Collaborative Testing Services, Inc.

Containerboard Interlaboratory Testing Program

Participant Summary Report #602 (M) - November 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
206	56A2	Mullen Burst of Linerboard, 56 lb Linerboard
215	42F1	Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard
216	56A2	Ring Crush of Linerboard, Rigid Platen Type, 56 lb Linerboard
223	42F1	STFI of Linerboard, 42 lb Linerboard
224	56A2	STFI of Linerboard, 56 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

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	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'.

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
698C4P	927.1	0.84	72.71	772.3	-1.44	104.32 H	4	ET
6R36PM	726.3	-1.70	69.65	794.6	-1.04	46.87	4	TB
6TJ6Y4	754.0	-1.35	25.17	814.0	-0.69	61.91	4	ER
6WJFU4	859.4	-0.01	87.52	854.3	0.03	27.65	4	ER
7H8LNJ	882.4	0.28	27.03	863.7	0.20	17.99	4	TE
7YZZEY	839.4	-0.27	87.66	862.2	0.18	18.56	4	LO
822B3L	912.6	0.66	68.60	907.3	0.98	4.30 L	4	EX
96YM7J	815.8	-0.57	35.93	847.6	-0.09	72.73	4	EX
CD3KDQ	843.4	-0.22	60.53	861.3	0.16	23.11	4	LG
E6XCXA	1,003.4	1.81	41.76	905.2	0.95	74.43	4	LS
GYL8YL	834.9	-0.32	69.25	843.5	-0.16	17.90	4	LS
KR7X2Z	1,003.5	1.81	59.20	987.6	2.42 *	30.64	4	LG
KZKJA4	987.0	1.60	22.96	873.8	0.38	81.49	4	LL
L6BDKA	822.6	-0.48	97.05	808.2	-0.79	32.77	4	LS
LRNYR9	874.8	0.18	66.41	893.5	0.74	26.29	4	ER
LXA2ND	817.5	-0.54	27.76	836.2	-0.29	30.63	4	LG
NPCBW2	763.1	-1.23	54.14	745.8	-1.91 *	19.73	4	LS
QQKXT7	954.8	1.19	35.08	949.2	1.73	5.05 L	4	ER
QVUAUD	892.2	0.40	19.14	892.4	0.72	8.02	4	LM
R44ZN4	846.5	-0.18	69.58	851.0	-0.03	3.45 L	4	LM
T2V3YT	795.6	-0.82	68.64	780.9	-1.28	30.25	4	LL
TQP23U	931.2	0.90	38.13	872.3	0.36	57.83	3	LC
YRMJ6B	808.2	-0.66	73.20	848.9	-0.06	37.11	4	ES
ZKJ2YX	755.1	-1.33	81.34	793.1	-1.06	32.33	4	LS

Consensus (All Labs) Results

Month Mean	860.45	Grand Mean	852.45
Avg SD	60.96	Avg SD Months	44.49
SD btwn Labs	78.96	SD btwn Labs	55.74
Labs Incld	24	Labs Incld	24

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	852.48	89.79	7.97	8
Clip sealing	864.43	75.80	3.99	16

Key to Instrument Codes Reported by Participants

ER	Emerson 6200 Series	ES	Emerson 8510
ET	Emerson 7200	EX	Emerson Apparatus (Model not specified)
LC	L&W Crush Tester 48	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

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2VDR43	37.4	0.62	1.93		34.2	-0.51	2.84	4	LD
6WJFU4	34.6	-0.29	2.83	H	33.4	-0.71	2.37	4	EN
8MHWDT	34.7	-0.27	0.82		35.8	-0.05	1.02	4	TF
96YM7J	35.2	-0.12	1.45		35.5	-0.15	1.23	4	LC
CD3KDQ	38.2	0.91	1.81		38.9	0.81	0.84	4	LE
E6ERQH	35.9	0.14	1.33		36.3	0.09	1.36	4	XX
E7NTVP	31.3	-1.40	0.50	L	30.8	-1.45	3.18	4	WK
GJQZQC	38.8	1.12	1.66		39.0	0.82	0.18	2	XX
GYL8YL	33.8	-0.58	1.37		34.4	-0.45	1.44	4	LD
KZKJA4	48.1	4.21	1.33		42.5	1.79	4.01	4	XX
N2PBTV	39.3	1.26	1.85		40.9	1.35	1.10	4	LC
NPCBW2	30.4	-1.70	2.58		30.9	-1.40	0.78	4	EM
TMTPD3	32.6	-0.96	1.57		32.5	-0.97	0.59	4	XX
ZKJ2YX	39.4	1.29	1.60		39.0	0.83	0.80	4	LC

X = H

Consensus (All Labs) Results

Month Mean	35.51	Grand Mean	36.00
Avg SD	1.74	Avg SD Months	1.89
SD btwn Labs	2.99	SD btwn Labs	3.63
Labs Incld	13	Labs Incld	14

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

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2B9YDX	38.3	-1.06	1.27		38.1	-1.23	1.26	3	EM
2VDR43	41.8	0.98	1.71		38.5	-0.93	2.23	4	LD
698C4P	43.4	1.96 *	1.20		39.7	0.13	2.87	4	TD
6R36PM	42.4	1.38	0.48	L	42.1	2.15 *	0.57	4	LD
6TJ6Y4	39.7	-0.24	1.34		39.4	-0.15	1.12	4	LD
6WJFU4	38.2	-1.16	2.53		36.5	-2.60 *	1.46	4	EN
78VWAN	40.7	0.37	2.34		40.2	0.59	0.32	4	LD
7H8LNJ	40.4	0.16	0.47	L	40.6	0.92	0.62	4	LD
7YZZEY	41.5	0.81	2.07		38.9	-0.54	2.55	4	LD
7ZBRLU	41.1	0.60	1.39		40.2	0.55	0.66	4	TG
8MHWDT	38.3	-1.08	0.67	L	39.1	-0.43	0.82	4	TD
96YM7J	39.3	-0.50	1.84		38.5	-0.89	1.30	4	LC
9LNL3Q	36.8	-1.98 *	1.46		35.5	-3.46 X	1.19	4	TD
C7GJ98	38.9	-0.71	2.09		38.5	-0.93	0.57	3	EM
CD2U4M	40.5	0.23	1.37		39.5	-0.04	0.94	4	TD
CD3KDQ	38.1	-1.21	2.93	H	39.8	0.22	1.62	4	LY
E6XCXA	43.2	1.85	1.69		40.3	0.66	3.37 H	4	TB
E7NTVP	40.4	0.17	1.12		33.3	-5.34 X	9.54 H	4	WK
G2U9DQ	37.2	-1.73	1.71		37.8	-1.51	0.84	4	LD
GJQZQC	39.0	-0.69	1.58		38.2	-1.16	1.07	2	XX
GYL8YL	41.9	1.05	1.28		41.1	1.32	0.86	4	LD
HJ8GJJ	39.7	-0.23	0.85		39.3	-0.18	0.82	3	TK
KDDYHD	42.1	1.20	2.29		41.4	1.57	2.42	3	LD
KR7X2Z	43.4	1.98 *	2.18		41.3	1.45	1.86	4	EM
LRNYR9	40.8	0.43	2.65		40.8	1.05	0.23 L	3	LD
LXA2ND	37.8	-1.36	1.25		39.4	-0.12	1.28	4	TJ
N2PBTV	41.1	0.58	2.34		41.4	1.59	1.11	4	LC
NPCBW2	38.3	-1.06	1.30		38.3	-1.07	0.45	4	EM
P2GQFC	41.6	0.86	1.86		40.4	0.73	0.88	4	TD
QQKXT7	39.0	-0.67	1.42		39.3	-0.19	0.31	4	EM
QVUAUD	39.8	-0.16	2.24		39.0	-0.46	0.90	4	EM
R44ZN4	40.3	0.14	1.16		39.6	0.04	2.65	4	TG
T2V3YT	38.3	-1.08	2.25		38.9	-0.55	2.92	4	LC
TMTPD3	41.3	0.73	1.79		39.5	-0.03	1.29	4	IM
UEW6V8	39.9	-0.11	1.67		38.5	-0.93	1.41	4	LD
WYP32N	46.1	3.58 X	1.00		45.5	5.04 X	0.84	2	TL
XWH8T6	39.9	-0.16	1.16		39.4	-0.16	0.82	4	EM
YRMJ6B	40.0	-0.07	1.89		40.3	0.63	1.82	4	LD
ZK3ZXG	39.0	-0.66	1.62		38.8	-0.66	0.85	3	LC

	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
ZKJ2YX	41.5	0.83	2.55	41.0	1.24	0.44	4	LC
ZVGX3K	39.5	-0.38	1.96	39.5	-0.07	0.00	1	IM

Consensus (All Labs) Results

Month Mean	40.11	Grand Mean	39.55
Avg SD	1.77	Avg SD Months	1.52
SD btwn Labs	1.67	SD btwn Labs	1.18
Labs Incld	40	Labs Incld	38

Key to Instrument Codes Reported by Participants

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
TK	TLS Compression Tester, Model 5184	TL	Tech-Lab Systems Compression
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
2263DZ	110.1	109.8 L	109.1	109.4	109.6	-0.27	6.8	0.4 L	109.5	-0.35	6.8	1.6	16	LA
2VDR43	110.9	107.2	109.9	106.9	108.7	-0.50	6.5	2.0	108.0	-0.81	6.7	2.9	16	LA
3D84YG	102.1	104.9	98.3 X	105.1	102.6	-2.13 *	7.8	3.2	105.1	-1.65	7.3	4.8	16	AH
4MTKA3	99.5 *	106.0	106.0	103.1 H	103.7	-1.85	11.9	3.1	105.3	-1.59	10.1	3.9	14	LJ
6TJ6Y4	114.5	113.5	114.5	115.4	114.5	1.02	8.2	0.8	113.3	0.78	8.5	3.7	16	AH
6WUC8V	102.7	104.9	105.6	101.2 *	103.6	-1.86	9.9	2.0	103.0	-2.29 *	8.8	2.6	16	LA
78VWAN	114.4	113.5	113.5	113.7	113.8	0.83	6.2	0.4 L	114.4	1.12	7.0	0.5 L	16	LA
7K2YZC	131.1XH	114.0	114.1	108.6	116.9	1.67	12.1	9.8 H	112.1	0.43	9.1	5.8	16	LA
822B3L	102.0	106.8	104.8	107.2	105.2	-1.44	9.5	2.4	106.6	-1.21	8.8	2.8	16	AH
8CK3AV	104.0	103.5	110.9	112.0	107.6	-0.81	7.6	4.5	109.4	-0.38	13.0	4.1	16	TB
8ENRKR	108.5	112.7	106.3	116.6	111.0	0.10	10.3	4.5	111.3	0.18	9.9	4.2	16	LC
8MHWDT	115.1 H	112.3 H	113.6	110.3	112.8	0.58	13.7	2.0	113.7	0.89	11.1	3.1	16	XX
8NFXNQ	118.8	117.9	116.6	112.4 H	116.4	1.54	14.1	2.8	115.7	1.51	11.5	2.9	16	LC
AMD89L	110.2	110.3 L	108.0	109.5 L	109.5	-0.31	3.9	1.1	109.9	-0.23	4.0	0.8 L	12	LA
B8ZY8H	110.8	110.9	110.9	110.7	110.8	0.05	6.4	0.1 L	110.7	0.01	5.6	0.2 L	16	LJ
CA2GRW	112.0	109.9	113.7	115.4	112.8	0.56	6.7	2.4	112.8	0.63	9.0	3.4	16	AH
CD3KDQ	117.4	116.9	115.8	117.8	117.0	1.68	5.9	0.9	116.9	1.86	6.7	1.7	16	AH
CUN7Y3	111.6	112.5	109.6	108.8	110.6	0.00	7.9	1.7	110.9	0.06	7.7	1.8	16	LA
CYXDAF	111.0	108.6	109.5	111.0	110.0	-0.16	6.4	1.2	109.7	-0.28	6.9	1.5	16	TP
DGDXUP	114.2	118.2 *	115.1	111.5	114.7	1.09	9.4	2.8	117.9	2.14 *	10.1	4.3	16	TB
DL4JDC	110.9	111.1	110.3	109.5	110.5	-0.05	5.9	0.7	109.5	-0.36	6.7	1.1	16	AH
G2U9DQ	107.1	109.2	104.9	107.3	107.1	-0.93	8.4	1.7	107.3	-1.01	8.8	2.9	16	LC
GJQZQC	113.0	116.1	115.9	114.6 L	114.9	1.14	4.5	1.4	117.1	1.91	27.3	8.5 H	12	XX
GT23CD	108.3	108.3	108.1	109.0	108.4	-0.59	10.0	0.4 L	107.9	-0.83	9.8	2.5	16	LA
GYL8YL	106.3	108.9	111.1	104.9	107.8	-0.75	9.7	2.8	106.3	-1.31	9.4	3.5	16	LA
GZV86E	113.1	No Data	113.2	No Data	113.1	0.67	9.6	0.0	111.9	0.36	8.7	5.5	14	LA
H96ZP9	112.6	112.5	112.5	115.9	113.4	0.73	8.1	1.7	112.6	0.59	9.2	2.8	16	LC
HFPA4X	116.6	113.8	107.8	111.5	112.4	0.48	7.7	3.8	111.2	0.17	8.5	3.5	16	LC
J7E8HW	104.9	107.2	109.7	107.6	107.4	-0.87	8.3	2.0	107.1	-1.08	8.6	2.4	16	LC
K4HT87	112.6	107.9	107.5	99.0 *	106.8	-1.02	10.4	5.7	106.8	-1.17	9.3	4.1	16	LA
K7UR3U	110.8	105.9	109.5	111.6	109.5	-0.31	7.7	2.5	110.4	-0.09	8.5	3.4	16	LA
KDDYHD	106.4	110.8	118.6 *	114.1	112.5	0.49	8.0	5.2	112.6	0.57	8.6	3.4	12	LC
L9RTY9	118.7	114.7	113.9	118.9	116.5	1.57	9.1	2.6	113.7	0.91	9.5	2.6	12	LZ
LQE6UN	102.7	108.2	104.5	104.9	105.1	-1.47	10.1	2.3	106.3	-1.29	10.1	4.0	16	LC
LRNYR9	106.3	110.9	108.9	108.1	108.5	-0.55	11.3	1.9	107.3	-1.01	9.9	2.5	16	LZ

Containerboard Interlaboratory Testing Program

Analysis 205

Bursting Strength (Mullen), 42 lb Linerboard - 42F1

TAPPI Official Test Method T807

Report #602 (M)
November 2019

	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
MWET3F	109.9 L	107.6 L	110.2 L	108.3 L	109.0	-0.43	3.6	1.3	109.6	-0.32	3.7	1.3	16	LA
MZJJBF	108.5	106.6	108.4	111.2	108.7	-0.52	7.2	1.9	109.1	-0.48	9.1	2.7	16	LB
NWF4HH	114.3	117.3	113.4	115.9	115.2	1.21	10.0	1.7	114.0	1.01	9.2	2.8	16	TB
PULWCC	109.6	111.4	106.2	109.8	109.3	-0.36	10.2	2.2	109.6	-0.33	9.7	3.4	16	LC
QBQNRL	110.5	110.4	107.9	107.9	109.2	-0.38	8.6	1.5	108.9	-0.53	10.4	3.2	16	LC
T34JPC	No Data	115.1	111.0	113.0 L	113.0	0.64	4.1	2.1	112.9	0.66	4.5	2.8	15	XX
TQQ4ZR	111.2	108.8	111.5	110.3	110.5	-0.04	10.8	1.2	109.7	-0.30	10.3	3.2	16	LC
TQRA8D	104.7	104.6	99.0 X	107.7	104.0	-1.75	7.7	3.6	108.5	-0.64	8.3	3.9	16	LC
U4WPRN	108.8	102.7 *	107.8	106.2	106.4	-1.13	8.7	2.7	107.4	-0.98	9.1	2.9	16	LC
VM76N9	116.9	112.4	111.0	114.8	113.8	0.83	9.4	2.6	113.2	0.76	11.1	4.4	16	AX
WABBQ7	111.4	115.0	118.3 *	115.8	115.1	1.19	8.9	2.9	117.1	1.92	10.5	2.7	14	LZ
WR8UDR	114.6	114.8	113.0	114.6	114.3	0.96	6.8	0.8	114.4	1.11	5.8	1.1	16	RE
XT73C4	117.8	114.9	119.5 *	110.2	115.6	1.31	9.4	4.1	111.4	0.23	10.7	3.8	16	LA
YRMJ6B	108.2	107.4	108.3	103.9	107.0	-0.97	10.6	2.1	110.1	-0.17	10.1	3.6	16	LA
ZC8XW7	109.7	109.8	109.0	109.6	109.5	-0.30	6.0	0.4 L	109.4	-0.38	8.9	3.2	16	LC
ZK3ZXG	112.1	112.7	113.4	120.6 *	114.7	1.08	11.3	4.0	114.5	1.15	9.6	3.2	16	LA
ZKJ2YX	113.2	108.4	107.9	107.1	109.2	-0.39	9.7	2.8	109.0	-0.50	9.0	3.4	16	AH
ZYFFYR	118.2	109.8	113.6	111.7	113.3	0.72	11.1	3.6	112.7	0.61	9.6	2.2	16	LC

Consensus (All Labs) Results

Wk Mean	110.58	110.56	110.87	110.42	Month Mean	110.63	Grand Mean	110.68
Avg SDr	8.42	8.32	8.60	9.99	Avg SD	8.86	Avg SD	9.59
SD btwn Labs	4.66	3.82	3.69	4.45	SD btwn Labs	3.78	SD btwn Labs	3.35
Labs Incld	51	52	51	52	SD btwn Wks	2.85	SD btwn Wks	3.37
Labs Excld	1	0	2	0	Labs Incld	53	Labs Incld	53
Labs not Rcvd	1	1	0	1				

Key to Instrument Codes Reported by Participants

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

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
2263DZ	114.9	116.8 L	119.8	107.4	114.7	0.64	5.4	5.3	115.4	0.79	7.3	3.1	12	LA
2VDR43	108.3	104.9	102.7	113.4	107.3	-1.23	8.9	4.7	109.5	-0.72	8.6	4.3	12	LA
3D84YG	109.2	106.5	108.1	110.1	108.5	-0.93	9.0	1.5	108.0	-1.10	9.0	3.3	12	AH
4MTKA3	107.0	95.5 X	104.6	101.1 *	102.0	-2.56 *	11.3	5.0	104.7	-1.92	11.5	5.8	8	LJ
6TJ6Y4	110.7	116.1	116.5	114.1	114.4	0.54	10.8	2.7	115.0	0.68	10.0	5.0	12	AH
6WUC8V	109.8	103.5 *	105.8	102.6 *	105.4	-1.71	9.2	3.2	104.9	-1.86	9.9	3.3	8	XX
78VWAN	115.5 L	114.5	114.3	115.1	114.9	0.67	6.3	0.6 L	115.0	0.66	6.4	0.5 L	12	LA
7K2YZC	114.9	113.1	112.9	114.4	113.8	0.41	12.3	1.0	113.6	0.33	10.3	2.4	12	LA
822B3L	115.2	105.2	101.2 *	108.0	107.4	-1.21	12.8	5.9	108.6	-0.94	10.2	4.3	12	AH
8CK3AV	109.7	108.7	117.8	105.4 H	110.4	-0.45	14.0	5.3	111.5	-0.22	11.8	3.4	12	TB
8ENRKR	112.6	114.2	112.0	117.2	114.0	0.46	11.8	2.3	112.2	-0.03	12.8	2.7	8	LC
8MHWDT	115.3	114.3 H	114.3	116.0	115.0	0.70	16.4	0.8	112.2	-0.03	14.0	3.2	8	XX
8NFXNQ	114.9	118.5	108.8	111.2	113.4	0.29	10.9	4.3	114.7	0.60	11.7	4.2	12	LC
AMD89L	110.6	112.0 L	113.3	107.3	110.8	-0.36	5.9	2.6	111.5	-0.22	5.5	1.9	8	LA
B8ZY8H	113.3	113.5	113.3	113.3	113.4	0.30	7.5	0.1 L	113.5	0.30	7.2	0.3 L	12	LJ
CA2GRW	108.8	111.4	116.5	112.5	112.3	0.03	11.1	3.2	113.4	0.26	12.4	2.9	12	AH
CD3KDQ	115.0	115.1	115.3	115.4	115.2	0.76	8.1	0.2 L	115.9	0.89	7.7	1.9	12	AH
CUN7Y3	110.8	112.9	113.8	111.2	112.2	0.00	11.9	1.4	112.8	0.11	11.6	1.8	12	LA
CYXDAF	111.9	114.3	110.7	113.8	112.7	0.12	8.1	1.7	112.3	0.00	8.1	1.4	12	TP
DGDXUP	120.0	119.8 H	115.9	113.3	117.2	1.27	13.3	3.2	121.5	2.31	*12.2	4.9	12	TB
DL4JDC	113.1	112.3	112.3	113.3	112.8	0.14	6.5	0.5 L	112.7	0.09	6.8	0.7 L	12	AH
G2U9DQ	111.3	111.1	109.7	110.6	110.7	-0.38	10.3	0.7	109.3	-0.76	11.5	3.5	12	LC
GT23CD	110.2	110.3	114.1	114.2	112.2	0.01	12.5	2.2	110.4	-0.48	11.4	3.5	12	LA
GYL8YL	103.3	108.2	107.7	109.5	107.2	-1.26	9.6	2.7	107.3	-1.26	9.6	2.3	12	LA
GZV86E	115.9	No Data	116.0	No Data	115.9	0.94	9.3	0.1	116.9	1.15	9.9	4.0	10	LA
H96ZP9	110.7	112.1	115.7	109.5	112.0	-0.05	14.6	2.7	114.3	0.50	12.7	5.0	12	LC
HFPA4X	116.7	102.7 *	107.2	110.0	109.1	-0.77	13.2	5.8	109.4	-0.74	11.8	5.1	12	LC
J7E8HW	109.7	114.6	109.8	110.5	111.2	-0.26	8.3	2.3	111.3	-0.26	10.9	1.9	12	LA
K4HT87	110.7	107.1	111.3	110.8	110.0	-0.56	12.2	2.0	108.4	-1.00	11.7	3.5	12	XX
K7UR3U	109.7	110.8	103.0	114.1	109.4	-0.70	10.9	4.7	108.2	-1.04	10.0	4.9	12	LA
KDDYHD	112.5	119.4	124.6 *	117.8	118.6	1.61	11.6	5.0	117.0	1.18	9.8	4.6	12	LC
L9RTY9	116.3	117.2	114.3	112.1	115.0	0.71	8.7	2.3	114.3	0.51	10.0	3.1	12	LZ
LQE6UN	105.9	111.8	105.9	110.2	108.4	-0.95	11.6	3.0	107.8	-1.15	10.4	6.2	12	LC
LRNYR9	100.1 *	108.3	106.9	104.4	104.9	-1.84	11.7	3.6	107.8	-1.15	9.9	4.3	12	LZ
MWET3F	121.5*L	120.0 L	120.5 L	120.3 L	120.6	2.12 *	3.4	0.6	120.4	2.03	* 3.1	1.5	12	LA

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
MZJJBF	110.7	112.8	112.8	112.4	112.2	0.00	7.8	1.0	110.9	-0.36	9.2	3.2	12	LB
NWF4HH	113.9	115.8	111.2	114.8	113.9	0.44	10.6	2.0	115.3	0.75	11.4	3.0	12	TB
PULWCC	109.3	111.0	113.5	109.1	110.7	-0.37	9.7	2.1	111.8	-0.13	12.1	2.9	12	LC
QBQNRL	115.5	110.6	114.6	109.1	112.5	0.07	9.7	3.1	110.4	-0.49	12.2	4.3	12	LC
T34JPC	123.8 *	116.0 L	122.8	No Data	120.9	2.19 *	5.1	4.2	120.6	2.09 *	6.3	3.0	10	XX
TQQ4ZR	103.6	111.1	108.5	119.6	110.7	-0.38	11.7	6.7	112.5	0.04	11.3	4.8	12	LC
TQRA8D	110.3	98.5 XH	104.2	108.9	105.5	-1.69	13.7	5.4	107.4	-1.24	13.8	5.8	12	LC
U4WPRN	103.5 H	108.1	113.5	110.3	108.9	-0.84	12.5	4.2	109.4	-0.73	11.9	3.0	12	LC
VM76N9	112.2	112.9	118.1	115.7	114.7	0.64	11.2	2.7	116.2	0.99	11.8	4.1	12	AX
WABBQ7	120.8	115.8	116.6	123.3 *	119.1	1.75	13.3	3.5	121.9	2.42	*12.4	6.1	12	LZ
WR8UDR	112.4 L	113.6	112.8	113.0	113.0	0.19	5.8	0.5 L	113.4	0.27	7.0	1.5	12	RE
XT73C4	116.5	120.9 *H	117.3	117.9	118.2	1.51	13.1	1.9	113.7	0.34	11.9	4.2	12	LA
YRMJ6B	104.6	111.2	116.6	110.5	110.7	-0.37	9.0	4.9	110.8	-0.39	10.9	3.6	12	LA
ZC8XW7	112.0	114.9	113.1	113.0	113.3	0.27	8.2	1.2	108.2	-1.04	10.3	4.6	12	LC
ZK3ZXG	107.4	115.5	124.7 *	120.5	117.0	1.22	12.0	7.4 H	115.4	0.78	10.9	5.3	12	LA
ZKJ2YX	111.7	108.3	109.6	111.3	110.2	-0.50	8.6	1.6	107.7	-1.17	9.6	4.1	12	AH
ZYFFYR	110.5	108.6	110.4	109.6	109.8	-0.61	11.0	0.9	113.9	0.39	9.5	4.6	12	LC

Consensus (All Labs) Results

Wk Mean	111.82	112.41	112.64	112.19
Avg SDr	10.63	10.20	10.19	11.22
SD btwn Labs	4.67	4.26	5.30	4.40
Labs Incld	52	49	52	50
Labs Excld	0	2	0	0
Labs not Rcvd	0	1	0	2

Month Mean	112.19
Avg SD	10.59
SD btwn Labs	3.96
SD btwn Wks	3.36
Labs Incld	52

Grand Mean	112.33
Avg SD	10.43
SD btwn Labs	3.97
SD btwn Wks	3.79
Labs Incld	52

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

	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
2263DZ	88.7	89.0 L	90.0	86.0	88.4	-0.56	2.5	1.7	86.4	-0.94	2.6	2.0	16	LD
2VDR43	97.8	87.7 L	93.0	90.9	92.3	0.22	2.4	4.2 H	89.4	-0.26	2.6	2.7	16	LD
3D84YG	98.9	97.9	100.5	98.3	98.9	1.51	3.5	1.1	96.7	1.43	4.0	4.3	16	LZ
4MTKA3	88.9	85.7	87.6	88.2	87.6	-0.72	3.2	1.4	89.9	-0.15	3.5	2.8	14	LD
6TJ6Y4	87.0	89.5	88.6	88.3 L	88.4	-0.57	2.8	1.1	84.2	-1.46	2.6	6.0 H	16	LD
6WJFU4	81.7	84.9	85.1	86.3	84.5	-1.33	3.1	1.9	84.0	-1.49	2.8	1.3	16	EN
78VWAN	92.1	92.0	92.4	91.9	92.1	0.17	3.1	0.2 L	92.1	0.37	3.5	0.6 L	16	LD
7H8LNJ	92.9	93.6 L	92.8	93.3	93.2	0.38	2.0	0.4	93.1	0.59	1.7	0.5 L	16	LD
7ZBRLU	93.3	97.0	95.1	96.4 L	95.4	0.83	1.7	1.6	94.9	1.00	2.7	1.3	16	TH
8M2Q6U	92.8	92.7	88.5	90.3	91.1	-0.03	2.9	2.1	89.8	-0.16	2.9	2.8	16	LC
9ELCVX	95.6	94.0	95.6	94.2	94.8	0.71	3.2	0.9	83.7	-1.57	3.8	8.3 H	16	EM
9LNL3Q	98.5 L	102.8 *L	104.6 *L	97.8	100.9	1.91	1.5	3.3	96.8	1.45	2.2	6.2 H	16	TD
AMD89L	89.9 L	92.6 L	93.2 L	90.1 L	91.5	0.05	1.3	1.7	90.5	-0.01	1.6	1.3	12	LZ
AR6T9G	99.1	94.3	98.1 H	100.6	98.0	1.34	3.7	2.7	92.2	0.39	3.2	4.7	16	LZ
B8ZY8H	91.9	91.3	91.9	91.8	91.7	0.10	2.2	0.3 L	91.5	0.23	2.8	0.2 L	16	LD
BTFFDT	82.9 H	95.4	97.6	90.6 H	91.6	0.08	6.1	6.5 H	90.7	0.05	5.3	4.4	16	MB
CD3KDQ	86.4	89.7	89.8	89.3	88.8	-0.48	2.8	1.6	89.5	-0.23	2.6	1.4	16	LG
CPXVP6	87.1	87.8	85.8	84.3	86.3	-0.98	2.9	1.5	86.5	-0.93	3.5	2.5	16	EX
CYXDAF	88.9	90.4	91.2	91.6	90.5	-0.14	4.2	1.2	90.1	-0.09	3.5	1.0	16	TJ
DGDXUP	99.3	98.9	101.3	99.0	99.6	1.65	2.8	1.1	100.7	2.34 *	3.0	2.5	16	LX
EZ4KHQ	98.8	100.6	98.6	97.6	98.9	1.52	4.4	1.3	96.3	1.33	3.5	3.1	16	TU
FD9XKJ	97.6	96.8	96.2	94.7	96.3	1.00	3.1	1.2	94.3	0.88	3.1	1.4	16	EX
G2U9DQ	91.4	87.8	89.8	92.0	90.3	-0.19	3.1	1.9	89.9	-0.14	3.3	1.7	16	LD
GT23CD	104.7 *	102.4 *	102.5 *	103.3 *	103.2	2.37 *	3.5	1.1	100.7	2.35 *	3.5	2.5	16	LD
GYL8YL	88.9	89.4 L	88.6 L	88.9	89.0	-0.45	2.2	0.4	91.2	0.15	2.5	2.2	16	LD
GZV86E	94.8	No Data	93.3	No Data	94.0	0.55	3.5	1.1	96.4	1.37	3.7	4.8	14	LD
H96ZP9	95.1	90.3	95.1	94.1	93.7	0.48	3.2	2.3	90.8	0.07	3.2	2.8	16	LC
HFPA4X	94.0 L	94.5	93.5	93.8	94.0	0.54	2.7	0.4	92.9	0.55	2.6	1.4	16	LC
HJ8GJJ	86.7 L	85.7 L	86.2 L	86.6	86.3	-0.97	1.5	0.5	86.8	-0.87	1.8	2.2	16	MB
J7E8HW	89.3	92.3	90.6	89.2	90.3	-0.17	3.3	1.5	89.5	-0.22	2.9	1.4	16	LD
K4HT87	86.2	90.3	89.1	89.5	88.8	-0.48	3.4	1.8	87.9	-0.60	3.4	1.9	16	LD
K4ZEQ2	92.9	93.5	92.1	96.0	93.6	0.47	3.5	1.7	92.6	0.49	3.9	2.1	12	TH
K7UR3U	88.2	90.3	87.0 H	90.7 H	89.1	-0.43	6.4	1.8	87.5	-0.69	4.5	1.7	16	LZ
KDDYHD	95.0	94.0	91.6	91.3	93.0	0.34	2.6	1.8	92.5	0.47	2.6	2.1	12	LD
LQE6UN	88.4	92.6	92.0	90.3	90.8	-0.08	4.4	1.9	92.9	0.55	3.9	2.5	16	LD

Containerboard Interlaboratory Testing Program

Analysis 215

Ring Crush, 42 lb Linerboard - 42F1

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
LRNYR9	94.5	91.6	91.7	92.4	92.5	0.26	3.1	1.4	92.4	0.44	3.0	1.4	16	LD
MG3U34	84.7	83.6 L	83.6	83.9	83.9	-1.44	1.9	0.5	84.6	-1.36	1.8	1.4	16	RS
MWET3F	80.2 *L	80.2 *L	80.2 *L	80.1 *L	80.2	-2.19 *	0.6	0.1 L	83.4	-1.64	1.2	2.2	16	TU
MZJJBF	92.9	90.7	90.6	90.8	91.3	0.00	3.1	1.1	92.3	0.41	3.3	2.3	16	LC
N2PBTV	86.7	88.9	87.5	86.9	87.5	-0.74	2.9	1.0	87.9	-0.59	2.8	0.8 L	16	LC
NWF4HH	91.7	92.1	No Data	94.2	92.7	0.28	3.6	1.3	91.9	0.32	3.6	2.4	9	LD
PULWCC	90.0	90.3	87.7	83.1	87.8	-0.68	2.7	3.3	87.3	-0.73	3.0	2.5	16	LD
QBQNRL	94.6	89.5	91.1	93.0	92.1	0.16	2.5	2.2	90.8	0.08	2.7	1.9	16	LD
T34JPC	77.4 *	80.8 *	83.1	No Data	80.4	-2.13 *	3.4	2.9	83.9	-1.53	3.3	3.9	15	LD
TMTPD3	87.2	88.5	87.0	87.1	87.4	-0.75	2.6	0.7	86.5	-0.92	3.5	2.6	16	MB
TQQ4ZR	95.0	94.6	90.4 L	91.8	92.9	0.33	2.6	2.2	91.4	0.20	3.7	4.4	16	LD
VM76N9	79.6 *H	79.0 *	80.8 *	79.1 *	79.6	-2.29 *	4.8	0.8	79.6	-2.52 *	4.7	2.4	16	LC
WABBQ7	90.7	92.8	90.3	90.7	91.1	-0.03	3.2	1.1	90.2	-0.06	2.8	2.0	14	LC
WR8UDR	89.6	89.3	89.9	90.0	89.7	-0.31	2.8	0.3 L	90.3	-0.04	2.3	3.3	16	LZ
XKNNEZ	92.2	92.5	90.9	91.5	91.8	0.11	3.3	0.7	91.1	0.15	3.7	1.4	16	LD
XT73C4	95.6	96.9	99.4	94.8	96.7	1.07	2.4	2.0	96.8	1.44	3.0	1.7	16	LZ
XWH8T6	90.5	88.8	93.1	90.7	90.8	-0.09	2.9	1.8	90.9	0.08	2.8	1.2	16	EM
ZC8XW7	96.2 H	100.8 H	98.1 H	97.7 H	98.2	1.37	7.1	1.9	95.0	1.03	5.6	7.0 H	16	LC
ZK3ZXG	82.6 H	76.9 *H	81.0 *	79.2 *H	79.9	-2.23 *	13.3	2.4	82.8	-1.77	7.6	2.7	16	LC
ZKJ2YX	90.2	89.3	92.6	90.7	90.7	-0.11	3.0	1.4	90.9	0.10	2.6	1.2	16	LC
ZYFFYR	97.5	95.7	95.2	92.3	95.2	0.78	2.4	2.1	93.5	0.70	2.5	2.2	16	LD

Consensus (All Labs) Results

Wk Mean	91.17	91.28	91.50	91.05	Month Mean	91.23	Grand Mean	90.51
Avg SDr	3.55	4.51	3.16	3.45	Avg SD	3.70	Avg SD	3.34
SD btwn Labs	5.54	5.40	5.32	4.99	SD btwn Labs	5.07	SD btwn Labs	4.34
Labs Incld	56	55	55	54	SD btwn Wks	1.90	SD btwn Wks	2.99
Labs Excld	0	0	0	0	Labs Incld	56	Labs Incld	56
Labs not Rcvd	0	1	1	2				

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)

	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
2263DZ	139.9	140.0	140.3	134.5	138.7	-0.40	3.7	2.8	136.6	-0.69	4.7	2.9	12	LD
2VDR43	153.3	140.6	143.2 L	141.9	144.8	0.40	2.9	5.8 H	139.6	-0.10	3.2	5.2	12	LD
3D84YG	152.8	149.2	156.8 *	154.3	153.3	1.53	5.5	3.2	149.3	1.87	5.5	7.2	12	LZ
4MTKA3	135.9	136.5	141.2	135.3	137.2	-0.59	6.1	2.7	138.5	-0.32	5.3	3.5	8	LD
6TJ6Y4	137.9	137.5	138.2	140.0	138.4	-0.43	4.3	1.1	135.9	-0.84	4.4	4.0	12	LD
6WJFU4	122.3 *	128.4	133.1	134.8	129.6	-1.59	6.3	5.6	129.0	-2.23 *	5.1	3.6	12	EN
78VWAN	142.9	143.0	143.4	143.3	143.2	0.19	3.8	0.2 L	143.1	0.61	3.6	0.4 L	12	LD
7H8LNJ	144.2	145.1 L	142.7 L	143.0	143.8	0.27	2.4	1.1	143.1	0.62	2.5	2.6	12	LD
7ZBRLU	141.2	147.4	145.4	146.5	145.1	0.45	4.1	2.7	144.4	0.88	4.7	1.7	12	TH
8M2Q6U	153.0	142.0	136.5	133.0	141.1	-0.08	4.0	8.7 H	139.3	-0.16	4.7	5.8	12	LC
9ELCVX	145.7	149.5	149.0	144.6	147.2	0.73	4.8	2.4	133.4	-1.34	5.0	10.8	12	EM
9LNL3Q	160.1 *L	162.1 *L	157.3 *L	153.0 L	158.1	2.17 *	1.7	3.9	147.2	1.44	4.8	8.6	12	TD
AMD89L	139.7 L	142.3 L	145.8	140.1	142.0	0.04	2.1	2.8	142.5	0.49	3.0	2.3	8	LZ
AR6T9G	151.3	143.3	152.2	152.4	149.8	1.07	4.9	4.4	145.1	1.02	4.3	5.3	12	LZ
B8ZY8H	141.9	141.9	141.8	141.6	141.8	0.01	5.2	0.2 L	141.1	0.22	4.0	0.6 L	12	LD
BTFFDT	136.6 H	146.2	152.2	143.7 H	144.7	0.39	7.4	6.5 H	144.4	0.88	8.0	6.1	12	MB
CD3KDQ	136.7	141.9 L	140.9	139.0	139.6	-0.27	3.6	2.3	139.2	-0.17	3.5	2.1	12	LY
CPXVP6	144.1	142.2	141.2	142.2	142.4	0.09	6.1	1.2	142.2	0.43	6.3	1.6	12	EX
CYXDAF	137.7	141.2	140.2	139.5	139.7	-0.27	6.4	1.5	139.5	-0.11	5.5	1.6	12	TJ
DGDXUP	157.4	163.3 *	156.6 *	156.3 *	158.4	2.20 *	4.9	3.3	160.1	4.04 X	5.2	3.0	12	LY
EZ4KHQ	100.8 X	99.0 XL	99.7 X	100.3 X	100.0	-5.50 X	3.3	0.8	131.8	-1.67	4.3	23.9 H	12	TU
FD9XKJ	151.7	153.0	152.6	153.5	152.7	1.45	3.2	0.8	149.9	1.99 *	4.6	3.2	8	EX
G2U9DQ	141.8	134.0	138.9	138.1	138.2	-0.46	4.2	3.2	137.2	-0.57	4.0	3.1	12	LD
GT23CD	160.7 *	157.0	154.9	155.3	157.0	2.01 *	5.8	2.6	157.5	3.52 X	5.5	2.3	12	LD
GYL8YL	130.4	131.7	130.1	133.8	131.5	-1.34	4.5	1.7	137.2	-0.58	4.8	4.6	12	LD
GZV86E	144.2	No Data	145.0	No Data	144.6	0.38	3.8	0.6	145.9	1.17	8.2	12.8 H	10	LC
H96ZP9	146.1	142.0	137.8	145.5	142.9	0.15	4.2	3.8	139.1	-0.20	5.1	3.8	12	LC
HFPA4X	141.3	141.6	138.2	142.0	140.8	-0.12	4.1	1.7	142.0	0.40	3.8	2.0	12	LC
HJ8GJJ	136.2 L	135.5 L	135.2 L	136.7 L	135.9	-0.76	1.7	0.7	135.7	-0.87	2.1	2.8	12	MB
J7E8HW	139.4	138.2	135.6	137.3	137.6	-0.54	4.7	1.6	138.2	-0.38	4.4	1.5 L	12	LD
K4HT87	136.4	136.2 H	134.5	138.8	136.5	-0.69	6.6	1.7	138.8	-0.26	5.2	3.8	12	LD
K4ZEQ2	150.0	149.7	147.8	145.7	148.3	0.87	6.2	2.0	143.5	0.70	6.3	4.4	12	TH
K7UR3U	133.8	136.1	135.3 H	136.2 H	135.3	-0.84	10.0	1.1	138.0	-0.42	7.4	3.9	12	LZ
KDDYHD	145.4	146.8	139.8	145.3	144.3	0.35	4.5	3.1	140.6	0.11	4.4	4.6	12	LD
LQE6UN	147.4	149.4	148.5	146.2	147.9	0.81	5.7	1.4	148.7	1.75	6.9	4.5	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
LRNYR9	139.7	142.1	143.7	144.2	142.4	0.10	4.0	2.0	142.3	0.45	6.1	3.4	12	LD
MG3U34	134.8	134.0	134.0 L	134.4 L	134.3	-0.98	2.2	0.4 L	134.9	-1.03	2.1	1.1 L	12	RS
MWET3F	123.5 *L	123.5 *L	123.5 *L	123.2 *L	123.4	-2.41 *	1.3	0.2 L	122.9	-3.45 X	2.2	9.1	12	TU
MZJJBF	147.1	148.1	143.1	144.2	145.6	0.52	3.9	2.3	145.8	1.17	4.6	3.1	12	LC
N2PBTV	139.0	140.9	139.3	141.0	140.0	-0.22	4.8	1.0	139.3	-0.15	4.1	1.4 L	12	LC
NWF4HH	149.8	152.1	No Data	148.1	150.0	1.09	5.4	2.0	148.7	1.75	5.2	3.0	4	LD
PULWCC	140.3	140.3	138.7	132.0	137.8	-0.51	4.9	4.0	137.1	-0.60	4.4	2.8	12	LD
QBQNRL	141.2	138.9	143.4	146.7	142.6	0.11	5.3	3.3	153.1	2.64 *	18.8	38.1 H	12	LD
T34JPC	123.0 *L	126.1	127.4	No Data	125.5	-2.14 *	4.0	2.3	130.2	-1.99 *	4.8	7.1	10	LD
TMTPD3	132.2	131.7	133.6	133.0	132.6	-1.20	3.5	0.8	134.0	-1.22	5.3	1.6	12	MB
TQQ4ZR	145.6	142.0	144.1	144.6	144.1	0.31	5.3	1.5	140.6	0.12	4.5	3.2	12	LD
VM76N9	131.0	127.6	128.7	127.1 *	128.6	-1.73	6.1	1.7	132.2	-1.59	6.3	7.9	12	LC
WABBQ7	135.7	139.7	136.0	136.3	136.9	-0.63	4.1	1.8	138.0	-0.42	5.3	3.0	12	LC
WR8UDR	137.1	137.3	138.9	138.3	137.9	-0.50	3.7	0.8	134.4	-1.14	3.9	5.7	12	LZ
XKNNEZ	139.7 H	141.3	140.1	144.9	141.5	-0.03	6.9	2.3	139.2	-0.17	6.2	5.2	12	LD
XT73C4	147.5	146.9	143.4 H	141.8	144.9	0.42	9.4	2.7	144.8	0.96	6.3	2.8	12	LZ
XWH8T6	136.1	131.7	136.5	139.3	135.9	-0.76	4.5	3.1	136.3	-0.76	4.5	2.3	12	EM
ZC8XW7	155.4 H	155.6	155.7	155.7 *	155.6	1.83	8.0	0.1 L	156.9	3.40 X	9.3	1.8	12	LC
ZK3ZXG	131.1	137.8 H	132.9	130.1	133.0	-1.15	10.5	3.4	137.5	-0.51	7.9	6.1	12	LC
ZKJ2YX	145.0	139.5	138.1	138.5	140.3	-0.19	3.7	3.2	141.4	0.27	4.1	2.6	12	LC
ZYFFYR	148.2	149.4	146.6	148.6	148.2	0.86	4.6	1.2	146.0	1.20	4.8	2.1	12	LD

Consensus (All Labs) Results

Wk Mean	141.86	141.87	141.48	141.60	Month Mean	141.70	Grand Mean	140.05
Avg SDr	4.84	5.51	5.35	5.02	Avg SD	5.17	Avg SD	5.08
SD btwn Labs	8.59	8.23	7.64	7.27	SD btwn Labs	7.59	SD btwn Labs	4.96
Labs Incld	55	54	54	53	SD btwn Wks	2.86	SD btwn Wks	5.66
Labs Excld	1	1	1	1	Labs Incld	55	Labs Incld	51
Labs not Rcvd	0	1	1	2				

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
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

Report #602 (M)
November 2019

	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
2263DZ	24.9	23.4	23.0	23.7	23.7	0.24	1.5	0.8	23.7	0.22	1.9	0.5	16	LA
2VDR43	24.8	22.6	24.6	24.5	24.1	0.59	1.5	1.0	22.5	-1.00	1.3	1.1	16	LH
3CEFUM	22.4	22.5	22.2	21.9	22.3	-1.17	1.6	0.3	22.4	-1.10	1.7	0.7	16	XX
4MTKA3	23.2	21.9	22.8	22.3	22.6	-0.88	1.5	0.6	22.7	-0.74	1.7	0.5	14	LY
6TJ6Y4	24.9	24.6	24.7	24.5	24.7	1.15	1.9	0.2	24.6	1.13	1.9	0.5	16	LU
6WJFU4	21.6	21.2 *	22.6	22.3	21.9	-1.51	1.6	0.6	22.1	-1.36	1.6	0.5	16	LY
6WUC8V	25.1	24.9 H	25.4	25.2 H	25.1	1.56	2.5	0.2	24.7	1.21	2.1	1.1	16	LH
78VWAN	23.2	23.5	23.1	23.2	23.2	-0.24	1.5	0.2	23.1	-0.41	1.6	0.2 L	16	LA
7H8LNJ	23.1	23.3	23.3	23.4	23.3	-0.19	1.6	0.1 L	23.5	0.07	1.8	0.3	16	LY
7K2YZC	24.3	23.6	23.8	23.4	23.8	0.27	1.6	0.4	24.2	0.67	1.7	1.0	16	LU
8CK3AV	22.6	22.3	22.0	22.2	22.3	-1.16	1.6	0.2	22.4	-1.09	1.7	0.3	16	LZ
8ENRKR	23.2	23.2	23.2	23.8	23.3	-0.14	1.6	0.3	23.2	-0.32	1.6	1.0	16	LA
8M2Q6U	23.1	22.3	21.8	22.0	22.3	-1.13	1.3	0.6	22.9	-0.55	1.3	1.1	16	LA
8NFXNQ	23.8 H	23.3	23.4	23.3	23.4	-0.04	2.0	0.3	23.7	0.21	1.8	0.4	16	LA
9LNL3Q	24.9	24.9	24.5	24.9	24.8	1.28	1.6	0.2	27.4	3.93 X	1.7	3.2 H	16	XX
AR6T9G	23.2	23.0	23.2	22.2	22.9	-0.56	1.8	0.5	22.8	-0.69	1.7	0.7	16	LA
BTFFDT	25.2	22.3	23.4	24.0	23.7	0.23	2.0	1.2	24.1	0.57	1.9	1.5	16	LA
CA2GRW	25.8	24.4	24.2 H	23.6	24.5	0.96	2.2	1.0	24.3	0.82	1.9	0.7	16	LU
CD3KDQ	22.5	23.6	23.0	22.3	22.9	-0.59	1.8	0.6	23.1	-0.39	1.6	0.5	16	LU
CPXVP6	25.3 L	24.3 L	22.3 L	23.2 L	23.8	0.27	0.0	1.3	24.0	0.55	0.0	0.8	16	TT
CUN7Y3	23.1	22.6	22.7	23.0	22.8	-0.61	1.8	0.2	23.2	-0.32	1.9	0.4	16	LY
CYXDAF	22.8	23.5	23.4	23.6	23.3	-0.15	1.1	0.4	23.3	-0.15	1.2	0.3	16	TT
D27VY3	21.0 *L	22.9	23.2	22.5	22.4	-1.04	1.7	1.0	22.3	-1.16	1.6	0.7	16	LW
DL4JDC	23.2	23.1	23.9	24.2 L	23.6	0.10	1.1	0.5	23.4	-0.03	1.1	0.4	16	TT
DVENFU	24.4	23.7	24.2	24.7	24.2	0.71	1.6	0.4	24.0	0.49	1.6	0.7	12	LY
EZ4KHQ	22.9 L	22.4 L	24.6 L	22.1 L	23.0	-0.46	0.4	1.1	24.0	0.48	1.1	1.1	16	LA
F7MU79	25.7	25.1	25.1	23.1	24.8	1.21	1.4	1.1	25.3	1.77	1.6	0.8	16	LH
FD9XKJ	21.4 *	21.1 *	20.4 *	21.3	21.1	-2.30 *	1.8	0.4	21.1	-2.33 *	1.6	0.6	16	LH
G2U9DQ	23.4	23.0	23.0	23.0	23.1	-0.37	1.5	0.2	22.9	-0.56	1.6	0.4	16	LA
GJQZQC	24.2	24.5	23.6	25.4	24.4	0.90	1.6	0.8	24.9	1.46	1.9	1.8	12	XX
GYL8YL	22.9	23.5	23.0	22.9	23.1	-0.40	1.8	0.3	23.1	-0.34	1.9	1.0	16	LZ
H96ZP9	23.7	19.2 X	19.8 X	20.7 *	20.8	-2.53 *	1.5	2.0 H	22.0	-1.49	1.6	1.7	16	LZ
HFPA4X	22.0	22.0	22.4	24.5	22.7	-0.72	1.5	1.2	22.3	-1.14	1.5	0.8	16	LA
J7E8HW	22.9 L	22.4	23.9	23.0	23.1	-0.40	1.4	0.6	22.7	-0.82	1.5	0.5	16	LA
K7UR3U	23.1	22.6	21.7	21.8 H	22.3	-1.14	1.8	0.7	22.1	-1.33	1.6	0.7	16	LA

Containerboard Interlaboratory Testing Program

Analysis 223

STFI, 42 lb Linerboard - 42F1

TAPPI Official Test Method T826

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
KDDYHD	24.0	23.7	24.1	23.8	23.9	0.40	1.6	0.2	23.3	-0.15	1.5	0.7	12	LA
L9RTY9	24.4	23.6	26.3 *L	23.8	24.5	0.98	1.3	1.2	24.7	1.19	1.8	0.9	12	LZ
LQE6UN	22.6	23.2	24.2	21.6	22.9	-0.56	1.5	1.1	24.6	1.08	2.1	1.4	16	LA
LRNYR9	23.0 L	23.8 L	23.5 L	23.3 L	23.4	-0.07	0.5	0.3	23.7	0.18	1.5	0.6	16	LY
MZJJBF	24.2	24.3	24.2	24.4	24.3	0.75	1.6	0.1 L	24.3	0.84	1.7	0.7	16	LW
NWF4HH	24.5	24.4	24.5	24.6	24.5	0.96	2.0	0.1 L	24.3	0.83	1.8	0.5	16	LW
QBQNRL	23.0	23.9	22.6	23.3	23.2	-0.30	1.7	0.6	22.2	-1.27	1.7	5.3 H	16	LA
QYUM86	24.9	24.8	24.3	26.5 *H	25.1	1.57	2.5	1.0	25.0	1.55	1.9	0.7	16	XX
TQQ4ZR	23.9 H	24.1	23.4	24.3	23.9	0.42	2.1	0.4	23.4	-0.07	1.9	0.6	16	LA
U4WPRN	25.1	24.8	24.5	23.7	24.5	0.97	1.8	0.6	24.4	0.90	1.9	0.7	12	LA
VM76N9	23.8	23.1	21.6	23.5	23.0	-0.48	2.0	1.0	22.3	-1.22	2.0	1.9	16	LZ
WABBQ7	24.7	24.8	24.5	23.9	24.4	0.92	1.6	0.4	24.6	1.15	1.7	0.4	14	LW
XKNNEZ	23.0	22.9	22.0	23.3	22.8	-0.67	1.6	0.5	22.9	-0.54	1.6	0.5	16	LH
XT73C4	22.8	21.4 *	21.8	22.3	22.1	-1.36	1.7	0.6	22.5	-0.94	1.8	0.6	16	LW
YRGHP4	24.6	25.1	24.6	24.6	24.7	1.16	1.6	0.3	24.8	1.27	1.6	0.7	16	LH
ZC8XW7	25.6 H	26.2 *	26.3 *	25.9 *	26.0	2.40 *	2.3	0.3	25.5	2.05 *	2.0	1.1	16	LA
ZK3ZXG	24.9	24.8	24.3	26.5 *H	25.1	1.57	2.5	1.0	25.0	1.55	1.9	0.7	16	LU
ZKJ2YX	23.4 L	23.9	23.3	23.6	23.5	0.05	1.6	0.2	23.3	-0.19	1.6	0.4	16	LU
ZYFFYR	22.8	23.3	22.9	22.9	23.0	-0.49	1.7	0.2	22.9	-0.53	1.6	0.5	16	LA

Consensus (All Labs) Results

Wk Mean	23.68	23.45	23.47	23.47	Month Mean	23.48	Grand Mean	23.48
Avg SDr	1.61	1.70	1.69	1.83	Avg SD	1.71	Avg SD	1.70
SD btwn Labs	1.13	1.08	1.16	1.23	SD btwn Labs	1.05	SD btwn Labs	1.00
Labs Incld	54	53	53	54	SD btwn Wks	0.71	SD btwn Wks	1.10
Labs Excld	0	1	1	0	Labs Incld	54	Labs Incld	53
Labs not Rcvd	0	0	0	0				

Analysis Notes

AR6T9G - Data appears to be switched between Analysis 223 and Analysis 224 for Week 1. Data switched by CTS.

Key to Instrument Codes Reported by Participants

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
2263DZ	34.0	33.6	34.5	33.6	33.9	-0.63	2.7	0.4	34.4	-0.34	2.7	0.7	12	LA
2VDR43	37.8 L	34.0 L	35.3	35.2 L	35.6	0.61	1.7	1.6	33.7	-0.79	1.9	1.8	12	LH
3CEFUM	31.2 *	31.2 *	31.7 *	31.2 *	31.3	-2.59 *	2.6	0.3	32.4	-1.64	2.3	2.1	12	XX
4MTKA3	33.5	35.8	32.5	34.3 H	34.0	-0.56	3.3	1.4	34.3	-0.42	3.2	1.2	8	XX
6TJ6Y4	35.7	36.5	36.7	36.6	36.4	1.20	2.9	0.5	35.7	0.47	3.2	1.0	12	LU
6WJFU4	32.2	32.6	32.8	32.0	32.4	-1.78	2.6	0.4	32.5	-1.57	2.6	0.4	12	LY
6WUC8V	38.9 *	37.0	36.5	37.8	37.5	2.10 *	3.3	1.1	36.6	1.08	3.2	1.8	8	LH
78VWAN	34.9	35.0	35.0	35.2	35.0	0.20	2.7	0.1 L	35.0	0.02	2.8	0.1 L	12	LA
7H8LNJ	34.2	34.5	34.3	35.0	34.5	-0.19	2.6	0.3	34.6	-0.24	2.7	0.4 L	12	LY
7K2YZC	36.7	37.4	34.8	34.9	36.0	0.90	2.9	1.3	36.8	1.17	3.1	1.4	12	LU
8CK3AV	34.5	32.6	33.1	33.3	33.4	-1.04	2.5	0.8	33.7	-0.84	2.6	0.8	12	LZ
8ENRKR	35.1	33.9	35.0	35.8	35.0	0.16	2.9	0.8	33.7	-0.81	2.9	1.8	8	LA
8M2Q6U	37.1	34.5	31.9	32.3 L	34.0	-0.61	2.2	2.4 H	34.2	-0.47	2.2	1.6	12	LA
8NFXNQ	34.8	36.0	35.9	35.2	35.5	0.55	2.5	0.6	35.8	0.58	3.0	0.9	12	LA
9LNL3Q	34.2	37.7	33.3	36.7	35.5	0.54	2.6	2.1	40.6	3.65 X	2.6	4.0 H	12	XX
AR6T9G	35.0	32.8	33.7 L	32.5	33.5	-0.94	2.5	1.1	34.4	-0.39	2.5	1.7	12	LA
BTFFDT	38.4 *H	35.1	33.6	36.3	35.8	0.82	3.2	2.1	35.6	0.42	3.0	1.3	12	LA
CA2GRW	35.2	35.1	35.8	34.7	35.2	0.32	3.2	0.5	36.5	1.03	3.2	1.4	12	LU
CD3KDQ	35.1	33.2	33.5	33.2	33.7	-0.77	2.5	0.9	33.9	-0.69	2.2	0.8	12	LU
CPXVP6	35.0 L	40.0 XL	37.2 L	34.1 L	36.6	1.38	0.0	2.6 H	36.8	1.22	0.0	1.6	12	LZ
CUN7Y3	34.6	34.7	33.9	34.5	34.4	-0.24	3.3	0.4	34.6	-0.20	3.0	0.8	12	LU
CYXDAF	34.3 L	34.7 L	34.3 L	34.5 L	34.5	-0.22	1.3	0.2	34.6	-0.25	1.3	0.3 L	12	TT
D27VY3	32.7	33.0	33.5	33.6	33.2	-1.18	3.2	0.4	32.5	-1.61	3.2	1.0	12	LW
DL4JDC	34.2 L	34.2 L	34.4 L	34.7 L	34.4	-0.29	1.2	0.3	34.4	-0.33	1.3	0.3 L	12	TT
DVENFU	34.2	35.8	36.4	35.8	35.6	0.61	3.0	0.9	34.8	-0.08	2.9	1.1	11	LY
EZ4KHQ	34.3	35.5 L	35.3 L	36.2 L	35.3	0.43	1.4	0.8	36.3	0.87	2.6	1.2	12	LA
F7MU79	36.9	38.3 *	35.8	34.2	36.3	1.16	2.7	1.7	38.5	2.27 *	2.9	2.1	12	LH
FD9XKJ	30.7 *	29.4 XL	30.8 *	30.5 *	30.3	-3.33 X	2.4	0.7	30.3	-3.03 X	2.2	0.7	8	LU
G2U9DQ	34.0	34.5	34.1	33.6	34.1	-0.52	2.9	0.4	34.2	-0.48	2.6	0.7	12	LA
GJQZQC	36.9	36.0	35.6	35.9	36.1	1.01	3.1	0.5	36.8	1.22	3.3	1.6	12	XX
GYL8YL	33.6	33.0	33.8	33.7	33.5	-0.93	2.5	0.4	34.7	-0.17	2.9	2.3	12	LZ
H96ZP9	36.0	30.4 *	29.5 X	27.4 X	30.8	-2.98 X	2.3	3.7 H	32.1	-1.82	2.6	2.7 H	12	LZ
HFPA4X	32.0	32.7	29.5 X	35.1	32.3	-1.83	2.9	2.3 H	32.9	-1.30	3.1	1.9	12	LA
J7E8HW	32.8	33.5	32.3	33.9	33.1	-1.25	2.5	0.7	33.6	-0.87	2.7	0.9	12	LW
K7UR3U	34.4	34.5	33.8	33.7	34.1	-0.51	2.2	0.4	33.9	-0.69	2.2	1.1	12	LA

Containerboard Interlaboratory Testing Program

Analysis 224

STFI, 56 lb Linerboard - 56A2

TAPPI Official Test Method T826

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
KDDYHD	33.7	35.1	33.8	34.4	34.3	-0.38	2.6	0.7	33.5	-0.94	2.9	0.9	12	LA
L9RTY9	37.6	35.5	36.3	35.2	36.2	1.05	2.6	1.1	37.4	1.58	3.0	1.5	12	LZ
LQE6UN	36.5	34.4	35.0	35.9	35.5	0.54	3.1	1.0	35.4	0.28	2.9	1.2	12	LA
LRNYR9	33.9 L	34.4 L	35.0 L	33.3 L	34.1	-0.47	1.2	0.7	35.0	0.01	2.3	1.0	12	LZ
MZJJBF	35.8 L	35.6 L	35.4	36.0 L	35.7	0.73	1.7	0.3	35.3	0.20	2.5	0.5	12	ID
NWF4HH	37.2	36.4	34.0	34.7	35.6	0.60	2.6	1.5	36.0	0.68	2.8	1.2	12	LW
QBQNRL	34.2	37.6	34.9 H	36.4	35.7	0.75	3.0	1.5	35.4	0.30	2.7	1.4	12	LA
QYUM86	35.1	34.5 H	36.5	37.6	35.9	0.87	4.4	1.4	38.2	2.09 *	3.5	2.1	12	LU
TQQ4ZR	34.4	34.7	35.4	34.9	34.9	0.07	2.8	0.5	34.4	-0.33	2.7	0.9	12	LA
U4WPRN	36.8	36.8	35.9	38.0 *	36.9	1.61	2.6	0.9	36.7	1.12	2.9	1.3	12	LA
VM76N9	34.6	32.7	33.2	35.2	33.9	-0.61	3.0	1.2	33.6	-0.90	2.9	1.1	12	XX
WABBQ7	36.1	36.1 H	35.7	37.1	36.2	1.12	3.6	0.6	36.4	0.91	3.1	0.6	12	LW
XKNNEZ	32.6	34.7	33.0	31.6	33.0	-1.34	2.4	1.3	33.1	-1.18	2.5	1.2	12	LH
XT73C4	31.9	31.4 *	33.2	32.6	32.3	-1.89	2.9	0.8	33.3	-1.05	2.7	1.1	12	LW
YRGHP4	37.1	36.0	35.4	37.1	36.4	1.24	2.4	0.9	36.7	1.13	2.4	1.1	12	LH
ZC8XW7	34.8 H	35.1	34.9	35.1 H	35.0	0.16	3.9	0.1 L	35.7	0.48	3.2	0.8	12	LA
ZK3ZXG	35.1	34.5 H	36.5	37.6	35.9	0.87	4.4	1.4	38.2	2.09 *	3.5	2.1	12	LU
ZKJ2YX	34.8	33.7	34.2	34.6	34.3	-0.33	2.7	0.5	34.3	-0.42	2.6	0.8	12	LU
ZYFFYR	33.3 L	34.4	35.0	33.7	34.1	-0.51	2.5	0.8	34.3	-0.39	2.6	0.8	12	LU

Consensus (All Labs) Results

Wk Mean	34.82	34.67	34.51	34.73	Month Mean	34.76	Grand Mean	34.95
Avg SDr	2.84	2.94	2.62	2.70	Avg SD	2.78	Avg SD	2.77
SD btwn Labs	1.77	1.66	1.40	1.70	SD btwn Labs	1.32	SD btwn Labs	1.55
Labs Incld	54	52	52	53	SD btwn Wks	1.10	SD btwn Wks	1.32
Labs Excld	0	2	2	1	Labs Incld	52	Labs Incld	52
Labs not Rcvd	0	0	0	0				

Analysis Notes

AR6T9G - Data appears to be switched between Analysis 223 and Analysis 224 for Week 1. Data switched by CTS.

Key to Instrument Codes Reported by Participants

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
6TJ6Y4	149.3	0.22	20.46		150.9	-0.21	5.29	4	EV
6WJFU4	155.1	0.53	19.57		150.5	-0.23	3.19 L	4	EV
6WUC8V	106.7	-2.11 *	11.04		111.4	-1.60	14.15	4	EV
78VWAN	152.0	0.37	10.99		152.4	-0.16	0.47 L	4	XX
7K2YZC	186.4	2.25 *	48.35	H	227.8	2.49 *	33.87	4	EV
7QT4TF	128.4	-0.92	18.98		138.5	-0.65	8.12	4	LS
8CK3AV	152.2	0.38	12.40		142.7	-0.50	7.69	4	LA
8ENRKR	155.5	0.56	11.66		162.5	0.19	14.77	4	LA
8NFXNQ	130.5	-0.81	8.76		130.2	-0.94	8.62	4	LA
BTFFDT	145.6	0.02	20.68		141.8	-0.54	6.55	4	LA
EZ4KHQ	162.0	0.91	24.39		195.0	1.34	36.10	4	LA
G2U9DQ	126.9	-1.01	14.16		126.5	-1.07	1.99 L	4	LS
GT23CD	152.4	0.39	40.96	H	166.5	0.33	12.27	4	EV
H96ZP9	134.2	-0.61	12.02		158.1	0.04	57.05 H	4	LA
HFPA4X	186.4	2.25 *	17.39		165.6	0.30	13.82	4	LA
J7E8HW	141.3	-0.22	14.88		144.1	-0.45	6.95	4	LA
K7UR3U	153.8	0.46	10.54		142.6	-0.51	13.42	4	EV
L9RTY9	132.1	-0.72	10.87		197.5	1.42	76.47 H	3	XX
LQE6UN	130.3	-0.82	16.73		126.9	-1.06	7.28	4	LA
LRNYR9	144.1	-0.07	17.31		153.1	-0.14	6.06	4	EV
TQQ4ZR	131.6	-0.75	18.83		177.7	0.73	55.87 H	4	LA
U4WPRN	237.5	5.05 X	15.05		198.9	1.47	48.87	4	LA
UFQ7GP	121.8	-1.29	16.47		128.0	-1.02	13.67	4	EV
WABBQ7	143.0	-0.13	13.67		146.9	-0.36	3.23 L	4	XX
XT73C4	139.7	-0.31	6.64	L	138.6	-0.65	5.96	4	EV
ZC8XW7	146.5	0.07	17.54		157.6	0.02	9.90	4	EV
ZK3ZXG	170.0	1.35	6.86	L	208.0	1.79	28.33	4	EV

Consensus (All Labs) Results

Month Mean	145.30	Grand Mean	157.00
Avg SD	19.31	Avg SD Months	25.04
SD btwn Labs	18.27	SD btwn Labs	28.48
Labs Incld	26	Labs Incld	26

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

	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
2263DZ	346.4	-1.20	7.88	353.0	-0.68	4.45	4	LA
3D84YG	347.5	-1.07	6.64	346.3	-1.69	3.04	4	XX
4MTKA3	363.3	0.84	6.94	365.2	1.16	8.39	4	PP
6WUC8V	355.3	-0.12	6.11	307.0	-7.61 X	99.02 H	4	LA
7QT4TF	351.1	-0.63	8.70	353.6	-0.59	2.29	4	LA
8ENRKR	353.8	-0.30	7.32	354.9	-0.40	2.35	4	LA
G2U9DQ	348.6	-0.93	5.27	349.9	-1.14	1.58	4	LA
GJQZQC	360.8	0.54	7.76	363.0	0.82	4.19	3	XX
GYL8YL	370.0	1.65	10.01	363.0	0.82	5.06	4	XX
KDDYHD	362.9	0.79	5.09	366.9	1.41	3.52	3	XX
QBQNRL	366.8	1.27	9.08	360.5	0.44	4.27	4	LA
TQRA8D	345.1	-1.36	5.62	352.4	-0.77	7.86	4	LA
ZKJ2YX	360.6	0.52	6.00	361.7	0.63	1.97	4	XX

Consensus (All Labs) Results

Month Mean	356.32	Grand Mean	357.53
Avg SD	7.26	Avg SD Months	4.58
SD btwn Labs	8.28	SD btwn Labs	6.64
Labs Incld	13	Labs Incld	12

Key to Instrument Codes Reported by Participants

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

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2263DZ	93.1	-0.51	3.99		93.1	-0.51	0.00	1	SC
4MTKA3	106.6	0.75	3.21		106.6	0.75	0.00	1	HY
6TJ6Y4	83.6	-1.39	2.70		83.6	-1.39	0.00	1	TM
7K2YZC	52.8	-4.26 X	2.17		52.8	-4.26 X	0.00	1	TM
7QT4TF	96.0	-0.24	1.73		96.0	-0.24	0.00	1	XX
8M2Q6U	89.2	-0.87	7.19		89.2	-0.87	0.00	1	TM
G2U9DQ	104.3	0.54	3.70		104.3	0.54	0.00	1	TM
GJQZQC	90.0	-0.79	3.39		90.0	-0.79	0.00	1	XX
GT23CD	100.6	0.19	3.58		100.6	0.19	0.00	1	HY
H9PRPK	103.3	0.44	6.24		103.3	0.44	0.00	1	SC
HFPA4X	122.0	2.18 *	10.37	H	122.0	2.18 *	0.00	1	SC
J7E8HW	118.6	1.87	6.35		118.6	1.87	0.00	1	HY
K7UR3U	89.0	-0.89	2.65		89.0	-0.89	0.00	1	TM
KDDYHD	89.2	-0.87	4.66		89.2	-0.87	0.00	1	TM
LRNYR9	91.8	-0.63	4.24		91.8	-0.63	0.00	1	XX
MQDG7H	110.0	1.07	5.79		110.0	1.07	0.00	1	TM
PULWCC	95.6	-0.27	5.99		95.6	-0.27	0.00	1	SC
QBQNRL	41.1	-5.34 X	0.38	L	41.1	-5.34 X	0.00	1	LZ
TQQ4ZR	96.8	-0.16	3.96		96.8	-0.16	0.00	1	TM
ZC8XW7	103.0	0.42	4.47		103.0	0.42	0.00	1	SC
ZK3ZXG	80.8	-1.65	3.49		80.8	-1.65	0.00	1	TM
ZKJ2YX	108.9	0.97	4.05		108.9	0.97	0.00	1	HY
ZYFFYR	96.8	-0.16	3.56		96.8	-0.16	0.00	1	HZ

Consensus (All Labs) Results

Month Mean	98.54	Grand Mean	98.54
Avg SD	4.91	Avg SD Months	0.00
SD btwn Labs	10.75	SD btwn Labs	10.75
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	97.91	10.41	0.63	16
Modified Scott Bond Mechanics	113.76	6.84	15.22	2

Analysis Notes

QBQNRL - 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
4MTKA3	25.2	-0.76	2.28		25.8	-0.39	0.59	4
6EHDDY	26.6	-0.32	1.82		27.7	0.36	3.52	3
6TJ6Y4	27.6	-0.01	2.46		29.3	1.03	1.79	4
6WJFU4	28.9	0.39	1.65		25.9	-0.35	2.05	4
6WUC8V	31.0	1.04	2.45		28.6	0.73	2.00	4
78VWAN	25.4	-0.70	0.89		25.4	-0.57	0.43	4
7K2YZC	25.4	-0.70	2.51		25.2	-0.67	0.60	4
8CK3AV	25.0	-0.82	0.71		24.7	-0.87	1.39	4
8ENRKR	32.4	1.47	1.52		29.0	0.91	2.92	4
8NFXNQ	30.8	0.96	5.11		29.9	1.27	1.41	4
G2U9DQ	25.8	-0.57	4.27		26.0	-0.31	0.40	4
GJQZQC	28.8	0.36	1.30		28.4	0.66	0.40	3
GYL8YL	32.6	1.53	1.52		30.1	1.37	2.93	4
GZV86E	29.2	0.48	1.64		28.3	0.62	0.93	4
H9PRPK	25.2	-0.76	1.79		25.8	-0.40	4.37	4
HFPA4X	35.2	2.34 *	2.91		35.2	3.47 X	1.16	4
J7E8HW	26.4	-0.39	1.14		28.4	0.66	2.11	4
K4HT87	29.0	0.42	6.20 H		27.3	0.19	1.42	4
K7UR3U	28.4	0.23	0.89		31.2	1.81	1.90	4
L9RTY9	24.0	-1.13	2.74		24.5	-0.95	0.50	3
LRNYR9	22.1	-1.72	2.30		21.1	-2.33 *	2.26	4
NWF4HH	32.0	1.35	6.24 H		28.5	0.68	3.47	4
QBQNRL	29.0	0.42	0.71		26.3	-0.20	4.96 H	4
QYUM86	25.8	-0.57	3.11		25.3	-0.63	1.69	4
TQQ4ZR	29.4	0.54	4.16		28.0	0.48	2.05	4
WABBQ7	27.0	-0.20	2.92		27.5	0.27	0.72	4
XKNNEZ	30.9	1.01	1.64		30.0	1.31	0.99	4
XT73C4	27.0	-0.20	4.18		23.5	-1.35	2.60	4
ZC8XW7	20.6	-2.18 *	1.34		21.7	-2.11 *	1.71	4
ZK3ZXG	25.0	-0.82	3.39		25.2	-0.67	2.27	4
ZKJ2YX	25.4	-0.71	4.15		25.4	-0.58	2.00	4

Consensus (All Labs) Results

Month Mean	27.65	Grand Mean	26.78
Avg SD	2.98	Avg SD Months	2.20
SD btwn Labs	3.23	SD btwn Labs	2.44
Labs Incld	31	Labs Incld	30

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
2263DZ	21.1	-0.27	1.56		21.1	-0.27	0.00	1	LA
4MTKA3	24.7	1.36	5.26	H	24.7	1.36	0.00	1	TP
6WUC8V	20.5	-0.54	1.49		20.5	-0.54	0.00	1	LP
78VWAN	20.4	-0.56	1.13		20.4	-0.56	0.00	1	LA
7H8LNJ	22.5	0.38	0.53	L	22.5	0.38	0.00	1	LP
7K2YZC	21.8	0.05	1.61		21.8	0.05	0.00	1	LA
7QT4TF	22.9	0.58	1.68		22.9	0.58	0.00	1	LP
8CK3AV	21.1	-0.28	1.39		21.1	-0.28	0.00	1	LP
8ENRKR	18.2	-1.60	1.88		18.2	-1.60	0.00	1	LA
AMD89L	18.5	-1.44	0.85	L	18.5	-1.44	0.00	1	XX
B9CTUA	22.9	0.55	1.06		22.9	0.55	0.00	1	LP
EZ4KHQ	25.7	1.84	1.81		25.7	1.84	0.00	1	LA
G2U9DQ	21.0	-0.31	1.46		21.0	-0.31	0.00	1	LA
GYL8YL	24.8	1.43	3.90	H	24.8	1.43	0.00	1	GA
HFPA4X	21.5	-0.07	1.69		21.5	-0.07	0.00	1	LA
J7E8HW	22.3	0.29	1.49		22.3	0.29	0.00	1	LP
K4HT87	21.5	-0.07	1.78		21.5	-0.07	0.00	1	LP
K7UR3U	21.3	-0.17	1.64		21.3	-0.17	0.00	1	LP
KDDYHD	20.9	-0.33	2.15		20.9	-0.33	0.00	1	LA
LQE6UN	21.8	0.07	1.89		21.8	0.07	0.00	1	LA
LRNYR9	22.0	0.15	1.52		22.0	0.15	0.00	1	LP
NUP3CU	26.3	2.12 *	3.96	H	26.3	2.12 *	0.00	1	GA
NWF4HH	21.8	0.06	2.30		21.8	0.06	0.00	1	LP
Q8QCWL	21.4	-0.11	2.00		21.4	-0.11	0.00	1	LP
QBQNRL	24.4	1.22	1.51		24.4	1.22	0.00	1	LA
QYUM86	18.9	-1.28	1.59		18.9	-1.28	0.00	1	LA
T34JPC	21.8	0.06	2.10		21.8	0.06	0.00	1	GG
TQQ4ZR	24.1	1.10	1.05		24.1	1.10	0.00	1	LA
XT73C4	17.7	-1.82	2.06		17.7	-1.82	0.00	1	XX
ZC8XW7	19.4	-1.03	1.17		19.4	-1.03	0.00	1	LA
ZK3ZXG	22.6	0.43	1.90		22.6	0.43	0.00	1	LA
ZKJ2YX	22.5	0.36	3.47	H	22.5	0.36	0.00	1	TP
ZZFDFE	16.9	-2.15 *	2.42		16.9	-2.15 *	0.00	1	LA

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

Consensus (All Labs) Results

Month Mean	21.67	Grand Mean	21.67
Avg SD	2.14	Avg SD Months	0.00
SD btwn Labs	2.20	SD btwn Labs	2.20
Labs Incld	33	Labs Incld	33

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
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
3CEFUM	57.3	57.8	55.0	56.6	56.7	-0.41	4.3	1.2	61.0	1.23	4.3	3.0	16	LD
3N9WJN	59.5	59.4	59.8 L	59.6	59.6	0.81	1.7	0.2 L	59.8	0.73	2.3	0.4 L	16	LD
4MTKA3	52.9	52.7	52.3	57.0	53.7	-1.64	3.2	2.2	55.4	-1.06	3.9	2.0	14	LD
6LHT38	57.9	59.0	58.4	58.1 L	58.4	0.29	1.5	0.5	58.2	0.07	1.5	0.3 L	16	LD
6TJ6Y4	54.0	53.6	54.6	54.1	54.1	-1.51	2.5	0.4	54.4	-1.47	3.1	2.6	16	LD
6WJFU4	58.7	58.9	59.8	59.2	59.1	0.63	3.7	0.5	58.4	0.18	3.3	1.2	16	EN
78VWAN	58.5	58.6	58.1	58.5	58.4	0.33	1.9	0.2 L	58.5	0.20	1.9	0.3 L	16	LD
7K2YZC	58.1	52.8	58.2	56.8 H	56.5	-0.50	4.5	2.5	55.5	-1.03	4.2	2.4	16	XX
7QT4TF	58.6	No Data	No Data	No Data	58.6	0.41	2.6	0.0	57.4	-0.25	2.5	1.5	4	XX
8CK3AV	55.3	55.8	62.0	61.4	58.6	0.41	3.1	3.6 H	57.5	-0.20	3.6	2.1	16	LZ
8ENRKR	57.5	56.6	54.5	50.9 *	54.9	-1.17	4.0	2.9	57.2	-0.34	4.1	2.9	16	LD
8M2Q6U	55.9	57.6	59.0	59.1	57.9	0.11	3.4	1.5	59.7	0.71	3.2	2.7	16	LC
9LNL3Q	60.6 L	61.2	61.5 L	59.6 L	60.7	1.29	1.4	0.8	63.0	2.07 *	2.4	4.0	16	TD
9PPHU7	60.2	60.3	60.4	60.7	60.4	1.17	2.5	0.2 L	59.9	0.78	2.4	0.6	16	EM
B8ZY8H	61.0	61.5	61.3	61.1	61.2	1.51	2.9	0.2 L	60.6	1.10	3.6	0.4 L	16	LD
B9CTUA	53.3	55.3	59.3	56.7	56.2	-0.63	3.3	2.5	56.6	-0.58	3.0	1.8	16	LD
BTFFDT	55.6	57.7 L	54.9	54.2	55.6	-0.86	3.1	1.5	55.3	-1.09	4.2	2.8	16	MB
CD3KDQ	56.3	57.5	55.5	56.7	56.5	-0.48	2.8	0.8	58.2	0.08	3.2	1.6	16	LZ
CPXVP6	57.4	57.1	57.5	55.8	56.9	-0.30	3.6	0.8	55.2	-1.16	3.5	2.5	16	EM
CUN7Y3	57.4	57.6	56.3	57.4	57.2	-0.20	3.8	0.6	58.6	0.26	4.4	1.6	16	LD
CYXDAF	61.3	59.3	58.2	60.5	59.8	0.92	3.4	1.4	59.4	0.60	3.8	1.1	16	TJ
DGDXUP	61.9	61.5	49.5 *	59.0	58.0	0.13	3.5	5.8 H	59.1	0.44	3.7	3.2	16	LD
DL4JDC	60.3	60.2	58.8	59.7	59.7	0.88	3.7	0.7	58.9	0.39	4.3	0.8	16	TG
DVENFU	54.0	56.7	56.3	52.6	54.9	-1.16	2.7	1.9	56.1	-0.76	3.7	2.4	12	LD
EL6J44	44.8 X	43.8 X	44.0 X	45.0 X	44.4	-5.59 X	4.8	0.6	45.6	-5.12 X	4.3	1.7	16	TC
EZ4KHQ	53.8	49.9 *	54.3	55.2 H	53.3	-1.83	5.2	2.3	53.7	-1.78	5.6	2.4	16	TU
F7MU79	55.7	51.1 *	52.6	51.8 *	52.8	-2.04 *	2.7	2.0	53.6	-1.80	3.0	1.4	16	LD
FD9XKJ	55.7	56.7	55.7	56.6	56.2	-0.62	2.7	0.6	55.6	-0.99	3.4	1.4	16	XX
G9WFTU	58.2	57.4	57.8	56.8	57.6	-0.04	3.1	0.6	57.6	-0.16	3.1	0.6	16	LC
GYL8YL	56.3	56.2	55.6	55.9	56.0	-0.70	3.9	0.3	57.0	-0.42	3.1	1.1	16	LZ
H96ZP9	52.6 H	55.4	56.0	54.3	54.6	-1.30	4.2	1.5	54.9	-1.27	3.9	2.0	16	LD
H9PRPK	56.9	56.8 H	57.8	54.3	56.4	-0.51	5.0	1.5	56.5	-0.59	4.2	1.5	16	LZ
HJ8GJJ	60.7 L	60.4 L	60.3 L	60.2 L	60.4	1.15	1.3	0.2 L	60.5	1.04	1.8	2.5	16	MB
J7E8HW	60.1	56.0	61.0	59.4	59.1	0.62	3.1	2.2	57.3	-0.28	3.4	1.9	16	LD
JZ9F8D	67.1 X	64.5 *H	66.9 *	66.5 X	66.3	3.63 X	4.2	1.2	63.2	2.14 *	4.2	3.8	16	LC

Containerboard Interlaboratory Testing Program

Analysis 240

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM11

TAPPI Official Test Method T809

	Weekly Means				Monthly Results				Cumulative Results					
WebCode	Week 1	Week 2	Week 3	Week 4	Mean	CPV	SD	SD Wks	Mean	CPV	SD	SD Wks	Wks	Inst
LRNYR9	58.9	56.4	59.9	56.7	58.0	0.14	3.3	1.7	58.5	0.21	3.6	1.3	16	LZ
MWET3F	56.9	61.2	61.5	57.8	59.4	0.72	2.7	2.3	61.3	1.35	2.3	1.8	16	TU
MZJJBF	61.7	59.6	59.5	60.4	60.3	1.11	3.2	1.0	60.3	0.94	3.0	1.4	16	LD
NWF4HH	61.5	61.6	62.6	61.0	61.7	1.69	3.6	0.7	60.7	1.13	3.4	1.4	16	LD
PM3D9C	64.3 *	66.9 X	64.9 *	63.9 *	65.0	3.10 X	3.3	1.3	64.4	2.64 *	4.4	2.4	16	EM
Q8QCWL	57.8	59.4	62.6	58.9	59.7	0.85	3.8	2.0	58.2	0.11	3.5	1.5	16	LD
QBQNRL	50.8 *	51.1 *	55.7	56.0	53.4	-1.80	3.0	2.8	54.3	-1.51	3.3	2.8	16	LD
QFGX2K	58.3	57.0	57.8	57.4	57.6	-0.01	3.1	0.6	57.6	-0.14	3.1	0.6	16	LD
QL23QE	62.6 H	60.1	61.9 H	60.6	61.3	1.54	5.4	1.2	59.7	0.72	6.9	2.8	16	LC
TQQ4ZR	57.6	58.3	58.0	59.1	58.3	0.26	4.8	0.6	59.1	0.44	4.9	3.7	16	LD
VM76N9	57.1	56.5	56.7	55.0	56.3	-0.56	3.2	0.9	56.1	-0.77	3.5	1.8	16	LC
WELGZW	56.6	55.0	55.4	54.0	55.2	-1.01	3.3	1.1	56.0	-0.83	3.1	1.4	16	TH
XKNNEZ	57.8	55.5	55.0	53.8	55.5	-0.90	3.0	1.7	56.5	-0.61	3.2	1.7	16	LD
YRGHP4	58.4	59.3	58.8	60.8	59.3	0.71	3.5	1.0	60.2	0.90	4.1	1.6	16	LD
ZK3ZXG	58.1	52.8	58.2	56.8 H	56.5	-0.50	4.5	2.5	55.5	-1.03	4.2	2.4	16	LC
ZKJ2YX	58.8	59.2	58.8 H	61.1	59.5	0.77	4.3	1.1	59.2	0.49	3.6	1.5	16	LC
ZYFFYR	57.3	55.1	58.7	61.0	58.0	0.16	2.8	2.5	56.9	-0.46	3.5	2.3	16	LD
ZZFDFE	No Data	No Data	62.6	No Data	62.6	2.09 *	5.0	0.0	57.0	-0.39	4.5	3.3	9	LD

Consensus (All Labs) Results

Wk Mean	57.76	57.37	58.19	57.63	Month Mean	57.65	Grand Mean	57.98
Avg SDr	3.47	3.39	3.55	3.48	Avg SD	3.47	Avg SD	3.66
SD btwn Labs	2.76	3.03	3.26	2.84	SD btwn Labs	2.37	SD btwn Labs	2.42
Labs Incld	50	49	51	49	SD btwn Wks	1.77	SD btwn Wks	2.10
Labs Excld	2	2	1	2	Labs Incld	50	Labs Incld	52
Labs not Rcvd	1	2	1	2				

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	EN	Emerson 2200 Series
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
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		

Containerboard Interlaboratory Testing Program

Analysis 250

Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium - CM11

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
2VDR43	67.6	66.0	65.3	68.4	66.8	-0.70	3.7	1.4	66.7	-0.78	4.5	2.5	16	LD
4MTKA3	68.2	68.5	68.5	68.2	68.3	0.08	4.3	0.2 L	69.0	0.29	3.7	0.9	14	LD
6LHT38	68.5	68.0	68.2 L	67.5	68.0	-0.07	1.8	0.4	68.4	0.00	1.6	0.4 L	16	LD
78VWAN	68.8	68.9	68.7 L	68.8	68.8	0.32	1.9	0.1 L	68.7	0.13	1.8	0.3 L	16	LD
8CK3AV	68.7	68.5	67.7	67.4	68.1	-0.06	3.7	0.6	68.1	-0.14	3.8	1.1	16	LZ
9LNL3Q	67.7 L	69.1 L	65.5 L	68.4 L	67.7	-0.26	0.8	1.5	68.9	0.21	3.0	2.3	16	TD
AMD89L	68.5	68.5 L	68.3 L	67.7	68.3	0.05	1.7	0.4	68.3	-0.06	1.5	0.4 L	12	LZ
B9CTUA	66.9	65.5	68.7	68.9	67.5	-0.35	2.5	1.6	67.2	-0.54	3.3	1.5	16	LD
CD3KDQ	65.9	66.3	68.1	70.2	67.6	-0.27	3.3	2.0	69.7	0.58	3.2	2.0	16	LZ
G9WFTU	68.8	68.0	67.7 H	68.3	68.2	0.01	5.1	0.5	68.2	-0.11	4.2	0.5	16	LD
HJ8GJJ	68.5	66.2	65.7 L	65.6	66.5	-0.86	1.7	1.3	65.9	-1.13	2.0	1.1	16	MB
J7E8HW	75.9 *	76.8 X	75.5 *	73.6	75.4	3.72 X	4.0	1.3	73.8	2.46 *	3.4	1.6	16	LD
K4ZEQ2	63.7 *	64.9 *	67.1	64.2 H	65.0	-1.65	4.1	1.5	64.2	-1.94 *	5.0	2.2	12	TH
MZJJBF	68.7	68.4	67.5	68.3	68.2	0.01	1.8	0.5	68.1	-0.13	2.0	0.8	16	LD
NWF4HH	70.1	68.5	68.8 H	71.9	69.8	0.83	5.1	1.5	70.3	0.89	4.0	1.2	16	LD
Q8QCWL	73.0	67.0	70.5	70.6	70.3	1.07	3.1	2.5	70.3	0.87	3.6	1.9	16	LD
QBQNRL	68.7	67.2	66.4	64.2	66.6	-0.80	3.9	1.9	67.5	-0.42	3.8	1.8	16	LD
TQQ4ZR	67.3	66.0	64.6	63.2	65.3	-1.49	4.4	1.7	64.4	-1.83	3.8	1.8	16	LD
ZK3ZXG	74.5 *	69.4 H	74.7 *	73.6	73.1	2.49 *	3.9	2.5	70.2	0.82	3.7	2.5	16	XX
ZKJ2YX	70.9	72.4 X	72.9	69.4	71.4	1.65	2.3	1.6	70.3	0.85	3.2	2.1	16	LC

Consensus (All Labs) Results

Wk Mean	69.04	67.48	68.52	68.43	Month Mean	68.18	Grand Mean	68.41
Avg SDr	3.33	3.30	3.66	3.25	Avg SD	3.35	Avg SD	3.40
SD btwn Labs	2.81	1.37	2.91	2.79	SD btwn Labs	1.95	SD btwn Labs	2.18
Labs Incld	20	18	20	20	SD btwn Wks	1.45	SD btwn Wks	1.60
Labs Excld	0	2	0	0	Labs Incld	19	Labs Incld	20
Labs not Rcvd	0	0	0	0				

Key to Instrument Codes Reported by Participants

LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LZ	L&W Crush Tester (model not specified)	MB	Messmer Buchel K440
TD	TMI Digital Crush Tester, Model 17-09	TH	TMI Compression Tester, Model 17-76
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
338DFU	46.2	46.5	44.6	45.0	45.6	0.82	2.8	0.9	44.5	0.69	3.7	2.3	12	LZ
3N9WJN	42.4 L	43.4	43.5	43.6	43.2	-0.07	2.3	0.6	41.8	-0.28	2.4	0.9	16	LD
4MTKA3	43.0	42.3	46.4	43.4	43.8	0.13	3.4	1.8	44.0	0.52	3.6	1.3	14	LD
78VWAN	43.6	43.2	43.6	43.4	43.5	0.02	3.1	0.2 L	42.3	-0.12	2.5	1.0	16	LD
7YZZEY	46.3	47.0	43.5	44.5	45.3	0.73	3.5	1.6	45.0	0.89	3.3	1.6	16	LD
7ZBRLU	42.7	43.5	42.8	44.2	43.3	-0.03	3.3	0.7	42.9	0.13	2.9	1.3	16	TH
9PPHU7	42.6	42.7 L	42.0	42.1	42.3	-0.40	1.7	0.4	41.9	-0.26	1.8	0.5	16	LC
AR6T9G	45.6	46.9	48.2	48.0 *	47.2	1.43	3.1	1.2	44.0	0.53	3.2	2.6	16	LZ
B8ZY8H	45.2	45.2	45.3	45.4	45.3	0.70	3.1	0.1 L	45.4	1.02	2.8	0.3 L	16	LD
B9CTUA	41.3	42.7	41.4	42.2	41.9	-0.56	3.1	0.7	41.6	-0.35	3.2	1.1	16	LD
CEBNZM	37.6	40.9	42.8	46.3	41.9	-0.56	4.1	3.6 H	40.2	-0.89	3.4	3.1	12	LZ
CPXVP6	40.5	39.1	41.0	41.7	40.6	-1.07	2.8	1.1	39.6	-1.09	2.9	2.0	16	EM
DGDXUP	47.6	46.1	55.7 X	41.8	47.8	1.66	4.4	5.8 H	47.0	1.62	4.0	3.1	16	LZ
EL6J44	37.5 H	38.2 *H	37.7 *H	36.9 XH	37.6	-2.20 *	6.4	0.5	36.6	-2.20 *	6.0	1.5	16	TC
GYL8YL	44.9	44.4	42.3	44.2	43.9	0.20	3.0	1.2	43.1	0.19	2.9	1.4	16	LD
H96ZP9	46.3	43.4	41.0	44.5	43.8	0.15	3.2	2.2	42.0	-0.21	3.4	1.9	16	LD
HJ8GJJ	43.8	44.3 L	44.2 L	44.0	44.1	0.26	1.7	0.2 L	41.0	-0.58	1.7	2.1	16	MB
JZ9F8D	29.1 X	30.1 X	29.4 X	28.4 X	29.3	-5.33 X	2.4	0.7	29.9	-4.65 X	2.8	2.9	16	LC
MWET3F	39.2 L	39.7 L	39.2 L	39.2 *L	39.3	-1.55	0.5	0.3 L	40.7	-0.69	1.6	1.2	16	TU
PM3D9C	45.8	45.7	46.6	43.4	45.4	0.75	3.2	1.4	43.0	0.14	3.9	2.5	16	LC
PXGHC2	41.7	41.7 H	42.8	41.5	41.9	-0.56	4.9	0.6	42.6	0.00	4.5	1.3	16	XX
Q8QCWL	41.7	44.2	44.4	45.0	43.8	0.15	2.7	1.5	43.6	0.36	2.7	0.9	16	LD
QBQNRL	44.1	44.5	44.8	47.0	45.1	0.65	3.4	1.3	44.9	0.83	3.4	1.5	16	LD
QL23QE	44.6	48.4	44.0 H	46.4	45.8	0.92	5.6	2.0	45.7	1.13	4.0	2.3	16	LC
V7F4VN	40.1	41.8	39.9	42.3	41.0	-0.90	4.6	1.2	38.7	-1.43	5.4	3.2	16	TX
WELGZW	35.0 *L	35.2 X	37.4 *	40.2	36.9	-2.43 *	2.7	2.4	35.7	-2.51 *	2.2	1.6	16	TH
ZKJ2YX	44.8	41.9	43.6	42.8 H	43.3	-0.05	4.3	1.2	43.8	0.45	3.5	1.3	16	LC
ZYFFYR	44.5	44.4	44.4	43.6	44.2	0.32	3.3	0.4	44.0	0.51	2.9	1.4	16	LD
ZZFDFE	46.5	47.0	48.4	47.4	47.3	1.48	3.6	0.8	46.9	1.60	3.5	1.8	12	LD

Consensus (All Labs) Results

Wk Mean	43.03	43.67	43.17	43.81	Month Mean	43.40	Grand Mean	42.58
Avg SDr	3.42	3.53	3.77	3.30	Avg SD	3.55	Avg SD	3.40
SD btwn Labs	3.09	2.53	2.73	2.13	SD btwn Labs	2.65	SD btwn Labs	2.72
Labs Incld	28	27	27	27	SD btwn Wks	1.73	SD btwn Wks	1.84
Labs Excld	1	2	2	2	Labs Incld	28	Labs Incld	28
Labs not Rcvd	0	0	0	0				

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 #602 (M)
November 2019

	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
338DFU	15.7 *H	14.6 *	13.6 H	14.4	14.6	1.56	1.2	0.9	14.2	1.76	1.2	1.0	12	LA
4MTKA3	13.8 H	13.7	13.2	13.3 H	13.5	-0.38	1.2	0.3	13.4	-0.46	1.1	0.3	14	LB
6LHT38	13.4 L	13.7 L	13.3 L	13.5 L	13.5	-0.46	0.4	0.2	13.5	-0.18	0.5	0.2	16	LA
6TJ6Y4	14.0	14.5	14.1	14.2	14.2	0.84	1.2	0.2	14.2	1.83	1.2	0.2	16	LU
78VWAN	13.5	13.3	13.5	13.5	13.4	-0.48	0.9	0.1	13.4	-0.64	0.8	0.1 L	16	LB
8ENRKR	13.1	13.9	13.2	13.4	13.4	-0.57	1.0	0.3	13.4	-0.64	1.0	0.6	16	LA
9LNL3Q	15.1	13.9 H	14.5	13.8	14.3	1.08	1.3	0.6	16.5	8.94 X	1.3	1.8 H	16	XX
9PPHU7	13.3	13.6	13.9	13.6	13.6	-0.21	1.0	0.2	13.5	-0.26	1.1	0.4	16	LB
AR6T9G	13.3	14.1	13.8 L	13.5	13.6	-0.12	0.8	0.4	13.3	-0.76	1.0	0.6	16	LA
BTFFDT	14.4	12.8 *	13.6	14.2	13.8	0.12	1.0	0.7	17.7	12.78 X	1.7	9.0 H	16	LA
CYXDAF	13.4	13.3	13.9 L	13.9 L	13.6	-0.19	0.6	0.3	13.5	-0.29	0.8	0.4	16	TT
EL6J44	15.6 *	15.8 XH	15.1 *	15.5 X	15.5	3.24 X	1.3	0.3	13.6	0.04	1.1	1.2 H	16	TS
EZ4KHQ	14.7 L	13.5 L	13.6 L	12.9 L	13.7	-0.07	0.2	0.8	13.6	0.18	0.2	0.8	16	LA
FD9XKJ	13.1 L	13.0 L	13.5 L	13.4 L	13.2	-0.85	0.1	0.2	13.0	-1.77	0.9	0.4	16	LH
G2U9DQ	14.5	13.7	13.7	14.2	14.0	0.56	1.1	0.4	13.7	0.34	1.0	0.4	16	LA
G9WFTU	13.2	14.2	13.6	13.4	13.6	-0.19	0.9	0.4	13.3	-0.83	0.8	0.4	16	LB
GYL8YL	13.5	13.5	13.3	13.4	13.4	-0.50	1.0	0.1 L	13.5	-0.28	1.0	0.4	16	LZ
H96ZP9	13.7	11.4 X	11.4 X	13.9	12.6	-2.07 *	1.0	1.4 H	12.9	-1.98 *	1.0	0.9	16	LZ
LRNYR9	13.8 L	13.6 L	13.8 L	14.0 L	13.8	0.17	0.1	0.2	13.8	0.80	1.0	0.3	15	LB
QBQNRL	13.7	13.9	14.5	13.8	14.0	0.49	1.1	0.4	13.9	1.06	1.1	0.4	16	LA
QFGX2K	13.7	14.1	14.0	13.0	13.7	0.00	0.9	0.5	13.5	-0.24	0.9	0.4	16	LB
TQQ4ZR	14.1	13.8	14.7	14.1	14.2	0.86	1.1	0.4	14.1	1.55	1.0	0.5	16	LA
V7F4VN	12.2 *	12.0 X	12.6 *	12.6 *	12.4	-2.45 *	0.9	0.3	12.3	-4.06 X	1.0	0.3	16	TT
XKNNEZ	14.3 H	13.4	14.1	13.9	13.9	0.39	1.2	0.4	13.8	0.74	1.1	0.5	16	LH
ZKJ2YX	13.4	14.2	13.7	13.6	13.7	0.02	1.0	0.3	13.6	0.04	1.0	0.4	16	LU
ZZFDFE	14.4	15.5 X	14.7	15.6 X	15.0	2.43 *	1.1	0.6	14.6	3.23 X	1.1	0.7	12	LA

Consensus (All Labs) Results

Wk Mean	13.87	13.73	13.82	13.65	Month Mean	13.71	Grand Mean	13.58
Avg SDr	0.97	0.99	0.90	0.97	Avg SD	0.95	Avg SD	0.98
SD btwn Labs	0.80	0.44	0.56	0.44	SD btwn Labs	0.55	SD btwn Labs	0.32
Labs Incld	26	22	25	24	SD btwn Wks	0.50	SD btwn Wks	0.56
Labs Excld	0	4	1	2	Labs Incld	25	Labs Incld	22
Labs not Rcvd	0	0	0	0				

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