	890.6	0.16	73.96		868.4	0.23	23.59	4	LO
RXFELQ	814.3	-1.20	60.36		796.5	-0.98	34.05	4	LS
UYHRLN	974.2	1.65	29.06		977.2	2.05 *	24.24	4	LG
W9EE9H	937.3	0.99	22.62		837.4	-0.29	88.76	4	ER
Z8BFHT	907.2	0.46	45.07		828.0	-0.45	60.71	4	LS

Consensus (All Labs) Results

Month Mean	881.66	Grand Mean	854.72
Avg SD	56.57	Avg SD Months	49.61
SD btwn Labs	56.01	SD btwn Labs	59.67
Labs Incld	23	Labs Incld	25

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	880.75	52.88	0.91	7
Clip sealing	882.06	59.01	0.40	16

Containerboard Interlaboratory Testing Program
Analysis 201
Top to Bottom Box Compression Strength, Corrugated Boxes - BX13
TAPPI Official Test Method T804

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Key to Instrument Codes Reported by Participants

ER	Emerson 6200 Series		ES	Emerson 8510
ET	Emerson 7200		EX	Emerson Apparatus (Model not specified)
LG	TLS / L.A.B. Validator Series		LL	Lansmont 76-5K
LM	Lansmont 122-15k		LO	Lansmont 152-30k
LS	Lansmont Squeezer		TB	TMI Monitor/Compression Tester, Model 17-70
TE	Testometric M500 - 25 KN			

Containerboard Interlaboratory Testing Program
Analysis 202
Edgewise Compressive Strength, by T811, Corrugated Board - EC12
TAPPI Official Test Method T811

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	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2KVRDF	36.9	0.32	1.37		33.6	-0.60	2.68	4	EN
3FJRMP	33.0	-0.92	1.78		32.8	-0.83	0.15 L	4	XX
677GBF	41.5	1.76	1.03 L		42.7	1.91 *	3.92 H	4	XX
9CLYJ9	39.2	1.04	1.21		40.3	1.27	1.31	4	LC
ARNPHV	38.5	0.82	2.12		38.5	0.76	0.24 L	4	LE
BVMT3A	33.9	-0.63	1.41		30.5	-1.47	2.70	4	WK
CQMVYB	35.8	-0.02	4.00 H		34.2	-0.43	1.20	4	LD
LCUNU8	36.0	0.03	2.26		35.7	-0.01	1.19	4	LC
LQF23Z	29.7	-1.95 *	2.36		30.8	-1.38	0.95	4	EM
RXFELQ	36.8	0.28	1.43		38.6	0.80	1.40	4	LC
TC92DG	34.5	-0.43	5.09 H		35.2	-0.17	1.50	4	LD
UNW27P	32.5	-1.06	0.53 L		34.9	-0.24	1.91	4	TF
Z7ZEVU	38.3	0.75	1.37		37.2	0.39	1.13	4	XX

Consensus (All Labs) Results

Month Mean	35.86		Grand Mean	35.78
Avg SD	2.33		Avg SD Months	1.85
SD btwn Labs	3.17		SD btwn Labs	3.60
Labs Incld	13		Labs Incld	13

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	TF	TMI Digital Crush Tester, Model 17-19
WK	Zwick Z005 Crush Tester	XX	Instrument make/model not specified by lab

Containerboard Interlaboratory Testing Program
Analysis 203
Edgewise Compressive Strength by T839, Corrugated Board - EC12
TAPPI Official Test Method T839

Report #603 (N)
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WebCode	Monthly Results Mean	CPV	SD		Cumulative Results Mean	CPV	SD Months	Months	Inst
28QWBZ	38.8	-0.69	1.80		39.1	-0.61	2.85	4	LC
2KVRDF	39.3	-0.41	2.15		37.6	-1.98 *	1.35	4	EN
3FJRMP	39.8	-0.05	1.01		39.8	0.02	1.13	4	IM
4JAEPN	39.2	-0.48	2.84 H		40.2	0.35	1.46	2	EM
4UDFEE	38.0	-1.24	1.50		38.5	-1.18	0.65	3	EM
6DPKHH	40.9	0.65	1.10		40.7	0.80	3.33 H	4	TB
6EJBLC	43.2	2.12 *	1.46		39.9	0.05	2.94 H	3	CT
7C6GUG	38.9	-0.65	1.63		39.5	-0.27	0.61	4	EM
7Q3CG9	39.0	-0.60	1.55		39.1	-0.60	0.20 L	4	EM
8XK67D	38.6	-0.83	0.87		39.4	-0.32	1.20	2	XX
9AVXDK	40.8	0.60	1.62		40.4	0.58	0.39	4	LD
9CLYJ9	40.3	0.25	1.35		41.4	1.43	1.18	4	LC
9FKAE9	38.9	-0.61	1.24		38.6	-1.12	0.52	4	EM
A82294	39.0	-0.61	1.85		38.1	-1.54	0.99	4	LD
ARNPHV	38.9	-0.62	2.04		39.1	-0.66	0.87	4	LY
B74HX9	40.4	0.31	1.32		40.3	0.42	0.66	4	TG
BVMT3A	37.6	-1.45	0.98		37.9	-1.77	1.89	4	WK
BZDELW	43.8	2.50 *	1.53		41.4	1.47	2.72	4	TD
CQMVYB	41.6	1.09	1.63		41.2	1.24	0.88	4	LD
DAYBLN	40.3	0.29	1.18		39.9	0.10	0.62	2	IM
ET49KA	40.1	0.11	0.48 L		41.5	1.53	1.06	4	LD
G6AZ3Z	46.5	4.26 X	0.65 L		45.8	5.51 X	0.84	3	TL
GK9PJ8	41.0	0.68	1.03		40.5	0.62	0.32	4	LD
J64A83	39.5	-0.28	0.87		38.9	-0.80	1.32	4	LD
K3VGRU	40.5	0.39	0.94		40.8	0.92	0.47	4	TG
LCUNU8	38.3	-1.00	1.62		38.9	-0.79	0.53	4	LC
LQF23Z	37.8	-1.34	0.84		38.2	-1.44	0.51	4	EM
MK7LDP	39.8	-0.07	1.53		39.3	-0.43	0.89	4	EM
MPWHV9	40.3	0.23	1.44		40.2	0.39	1.13	3	LC
MWHFJV	42.1	1.40	1.36		41.6	1.61	2.00	4	LD
N3YBZP	40.9	0.63	2.21		40.9	1.00	0.09 L	3	LD
NDG2AV	42.9	1.92	0.69 L		40.2	0.37	2.19	4	TJ
NJ4BVR	38.8	-0.69	1.82		40.5	0.61	1.56	4	LD
NYZPVK	40.7	0.49	1.74		39.8	0.00	2.31	4	LD
RXFELQ	40.6	0.46	1.58		40.8	0.95	0.43	4	LC
TBDZBT	41.7	1.17	2.39		41.0	1.08	0.77	4	TD
TC92DG	37.9	-1.29	1.85		38.5	-1.20	2.22	4	LD
UNW27P	37.1	-1.79	0.88		38.7	-1.01	1.30	4	TD
UYHRLN	41.3	0.93	2.63 H		41.2	1.28	1.85	4	EM

Containerboard Interlaboratory Testing Program
Analysis 203
Edgewise Compressive Strength by T839, Corrugated Board - EC12
TAPPI Official Test Method T839

Report #603 (N)
December 2019

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
W22QNC	38.3	-1.02	1.21		38.7	-1.04	0.73	4	LC
W9EE9H	39.2	-0.48	2.80	H	39.7	-0.06	0.44	4	LD
YCVQEK	32.8	-4.57 X	2.47		34.6	-4.72 X	1.65	4	TD

Consensus (All Labs) Results

Month Mean	39.89		Grand Mean	39.80
Avg SD	1.61		Avg SD Months	1.46
SD btwn Labs	1.56		SD btwn Labs	1.09
Labs Incld	40		Labs Incld	40

Key to Instrument Codes Reported by Participants

CT	Con-Ten		EM	Emerson 1200 Series
EN	Emerson 2200		IM	Instron 5500 Series
LC	L&W Crush Tester 48		LD	L&W Crush Tester 248
LY	L&W 830		TB	TMI Monitor/Compression Tester, Model 17-70
TD	TMI Digital Crush Tester, Model 17-09		TG	TMI Digital Crush Tester, 17-76
TJ	TLS Compression Tester, Model CDM-5		TL	Tech-Lab Systems Compression
WK	Zwick Z005 Crush Tester		XX	Instrument make/model not specified by lab

Containerboard Interlaboratory Testing Program
Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42F1
TAPPI Official Test Method T807

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
2CNDPF	105.9	103.5	105.3	104.9	104.9	-1.61	8.3	1.0	105.3	-1.58	7.5	3.1	16	AH
32XPC6	108.5	113.8	112.3	109.0	110.9	0.11	9.8	2.6	112.0	0.39	10.5	3.2	16	LA
42ERBC	109.4	114.3	111.3	110.4	111.4	0.24	7.1	2.1	113.1	0.73	9.0	2.7	16	LZ
4DRR86	105.1	108.8	106.4	101.3 *	105.4	-1.46	9.3	3.1	107.4	-0.97	9.4	2.8	16	LC
4Y4H8X	117.5	119.8 *	114.3	118.3	117.5	1.98 *	8.9	2.3	117.7	2.06 *	9.8	4.3	16	TB
62BMDE	111.8	110.7 L	111.6 L	111.1 L	111.3	0.22	3.7	0.5	111.7	0.30	3.9	1.7	15	XX
6EJBLC	111.1	113.8	116.1	111.9	113.2	0.77	11.4	2.2	116.0	1.57	10.1	2.9	12	XX
7J98N8	119.3 *	117.2	115.2	114.2	116.4	1.69	8.6	2.3	112.9	0.67	8.4	6.0	14	LA
7YJNYG	115.4 L	115.4 L	114.6 L	115.2	115.2	1.32	3.0	0.4 L	114.8	1.21	5.0	0.8	16	RE
9AVXDK	113.1	114.1	114.0	113.5	113.7	0.90	5.6	0.5	114.2	1.04	6.7	0.6 L	16	LA
A82294	104.3	112.4	103.9 *	106.8	106.9	-1.04	9.0	3.9	107.4	-0.95	8.5	2.7	16	LC
AB429Z	117.7	114.8	112.3	105.5	112.5	0.58	8.7	5.2 H	113.4	0.81	10.5	4.7	16	AX
ARNPHV	111.6	114.1	118.6 *	117.6	115.5	1.41	7.3	3.2	116.8	1.82	6.7	2.2	16	AH
BMUHQT	107.7	108.0	111.3	113.6	110.2	-0.10	8.9	2.8	110.6	-0.02	7.7	1.9	16	LA
CQMVYB	111.3	111.0	110.0	102.9	108.8	-0.48	8.6	4.0	107.9	-0.81	9.2	3.2	16	LA
DGRDX8	98.5 *	105.8	102.9 *	101.4 *	102.2	-2.38 *	8.3	3.0	102.5	-2.41 *	8.5	2.7	16	LA
DQ6FAZ	106.4	106.0	107.6	100.8 *	105.2	-1.52	9.0	3.0	105.6	-1.49	9.0	2.5	16	AH
E4PCRA	109.6	111.0	112.2	111.7	111.1	0.17	6.3	1.1	110.1	-0.18	6.7	1.2	16	AH
EDALCW	107.6	110.2	109.1	112.0	109.7	-0.23	9.3	1.8	111.9	0.36	9.9	2.6	16	LC
EUEK8Y	110.7	113.8	112.7	114.6	113.0	0.69	8.5	1.7	112.8	0.62	8.6	3.0	16	AH
EZ6UGW	109.9	109.3	108.1	108.6	109.0	-0.44	8.6	0.8	109.6	-0.31	9.0	3.0	16	LC
FCWBYQ	108.5	107.3	106.6	107.0	107.4	-0.90	10.0	0.8	107.1	-1.05	8.7	2.0	16	LC
FGQ6WR	108.9 L	107.1	110.9	109.3 L	109.1	-0.42	4.3	1.6	109.5	-0.34	4.1	1.2	12	LA
FW7B76	110.3	108.8 L	111.1 L	109.9	110.0	-0.14	3.7	1.0	109.5	-0.33	3.8	1.1	16	LA
GHGQ3M	104.8	105.1	106.9	106.0	105.7	-1.37	10.0	0.9	108.2	-0.73	9.7	3.4	16	LC
HTCWHJ	109.3	111.1	110.3	111.4	110.5	0.00	8.1	0.9	109.2	-0.44	8.7	2.8	16	LB
K4J39X	113.1	110.8 H	111.7	111.3 L	111.7	0.34	9.7	1.0	110.5	-0.05	10.0	3.7	16	LC
KDV8BG	105.7 L	104.8	108.4	102.3	105.3	-1.49	6.4	2.5	103.6	-2.08 *	14.9	4.4	5	AH
LCVYRF	114.9	113.8	110.3	111.4	112.6	0.59	9.0	2.1	112.6	0.57	9.0	2.1	4	LA
LL4YEJ	101.5 *	110.1	109.8	111.5	108.2	-0.66	7.6	4.6	107.8	-0.83	8.0	4.0	16	LC
MWHFJV	110.7	114.7	109.3	111.6	111.6	0.30	7.9	2.3	112.3	0.49	8.4	3.1	16	LC
N3YBZP	112.8	102.8 *	108.0	106.1	107.4	-0.88	6.8	4.2	107.4	-0.97	9.3	3.0	16	LZ
N7JVRR	106.1	112.0	111.5	109.3	109.7	-0.23	9.1	2.7	109.2	-0.44	9.6	2.3	16	LC
NJ4BVR	112.6	108.5	108.9	111.8	110.5	-0.02	8.2	2.1	110.2	-0.13	9.9	3.2	16	LA
PJLB4U	118.0	114.5	115.7	111.2	114.9	1.23	7.8	2.8	115.9	1.56	10.8	2.9	16	LC

Containerboard Interlaboratory Testing Program
Analysis 205
Bursting Strength (Mullen), 42 lb Linerboard - 42F1
TAPPI Official Test Method T807

Report #603 (N)
December 2019

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
		Weekly Means				Monthly Results				Cumulative Results				
PUK4GR	109.9	108.8	107.1	113.0	109.7	-0.24	8.4	2.5	110.0	-0.18	10.0	2.8	16	LC
QFHVBW	113.9	108.6	115.2	111.1	112.2	0.47	12.2	2.9	113.3	0.77	9.6	2.3	16	LC
R38L7J	110.6	110.5	110.5	110.8	110.6	0.02	6.2	0.1 L	110.7	0.01	5.9	0.2 L	16	LJ
RXFELQ	108.9	104.6	106.3 H	110.3	107.5	-0.85	10.9	2.6	108.0	-0.80	9.4	2.7	16	AH
T78PHJ	116.6	111.1	113.3	114.3	113.8	0.94	10.6	2.3	113.3	0.79	10.3	2.3	16	TB
TBFGZC	109.8	107.7 H	112.7	112.5	110.7	0.04	10.3	2.4	111.0	0.09	9.1	3.5	16	LC
TC92DG	112.9	106.7	113.6 L	106.6	109.9	-0.16	6.7	3.8	108.5	-0.63	6.6	3.4	16	LA
UNW27P	113.5	115.6	113.0	113.8	114.0	0.99	9.1	1.1	113.8	0.94	11.2	3.1	16	XX
V8CU9D	111.2	112.5	111.3	118.3	113.3	0.81	9.2	3.4	110.3	-0.12	7.3	2.6	16	LA
W22QNC	112.2	112.5	111.6	113.2	112.4	0.54	8.6	0.7	114.0	0.97	9.5	3.3	16	LA
W9EE9H	115.5	110.2	115.1	106.8	111.9	0.39	7.8	4.2	112.1	0.43	8.1	3.5	16	AH
WAU2ZR	110.6	111.3	112.4	108.0	110.6	0.02	7.1	1.9	109.9	-0.21	6.8	1.6	16	TP
WP98A7	111.0	107.9	112.4	105.5	109.2	-0.38	9.3	3.1	110.2	-0.14	8.8	3.3	16	LA
XV9HQF	103.1	104.5	102.5 *	104.2	103.6	-1.98 *	8.9	0.9	104.8	-1.73	8.7	3.1	16	LC
YTECKA	107.3	110.8	111.7 H	111.5	110.3	-0.05	11.6	2.1	109.3	-0.40	10.3	3.4	16	TB
ZDKEC7	105.7	114.0	106.7	109.7	109.0	-0.42	7.8	3.7	111.0	0.10	9.0	6.0	16	LA
ZUPD79	119.7 *	119.6 *	121.9 X	118.5 *	119.9	2.68 *	9.5	1.4	117.5	2.01 *	9.7	2.9	14	LZ

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4		Monthly		Grand / Cumulative	
Wk Mean	110.42	110.69	110.68	110.06	Month Mean	110.52	Grand Mean	110.66
Avg SDr	8.69	8.58	8.22	8.53	Avg SD	8.50	Avg SD	8.86
SD btwn Labs	4.45	3.93	3.47	4.37	SD btwn Labs	3.51	SD btwn Labs	3.39
Labs Incld	52	52	51	52	SD btwn Wks	2.53	SD btwn Wks	3.04
Labs Excld	0	0	1	0	Labs Incld	52	Labs Incld	52
Labs not Rcvd	0	0	0	0				

Analysis Notes

LCVYRF - Data appears to be switched between Analysis 205 and Analysis 207. Data switched by CTS.

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 207
Bursting Strength (Mullen), 35 lb Linerboard - 35E1
TAPPI Official Test Method T807

Report #603 (N)
December 2019

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
		Weekly Means				Monthly Results				Cumulative Results				
2CNDPF	90.4	91.7	86.9	93.1	90.5	-0.56	5.4	2.7	90.1	-0.69	5.9	2.1	12	AH
32XPC6	98.0	96.6	93.4	93.5	95.4	1.24	7.5	2.3	92.3	0.12	7.4	4.1	12	LA
42ERBC	95.9	91.6	95.6	96.2	94.8	1.04	8.8	2.1	96.3	1.59	8.7	2.3	8	LZ
4DRR86	91.3	89.3	89.0	85.9	88.9	-1.17	9.1	2.2	89.9	-0.79	8.2	2.2	12	LC
4Y4H8X	99.5 *	98.0	95.1	97.5	97.5	2.04 *	8.3	1.8	98.4	2.35 *	7.4	2.6	12	TB
62BMDE	90.1 L	91.9	88.5	92.6 L	90.8	-0.46	3.6	1.8	91.4	-0.23	4.7	1.7	12	XX
6EJBLC	93.0	96.9	98.6 *	97.4	96.5	1.65	8.3	2.4	97.0	1.85	8.6	2.5	12	XX
7J98N8	96.3	101.2 *	96.0	96.5	97.5	2.04 *	6.6	2.4	91.8	-0.09	6.9	6.6 H	12	LA
7YJNYG	92.0 L	92.0 L	92.0 L	92.2 L	92.1	0.01	2.3	0.1 L	94.6	0.96	4.0	2.0	12	RE
9AVXDK	93.4	93.8	92.4	92.1	92.9	0.33	4.0	0.8	92.6	0.23	4.4	0.7 L	12	LA
A82294	95.5	88.8	91.8	90.6	91.7	-0.13	8.9	2.9	91.2	-0.28	7.5	2.5	12	LC
AB429Z	91.8	94.9	93.6	92.8	93.3	0.46	7.5	1.3	94.0	0.74	7.9	3.3	12	AX
ARNPHV	92.4	95.5	94.2	93.7	94.0	0.72	6.2	1.3	93.8	0.68	6.3	1.6	12	AH
BMUHQT	93.8	89.8	95.6	90.0	92.3	0.10	7.3	2.9	92.4	0.14	7.3	2.1	12	LA
CQMVYB	90.9	92.5	97.6	93.4	93.6	0.58	7.7	2.8	90.4	-0.60	8.6	3.5	12	LA
DGRDX8	83.1 *	86.7	89.0	87.8	86.7	-2.00 *	6.5	2.5	84.8	-2.65 *	7.7	2.8	12	LA
DQ6FAZ	84.0 *	86.0	90.0	86.8	86.7	-1.98 *	8.1	2.5	88.3	-1.38	7.9	3.2	12	AH
E4PCRA	92.3	90.4	90.8	89.7	90.8	-0.46	5.1	1.1	91.0	-0.37	5.0	0.7 L	12	AH
EDALCW	90.5	97.1	90.1	96.4	93.5	0.56	10.0	3.8	94.2	0.82	9.3	2.6	12	LC
EUEK8Y	94.4	95.8	94.3	90.1	93.7	0.60	7.5	2.5	94.8	1.04	8.8	1.9	12	AH
EZ6UGW	92.4	92.4	92.9	93.2	92.7	0.26	5.9	0.4 L	91.1	-0.35	7.3	2.8	12	LC
FCWBYQ	93.2	87.6	91.2	91.5	90.9	-0.43	7.3	2.4	90.1	-0.72	7.5	2.6	12	LA
FGQ6WR	92.0 L	89.3	90.1	91.2	90.7	-0.50	3.5	1.2	90.1	-0.71	4.0	1.1	12	LA
FW7B76	93.4 L	89.2	89.6	91.3	90.9	-0.43	3.5	1.9	92.8	0.29	3.5	2.4	12	LA
GHGQ3M	88.8	89.8	91.0	87.0	89.2	-1.07	6.8	1.7	89.7	-0.84	8.1	1.4	12	LC
HTCWHJ	85.6	85.1	91.8	86.3	87.2	-1.79	7.1	3.1	87.7	-1.59	7.2	2.2	12	LB
K4J39X	94.5	92.3	93.6	94.4	93.7	0.63	8.7	1.0	97.0	1.84	9.1	4.2	12	LC
KDV8BG	88.8	92.5	93.0	86.7	90.3	-0.66	8.3	3.0	91.5	-0.20	8.0	2.8	8	AH
LCVYRF	94.3	94.3	90.6	91.0	92.6	0.20	6.5	2.0	92.8	0.29	6.7	1.9	6	LA
LL4YEJ	91.6	93.0	85.3 *	90.1	90.0	-0.76	7.2	3.3	91.1	-0.35	7.6	3.5	12	LC
MWHFJV	92.3	94.2	91.7	95.3	93.4	0.50	7.4	1.7	93.3	0.48	7.8	1.7	8	LC
N3YBZP	84.9 *	88.9	87.7	87.2	87.2	-1.81	8.9	1.7	88.8	-1.18	8.3	2.6	12	LA
N7JVRR	88.9	93.1	95.8	95.9	93.4	0.52	7.5	3.3	92.3	0.11	7.1	2.8	12	LC
NJ4BVR	93.7	90.6	92.7	93.1	92.5	0.19	8.5	1.3	91.7	-0.12	9.4	3.6	12	LA
PJLB4U	96.0	100.5 *	91.8	92.2	95.1	1.15	7.7	4.1	95.1	1.16	8.5	3.4	12	LC

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

Report #603 (N)
December 2019

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
PUK4GR	88.5	96.9	92.2	90.2	92.0	-0.03	7.4	3.6	92.5	0.17	8.3	3.7	12	LC
QFHVBW	97.6	93.7	94.4	88.9	93.6	0.60	9.0	3.6	93.9	0.70	8.5	3.3	12	LC
R38L7J	90.8	90.7	90.9	90.7	90.8	-0.47	5.8	0.1 L	90.4	-0.58	5.2	0.3 L	12	LJ
RXFELQ	90.0	84.5 *	90.1	88.6	88.3	-1.38	8.0	2.6	88.5	-1.31	8.1	2.6	12	AH
T78PHJ	86.5	94.5	94.0	96.0	92.7	0.27	7.9	4.2	94.3	0.85	8.2	3.4	12	TB
TBFGZC	93.8	91.4	87.1	92.7	91.2	-0.29	8.1	3.0	90.7	-0.47	7.6	1.9	12	LC
TC92DG	91.8	87.6 L	88.7	91.2	89.8	-0.83	6.2	2.0	88.1	-1.46	6.3	2.5	12	LA
UNW27P	94.6	93.7	92.2	97.8	94.6	0.95	9.7	2.4	91.8	-0.08	10.3	2.8	12	XX
V8CU9D	88.7	89.4	98.4 *	96.5	93.2	0.45	8.1	4.9	90.4	-0.59	7.9	4.6	12	LA
W22QNC	91.2	90.9	96.4	97.0	93.9	0.68	9.4	3.2	94.0	0.73	8.8	3.2	12	LA
W9EE9H	86.1	90.8	93.6	94.5	91.3	-0.29	7.2	3.8	93.2	0.44	8.0	3.3	12	AH
WAU2ZR	90.0	91.4	91.6	89.5	90.6	-0.52	4.6	1.0	90.5	-0.58	5.5	1.7	12	TP
WP98A7	92.4 H	93.0	93.5	86.9	91.4	-0.22	8.5	3.0	91.4	-0.24	7.9	3.0	12	LA
XV9HQF	90.2	85.0	90.7	92.1	89.5	-0.94	7.3	3.1	91.3	-0.25	8.0	4.3	12	LC
YTECKA	93.5	92.5	93.2	87.5 H	91.7	-0.13	9.4	2.8	90.3	-0.61	9.0	2.7	12	TB
ZDKEC7	89.8	88.4	86.1 *	92.8	89.3	-1.03	8.0	2.8	90.0	-0.74	8.5	2.2	12	LA
ZUPD79	93.8	106.2 XH	95.4	100.2 *	98.9	2.55 *	10.5	5.6 H	98.6	2.45 *	9.5	4.1	10	LZ

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4				
Wk Mean	91.70	91.91	92.15	92.07	Month Mean	92.02	Grand Mean	92.01
Avg SDr	6.98	7.41	7.64	7.72	Avg SD	7.49	Avg SD	7.62
SD btwn Labs	3.46	3.71	3.02	3.49	SD btwn Labs	2.69	SD btwn Labs	2.71
Labs Incld	52	51	52	52	SD btwn Wks	2.67	SD btwn Wks	2.90
Labs Excld	0	1	0	0	Labs Incld	52	Labs Incld	52
Labs not Rcvd	0	0	0	0				

Analysis Notes

LCVYRF - Data appears to be switched between Analysis 205 and Analysis 207. Data switched by CTS.

Key to Instrument Codes Reported by Participants

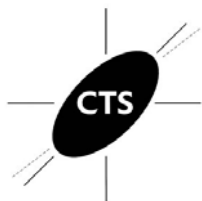|			
AH	Perkins Model AH	AX	Perkins Mullen Tester (model not specified)
LA	L&W Bursting Strength Tester	LB	L&W Burst-O-Matic
LC	L&W Autoline	LJ	L&W Bursting Strength Tester J-Type
LZ	L&W (model not specified)	RE	Regmed/Mullen Tester
TB	TMI Monitor/Burst 1000	TP	Technidyne PROFILE/Plus
XX	Instrument make/model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

Containerboard Interlaboratory Testing Program
Analysis 215
Ring Crush, 42 lb Linerboard - 42F1
TAPPI Official Test Method T822

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
		Weekly Means				Monthly Results				Cumulative Results				
2AJTYU	94.5	93.7	94.0	95.2	94.4	0.84	2.9	0.7	94.5	0.92	3.0	1.4	16	EN
2CNDPF	101.4 *	99.6 *	101.5 *	99.5 *	100.5	2.20 *	3.9	1.1	97.5	1.69	3.8	3.2	16	LZ
2KVRDF	82.7	85.9	84.8	85.4	84.7	-1.30	2.7	1.4	84.1	-1.75	2.8	1.3	16	EN
32XPC6	96.9 L	96.5	96.2	99.5 *	97.3	1.48	2.5	1.5	97.1	1.59	2.9	1.6	16	LZ
3FJRMP	86.5 L	86.3	88.8	86.8	87.1	-0.77	1.9	1.2	87.3	-0.94	3.1	2.3	16	MB
4K8T7E	87.7	91.5	87.1	89.5	88.9	-0.36	4.4	2.0	91.7	0.20	4.1	2.6	16	TH
4Y4H8X	96.7	100.1 *	99.5	96.6	98.2	1.70	3.7	1.8	99.9	2.31 *	3.2	2.6	16	LX
62BMDE	79.0 *	85.4	90.8	86.8	85.5	-1.12	3.4	4.9 H	84.0	-1.77	3.3	4.2	15	LD
7C6GUG	89.6	90.3	90.7	90.0	90.2	-0.09	2.4	0.5	90.6	-0.08	2.5	1.1	16	EM
7J98N8	90.1	92.1	91.6	90.6	91.1	0.12	3.1	0.9	94.9	1.02	3.7	5.4	14	LD
7YJNYG	93.8 L	93.4	90.9	91.9	92.5	0.42	2.4	1.4	91.0	0.01	2.4	3.5	16	LZ
9AVXDK	91.9	92.7	92.8	91.5	92.2	0.37	3.1	0.6	92.0	0.27	3.4	0.5 L	16	LD
9CLYJ9	88.4 L	88.6	89.0	87.7	88.4	-0.47	2.7	0.5	88.0	-0.74	2.7	0.8 L	16	LC
A82294	88.9	90.1	90.4	88.6	89.5	-0.24	3.7	0.9	90.1	-0.22	3.3	1.4	16	LD
AB429Z	76.7 *	75.9 XH	82.3	83.1	79.5	-2.45 *	5.2	3.7	79.0	-3.06 X	5.0	2.4	16	LC
ARNPHV	88.7 L	88.6	85.7	88.6	87.9	-0.59	2.7	1.5	89.1	-0.46	2.6	1.6	16	LG
B74HX9	89.4	89.1	89.9	90.2	89.6	-0.20	2.9	0.5	93.6	0.69	2.8	2.6	16	TH
CQMVYB	88.0	90.0	89.9	90.6	89.6	-0.21	3.4	1.1	90.7	-0.07	2.7	2.1	16	LD
EDALCW	95.0 L	93.6	95.9	95.4	95.0	0.98	2.5	1.0	94.0	0.78	2.5	2.1	16	LD
EZ6UGW	93.6	93.5 H	93.5 H	92.4 H	93.3	0.60	8.1	0.6	95.1	1.06	6.6	6.9 H	16	LC
FCWBYQ	88.6 L	89.0	91.3	87.6	89.1	-0.32	3.0	1.5	89.4	-0.40	2.9	1.4	16	LD
FGQ6WR	87.4 L	91.2 L	90.5 L	90.6 L	89.9	-0.14	1.2	1.7	90.3	-0.15	1.2	1.5	12	LZ
FW7B76	83.8 L	81.8 *	83.5	83.1	83.1	-1.66	1.7	0.9	83.3	-1.96 *	1.2	2.2	16	TU
GHGQ3M	93.5 L	90.8	91.2	91.3	91.7	0.25	2.4	1.2	91.4	0.12	2.7	1.7	16	LD
GK9PJ8	91.2 L	92.7	93.4	92.9	92.6	0.44	1.9	0.9	92.9	0.51	1.8	0.6 L	16	LD
HTCWHJ	92.2	91.6	91.3	91.2	91.6	0.23	3.6	0.5	92.4	0.38	3.5	2.0	16	LC
KDV8BG	82.0	93.7	85.2 H	92.3	88.3	-0.51	5.7	5.6 H	88.3	-0.68	5.7	5.6	4	LC
L9UCY8	94.4	98.1	98.0	96.2	96.7	1.36	3.6	1.8	94.6	0.94	3.3	3.5	16	LZ
LCVYRF	94.8 L	89.7	85.8	84.5	88.7	-0.41	3.0	4.6 H	90.1	-0.21	3.0	3.1	16	LC
MWHFJV	90.6 L	92.3	91.8	89.6	91.1	0.11	2.1	1.2	92.2	0.32	2.5	2.0	16	LD
N3YBZP	93.6	91.7	93.3	90.6	92.3	0.38	3.0	1.4	92.3	0.34	3.0	1.5	16	LD
N7JVRR	86.2	85.2	86.7	82.5	85.1	-1.20	3.5	1.9	87.3	-0.93	3.0	2.7	16	LD
NQNRC3	85.1 L	85.0	84.7 L	84.7	84.9	-1.26	1.5	0.2 L	85.1	-1.49	1.9	0.9	16	RS
PUK4GR	91.8 L	93.0	95.4	92.4	93.1	0.57	3.5	1.6	92.7	0.45	3.8	3.4	16	LD
QFHVBW	96.7	98.8 *	93.8	94.4	95.9	1.18	3.3	2.3	92.4	0.37	3.2	3.6	16	LD

Containerboard Interlaboratory Testing Program
Analysis 215
Ring Crush, 42 lb Linerboard - 42F1
TAPPI Official Test Method T822

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
		Weekly Means				Monthly Results				Cumulative Results				
R38L7J	91.8	91.7	91.9	91.7	91.8	0.27	4.2	0.1 L	91.6	0.18	3.2	0.2 L	16	LD
RXFELQ	92.1	89.9	89.4	92.4	91.0	0.09	3.2	1.5	90.9	-0.01	2.7	1.4	16	LC
T78PHJ	94.8	No Data	No Data	97.7	96.3	1.26	2.8	2.1	93.3	0.60	3.6	2.3	10	LD
TBFGZC	83.4 H	91.7	91.1	90.0	89.0	-0.34	14.8	3.8	92.1	0.29	7.7	2.8	16	LC
TC92DG	88.1	91.7	91.3	88.3	89.8	-0.16	2.5	1.9	89.7	-0.30	2.6	2.8	16	LD
UQT4PZ	86.4	86.8	88.5	86.2	87.0	-0.80	2.8	1.0	90.4	-0.13	3.6	2.4	16	LD
V8CU9D	87.7	88.0	87.5	87.1	87.5	-0.67	3.3	0.4	86.9	-1.03	2.7	1.9	16	LD
VDFZMF	100.6 *	103.3 X	102.3 *	104.0 X	102.5	2.65 *	3.7	1.5	97.8	1.77	3.6	4.2	16	TU
VKXWJX	No Data	No Data	96.1	98.1	97.1	1.45	3.0	1.4	97.2	1.60	3.9	5.7	9	MB
W22QNC	80.3	78.4 X	79.5 *	82.0 *	80.1	-2.33 *	4.5	1.5	81.9	-2.30 *	7.6	2.9	16	LC
W9EE9H	88.0 L	86.8	87.3 L	86.6	87.2	-0.75	2.2	0.6	87.3	-0.92	2.5	1.4	16	LD
WAU2ZR	89.0	91.3	90.7	88.1	89.8	-0.18	3.8	1.5	90.3	-0.16	3.7	1.0	16	TJ
WP98A7	89.7	91.2	88.5	87.4	89.2	-0.30	3.8	1.6	88.1	-0.72	4.6	1.9	16	LZ
X7PRAM	75.7 *	74.5 X	76.5 X	73.9 X	75.2	-3.41 X	3.8	1.2	83.9	-1.79	3.7	8.0 H	16	EM
XV9HQF	94.5	91.3	96.2	93.9	94.0	0.76	3.6	2.0	92.7	0.46	3.9	2.4	16	LD
XW22KA	90.7	89.2	89.8	89.9	89.9	-0.15	3.0	0.6	88.1	-0.71	3.5	1.8	16	EX
YCVQEK	89.5 L	88.4	87.0 L	89.5 L	88.6	-0.43	1.3	1.2	96.0	1.30	1.7	7.0 H	16	TD
ZKJWQJ	81.4 H	93.9	96.5	No Data	90.6	0.01	5.5	8.1 H	91.0	0.02	5.3	5.4	15	MB
ZUPD79	91.7	88.0	88.5	88.3	89.1	-0.32	3.3	1.7	89.9	-0.25	3.0	2.0	14	LC

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4							
Wk Mean	89.56	90.95	90.83	90.21	Month Mean	90.56		Grand Mean	90.92		
Avg SDr	5.34	3.30	3.55	3.11	Avg SD	3.95		Avg SD	3.57		
SD btwn Labs	5.46	3.80	4.63	4.25	SD btwn Labs	4.52		SD btwn Labs	3.90		
Labs Incld	53	48	52	51	SD btwn Wks	2.18		SD btwn Wks	3.15		
Labs Excld	0	4	1	2	Labs Incld	53		Labs Incld	53		
Labs not Rcvd	1	2	1	1							

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)

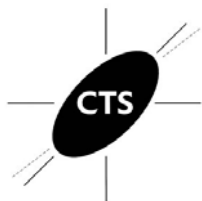Containerboard Interlaboratory Testing Program
Analysis 217
Ring Crush, 35 lb Linerboard - 35E1
TAPPI Official Test Method T822

Report #603 (N)
December 2019

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
2AJTYU	82.1	85.1	82.3	81.3	82.7	0.66	4.0	1.7	80.8	0.35	4.1	2.9	12	EN
2CNDPF	88.0	82.3	82.6	84.5	84.3	1.02	4.0	2.6	83.4	1.11	4.0	2.9	12	LZ
2KVRDF	76.6	77.7	74.5	76.2	76.2	-0.74	3.1	1.3	76.0	-1.06	3.2	1.1	12	EN
32XPC6	84.7	86.0	86.2	86.3	85.8	1.33	2.6	0.7	85.2	1.65	3.2	2.1	12	LZ
3FJRMP	79.8	79.1	77.4	77.7	78.5	-0.25	3.1	1.2	75.8	-1.15	3.0	4.7	12	MB
4K8T7E	77.2	76.2	80.9	80.8	78.8	-0.19	4.5	2.5	81.0	0.40	4.7	3.0	8	TH
4Y4H8X	89.6	83.9	89.6 *	81.8	86.2	1.43	3.7	4.0	88.4	2.58 *3.6		3.5	12	LX
62BMDE	70.3	71.3 *	79.6	74.1	73.8	-1.26	3.8	4.2	72.7	-2.06 *3.7		3.5	12	LD
7C6GUG	79.9	82.1	81.8	78.3	80.5	0.19	3.4	1.8	79.4	-0.07	3.2	1.5	12	EM
7J98N8	82.4	84.7	87.1	86.9	85.3	1.22	3.7	2.2	83.9	1.25	3.6	2.2	8	LC
7YJNYG	82.9	83.3	83.2	81.5 L	82.7	0.67	2.1	0.8	82.9	0.95	2.2	3.7	12	LZ
9AVXDK	81.5	82.0	81.5	81.5	81.6	0.43	2.9	0.3 L	80.6	0.28	2.8	0.9 L	12	LD
9CLYJ9	79.5	78.6	78.5	79.7	79.1	-0.12	3.5	0.6	79.1	-0.16	3.4	0.9	12	LC
A82294	77.2	75.6	76.5	78.1	76.8	-0.61	3.5	1.1	77.3	-0.69	3.5	1.4	12	LD
AB429Z	66.3 *	66.2 X	71.4 *	73.2	69.3	-2.25 *	4.8	3.6	69.6	-2.98 X4.3		3.2	12	LC
ARNPHV	80.4	79.6	77.4	76.1	78.4	-0.28	3.6	2.0	79.2	-0.15	3.3	2.1	12	LG
B74HX9	87.4	84.5	86.7	84.8	85.9	1.35	2.9	1.4	81.7	0.60	3.1	3.3	12	TH
CQMVYB	79.8	75.0	76.1	76.6	76.9	-0.60	4.0	2.1	79.1	-0.18	3.6	2.3	12	LD
EDALCW	84.2	83.4	83.9	82.7	83.5	0.85	3.2	0.7	83.0	0.99	3.3	2.1	12	LD
EZ6UGW	78.7 H	77.8	77.7 H	76.6	77.7	-0.42	5.8	0.9	75.5	-1.22	4.7	2.1	12	LC
FCWBYQ	79.1	77.9	79.7	77.9	78.6	-0.22	2.5	0.9	79.5	-0.06	2.8	1.7	12	LD
FGQ6WR	74.5	78.7	80.1	78.7	78.0	-0.36	2.3	2.4	78.5	-0.34	2.3	1.4	12	LZ
FW7B76	75.7 L	75.8	75.6	73.4	75.1	-0.98	1.7	1.1	75.5	-1.21	1.5	1.1	12	TU
GHGQ3M	80.8	80.8	80.4	80.6	80.7	0.22	2.8	0.2 L	81.8	0.63	3.2	1.1	12	LD
GK9PJ8	83.5 L	83.0	83.1	85.2	83.7	0.87	1.9	1.0	83.0	1.00	1.7	0.8 L	12	LD
HTCWHJ	85.4	83.1 H	83.1 H	83.9	83.9	0.92	5.8	1.1	81.9	0.67	5.4	2.0	12	LC
KDV8BG	72.5 H	77.3 H	77.5 H	85.4	78.2	-0.32	6.5	5.3 H	79.2	-0.14	6.7	4.1	7	LC
L9UCY8	84.3	90.9 *	90.9 *	86.3	88.1	1.84	3.0	3.4	82.4	0.81	3.2	5.5	12	LZ
LCVYRF	83.6	80.8	74.0	74.1	78.1	-0.33	3.4	4.8	77.3	-0.70	3.0	3.2	12	LC
MWHFJV	80.4	80.4	80.0	80.2	80.3	0.13	2.7	0.2 L	81.5	0.55	2.9	1.5	8	LD
N3YBZP	82.7	82.9	80.3	81.0	81.7	0.46	2.9	1.3	82.9	0.95	3.5	1.7	12	LD
N7JVRR	72.5	75.2 H	77.2	74.9	75.0	-1.02	4.7	1.9	75.7	-1.15	3.5	3.6	12	LD
NQNRC3	74.3 L	75.0 L	76.0	75.9 L	75.3	-0.95	1.8	0.8	75.0	-1.36	2.0	1.0	12	RS
PUK4GR	80.3	82.0	85.0	81.4	82.1	0.54	3.2	2.0	80.7	0.31	3.6	4.6	12	LD
QFHVBW	83.5	85.9 L	79.7	81.7	82.7	0.66	3.8	2.7	79.9	0.08	3.4	3.2	12	LD

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

WebCode	Weekly Means				Monthly Results				Cumulative Results					
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
R38L7J	82.0	81.8	81.9	81.9	81.9	0.48	4.7	0.1 L	81.6	0.57	3.7	0.3 L	12	LD
RXFELQ	79.9	79.8	79.2	80.5	79.9	0.04	3.6	0.6	80.3	0.18	3.7	0.9	12	LC
T78PHJ	83.3	No Data	No Data	84.5 H	83.9	0.92	6.0	0.8	81.2	0.46	5.7	3.2	7	LC
TBFGZC	62.8 *	79.3	76.5	76.6	73.8	-1.27	4.4	7.4 H	78.5	-0.35	3.9	7.6 H	12	LC
TC92DG	76.1	77.7	79.0 L	78.5	77.8	-0.40	3.5	1.3	77.3	-0.71	3.3	1.4	12	LD
UQT4PZ	80.3	79.3	78.1	78.8	79.1	-0.12	3.0	0.9	80.8	0.35	3.6	2.3	12	LD
V8CU9D	77.1	77.6	76.0	77.3	77.0	-0.58	5.6	0.7	75.7	-1.15	3.8	2.2	12	LD
VDFZMF	89.9	87.5 H	92.3 X	88.8 *	89.6	2.17 *	4.7	2.0	85.4	1.71	8.1	4.9	12	TU
VKXWJX	No Data	No Data	84.9	89.5 *	87.2	1.64	3.6	3.3	84.8	1.52	4.8	7.6 H	9	MB
W22QNC	69.1	67.5 X	65.4 X	73.2 H	68.8	-2.36 *	3.9	3.3	70.7	-2.64 *	4.2	2.4	12	LC
W9EE9H	77.4	74.9	75.9	76.5	76.2	-0.75	2.6	1.0	80.3	0.19	3.0	4.5	12	LD
WAU2ZR	77.3	77.0	78.8	77.3	77.6	-0.45	4.1	0.8	77.8	-0.55	4.1	0.7 L	12	TJ
WP98A7	80.2	78.8	80.0	81.2	80.0	0.08	4.4	1.0	78.4	-0.37	4.1	2.4	12	LZ
X7PRAM	65.8 *	60.6 X	64.3 X	61.3 X	63.0	-3.61 X	3.9	2.5	67.7	-3.52 X	4.4	7.7 H	12	EM
XV9HQF	81.1 L	78.9	81.3	87.1	82.1	0.53	3.6	3.5	81.4	0.52	4.3	2.2	12	LD
XW22KA	78.0	77.0	76.6	76.5	77.0	-0.57	3.7	0.7	75.7	-1.16	3.3	2.7	12	EX
YCVQEK	66.4 *L	68.9 *	66.7 XL	69.0 *	67.8	-2.58 *	1.7	1.4	76.5	-0.92	3.5	7.7 H	12	TD
ZKJWQJ	70.2	82.0	83.1	No Data	78.4	-0.26	4.1	7.2 H	77.7	-0.58	5.2	5.8	11	MB
ZUPD79	79.1	78.6	75.6	78.0	77.8	-0.40	3.0	1.6	77.9	-0.51	3.1	1.9	10	LC

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4						
Wk Mean	78.82	79.94	80.08	79.89	Month Mean		79.65	Grand Mean		79.65
Avg SDr	3.84	3.78	3.72	3.69	Avg SD		3.77	Avg SD		3.82
SD btwn Labs	5.97	4.13	4.07	4.44	SD btwn Labs		4.61	SD btwn Labs		3.39
Labs Incld	53	49	49	52	SD btwn Wks		2.51	SD btwn Wks		3.27
Labs Excld	0	3	4	1	Labs Incld		53	Labs Incld		52
Labs not Rcvd	1	2	1	1						

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)

Containerboard Interlaboratory Testing Program
Analysis 223
STFI, 42 lb Linerboard - 42F1
TAPPI Official Test Method T826

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
2AJTYU	22.1	21.1	21.6	22.0	21.7	-1.70	1.6	0.5	21.3	-2.26 *	1.5	0.6	16	LH
2KVRDF	21.8	22.8	22.1	22.9	22.4	-1.10	1.4	0.5	22.1	-1.48	1.6	0.5	16	LY
32XPC6	21.9	21.7	21.8	22.5	21.9	-1.49	2.0	0.3	22.4	-1.22	1.8	0.7	16	LW
3PKNFB	No Data	23.2	No Data	No Data	23.2	-0.46	2.0	0.0	24.0	0.40	1.7	0.6	12	LY
42ERBC	25.2	24.7	25.5	25.3	25.2	1.20	1.7	0.3	24.8	1.14	1.8	0.9	16	LZ
4DRR86	27.4 *L	25.3	24.7	25.2	25.6	1.56	1.7	1.2	25.0	1.33	1.9	0.9	12	LA
9AVXDK	23.3 L	23.4	23.0	23.4	23.3	-0.39	1.5	0.2	23.2	-0.46	1.6	0.2 L	16	LA
A4YP7V	22.8	22.7	23.0	23.2	22.9	-0.69	1.8	0.2	22.5	-1.09	1.8	0.7	16	LW
A82294	23.1	23.5	23.7	23.4	23.4	-0.28	1.6	0.3	23.1	-0.56	1.6	0.4 L	16	LA
AB429Z	22.8	20.1 *	19.6 X	21.0 *	20.9	-2.36 *	1.8	1.4	22.5	-1.06	2.0	1.4	16	LZ
ARNPHV	22.8	22.9	21.9	23.2	22.7	-0.88	1.3	0.6	23.0	-0.58	1.6	0.5	16	LU
BMUHQT	23.0	23.0	23.1	23.4	23.1	-0.53	1.9	0.2	23.1	-0.47	1.9	0.3 L	16	LY
CQMVYB	23.8	22.3	23.2	22.0	22.8	-0.78	1.8	0.8	22.9	-0.75	1.8	0.6	16	LZ
DGRDX8	27.2 *	25.2	24.7	25.3 H	25.6	1.54	2.4	1.1	25.0	1.37	2.2	1.1	16	LH
E4PCRA	23.6 L	23.5	23.6	23.7	23.6	-0.13	1.1	0.1 L	23.6	-0.07	1.1	0.4 L	16	TT
EDALCW	23.6	23.0	24.6	23.0	23.6	-0.16	1.9	0.7	23.1	-0.49	1.7	0.6	16	LA
EUEK8Y	25.8	23.3	24.4	24.1	24.4	0.54	2.2	1.0	24.2	0.60	2.0	0.7	16	LU
EZ6UGW	25.4	25.4	26.7 *	26.5 *	26.0	1.88	2.2	0.7	25.3	1.65	2.1	0.9	16	LA
FCWBYQ	22.9	23.0	22.1	22.9	22.7	-0.83	1.5	0.4	22.8	-0.85	1.4	0.5	16	LA
GHGQ3M	23.2	23.6	23.3	24.4	23.6	-0.10	2.0	0.5	22.1	-1.54	1.7	5.3 H	16	LA
GK9PJ8	23.0	23.1	23.4	23.1	23.2	-0.47	1.4	0.2	23.5	-0.18	1.7	0.3 L	16	LY
HTCWHJ	24.3	23.6	23.3	23.3	23.6	-0.09	1.4	0.5	24.0	0.32	1.6	0.6	16	LW
K4J39X	23.2	23.7	22.9	23.4	23.3	-0.36	1.6	0.3	23.3	-0.34	1.6	1.0	16	LA
KDV8BG	23.1 H	25.5 H	24.6 H	24.0 H	24.3	0.49	4.0	1.0	23.8	0.16	3.3	1.1	6	LH
L9UCY8	23.6	22.7 L	24.4	24.2	23.7	-0.01	1.8	0.7	23.0	-0.63	1.7	0.8	16	LA
LCVYRF	25.2	23.2	21.9	22.1	23.1	-0.53	1.6	1.5	23.0	-0.65	1.4	1.0	16	LA
MWHFJV	22.9	22.9	22.8 L	23.4 L	23.0	-0.61	1.3	0.3	23.2	-0.38	1.4	0.6	16	LA
N3YBZP	24.1 L	23.6 L	24.3 L	24.6 L	24.2	0.34	0.4	0.4	23.7	0.09	1.3	0.5	16	LY
N72ABH	25.2	25.7	24.7	24.6	25.0	1.06	2.0	0.5	25.0	1.35	2.0	0.7	16	XX
PAA73W	24.6	24.7	24.6	25.1	24.7	0.82	1.6	0.3	24.6	0.99	1.6	0.5	16	LH
PJLB4U	25.0	23.1	23.4	23.4	23.7	-0.01	1.8	0.8	23.6	0.02	1.8	0.5	16	LA
PUK4GR	24.3	24.0	24.1	23.8	24.1	0.26	1.8	0.2	23.7	0.04	1.9	0.6	16	LA
QFHVBW	20.4 *H	39.8 XH	39.0 X	23.0	30.5	5.63 X	3.7	10.3 H	24.0	0.41	2.3	6.2 H	16	LZ
RQCPRY	24.9	25.5	25.6	24.9	25.2	1.21	1.6	0.4	25.1	1.43	1.6	0.7	16	LH
RXFELQ	23.7	23.5	22.7	23.1	23.2	-0.41	1.7	0.5	23.3	-0.32	1.6	0.4	16	LU

Containerboard Interlaboratory Testing Program
Analysis 223
STFI, 42 lb Linerboard - 42F1
TAPPI Official Test Method T826

Report #603 (N)
December 2019

| WebCode | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
T78PHJ	24.8	25.5	25.7	22.6	24.7	0.77	1.7	1.4	24.6	0.91	1.8	0.7	16	LW
TBFGZC	21.7	20.5 *	22.4	25.4	22.5	-1.04	1.9	2.1 H	22.4	-1.22	1.6	1.2	16	LA
TC92DG	23.6	23.0	24.1 L	24.3	23.7	-0.01	1.5	0.6	22.9	-0.71	1.4	1.2	16	BK
UQT4PZ	22.1	21.7	21.7	21.5	21.7	-1.66	1.6	0.3	22.7	-0.94	1.6	0.7	16	LH
V8CU9D	23.6 L	23.4	23.8	22.8	23.4	-0.28	1.4	0.4	23.8	0.13	1.6	0.5	16	LA
VDFZMF	26.6 *L	25.7 L	25.7 L	25.9 L	26.0	1.86	0.3	0.4	24.4	0.78	0.4	1.4	16	LA
VKXWJX	No Data	28.9 XH	25.7	24.6	26.4	2.20 *	2.0	2.3 H	25.6	1.92	2.3	5.5 H	11	LA
W22QNC	25.2	25.7	24.7	24.6	25.0	1.06	2.0	0.5	25.0	1.35	2.0	0.7	16	LU
W9EE9H	25.3	25.5	26.0	25.5	25.6	1.50	1.6	0.3	24.9	1.24	1.9	0.5	16	LU
WAU2ZR	23.8	23.7	23.5	23.8 L	23.7	-0.03	1.1	0.2	23.5	-0.17	1.2	0.3 L	16	TT
WP98A7	22.9	22.8	22.5	22.6	22.7	-0.86	1.6	0.2	22.2	-1.44	1.6	0.7	16	LA
XV9HQF	23.6	23.2	25.2	25.4	24.3	0.50	1.6	1.1	24.2	0.56	1.9	1.2	16	LA
XW22KA	25.2 L	25.3 L	25.3 L	24.6 L	25.1	1.13	0.0	0.3	24.4	0.71	0.0	0.9	16	TT
YCVQEK	24.0	24.2	24.2	24.3	24.2	0.38	1.6	0.1	25.8	2.16 *	1.6	2.7	16	XX
YTECKA	22.4	21.8	22.1	22.5	22.2	-1.28	1.7	0.3	22.4	-1.21	1.7	0.3 L	16	LZ
Z8RNCN	22.3	21.8	22.3	22.6	22.2	-1.26	2.0	0.3	22.5	-1.14	1.7	0.5	16	XX
ZDKEC7	24.1	24.4	24.2	23.6	24.1	0.26	1.7	0.3	24.0	0.35	1.7	0.9	16	LU
ZKJWQJ	22.9	24.4	24.2	No Data	23.8	0.08	1.8	0.8	23.7	0.10	1.8	0.9	15	LA
ZUPD79	24.2	23.8	24.0	23.8 L	23.9	0.16	1.5	0.2	24.4	0.73	1.6	0.5	14	LW

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4						
Wk Mean	23.79	23.55	23.78	23.72	Month Mean		23.74	Grand Mean		23.63
Avg SDr	1.96	1.76	1.77	1.70	Avg SD		1.76	Avg SD		1.76
SD btwn Labs	1.39	1.36	1.28	1.18	SD btwn Labs		1.21	SD btwn Labs		1.02
Labs Incld	52	52	51	52	SD btwn Wks		0.76	SD btwn Wks		1.57
Labs Excld	0	2	2	0	Labs Incld		53	Labs Incld		54
Labs not Rcvd	2	0	1	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		
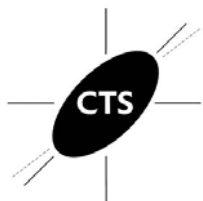
Containerboard Interlaboratory Testing Program
Analysis 225
STFI, 35 lb Linerboard - 35E1
TAPPI Official Test Method T826

Report #603 (N)
December 2019

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
2AJTYU	20.5 *	20.4 *	21.1	20.7	20.7	-2.41 *	1.5	0.3	20.9	-1.89	1.7	0.8	12	LH
2KVRDF	20.8	21.5	22.5	21.6	21.6	-1.27	1.8	0.7	21.2	-1.60	1.7	0.5	12	LY
32XPC6	21.1	20.6	21.5	21.1	21.1	-1.93	1.7	0.3	21.3	-1.46	1.8	0.3	12	LW
3PKNFB	No Data	22.3	No Data	No Data	22.3	-0.49	1.7	0.0	22.7	0.00	1.6	1.0	6	LY
42ERBC	24.6	24.2	23.5	24.0	24.1	1.69	1.8	0.5	24.3	1.83	2.0	0.4	8	LZ
4DRR86	24.1	23.3	21.5	22.4	22.8	0.19	2.0	1.1	22.6	-0.09	1.9	0.8	8	LA
9AVXDK	22.5	22.8	22.7	22.6	22.7	0.02	1.4	0.1 L	22.4	-0.27	1.4	0.2 L	12	LA
A4YP7V	21.7	22.0	23.3	21.9	22.2	-0.52	1.7	0.7	22.1	-0.66	1.8	0.7	12	LW
A82294	22.2	22.1	21.8	22.9	22.3	-0.48	1.6	0.5	22.0	-0.71	1.7	0.4	12	LA
AB429Z	20.6 *	19.0 X	19.2 X	18.4 X	19.3	-4.02 X	1.6	0.9	20.3	-2.59 *	1.7	2.0	12	XX
ARNPHV	22.3	21.8	21.4	21.8	21.9	-0.98	1.4	0.4	22.1	-0.64	1.5	0.7	12	LW
BMUHQT	22.4	21.9	21.6	22.5	22.1	-0.71	1.8	0.4	22.4	-0.27	1.9	0.5	12	LU
CQMVYB	22.1	21.5	21.7	21.9	21.8	-1.07	1.5	0.2	22.4	-0.34	1.5	0.6	12	LZ
DGRDX8	25.2 *H	24.3	23.9	24.2 H	24.4	2.10 *	2.8	0.6	24.1	1.57	2.3	1.1	12	LH
E4PCRA	22.9	23.0	22.7	22.9	22.9	0.27	1.2	0.1 L	22.6	-0.07	1.1	0.6	12	TT
EDALCW	22.3	22.1	23.3	22.3	22.5	-0.22	1.4	0.5	22.7	0.02	1.6	0.5	12	LU
EUEK8Y	24.2	22.8	23.1 H	24.1	23.6	1.09	2.2	0.7	23.2	0.54	1.9	0.6	12	LU
EZ6UGW	23.6	22.9	23.1	23.3	23.2	0.68	2.0	0.3	23.1	0.48	1.7	0.4	12	LA
FCWBYQ	22.2	22.2	22.5	22.0	22.2	-0.52	1.5	0.2	22.3	-0.35	1.6	0.6	12	LW
GHGQ3M	22.6	23.3	23.2	22.3	22.8	0.21	1.5	0.5	22.8	0.16	1.7	0.4	12	LA
GK9PJ8	22.5	23.2	22.5	22.6	22.7	-0.01	1.6	0.3	22.6	-0.04	1.7	0.4	12	LY
HTCWHJ	23.7	23.4	22.7	23.2	23.2	0.70	1.5	0.4	23.5	0.91	1.6	0.6	12	LW
K4J39X	22.4	21.9	22.5	22.2	22.2	-0.52	1.6	0.2	22.2	-0.55	1.5	0.7	12	LA
KDV8BG	27.8 XH	21.1 H	24.0 H	23.3 H	24.0	1.65	4.0	2.8 H	23.3	0.66	3.8	2.2	7	LH
L9UCY8	22.5	22.8 L	22.4	22.3	22.5	-0.21	1.9	0.2	22.1	-0.59	1.6	0.5	12	LA
LCVYRF	24.0	22.6	20.7 *	21.0	22.1	-0.71	1.5	1.5	21.6	-1.20	1.5	1.1	12	LA
MWHFJV	22.4	21.5	22.2 L	21.2	21.8	-1.01	1.1	0.6	22.3	-0.41	1.4	0.7	8	LA
N3YBZP	22.6 L	23.3 L	22.6 L	23.6 L	23.0	0.42	0.3	0.5	23.1	0.46	1.3	0.4	12	LY
N72ABH	22.9	23.5	23.1	23.3	23.2	0.66	1.6	0.3	23.6	1.07	1.7	0.5	12	XX
PAA73W	24.0	24.6 *	23.7	24.0	24.1	1.68	1.5	0.4	24.0	1.45	1.5	0.5	12	LH
PJLB4U	23.3	22.6	23.8	23.4	23.3	0.73	1.6	0.5	23.6	1.05	1.6	0.5	12	LA
PUK4GR	22.5	22.7	22.6	23.1	22.7	0.07	1.7	0.3	22.5	-0.14	1.6	0.5	12	LA
QFHVBW	23.3	34.0 XH	32.0 X	21.5	27.7	6.05 X	2.0	6.2 H	23.9	1.33	1.7	4.3 H	12	LZ
RQCPRY	24.3	25.9 X	25.3 X	25.3 *	25.2	3.08 X	1.4	0.7	25.5	3.10 X	1.5	0.6	12	LH
RXFELQ	23.5	22.5	22.8	22.4	22.8	0.14	1.7	0.5	22.7	0.04	1.6	0.5	12	LU
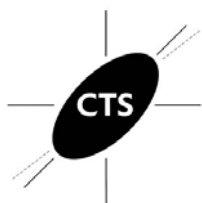
Containerboard Interlaboratory Testing Program
Analysis 225
STFI, 35 lb Linerboard - 35E1
TAPPI Official Test Method T826

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
T78PHJ	24.5	23.5	23.3 H	24.6	24.0	1.58	2.0	0.7	23.4	0.85	1.9	0.7	12	LW
TBFGZC	22.0	20.7	23.5	24.8	22.7	0.08	1.4	1.8 H	22.1	-0.65	1.6	1.3	12	LA
TC92DG	23.1	22.4	22.8 L	23.0	22.8	0.21	1.3	0.3	21.5	-1.29	1.3	1.1	12	BK
UQT4PZ	21.9	20.2 *	21.8	22.3	21.6	-1.33	1.4	0.9	22.0	-0.68	1.5	0.9	12	LH
V8CU9D	22.9 L	23.5	22.2	22.0	22.7	-0.02	1.4	0.7	22.8	0.16	2.0	0.6	12	LA
VDFZMF	22.2 L	22.0 L	24.0 L	23.7 L	23.0	0.36	0.3	1.0	22.6	-0.06	0.4	1.6	12	LA
VKXWJX	No Data	21.8	23.9	21.3	22.3	-0.40	2.3	1.4	23.9	1.38	2.0	3.4 H	11	LA
W22QNC	22.9	23.5	23.1	23.3	23.2	0.66	1.6	0.3	23.6	1.07	1.7	0.5	12	LU
W9EE9H	25.6 *	23.4	23.3	24.7	24.2	1.89	1.6	1.1	23.8	1.22	1.7	0.9	12	LU
WAU2ZR	22.6	22.9	22.6	22.6 L	22.7	-0.01	1.1	0.1	22.5	-0.16	1.2	0.4	12	TT
WP98A7	23.0	21.3	21.3	21.1	21.7	-1.19	1.7	0.9	21.6	-1.11	1.6	0.9	12	LA
XV9HQF	22.3	22.7	23.8	23.9	23.2	0.60	1.7	0.8	23.0	0.32	2.1	0.8	12	LA
XW22KA	22.0 L	23.0 L	23.2 L	22.9 L	22.7	0.09	0.0	0.5	22.7	0.06	0.0	1.4	12	LZ
YCVQEK	23.4	22.4	23.8	22.7	23.1	0.52	1.7	0.6	25.0	2.53 *	1.6	2.5 H	12	XX
YTECKA	22.4	21.3	22.0	21.8	21.9	-0.97	1.6	0.5	21.6	-1.16	1.6	0.4	12	LZ
Z8RNCN	21.5	20.9	21.4	20.3 *	21.0	-1.99 *	1.5	0.5	22.0	-0.76	1.6	0.9	12	XX
ZDKEC7	23.5	23.1	22.5	22.2	22.8	0.18	2.0	0.6	22.8	0.17	1.8	0.6	12	LU
ZKJWQJ	22.0	23.2	21.4	No Data	22.2	-0.57	1.7	1.0	22.1	-0.62	1.7	1.0	11	LA
ZUPD79	23.9	23.7	23.0	23.5	23.5	1.05	1.8	0.4	23.6	1.05	1.8	0.5	10	LW

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4				
Wk Mean	22.81	22.47	22.66	22.69	Month Mean	22.66	Grand Mean	22.66
Avg SDr	1.66	1.67	1.73	1.76	Avg SD	1.73	Avg SD	1.73
SD btwn Labs	1.09	1.01	0.86	1.12	SD btwn Labs	0.83	SD btwn Labs	0.91
Labs Incld	51	51	50	51	SD btwn Wks	0.77	SD btwn Wks	1.16
Labs Excld	1	3	3	1	Labs Incld	51	Labs Incld	53
Labs not Rcvd	2	0	1	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, 42 lb Linerboard - 42F

TAPPI Official Test Method T575

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months		Months	Inst
2KVRDF	147.9	-0.12	14.98		150.2	-0.14	3.42 L	4	EV
32XPC6	136.1	-0.54	3.60 L		139.5	-0.53	4.95	4	EV
42ERBC	142.2	-0.32	11.70		183.7	1.06	68.29 H	4	XX
4DRR86	222.4	2.56 *	26.58		199.6	1.64	49.28 H	4	LA
9AVXDK	151.7	0.02	15.08		152.3	-0.07	0.54 L	4	XX
A82294	129.5	-0.78	14.84		127.5	-0.96	2.30 L	4	LS
DGRDX8	113.4	-1.36	9.66 L		106.6	-1.71	4.79	4	EV
EZ6UGW	166.1	0.54	14.92		158.3	0.15	10.52	4	EV
FCWBYQ	142.4	-0.32	22.86		145.1	-0.33	6.05	4	LA
K4J39X	201.3	1.80	60.72 H		172.3	0.65	24.36	4	LA
N3YBZP	151.8	0.02	13.16		151.7	-0.09	5.43	4	EV
PJLB4U	131.9	-0.70	23.04		127.9	-0.94	5.26	4	LA
PUK4GR	142.6	-0.31	27.26		181.4	0.98	51.81 H	4	LA
QFHVBW	146.9	-0.15	16.84		134.1	-0.72	11.06	4	LA
QP34VK	117.8	-1.20	10.91		120.6	-1.21	5.24	4	EV
RQD7GJ	126.0	-0.91	13.44		136.0	-0.65	10.37	4	LS
TBFGZC	173.8	0.81	40.17 H		169.4	0.55	13.37	4	LA
VDFZMF	161.8	0.38	21.66		187.8	1.21	39.95	4	LA
VKXWJX	144.3	-0.25	12.33		144.2	-0.36	0.01	2	LA
W22QNC	217.4	2.38 *	31.06		208.5	1.96 *	28.51	4	EV
W9EE9H	143.4	-0.28	12.52		147.1	-0.25	3.04 L	4	EV
WP98A7	147.5	-0.13	13.21		143.7	-0.37	13.65	4	EV
XV9HQF	128.1	-0.83	14.85		125.0	-1.05	4.91	4	LA
YTECKA	137.8	-0.48	13.26		143.7	-0.38	6.21	4	LA
ZDKEC7	186.4	1.27	53.95 H		220.3	2.38 *	39.99	4	EV
ZKJWQJ	126.1	-0.91	17.61		138.8	-0.55	10.41	4	LA
ZUPD79	146.2	-0.18	8.22 L		145.8	-0.30	2.22 L	4	XX

Consensus (All Labs) Results

Month Mean	151.21		Grand Mean	154.12
Avg SD	23.80		Avg SD Months	23.93
SD btwn Labs	27.78		SD btwn Labs	27.78
Labs Incld	27		Labs Incld	27

Key to Instrument Codes Reported by Participants

EV	Emveco Microgage Model 210-R	LA	L&W Autoline
LS	L&W 263	XX	Instrument make/model not specified by lab

Containerboard Interlaboratory Testing Program
Analysis 229
Roughness - Sheffield Method, 42 lb Linerboard - 42F1
TAPPI Official Test Method T538

Report #603 (N)
December 2019

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2CNDPF	354.2	-0.38	6.53		349.0	-1.21	4.14	4	XX
A82294	348.6	-1.17	4.91		349.0	-1.21	0.54 L	4	LA
CQMVYB	371.2	2.00 *	7.41		365.3	1.40	6.38	4	XX
DGRDX8	350.7	-0.87	7.48		304.6	-8.34 X	97.44 H	4	LA
GHGQ3M	366.6	1.36	5.91		362.7	0.98	4.70	4	LA
K4J39X	351.6	-0.74	9.41		354.3	-0.36	2.88	4	LA
LL4YEJ	349.5	-1.04	4.78		352.0	-0.74	8.00	4	LA
MWHFJV	357.6	0.09	9.96		364.6	1.29	5.46	4	XX
RQD7GJ	359.9	0.42	7.00		354.4	-0.34	3.82	4	LA
RXFELQ	358.0	0.15	8.88		360.9	0.69	2.74	4	XX
V8CU9D	358.3	0.19	6.11		353.6	-0.48	5.05	4	LA

Consensus (All Labs) Results

Month Mean	356.93		Grand Mean	356.57
Avg SD	7.31		Avg SD Months	4.80
SD btwn Labs	7.13		SD btwn Labs	6.23
Labs Incld	11		Labs Incld	10

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, 42 lb Linerboard - 42F
TAPPI Official Test Method T569

Report #603 (N)
December 2019

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
A82294	102.3	0.79	2.36		103.3	0.70	1.39	2	TM
AB429Z	66.3	-2.11 *	2.04		66.3	-1.94 *	0.00	1	SC
EDALCW	99.6	0.57	4.67		98.2	0.33	1.98	2	HZ
EZ6UGW	102.0	0.76	7.58		102.5	0.64	0.71	2	SC
FCWBYQ	111.0	1.48	7.94		114.8	1.51	5.37	2	HY
GHGQ3M	41.4	-4.11 X	0.96 L		41.3	-3.73 X	0.21	2	LZ
KUZ87H	98.2	0.45	4.99		100.7	0.51	3.64	2	SC
LCVYRF	89.4	-0.25	6.27		89.3	-0.30	0.14	2	TM
MWHFJV	87.2	-0.43	2.17		88.2	-0.38	1.41	2	TM
N3YBZP	89.2	-0.27	3.67		90.5	-0.22	1.84	2	XX
N7JVRR	93.0	0.04	5.67		94.3	0.06	1.84	2	SC
PUK4GR	78.8	-1.11	4.09		87.8	-0.41	12.73	2	TM
RQD7GJ	95.0	0.20	1.00 L		95.5	0.14	0.71	2	HY
RXFELQ	107.0	1.16	5.62		107.9	1.02	1.39	2	HY
TBFGZC	110.0	1.40	9.35		116.0	1.60	8.49	2	SC
V8CU9D	94.8	0.18	4.03		93.9	0.03	1.21	2	SC
W22QNC	79.8	-1.02	2.49		80.3	-0.94	0.71	2	TM
W9EE9H	82.8	-0.78	1.10 L		83.2	-0.74	0.57	2	TM
WP98A7	88.4	-0.33	2.30		88.7	-0.35	0.42	2	TM
ZC9U6H	105.0	1.00	1.00 L		107.5	0.99	3.54	2	TM
ZDKEC7	71.2	-1.72	9.31		62.0	-2.25 *	13.01	2	TM

Consensus (All Labs) Results

Month Mean	92.55		Grand Mean	93.56
Avg SD	5.10		Avg SD Months	5.02
SD btwn Labs	12.44		SD btwn Labs	14.03
Labs Incld	20		Labs Incld	20

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	90.80	12.07	1.75	17
Modified Scott Bond Mechanics	108.98	2.86	16.43	2

Analysis Notes

GHGQ3M -   Method used is not covered in this test. Data excluded from consensus calculation.

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

Report #603 (N)
December 2019

Key to Instrument Codes Reported by Participants

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

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

Report #603 (N)
December 2019

WebCode	Monthly Results			Cumulative Results				
	Mean	CPV	SD	Mean	CPV	SD Months		Months
2KVRDF	28.4	0.51	2.27	27.0	0.07	1.95		4
32XPC6	22.0	-1.49	0.71	23.5	-1.13	2.64		4
42ERBC	23.8	-0.93	2.39	24.3	-0.84	0.53		4
7J98N8	28.7	0.60	2.61	28.4	0.55	0.95		4
9AVXDK	26.2	-0.18	0.84	25.8	-0.34	0.34	L	4
A82294	26.2	-0.18	3.37	26.0	-0.25	0.40	L	4
CQMVYB	16.0	-3.36 X	3.10	26.0	-0.28	7.05	H	4
DGRDX8	26.8	0.01	1.30	28.4	0.54	2.16		4
EP4AGP	24.0	-0.86	2.45	24.0	-0.94	0.00		1
EZ6UGW	20.6	-1.92 *	0.55 L	21.6	-1.78	1.77		4
FCWBYQ	32.2	1.69	0.84	29.0	0.76	2.85		4
GHGQ3M	27.6	0.26	0.89	26.9	0.06	4.91		4
K4J39X	29.8	0.94	3.35	29.0	0.76	2.92		4
KUZ87H	23.8	-0.93	2.39	23.9	-0.99	2.03		4
MWHFJV	25.7	-0.35	4.32	26.8	0.03	1.06		3
N3YBZP	20.8	-1.87	2.34	20.3	-2.19 *	1.39		4
N72ABH	22.0	-1.49	2.83	24.8	-0.67	2.33		4
PJLB4U	28.9	0.66	2.82	30.0	1.11	1.22		4
PUK4GR	29.6	0.88	1.52	29.0	0.76	1.21		4
RXFELQ	25.0	-0.55	3.26	24.6	-0.75	0.75		4
T78PHJ	27.8	0.32	4.60	28.6	0.63	3.41		4
TBFGZC	29.6	0.88	2.41	34.2	2.55 *	3.12		4
UQT4PZ	31.1	1.35	1.64	30.3	1.21	1.10		4
W22QNC	26.2	-0.18	1.64	25.0	-0.62	2.08		4
W9EE9H	29.6	0.88	1.34	28.8	0.69	1.07		4
WP98A7	29.4	0.82	5.03	30.7	1.33	2.06		4
YTECKA	24.8	-0.61	0.84	25.2	-0.53	0.37	L	4
ZDKEC7	31.5	1.47	4.15	26.6	-0.06	3.31		4
ZUPD79	27.6	0.26	4.04	27.7	0.30	0.57		4

Consensus (All Labs) Results

Month Mean	26.77		Grand Mean	26.76
Avg SD	2.69		Avg SD Months	2.47
SD btwn Labs	3.21		SD btwn Labs	2.93
Labs Incld	28		Labs Incld	29

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

Report #603 (N)
December 2019

Key to Instrument Codes Reported by Participants

ZZ   Instruments No Longer Tracked

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

Report #603 (N)
December 2019

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
32XPC6	21.9	-0.01	2.26		19.8	-1.21	3.02	2	XX
42ERBC	20.5	-1.04	1.27		20.5	-0.75	0.00	1	TD
62BMDE	25.2	2.35 *	4.83 H		23.5	1.19	2.40	2	GG
9AVXDK	20.2	-1.26	1.23		20.3	-0.87	0.16	2	LA
A82294	22.2	0.17	1.19		21.6	-0.05	0.84	2	LA
C7ZDXQ	20.3	-1.20	0.88		20.9	-0.53	0.81	2	LP
CHUUMR	19.4	-1.84	1.43		18.2	-2.27 *	1.74	2	LA
CQMVYB	22.7	0.57	2.39		23.8	1.38	1.48	2	GA
DGRDX8	22.2	0.21	1.29		21.4	-0.20	1.24	2	LP
EZ6UGW	19.6	-1.69	1.43		19.5	-1.40	0.14	2	LA
F37QTR	23.1	0.85	2.67		24.7	1.99 *	2.27	2	GA
FCWBYQ	23.3	0.98	1.64		22.8	0.74	0.71	2	LP
FGQ6WR	21.8	-0.10	1.14		20.2	-0.98	2.33	2	XX
GHGQ3M	23.1	0.85	1.27		23.7	1.35	0.87	2	LA
GK9PJ8	22.7	0.54	0.82 L		22.6	0.61	0.14	2	LP
K4J39X	19.3	-1.89	2.20		18.7	-1.90	0.83	2	LA
KAVWFG	22.1	0.10	2.29		22.5	0.53	0.57	2	LP
MWHFJV	21.3	-0.46	1.55		21.1	-0.35	0.25	2	LA
N3YBZP	23.0	0.77	1.41		22.5	0.55	0.71	2	LP
N72ABH	22.7	0.56	0.95		20.8	-0.57	2.74	2	LA
PUK4GR	23.8	1.36	1.26		24.0	1.49	0.19	2	LA
RQD7GJ	22.4	0.30	1.44		22.7	0.64	0.41	2	LP
RXFELQ	23.0	0.77	3.88 H		22.7	0.70	0.38	2	TP
T78PHJ	20.9	-0.78	0.98		21.3	-0.21	0.66	2	LP
TBFGZC	23.1	0.86	1.31		22.3	0.43	1.15	2	LA
V8CU9D	22.0	0.02	1.63		21.5	-0.09	0.63	2	LA
VDFZMF	27.5	3.98 X	1.82		26.6	3.20 X	1.23	2	LA
VKXWJX	20.4	-1.14	1.88		20.4	-0.84	0.00	1	LA
W22QNC	23.0	0.78	1.21		22.8	0.75	0.29	2	LA
WP98A7	20.8	-0.82	1.64		21.1	-0.39	0.35	2	LP
XV9HQF	21.8	-0.10	1.45		21.8	0.10	0.01	2	LA
YTECKA	21.3	-0.49	1.74		21.2	-0.33	0.14	2	LP
ZDKEC7	23.0	0.79	1.24		22.4	0.49	0.88	2	LA

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

Report #603 (N)
December 2019

Consensus (All Labs) Results

Month Mean	21.94	Grand Mean	21.66
Avg SD	1.87	Avg SD Months	1.26
SD btwn Labs	1.39	SD btwn Labs	1.54
Labs Incld	32	Labs Incld	32

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		TP	Technidyne Profile/ plus Roughness & Porosity
XX	Instrument make/model not specified by lab			

Containerboard Interlaboratory Testing Program
Analysis 240
Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM11
TAPPI Official Test Method T809

Report #603 (N)
December 2019

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
		Weekly Means				Monthly Results				Cumulative Results				
2AJTYU	57.4	56.9	57.4 L	56.4	57.0	-0.36	3.0	0.5	55.6	-0.99	3.3	1.5	16	EN
2KVRDF	61.3	58.9	57.2	59.5	59.2	0.72	3.3	1.7	59.0	0.61	3.4	1.1	16	EN
3PKNFB	No Data	57.7	No Data	No Data	57.7	-0.02	3.8	0.0	55.9	-0.86	3.8	2.0	12	LD
4Y4H8X	56.0	62.2	57.3	60.9	59.1	0.66	3.5	2.9	59.2	0.71	3.7	3.2	16	LD
7WTPHW	57.9 L	58.0	57.7	57.7	57.8	0.03	1.8	0.2 L	58.2	0.23	1.6	0.3 L	16	LD
8ADNM6	68.9 X	67.3 X	66.6 X	65.0 *	66.9	4.49 X	4.3	1.6	65.6	3.78 X	4.3	2.1	16	EM
9AVXDK	57.9	58.3 L	58.5	58.4	58.3	0.26	1.7	0.3 L	58.4	0.34	1.8	0.3 L	16	LD
AB429Z	57.6	60.0	55.9	56.0	57.4	-0.18	3.4	1.9	56.3	-0.66	3.5	2.0	16	LC
AG7JX8	60.3	59.0	56.9	58.8	58.8	0.49	2.4	1.4	59.7	0.95	6.7	2.8	16	LC
ARNPHV	59.3	60.8	59.2	58.8	59.5	0.86	3.9	0.9	58.3	0.29	3.3	1.6	16	LZ
BMUHQT	61.2 H	58.7	58.9 H	59.5	59.6	0.90	5.8	1.1	58.7	0.50	4.8	1.7	16	LD
BNGDZF	60.9	60.5	59.5	60.5	60.4	1.28	2.7	0.6	59.8	0.99	2.5	0.5 L	16	LD
C7ZDXQ	57.9	60.4	57.0	57.2	58.1	0.18	4.2	1.6	58.2	0.25	3.6	1.6	16	LD
CHUUMR	54.7	54.6	54.3	55.6	54.8	-1.43	4.6	0.6	56.4	-0.64	4.5	2.9	13	LD
CQMVYB	58.7	56.1	57.4	57.0	57.3	-0.22	3.8	1.1	57.1	-0.30	3.3	1.1	16	LZ
E4PCRA	58.0	59.3	59.4	59.8	59.1	0.68	4.6	0.8	59.2	0.71	4.3	0.7	16	TG
EDALCW	54.4	55.5	56.3	55.6	55.5	-1.11	3.0	0.8	56.6	-0.50	3.2	1.9	16	LD
FCWBYQ	56.5	59.3	57.1	58.6	57.9	0.06	3.9	1.3	57.6	-0.03	3.4	1.9	16	LD
FW7B76	60.7	61.3	60.2	59.6 L	60.5	1.34	2.1	0.7	60.7	1.44	2.3	1.6	16	TU
GHGQ3M	52.5 *	53.3	55.2	54.5	53.9	-1.90	3.5	1.2	54.7	-1.43	3.3	2.7	16	LD
HTCWHJ	59.0	60.3	60.0	60.4	59.9	1.07	2.3	0.7	59.9	1.07	3.0	0.9	16	LD
K4J39X	52.5 *	54.2	59.3	53.9	55.0	-1.35	4.5	3.0	56.4	-0.61	4.1	3.0	16	LD
KAVWFG	55.0	55.5	57.9 H	56.4	56.2	-0.75	4.0	1.3	56.5	-0.58	3.3	1.8	16	LD
KUZ87H	57.1	56.9	55.7	56.8	56.6	-0.54	3.8	0.6	56.5	-0.56	4.1	1.4	16	LZ
LCVYRF	60.4	56.0	57.4	63.1	59.2	0.73	3.4	3.2	59.0	0.63	3.3	2.4	16	LC
N3YBZP	56.5	58.8	57.3	58.4	57.8	0.00	3.3	1.1	58.0	0.17	3.5	1.1	16	LZ
PAA73W	59.6	61.3	59.7	61.2	60.4	1.31	2.7	0.9	60.2	1.23	3.8	1.3	16	LD
PUK4GR	57.7	57.6	56.9	57.6	57.4	-0.15	3.9	0.4	59.1	0.67	4.9	3.5	16	LD
QFHVBW	53.4	54.4	59.1	52.1 *	54.8	-1.46	3.1	3.0	54.8	-1.40	3.9	2.4	16	LD
R38L7J	61.3	61.1	61.4	61.2	61.2	1.71	3.7	0.1 L	60.8	1.50	3.6	0.5 L	16	LD
RQCPRY	54.8	52.5 *	53.5 *H	52.2 *	53.3	-2.19 *	4.1	1.2	53.4	-2.07 *	3.3	1.4	16	LD
RQD7GJ	53.8	No Data	No Data	No Data	53.8	-1.91	4.9	0.0	57.0	-0.34	3.4	2.2	4	LD
RXFELQ	57.8	58.9	59.0	61.2	59.2	0.72	3.2	1.5	59.2	0.74	3.5	1.3	16	LC
T78PHJ	59.9	60.2	59.0	61.1	60.1	1.13	2.8	0.9	60.4	1.29	3.4	1.4	16	LD
UNYHVA	59.1	59.7	60.0	60.4	59.8	1.00	2.5	0.6	59.9	1.07	2.5	0.6 L	16	EM

Containerboard Interlaboratory Testing Program
Analysis 240
Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM11
TAPPI Official Test Method T809

Report #603 (N)
December 2019

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
	Weekly Means				**Monthly Results**				**Cumulative Results**					
UQT4PZ	58.2	53.5	59.8	57.2	57.2	-0.28	4.0	2.7	56.9	-0.36	3.4	2.0	16	LD
VDFZMF	60.0 H	56.9	60.2	61.7	59.7	0.96	5.9	2.0	55.0	-1.27	4.9	3.5	16	TU
VH7X4D	44.2 X	45.5 X	44.1 X	45.4 X	44.8	-6.33 X	4.6	0.8	45.3	-5.95 X	4.2	1.5	16	TC
VKXWJX	54.4	NO DATA	59.1	50.6 *	54.7	-1.50	4.7	4.3 H	52.7	-2.41 *	4.3	6.7 H	10	MB
VP9J2L	58.1	57.6	57.0	57.4	57.5	-0.11	3.7	0.5	57.7	0.00	3.2	0.5 L	16	LD
W22QNC	57.9	57.1	57.8	62.8	58.9	0.57	4.2	2.6	56.8	-0.42	4.2	2.6	16	LC
W9EE9H	54.4	55.4	54.8	55.0	54.9	-1.39	3.7	0.4	54.6	-1.49	3.2	2.6	16	LD
WAU2ZR	61.3	59.9	58.4	58.6	59.6	0.88	3.9	1.3	59.6	0.91	3.8	1.1	16	TJ
WK8VXJ	58.3	57.8	57.1	58.0	57.8	0.03	3.2	0.5	57.6	-0.03	3.2	0.6 L	16	LC
XW22KA	54.7	55.9	55.0	57.6	55.8	-0.95	4.0	1.3	56.2	-0.70	3.7	1.1	16	EM
Y73LKG	67.6 XH	69.5 X	69.1 X	68.6 X	68.7	5.35 X	4.9	0.8	66.0	4.00 X	4.0	2.1	16	LC
YCVQEK	59.1 L	57.1 L	62.2 *L	61.0 L	59.8	1.02	1.3	2.2	62.8	2.43 *	1.9	4.2	16	TD
YTECKA	55.7	55.6	61.5	55.9	57.2	-0.28	3.5	2.9	57.5	-0.10	3.4	2.3	16	LZ
YVHJU9	57.9	53.6	55.9	56.5	56.0	-0.86	3.2	1.8	56.2	-0.73	3.2	1.3	16	TH
Z8RNCN	59.1	60.9	58.8	60.2	59.8	0.99	3.6	1.0	60.3	1.25	4.1	2.9	16	LD
ZDKEC7	57.9	57.1	57.8	62.7	58.9	0.55	4.2	2.6	56.8	-0.42	4.2	2.6	16	XX
ZKJWQJ	52.4 *	60.1	53.5	* NO DATA	55.3	-1.19	3.2	4.1 H	55.5	-1.07	4.3	3.1	15	MB

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4					
Wk Mean	57.51	57.80	57.88	58.31	Month Mean	57.74	Grand Mean	57.69	
Avg SDr	3.79	3.79	3.52	3.38	Avg SD	3.66	Avg SD	3.67	
SD btwn Labs	2.53	2.48	2.01	3.00	SD btwn Labs	2.04	SD btwn Labs	2.08	
Labs Incld	48	47	47	47	SD btwn Wks	1.77	SD btwn Wks	2.24	
Labs Excld	3	3	3	2	Labs Incld	49	Labs Incld	49	
Labs not Rcvd	1	2	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	TU	TMI Universal Crush Tester (TMI K440)
XX	Instrument make/model not specified by lab		

Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium - CM11
TAPPI Official Test Method T843

WebCode	Week 1		Week 2		Week 3		Week 4		Mean	CPV		SD	SD Wks		Mean	CPV		SD	SD Wks		Wks	Inst
4K8T7E	64.4	*	64.7		65.7		65.4		65.1	-1.88	*	3.9	0.6		64.4	-2.01	*	4.7	1.9		16	TH
7WTPHW	68.4	L	68.5		68.5		68.5		68.5	-0.15		1.9	0.1	L	68.4	-0.14		1.7	0.3	L	16	LD
9AVXDK	68.6	L	68.9		69.2		69.1	L	69.0	0.10		1.6	0.3		68.8	0.07		1.8	0.3	L	16	LD
ARNPHV	71.4		70.5		70.0		71.6		70.9	1.07		3.5	0.7		69.5	0.41		3.3	1.7		16	LZ
C7ZDXQ	70.3		72.6		70.3		69.7		70.8	1.01		4.0	1.3		70.3	0.80		3.8	1.7		16	LD
FCWBYQ	70.0		74.4	*	72.0		73.0		72.3	1.82		4.4	1.9		73.6	2.36	*	3.8	1.8		16	LD
FGQ6WR	67.8	L	68.5	L	67.9		68.3	L	68.1	-0.34		1.4	0.3		68.3	-0.16		1.4	0.4	L	12	LZ
GHGQ3M	68.7		67.8		67.9		67.8		68.1	-0.35		3.4	0.4		67.9	-0.35		3.6	1.4		16	LD
HTCWHJ	67.8		68.8		68.1		69.4		68.5	-0.12		2.2	0.7		68.1	-0.27		2.2	0.7		16	LD
KAVWFG	67.6		65.4		66.2		66.8		66.5	-1.16		3.8	0.9		67.1	-0.72		3.5	1.3		16	LD
PUK4GR	68.7		66.5		64.4		67.4		66.8	-1.02		4.0	1.8		65.4	-1.52		3.9	1.7		16	LD
RXFELQ	71.5		65.7		71.1		73.4		70.4	0.85		2.4	3.3	H	70.3	0.77		3.0	2.3		16	LC
T78PHJ	70.0		68.8		71.0	H	70.1		70.0	0.61		4.9	0.9		70.0	0.67		4.3	1.1		16	LD
TC92DG	64.3	*	67.1		65.6	H	66.3		65.8	-1.50		4.9	1.2		66.6	-0.98		4.8	2.5		16	LD
W22QNC	73.4	*	72.5		66.9		72.3		71.3	1.28		4.2	3.0		71.0	1.12		3.9	2.4		16	XX
WK8VXJ	67.6		67.4		68.1		68.4		67.9	-0.45		3.1	0.5		68.0	-0.29		4.2	0.5		16	LD
YCVQEK	68.2	L	68.5	L	71.9	L	66.1	L	68.7	-0.03		1.1	2.4		69.4	0.37		1.2	1.9		16	TD
YTECKA	70.6		68.7		68.9		69.1		69.3	0.28		3.4	0.9		68.4	-0.14		3.8	1.0		16	LZ

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4					
Wk Mean	68.85	68.63	68.55	69.03	Month Mean	68.76	Grand Mean	68.64	
Avg SDr	3.64	3.40	3.60	3.07	Avg SD	3.43	Avg SD	3.46	
SD btwn Labs	2.28	2.56	2.23	2.33	SD btwn Labs	1.96	SD btwn Labs	2.10	
Labs Incld	18	18	18	18	SD btwn Wks	1.48	SD btwn Wks	1.56	
Labs Excld	0	0	0	0	Labs Incld	18	Labs Incld	18	
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
TH	TMI Compression Tester, Model 17-76		XX	Instrument make/model not specified by lab

Containerboard Interlaboratory Testing Program
Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM11
TAPPI Official Test Method T822

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
4QRKNF	48.6	38.1	40.4	43.1	42.6	-0.62	2.8	4.5	40.8	-1.54	3.2	3.5	16	LZ
4Y4H8X	45.1	44.8	47.1	44.4	45.4	0.40	4.1	1.2	46.9	1.57	4.1	3.1	16	LZ
6BFDD6	40.7	41.7 H	41.5	38.9	40.7	-1.28	5.2	1.3	40.4	-1.71	5.0	1.3	16	TX
8ADNM6	42.7	46.0	45.1	40.3	43.5	-0.26	4.1	2.6	43.2	-0.27	3.8	2.2	16	EM
9AVXDK	43.0	43.7	43.5	42.8	43.3	-0.36	2.8	0.4 L	42.8	-0.48	2.7	0.7	16	LD
AG7JX8	49.0	50.2 *	47.0	47.4	48.4	1.51	2.7	1.5	46.8	1.53	3.8	2.0	16	LC
B74HX9	47.6	47.0 L	45.6	47.8	47.0	1.01	2.6	1.0	43.9	0.04	2.9	2.2	16	TH
BNGDZF	44.2	44.2	44.3	44.3	44.2	0.00	2.1	0.1 L	42.6	-0.60	2.3	1.3	16	LD
C7ZDXQ	42.7	40.5	42.9	42.1	42.1	-0.79	2.4	1.1	43.1	-0.34	2.7	1.2	16	LD
CHUUMR	49.5	48.8	47.3	44.8	47.6	1.23	3.4	2.1	47.1	1.70	3.4	1.8	16	LD
CQMVYB	42.1	43.3	43.7	43.9	43.2	-0.37	4.1	0.8	43.0	-0.38	3.4	1.3	16	LD
DRDMEE	44.8	43.7	45.2	44.3	44.5	0.09	3.7	0.6	45.0	0.60	3.7	1.3	12	LZ
EDALCW	46.5	46.0	48.1	45.4	46.5	0.82	3.3	1.1	44.6	0.41	3.1	1.8	16	LD
FW7B76	60.7 X	61.3 X	40.4	39.2 L	50.4	2.25 *	2.1	12.3 H	43.2	-0.31	1.6	7.1 H	16	TU
GHGQ3M	44.3	44.5	43.0	42.2	43.5	-0.26	3.1	1.1	44.9	0.57	3.4	1.4	16	LD
KAVWFG	40.7	40.3	38.8	41.6	40.3	-1.42	3.4	1.2	41.4	-1.23	3.3	1.0	16	LD
L8LAG3	42.5	44.0	43.2 H	43.9 H	43.4	-0.30	5.1	0.7	42.8	-0.51	4.7	1.3	16	XX
L9UCY8	49.0	48.5	46.7	43.0	46.8	0.93	3.2	2.7	45.5	0.86	3.3	2.3	16	LZ
NYZPVK	44.7	46.2	46.4	47.1 L	46.1	0.68	3.1	1.0	45.3	0.79	3.4	1.7	16	LD
QFHVBW	45.9	46.7	42.2	42.8	44.4	0.05	2.5	2.3	42.9	-0.45	3.1	2.1	16	LD
R38L7J	45.6	45.8	45.3	45.4	45.5	0.46	2.4	0.2 L	45.4	0.83	2.7	0.3 L	16	LD
RXFELQ	43.1	44.2	43.6	43.4	43.6	-0.25	3.0	0.5	43.7	-0.06	3.4	1.2	16	LC
UNYHVA	42.1	42.3 L	42.8	41.7	42.2	-0.74	2.0	0.4 L	42.1	-0.84	1.8	0.3 L	16	LC
VH7X4D	38.5	38.4	36.9 *H	38.0 *	38.0	-2.29 *	4.5	0.7	37.2	-3.37 X	5.7	1.4	16	TC
VKXWJX	NO DATA	NO DATA	45.5	46.6 H	46.1	0.67	4.9	0.8	46.5	1.39	3.6	5.4 H	10	MB
XW22KA	40.9	40.0	40.7	42.8	41.1	-1.14	3.7	1.2	40.7	-1.56	3.0	1.0	16	EM
Y73LKG	28.9 X	31.2 X	31.1 X	29.9 X	30.3	-5.08 X	3.6	1.1	30.2	-6.96 X	3.0	2.8	16	XX
YVHJU9	35.4 *	33.3 X	34.9 X	38.8	35.6	-3.14 X	3.3	2.3	35.8	-4.06 X	2.6	1.8	16	TH

Consensus (All Labs) Results

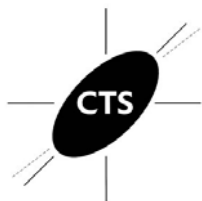|	Week 1	Week 2	Week 3	Week 4				
Wk Mean	43.96	44.13	43.74	43.18	Month Mean	44.24	Grand Mean	43.78
Avg SDr	3.67	3.47	3.15	3.36	Avg SD	3.44	Avg SD	3.35
SD btwn Labs	3.41	3.18	2.79	2.62	SD btwn Labs	2.75	SD btwn Labs	1.96
Labs Incld	25	24	26	27	SD btwn Wks	2.85	SD btwn Wks	2.45
Labs Excld	2	3	2	1	Labs Incld	26	Labs Incld	25
Labs not Rcvd	1	1	0	0				

Containerboard Interlaboratory Testing Program
Analysis 255
Ring Crush (RCT), 26 lb Corrugating Medium - CM11
TAPPI Official Test Method T822

Report #603 (N)
December 2019

Key to Instrument Codes Reported by Participants

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

Containerboard Interlaboratory Testing Program
Analysis 261
STFI, 26 lb Corrugating Medium - CM11
TAPPI Official Test Method T826

Report #603 (N)
December 2019

WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
			Weekly Means			Monthly Results				Cumulative Results				
2AJTYU	12.7 H	13.1	13.8	13.6	13.3	-0.79	1.1	0.5	13.0	-1.14	1.0	0.4 L	16	LH
6BFDD6	12.7	12.3 *	12.3 *	12.4 *	12.4	-2.56 *	0.8	0.2	12.3	-2.06 *	0.9	0.3 L	16	TT
7WTPHW	13.7 L	13.7 L	13.5	13.6 L	13.6	-0.19	0.4	0.1	13.5	-0.48	0.5	0.2 L	16	LA
9AVXDK	13.4	13.6	13.3	13.5	13.5	-0.49	0.8	0.1	13.4	-0.62	0.8	0.1 L	16	LB
A82294	13.4	14.1	14.0	13.6	13.8	0.18	1.0	0.3	13.8	-0.19	1.1	0.4 L	16	LA
CHUUMR	14.3 H	15.2 *	14.2	14.4	14.5	1.74	1.2	0.5	14.6	0.91	1.1	0.6	16	LA
CQMVYB	13.5	13.7	13.9	13.4	13.6	-0.14	1.1	0.2	13.4	-0.59	1.0	0.3 L	16	LZ
DRDMEE	13.0	14.0	13.5	14.1	13.6	-0.08	1.0	0.5	14.3	0.55	1.1	0.8	12	LA
K4J39X	13.5	13.7	13.7	13.5	13.6	-0.19	0.9	0.1	13.4	-0.68	1.0	0.5 L	16	LA
L9UCY8	14.0	13.5	15.2 *	13.5	14.1	0.74	1.2	0.8	13.6	-0.39	1.0	0.7	16	LA
N3YBZP	13.8	14.2	13.4	14.7	14.0	0.72	1.1	0.6	13.9	0.00	1.0	0.4 L	15	LB
PUK4GR	13.7	14.5	13.7 H	14.5	14.1	0.87	1.2	0.5	14.2	0.37	1.1	0.5 L	16	LA
QFHVBW	13.8 L	23.5 XH	22.4 XH	13.6	18.3	9.47 X	1.5	5.4 H	14.2	0.38	1.1	3.5	16	LZ
RXFELQ	13.9	13.2	13.9	13.2	13.6	-0.25	1.0	0.4	13.6	-0.36	1.0	0.4 L	16	LU
UNYHVA	13.1	12.9	13.3	13.7	13.2	-0.92	1.0	0.3	13.5	-0.51	1.1	0.3 L	16	LB
UQT4PZ	13.1	12.9	13.4	12.8	13.1	-1.27	0.8	0.3	13.7	-0.25	1.0	0.5	16	LH
VDFZMF	12.1 *L	14.3 L	14.4 L	13.0 L	13.4	-0.52	0.2	1.1 H	13.8	-0.11	0.2	0.8	16	LA
VH7X4D	15.8 X	14.9	15.3 *	15.1 *	15.3	3.34 X	1.1	0.4	14.3	0.49	1.1	1.2	16	TS
VKXWJX	No Data	No Data	14.8	13.7	14.2	1.15	0.9	0.8	15.3	1.82	1.2	2.8	10	LA
VP9J2L	13.6	13.9	13.7	14.0	13.8	0.22	0.8	0.2	13.6	-0.39	0.9	0.4 L	16	LB
W9EE9H	14.8 *	15.1	14.3	14.5	14.6	1.97 *	1.1	0.4	14.3	0.55	1.1	0.3 L	16	LU
WAU2ZR	13.5	13.1	13.3	13.3	13.3	-0.77	0.8	0.2	13.4	-0.67	0.8	0.3 L	16	TT
WK8VXJ	13.8	13.7	13.6	13.7	13.7	0.03	0.9	0.1	13.5	-0.57	0.9	0.4 L	16	LB
YCVQEK	14.1	13.8	13.6	14.9	14.1	0.90	1.0	0.6	15.5	2.08 *	1.1	1.7	16	XX
ZKJWQJ	13.3	13.8	13.4	No Data	13.5	-0.36	1.1	0.3	15.6	2.24 *	1.6	8.4 H	15	LA

Consensus (All Labs) Results

	Week 1	Week 2	Week 3	Week 4		Monthly		Grand	
Wk Mean	13.51	13.79	13.82	13.77	Month Mean	13.69	Grand Mean	13.91	
Avg SDr	1.01	0.92	0.95	1.00	Avg SD	0.96	Avg SD	1.01	
SD btwn Labs	0.57	0.72	0.66	0.67	SD btwn Labs	0.49	SD btwn Labs	0.77	
Labs Incld	23	23	24	24	SD btwn Wks	0.46	SD btwn Wks	1.91	
Labs Excld	1	1	1	0	Labs Incld	23	Labs Incld	24	
Labs not Rcvd	1	1	0	1					

Containerboard Interlaboratory Testing Program
Analysis 261
STFI, 26 lb Corrugating Medium - CM11
TAPPI Official Test Method T826

Report #603 (N)
December 2019

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