Collaborative Testing Services, Inc.

Containerboard Interlaboratory Testing Program

Participant Summary Report #648 - September 2023

Introduction to the Containerboard Program

Explanation of Tables and Definitions of Terms

Analysis	Sample	Analysis Name
201	BX17	Top to Bottom Box Compression Strength, Corrugated Boxes
202	EC15	Edgewise Compressive Strength, by T811, Corrugated Board
203	EC15	Edgewise Compressive Strength by T839, Corrugated Board
205	42H2	Bursting Strength (Mullen), 42 lb Linerboard
206	56G3	Bursting Strength (Mullen), 56 lb Linerboard
215	42H2	Ring Crush, 42 lb Linerboard
216	56G3	Ring Crush, 56 lb Linerboard
223	42H2	STFI, 42 lb Linerboard
224	56G3	STFI, 56 lb Linerboard
228	42H2	Roughness - Stylus Method, 42 lb Linerboard
229	42H2	Roughness - Sheffield Method, 42 lb Linerboard
231	42H	Internal Bond, 42 lb Linerboard
234	42H	COF Inclined Plane (Slide Angle), 42 lb Linerboard
237	42H2	Air Resistance, 42 lb Linerboard
240	CM13	Flat Crush Strength (CMT), 26 lb Corrugating Medium
250	CM13	Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium
255	CM13	Ring Crush (RCT), 26 lb Corrugating Medium
261	CM13	STFI, 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; 35 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# Corrugating Medium	CM12	July 2021 - Current
	CM11	April 2019 - June 2021
35# Corrugating Medium	35E3	June 2022 - Current
	35E2	June 2020 - April 2022
42# Corrugating Medium	42H2	December 2022 - Current
	42H1	April 2022 - November 2022
56# Corrugating Medium	56G3	July 2022 - Current
	56G2	May 2021 - May 2022

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, agriculture, hemp, 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 100 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
2Y3AWE	745.8	-1.78		55.06	754.1	-1.66	7.58 L	4	ET
6K9EN4	798.0	-0.82		90.06	797.8	-0.76	20.51	4	EX
6VQVFB	875.2	0.60		33.18	894.7	1.23	93.38	4	LS
7ARU48	824.3	-0.33		32.21	817.4	-0.36	19.07	4	EX
8JQ8ER	765.4	-1.42		26.54	751.2	-1.72	39.27	4	LL
8N4RLD	796.8	-0.84		37.61	904.3	1.43	76.50	4	ES
92NQPL	843.6	0.02		52.38	837.9	0.06	30.62	4	LM
B44ZU3	951.1	2.00	*	38.75	802.2	-0.67	132.92 H	4	LG
B83CP3	804.6	-0.70		39.28	823.1	-0.24	39.86	4	LG
C2V8CA	883.1	0.75		85.60	889.3	1.12	18.74	4	LM
C3B46A	738.6	-1.91	*	64.93	884.0	1.01	98.80	4	ER
C7BFZ9	908.1	1.21		35.51	870.0	0.72	25.50	4	ER
CBKVAX	900.6	1.07		71.54	882.5	0.98	29.32	4	EX
EJMT9K	895.2	0.97		45.00	866.2	0.65	41.57	4	XX
FFGU9C	831.4	-0.20		96.04	858.5	0.49	28.87	4	EX
GJG3DL	885.4	0.79		66.96	861.7	0.55	32.50	4	LG
JEE3T8	829.4	-0.24		45.06	856.4	0.44	22.42	4	LN
K99LWR	820.3	-0.41		64.38	805.5	-0.61	47.20	4	TB
KDFCZX	887.7	0.83		51.69	834.9	0.00	53.40	4	LS
LNDF37	888.6	0.85		104.13	884.9	1.03	43.23	4	ER
N4GTAE	792.2	-0.92		22.02	794.5	-0.83	27.32	4	LG
NRQYY7	793.6	-0.90		59.40	813.0	-0.45	15.66	4	ER
PHJG4U	856.0	0.25		85.86	838.5	0.07	53.02	4	EX
PQR97W	861.8	0.36		89.00	880.7	0.94	15.51	4	LO
PV4W8T	803.0	-0.72		62.80	799.5	-0.73	33.67	4	LG
R8AREN	888.1	0.84		21.76	888.1	1.10	12.57	4	ER
U446EF	915.6	1.35		20.48	818.0	-0.35	85.88	4	EX
XFLWRF	803.7	-0.71		102.62	795.0	-0.82	64.53	4	LS
YHKUDR	627.8	-3.95	X	62.49	708.2	-2.61	* 113.82	2	ER

Consensus (All Labs) Results

Month Mean	842.40	Grand Mean	834.89
Avg SD	62.45	Avg SD Months	55.61
SD btwn Labs	54.32	SD btwn Labs	48.54
Labs Incld	28	Labs Incld	29

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Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Hot melt adhesive sealing	854.94	54.06	12.54	9
Clip sealing	833.59	54.98	8.81	18
Staple sealing	888.08	0.00	45.68	1

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	LN	Lansmont 152-50k
LO	Lansmont 152-30k	LS	Lansmont Squeezer
TB	TMI Monitor/Compression Tester, Model 17-70	XX	Instrument make/model not specified by lab

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	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3HT6JM	157.3	32.14 X	6.68	H	160.8	39.25 X	3.92	4	LD
49H7PB	50.0	1.57	2.27		47.9	1.37	2.36	4	XX
6K9EN4	41.5	-0.87	1.32		42.4	-0.48	1.36	3	LC
B44ZU3	51.1	1.87 *	1.43		48.5	1.57	3.64	2	EM
C7BFZ9	41.9	-0.74	3.54	H	41.5	-0.76	1.18	4	EN
EJMT9K	39.4	-1.46	2.48		42.2	-0.54	2.20	4	TS
FL74KV	46.5	0.58	1.58		46.5	0.91	0.00	1	LD
FQY9CE	46.2	0.48	1.52		46.7	0.96	1.32	4	XX
GJG3DL	45.1	0.16	2.35		43.3	-0.18	1.21	4	EX
KDFCZX	43.2	-0.36	1.82		40.6	-1.09	2.76	4	LD
PHJG4U	44.7	0.07	1.54		44.3	0.17	1.24	4	LC
QDLFEK	41.7	-0.79	1.72		39.2	-1.55	1.84	4	TS
XLD72D	42.7	-0.51	1.77		42.7	-0.38	0.00	1	XX

Consensus (All Labs) Results

Month Mean	44.49	Grand Mean	43.81
Avg SD	2.04	Avg SD Months	2.07
SD btwn Labs	3.51	SD btwn Labs	2.98
Labs Incld	12	Labs Incld	12

Key to Instrument Codes Reported by Participants

EM	Emerson 1200 Series	EN	Emerson 2200
EX	Emerson (model not specified)	LC	L&W Crush Tester 48
LD	L&W Crush Tester 248	TS	TMI Digital Crush Tester, Model 17-56
XX	Instrument make/model not specified by lab		

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	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
2C8T8E	45.1	-0.31	1.12		45.0	-0.38	0.61	4	BU
2Y3AWE	47.5	0.67	1.40		46.4	0.13	2.93	4	TD
6K9EN4	48.6	1.16	0.81		47.3	0.47	1.28	3	LC
6VQVFB	49.7	1.61	1.25		52.1	2.18 *	2.45	4	EM
7ARU48	47.6	0.73	0.84		45.4	-0.22	4.42	4	TL
8N4RLD	46.9	0.42	2.26		47.3	0.47	0.77	4	LD
8QVNB8	53.5	3.19 X	2.02		53.1	2.55 *	0.27 L	4	LC
92NQPL	46.2	0.15	2.58		45.6	-0.14	1.55	4	TG
B83CP3	43.3	-1.07	1.31		45.1	-0.31	1.35	4	EM
C2V8CA	44.9	-0.42	2.17		46.5	0.17	2.30	4	EM
C3B46A	46.0	0.06	1.15		46.8	0.29	1.44	4	LD
C7BFZ9	45.7	-0.05	1.64		45.5	-0.17	1.18	4	EN
D74NLX	42.2	-1.53	2.12		39.0	-2.53 *	3.62	3	XX
E72D6L	48.7	1.19	1.48		49.4	1.24	0.52	4	TH
E7K4E7	42.5	-1.41	2.15		43.1	-1.04	1.52	4	TD
EJMT9K	43.3	-1.05	1.99		45.3	-0.25	1.72	4	TS
EML46K	43.9	-0.82	1.89		43.7	-0.83	1.10	4	BU
FFGU9C	46.5	0.29	1.71		45.9	-0.05	1.30	4	LD
FQY9CE	46.5	0.26	1.33		46.5	0.18	1.36	4	XX
GJG3DL	47.4	0.65	1.11		45.2	-0.28	1.53	4	LY
K99LWR	47.6	0.72	0.76 L		47.1	0.39	0.81	4	LD
KDFCZX	44.9	-0.40	2.31		43.8	-0.79	2.04	4	LD
LNDF37	45.0	-0.35	1.96		46.2	0.06	3.25	4	LD
NRQYY7	45.7	-0.08	1.68		46.3	0.12	0.52	4	EM
PD4AFU	50.8	2.07 *	0.99		47.8	0.64	3.10	4	EM
PHJG4U	45.8	-0.03	1.49		47.7	0.62	1.48	4	LC
PQR97W	42.7	-1.32	2.45		43.0	-1.09	0.74	4	LD
PV4W8T	48.7	1.17	1.41		49.9	1.39	1.13	4	MK
QDLFEK	44.3	-0.66	2.56		43.9	-0.75	1.93	4	TS
QGGACL	51.3	2.26 *	1.28		49.0	1.06	1.55	4	TG
R8AREN	46.9	0.42	1.22		49.4	1.22	2.31	4	LD
U446EF	43.5	-0.99	2.73		44.8	-0.45	1.40	4	CT
V9DLN6	43.3	-1.08	1.73		45.6	-0.16	1.88	4	TU
VD8MNX	43.7	-0.91	1.23		43.3	-0.96	1.03	4	TK
VVPLVG	46.3	0.19	2.99 H		41.6	-1.60	9.80 H	4	XX
XFLWRF	42.1	-1.56	1.21		42.7	-1.17	0.86	4	EM

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Consensus (All Labs) Results

Month Mean	45.85	Grand Mean	46.00
Avg SD	1.76	Avg SD Months	2.47
SD btwn Labs	2.39	SD btwn Labs	2.78
Labs Incld	35	Labs Incld	36

Key to Instrument Codes Reported by Participants

BU	Buchel Digital Crush Tester	CT	Con-Ten
EM	Emerson 1200 Series	EN	Emerson 2200
LC	L&W Crush Tester 48	LD	L&W Crush Tester 248
LY	L&W 830	MK	Mark-10 ESM303
TD	TMI Digital Crush Tester, Model 17-09	TG	TMI Digital Crush Tester, 17-76
TH	TMI Monitor/Compression Tester, Model 17-76	TK	TLS Compression Tester, Model 5184
TL	Tech-Lab Systems Compression	TS	TMI Digital Crush Tester, Model 17-56
TU	TMI Universal Crush Tester (TMI K440)	XX	Instrument make/model not specified by lab

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Containerboard Interlaboratory Testing Program

Analysis 205

Bursting Strength (Mullen), 42 lb Linerboard - 42H2

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
3BFWHK	111.3	109.3	112.8	110.6	111.0	-1.07	9.2	1.5	113.9	-0.54	9.1	2.9	16	LA
3HT6JM	100.9 *	104.6 *	106.5	104.9 *	104.2	-2.55 *	10.5	2.4	106.0	-2.26 *	9.7	3.6	16	LA
3X6LTA	126.1	117.0	119.7	119.2	120.5	1.00	9.6	3.9	119.3	0.66	8.9	3.6	12	LC
3X6LTA_AL	125.1	117.0	125.7	123.3	122.8	1.49	9.0	4.0	123.4	1.55	10.8	2.5	12	AL
423JG8_AL	119.0	117.7	113.9	108.4	114.8	-0.25	10.2	4.8	116.6	0.07	10.1	4.4	16	AL
6K9EN4	113.0	116.5	117.6	116.5	115.9	-0.01	9.0	2.0	114.3	-0.45	9.0	3.1	16	AH
6PMW6L_AL	111.3	118.5	120.4	119.6	117.5	0.33	8.7	4.2	116.7	0.07	8.0	3.2	16	AL
78ZVPA	117.5	116.5	117.0	116.2	116.8	0.19	5.4	0.6 L	115.9	-0.09	5.9	0.8 L	16	LA
7KPRPM	113.2	115.7	118.4	117.2	116.1	0.04	6.4	2.2	116.0	-0.08	5.2	2.4	16	LA
7Y7M6H	108.7	111.0	112.3	114.3	111.6	-0.94	9.0	2.3	110.5	-1.27	9.0	2.6	16	LC
8FAJ2M	122.7	121.4	118.7	118.5	120.3	0.96	11.6	2.1	120.6	0.93	11.1	2.4	16	LJ
8N4RLD	111.4	111.6	114.4	112.4	112.5	-0.75	8.0	1.4	112.2	-0.90	9.0	3.2	16	LA
9BCHCD	117.2	114.4	115.9	115.1	115.6	-0.06	7.5	1.2	116.2	-0.02	9.4	3.4	12	LZ
A4AT9E	114.8	118.3	110.8	109.0	113.2	-0.59	8.4	4.1	112.5	-0.85	9.5	3.3	16	LC
A7YW6R	117.1	117.8	111.6	110.3	114.2	-0.38	9.9	3.8	114.7	-0.36	9.8	3.6	16	XX
ACKWJJ	116.0	115.0	117.0	116.4	116.1	0.04	5.6	0.8	115.9	-0.10	5.8	0.8 L	16	LJ
AJ2PAA	106.7	104.3 *	111.6	105.6 *	107.1	-1.93	9.5	3.2	109.0	-1.60	8.6	3.4	16	LA
AUJAU7	121.2	116.5	121.0	111.6	117.6	0.36	10.3	4.5	117.7	0.30	9.6	3.5	16	LC
BGAULF	114.2	113.7 L	113.4 L	113.0	113.6	-0.51	3.9	0.5 L	113.6	-0.60	3.9	0.5 L	4	LA
BGPD6D	121.8	118.3	119.2	119.1	119.6	0.80	7.1	1.5	118.6	0.49	9.0	3.3	16	TB
BVUCF6	121.4 L	121.0 L	121.3 L	121.2 L	121.2	1.15	2.8	0.2 L	122.4	1.33	2.8	1.2	16	AH
C3B46A	116.9	113.9	116.1	115.1	115.5	-0.09	9.3	1.3	115.8	-0.11	8.7	2.4	16	AH
CMV7Z9_AL	117.4	123.8	130.2 *	124.9 *	124.1	1.78	9.3	5.3	121.3	1.09	8.2	3.1	16	AL
E4T6Z8	114.4	118.0	122.0	107.5	115.5	-0.10	9.4	6.2	125.0	1.89	9.7	10.8 H	16	LB
FFGU9C	114.4	120.4	108.0	115.6	114.6	-0.29	7.2	5.1	115.4	-0.21	8.6	4.0	16	AH
FQY9CE	116.2	115.7	118.1	117.6	116.9	0.22	5.7	1.1	115.7	-0.14	7.2	1.9	16	LC
GJG3DL	117.9	129.0 *	126.0	120.8	123.4	1.63	9.1	5.0	123.8	1.63	9.6	3.2	16	AH
HFEJRY	132.0 *	133.5 XH	131.6 *	130.5 X	131.9	3.47 X	12.1	1.2	124.5	1.80	9.0	8.0 H	16	AX
K99LWR	106.9	113.4	109.8	107.4	109.4	-1.42	10.0	3.0	110.6	-1.25	8.9	3.6	16	XX
KDFCZX	118.7	113.6	106.7	116.0	113.8	-0.47	8.7	5.1	114.6	-0.38	8.9	4.4	16	LA
KQNVXT	115.3	115.6	116.0	116.2	115.8	-0.03	7.4	0.4 L	116.3	-0.01	6.5	1.1	16	AH
KUP433_AL	118.2	129.6 *	128.3	129.0 XH	126.2	2.24 *	13.0	5.4	125.1	1.93	11.7	5.1	16	AL
L899M6	116.2	109.3	109.3	No Data	111.6	-0.94	7.7	4.0	109.4	-1.53	8.7	3.6	12	LA
L899M6_AL	126.4	129.8 *	121.0	No Data	125.7	2.13 *	9.3	4.4	124.9	1.87	10.1	3.9	11	AL
LNDF37	110.3	115.7	112.7	112.3	112.7	-0.69	8.5	2.2	111.5	-1.06	9.3	3.6	16	LZ

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Containerboard Interlaboratory Testing Program

Analysis 205

Bursting Strength (Mullen), 42 lb Linerboard - 42H2

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
LU6MMZ	115.0	113.7	110.7	115.0	113.6	-0.50	6.9	2.0	112.4	-0.86	7.5	3.6	16	ME
NMW3BF	131.0 *	122.3	114.3	116.7	121.1	1.12	8.4	7.4 H	121.3	1.09	7.7	4.4	16	LA
PBBDQZ_AL	114.0	117.0	113.5	120.1	116.2	0.05	8.0	3.1	117.9	0.35	7.6	3.5	10	AL
PYLGRM	113.4	114.8	115.6	114.1	114.5	-0.31	6.5	0.9	115.3	-0.23	6.1	1.1	16	TP
Q4WRHW_AI	114.0	114.8	109.4	120.9	114.8	-0.25	8.8	4.7	116.3	0.00	9.0	3.3	16	AL
QTV4PY_AL	108.1	106.4	111.2	111.7	109.4	-1.42	6.0	2.5	110.1	-1.37	6.4	3.0	16	XX
R8AREN	115.7 L	108.9 L	108.0 L	118.2 L	112.7	-0.70	2.8	5.0	113.5	-0.63	6.9	3.7	8	XX
T6DV3Y	120.2	112.0 H	121.0	118.9	118.0	0.45	13.2	4.1	119.3	0.64	11.4	3.8	16	LC
TAALBV_AL	138.5XH	137.6 XH	131.9 *H	134.0 XH	135.5	4.26	X 20.8	3.1	133.1	3.68	X20.8	3.3	16	AL
U446EF	116.5	125.5	116.0	121.0	119.8	0.83	11.4	4.4	119.4	0.68	10.3	4.0	16	XX
UDQ7VQ	123.2	119.9	117.2	118.0	119.6	0.80	10.3	2.6	119.5	0.70	9.4	2.6	16	LA
UDQ7VQ_AL	120.1	120.3	118.0	114.9	118.3	0.52	7.9	2.5	117.7	0.31	6.9	2.1	16	AL
UEH3KK_AL	118.9	117.9	118.8	115.4	117.7	0.40	9.4	1.6	116.9	0.12	8.8	2.1	12	AL
VHHT46	112.4	110.1 L	110.0	113.4	111.5	-0.97	6.1	1.7	111.3	-1.10	6.5	2.2	15	XX
Y3UPA6_AL	115.3	112.2	114.5	113.6	113.9	-0.45	10.6	1.3	116.2	-0.02	9.1	4.0	12	AL
YDAJMJ_AL	104.8	109.5	109.8	108.9	108.3	-1.67	9.2	2.3	108.9	-1.62	9.6	3.2	16	AL
YH784Q_AL	112.5 H	116.0	117.9	115.9	115.5	-0.08	13.1	2.3	114.2	-0.46	11.5	2.9	16	AL
YM222R_AL	No Data	116.2	123.9	No Data	120.1	0.90	7.1	5.5	119.1	0.60	10.3	3.4	14	AL

Consensus (All Labs) Results

Wk Mean	116.21	116.10	116.54	115.16	Month Mean	115.92	Grand Mean	116.32
Avg SDr	9.22	8.60	9.04	8.64	Avg SD	8.75	Avg SD	8.73
SD btwn Labs	6.07	5.58	6.19	4.60	SD btwn Labs	4.60	SD btwn Labs	4.57
Labs Incld	51	51	53	47	SD btwn Wks	3.47	SD btwn Wks	3.63
Labs Excld	1	2	0	3	Labs Incld	51	Labs Incld	52
Labs not Rcvd	1	0	0	3				

Key to Instrument Codes Reported by Participants

AH	Perkins Model AH	AL	L & W Autoline 400
AX	Perkins Mullen Tester (model not specified)	LA	L&W Bursting Strength Tester
LB	L&W Burst-O-Matic	LC	L&W Autoline (205 Enrollment)
LJ	L&W Bursting Strength Tester J-Type	LZ	L&W (model not specified)
ME	Messmer Automatic Burst Tester ME-06	TB	TMI Monitor/Burst 1000
TP	Technidyne PROFILE/Plus	XX	Instrument make/model not specified by lab

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	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
3BFWHK	116.4	117.1	122.8	113.1	117.3	0.37	11.2	4.0	114.0	-0.38	11.8	4.6	12	LA
3HT6JM	110.2	107.0 *	100.4 *	105.6	105.8	-2.49 *	12.4	4.1	107.4	-2.05	*11.0	4.6	12	LA
3X6LTA	120.2	115.2	124.5	120.4	120.1	1.04	10.7	3.8	119.8	1.08	10.8	6.0	12	LC
3X6LTA_AL	122.3	115.2	122.0	108.5	117.0	0.28	13.8	6.5	119.7	1.04	12.2	6.3	12	XX
423JG8_AL	114.6	115.9	116.7	119.5	116.7	0.20	8.7	2.1	117.6	0.51	9.5	2.4	12	AL
6K9EN4	119.2	117.3	114.6	116.8	117.0	0.28	8.8	1.9	115.4	-0.04	9.6	3.6	12	AH
6PMW6L_AL	118.7	115.8	113.5	118.2 L	116.5	0.17	9.0	2.4	114.1	-0.36	8.7	2.7	12	AL
78ZVPA	115.3	116.4	114.3 L	115.7 L	115.4	-0.11	4.3	0.9	115.9	0.09	6.0	0.8 L	12	LA
7KPRPM	119.3 L	117.1	114.8 L	118.5 L	117.4	0.39	3.9	2.0	120.3	1.20	3.3	2.7	12	LA
7Y7M6H	112.6	112.0	112.0	113.5	112.5	-0.82	8.5	0.7	111.9	-0.92	10.3	2.0	12	LA
8FAJ2M	121.9	118.9	122.4	118.3	120.4	1.12	10.5	2.1	119.6	1.04	11.1	2.4	12	LZ
8N4RLD	110.2	109.5	112.4	106.1	109.6	-1.56	11.0	2.6	112.3	-0.81	10.5	3.7	12	LA
9BCHCD	112.0	110.3	117.0	115.1	113.6	-0.56	11.5	3.0	116.7	0.29	13.1	4.2	12	LZ
A4AT9E	111.9	114.7	111.0	109.9	111.9	-0.99	11.3	2.0	111.9	-0.92	10.8	3.2	12	LC
A7YW6R	112.0	109.5 H	110.7	114.9	111.8	-1.00	12.8	2.3	113.0	-0.64	12.1	2.8	12	XX
ACKWJJ	117.0	115.7	116.9	115.8	116.4	0.13	6.3	0.7	116.2	0.17	5.8	1.3	12	LJ
AJ2PAA	109.3 *	115.9	108.5	117.1	112.7	-0.78	10.5	4.4	112.1	-0.88	10.2	4.4	12	LA
AUJAU7	125.2 *	120.1	120.5	120.2	121.5	1.40	9.5	2.5	120.6	1.29	9.6	4.5	12	XX
BGAULF	116.2	115.1 L	104.1 H	117.7	113.3	-0.64	16.9	6.2	113.3	-0.57	16.9	6.2	4	LA
BGPD6D	119.4	117.5	116.1	116.4	117.3	0.37	9.9	1.5	118.4	0.74	10.6	3.5	12	TB
BVUCF6	131.0XL	130.7XL	131.3 *L	131.5 *L	131.1	3.78 X	3.3	0.3 L	133.4	4.52 X	3.0	2.1	12	AH
C3B46A	119.8	113.8	114.3	109.4	114.3	-0.38	9.5	4.3	116.9	0.35	9.2	4.5	12	AH
CMV7Z9_AL	121.1	116.7	124.0	125.3	121.8	1.46	10.6	3.8	119.6	1.04	9.6	4.4	12	AL
E4T6Z8	120.2	118.9	122.7	114.4	119.0	0.79	11.3	3.5	119.6	1.03	12.3	8.9 H	12	LB
FFGU9C	117.2	106.0 *	110.8	113.2	111.8	-1.00	10.3	4.7	111.5	-1.02	10.0	3.5	12	AH
GJG3DL	129.2 X	128.5 X	128.0	121.4	126.8	2.70 *	10.2	3.6	124.2	2.20	*10.2	2.9	12	AH
HFEJRY	121.5	118.5	129.8 *	124.4 H	123.6	1.90	14.1	4.8	124.9	2.36	*10.1	3.3	12	XX
K99LWR	116.6	111.4	108.3	101.8 *	109.5	-1.57	9.9	6.2	110.6	-1.25	8.7	4.0	12	XX
KDFCZX	114.4	120.1	117.6	117.2	117.3	0.37	10.8	2.3	114.7	-0.21	9.0	5.1	12	LA
KQNVXT	114.8	115.3	115.9	115.9	115.5	-0.09	7.1	0.5 L	114.8	-0.18	6.5	0.9 L	12	AH
KUP433_AL	119.1	121.2	124.3	124.3	122.2	1.58	10.4	2.5	118.3	0.69	10.3	4.8	12	AL
L899M6	117.1	114.4	110.9	No Data	114.1	-0.43	9.7	3.1	108.8	-1.70	10.8	7.8	11	LA
L899M6_AL	119.0	115.2 L	110.1	No Data	114.8	-0.27	8.3	4.5	112.4	-0.78	10.3	4.2	11	AL
LNDF37	113.9	113.4 H	107.4	115.8	112.6	-0.80	12.4	3.6	111.1	-1.12	10.9	3.2	12	LZ
LU6MMZ	118.5	115.3	113.8	113.7	115.3	-0.13	11.2	2.2	114.6	-0.24	10.2	4.6	11	LA

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Containerboard Interlaboratory Testing Program
Analysis 206
Bursting Strength (Mullen), 56 lb Linerboard - 56G3
TAPPI Official Test Method T807

Report #648
September 2023

	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
NMW3BF	121.8	119.4	117.6	116.9 L	118.9	0.76	7.8	2.2	118.3	0.69	8.0	2.0	12	LA
PBBDQZ_AL	114.0	112.8 H	114.9	118.9	115.1	-0.18	12.2	2.7	114.3	-0.31	12.3	2.9	9	AL
PYLGRM	113.9	114.9	115.0	114.1	114.5	-0.34	6.4	0.6 L	115.0	-0.13	6.7	0.7 L	12	TP
Q4WRHW_AI	115.0	119.9	117.8	114.3	116.8	0.22	9.4	2.6	114.8	-0.19	10.8	4.3	12	XX
QTV4PY_AL	112.4	115.6	109.0	113.1	112.5	-0.82	8.0	2.8	111.6	-0.99	9.3	2.3	12	XX
R8AREN	122.0	121.1	123.0	124.2	122.6	1.66	10.2	1.3	122.6	1.78	10.2	1.3	4	XX
T6DV3Y	115.7	124.5 *	115.3	116.2	117.9	0.51	10.5	4.4	118.9	0.85	10.5	3.7	12	LC
TAALBV_AL	137.6XH	136.9XH	127.9 H	136.5XH	134.7	4.67 X	26.2	4.6	131.8	4.12 X	24.8	5.7	12	XX
U446EF	118.0	119.5	113.5	109.5	115.1	-0.18	11.6	4.5	116.2	0.16	12.4	4.3	12	XX
UDQ7VQ	120.3	114.0	119.7	124.4	119.6	0.93	10.1	4.3	119.8	1.08	10.9	3.5	12	LA
UDQ7VQ_AL	119.1	113.5	116.1	118.3	116.8	0.22	7.3	2.5	118.0	0.62	8.5	3.4	12	XX
UEH3KK_AL	120.7 H	115.5	115.7	110.8	115.7	-0.05	12.4	4.0	116.4	0.23	10.8	4.5	12	AL
VHHT46	111.5	114.2	114.2	107.4	111.8	-1.00	6.1	3.2	109.3	-1.58	8.7	3.5	10	XX
Y3UPA6_AL	117.7	110.7	110.1	103.1 *H	110.4	-1.35	19.6	6.0	112.4	-0.79	16.2	4.9	8	AL
YDAJMJ_AL	112.4	108.3	116.2	110.9 H	111.9	-0.97	12.1	3.3	110.2	-1.35	10.9	4.3	12	AL
YH784Q_AL	114.8	108.8	110.6	113.5	111.9	-0.98	9.1	2.8	113.3	-0.55	10.2	4.6	12	AL
YM222R_AL	No Data	119.0	118.0	No Data	118.5	0.65	12.4	0.7	113.4	-0.55	10.6	5.5	9	AL

Consensus (All Labs) Results

Wk Mean	116.80	115.26	116.13	115.52	Month Mean	115.86	Grand Mean	115.53
Avg SDr	10.43	9.91	11.04	11.13	Avg SD	10.60	Avg SD	10.42
SD btwn Labs	3.78	3.90	6.38	5.91	SD btwn Labs	4.04	SD btwn Labs	3.96
Labs Incld	48	49	52	48	SD btwn Wks	3.41	SD btwn Wks	4.12
Labs Excld	3	3	0	1	Labs Incld	50	Labs Incld	50
Labs not Rcvd	1	0	0	3				

Key to Instrument Codes Reported by Participants

AH	Perkins Model AH	AL	L & W Autoline 400
LA	L&W Bursting Strength Tester	LB	L&W Burst-O-Matic
LC	L&W Autoline (206 Enrollment)	LJ	L&W Bursting Strength Tester J-Type
LZ	L&W (model not specified)	TB	TMI Monitor/Burst 1000
TP	Technidyne PROFILE/Plus	XX	Instrument make/model not specified by lab

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Containerboard Interlaboratory Testing Program

Analysis 215

Ring Crush, 42 lb Linerboard - 42H2

TAPPI Official Test Method T822

Report #648
September 2023

	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
2VM29F	98.3 L	98.2 L	99.8 L	99.7 L	99.0	0.85	0.7	0.8	96.6	0.24	0.6	2.1	16	MZ
3FMMLQ	100.6	100.1	102.4	98.4	100.4	1.31	2.8	1.7	100.5	1.76	2.6	1.6	16	LD
3HT6JM	95.1	97.5	94.7	94.6	95.5	-0.35	3.5	1.4	96.6	0.22	17.1	2.7	16	LB
3X6LTA	88.3	88.6 *	87.7 X	91.7	89.1	-2.53 *	3.4	1.8	89.6	-2.49 *	3.1	2.8	12	LD
6K9EN4	96.9	97.4	97.2	94.9	96.6	0.03	2.8	1.1	96.1	0.06	2.6	1.1	13	LC
78YXED	102.0	101.4	103.2 *H	102.5 *	102.3	1.96 *	3.9	0.8	100.0	1.57	3.5	3.1	16	LD
7KPRPM	95.9 L	95.7 L	95.7 L	95.9 L	95.8	-0.24	0.7	0.1 L	96.0	0.02	1.2	2.1	16	TU
7Y7M6H	94.2	95.2	93.8	91.0	93.5	-1.02	2.5	1.8	93.9	-0.83	2.7	1.6	16	LD
88EGYB	97.6	94.9	97.3	95.5	96.3	-0.07	3.3	1.4	96.1	0.05	3.7	1.7	16	RS
8QVNB8	97.4	95.3	95.6	93.4	95.4	-0.37	2.9	1.7	94.9	-0.44	3.0	1.6	16	LC
8R2794	98.8 H	95.4 H	99.4	99.1	98.2	0.57	5.1	1.9	98.4	0.91	5.3	2.7	16	LD
9BCHCD	92.9	96.5	92.9	93.5	93.9	-0.88	4.1	1.7	90.2	-2.24 *	3.7	3.9	12	LC
9MPH98	98.2 L	98.1 L	99.6 L	99.3 L	98.8	0.78	0.7	0.8	96.7	0.27	0.6	2.0	16	MZ
A4AT9E	88.6	95.9	97.3	97.7	94.9	-0.55	3.3	4.3 H	96.0	-0.01	4.0	2.7	16	LD
ACKWJJ	94.9	94.4	94.3	94.2	94.4	-0.71	3.2	0.3 L	95.0	-0.38	3.1	0.9	16	LD
AUJAU7	101.5	102.9 *	98.4	100.9	100.9	1.50	2.7	1.9	96.9	0.34	3.9	4.4	16	MB
BGAULF	96.1 L	96.7	97.1	95.6 L	96.4	-0.05	1.3	0.7	96.4	0.14	1.3	0.7 L	4	LZ
BGPD6D	93.0	94.2	97.7	94.7 H	94.9	-0.55	4.0	2.0	93.5	-0.98	3.6	3.7	16	LD
BVUCF6	92.1	92.6	92.9	92.3	92.4	-1.39	2.3	0.3	94.5	-0.56	2.5	1.9	16	LD
C3B46A	94.1	98.6	95.4	95.3	95.9	-0.22	2.8	1.9	95.1	-0.35	2.5	1.4	16	LD
C7BFZ9	93.3	92.4	91.5 *	91.7	92.2	-1.46	3.0	0.8	92.8	-1.24	3.2	1.5	16	LC
E4T6Z8	99.6	96.2	99.2	94.7	97.4	0.32	3.5	2.4	98.1	0.81	4.1	6.3 H	16	LD
GJG3DL	94.5	96.5	97.2	96.3	96.1	-0.15	2.4	1.2	96.1	0.03	2.6	1.1	16	LG
HFEJRY	86.0 *H	91.2	97.3	93.7	92.0	-1.53	4.4	4.8 H	92.6	-1.30	3.3	2.9	16	LD
K4TDAT	97.7	95.8	98.3	99.1	97.7	0.40	2.9	1.4	97.9	0.74	3.1	1.1	16	MB
KDFCZX	98.0	93.6	98.4	97.6	96.9	0.13	3.0	2.2	97.2	0.47	3.2	1.6	16	LD
KUP433	99.9	98.4	99.5	102.0	99.9	1.17	3.4	1.5	98.9	1.14	3.6	6.9 H	16	LZ
KVG3G2	104.3 *H	100.9	100.1	97.8	100.8	1.45	3.7	2.7	99.6	1.41	3.9	4.8	16	TU
LNDF37	99.8	97.5	96.0	96.4	97.5	0.32	3.0	1.7	95.9	-0.04	3.0	2.6	16	LD
LU6MMZ	101.3	95.4	100.6	102.6 *	100.0	1.18	3.7	3.1	101.4	2.10 *	3.4	3.6	16	LX
NMW3BF	88.0 *	90.4 L	92.0	94.1	91.1	-1.83	2.4	2.6	93.5	-0.98	3.1	2.3	16	LC
PBBDQZ	97.0	96.1	97.8	97.1	97.0	0.17	3.8	0.7	98.1	0.83	4.6	1.7	16	LC
PD4AFU	100.9	103.6 *	96.7	96.1	99.3	0.95	3.1	3.5	94.3	-0.66	2.7	4.1	16	EM
PLWGZK	80.8 X	77.5 X	74.9 X	77.1 X	77.6	-6.45 X	3.6	2.4	83.8	-4.74 X	4.0	4.5	16	EM
PYLGRM	94.1	93.7	96.1	94.4	94.6	-0.66	2.6	1.0	94.9	-0.44	2.9	1.2	16	TH

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Containerboard Interlaboratory Testing Program

Analysis 215

Ring Crush, 42 lb Linerboard - 42H2

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
Q4WRHW	100.5	99.9	101.7	99.7	100.4	1.33	3.4	0.9	101.1	1.97 *	2.9	2.2	16	LD
QGGACL	101.1	100.2	99.0	100.7	100.2	1.27	3.2	0.9	95.9	-0.05	3.0	3.1	16	TH
QTV4PY	96.7	94.7	94.7	99.2	96.3	-0.07	2.8	2.2	96.5	0.19	2.8	1.4	16	LD
T6DV3Y	95.7	97.8	96.8	92.7	95.8	-0.25	3.1	2.2	94.8	-0.47	2.6	1.6	16	LD
TAALBV	89.3	91.4	68.7 X	69.7 XH	79.8	-5.70 X	4.9	12.2 H	74.1	-8.49 X	6.1	12.2 H	16	LC
UDQ7VQ	97.9	94.4	99.4	97.3	97.2	0.24	3.1	2.1	96.8	0.31	3.4	2.8	16	LD
UEH3KK	70.7 XH	70.2 XH	71.8 XH	71.8 XH	71.1	-8.65 X	8.3	0.8	68.7	-10.54 X	8.6	2.4	12	LD
VD8MNX	93.4	94.0	93.5	93.3	93.5	-1.01	1.6	0.3 L	93.7	-0.88	1.6	0.5 L	16	MB
VHHT46	94.8	95.9	97.2	90.0 *	94.5	-0.70	2.4	3.1	93.5	-0.95	4.4	4.1	15	TU
YH784Q	99.5	98.6	99.9	95.7	98.4	0.66	3.3	1.9	95.3	-0.27	3.3	3.5	16	LD

Consensus (All Labs) Results

Wk Mean	96.27	96.23	97.25	96.24	Month Mean	96.51	Grand Mean	95.99
Avg SDr	3.12	3.11	3.10	3.07	Avg SD	3.09	Avg SD	4.09
SD btwn Labs	4.17	3.19	2.75	3.19	SD btwn Labs	2.94	SD btwn Labs	2.58
Labs Incld	43	43	41	42	SD btwn Wks	1.98	SD btwn Wks	2.87
Labs Excld	2	2	4	3	Labs Incld	42	Labs Incld	42
Labs not Rcvd	0	0	0	0				

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	LB	L&W Crush Tester 240
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
MZ	Messmer Buchel (model not specified)	RS	Regmed Digital Crush Tester CT-2000
TH	TMI Compression Tester, Model 17-76	TU	TMI Universal Crush Tester (TMI K440)

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	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
2VM29F	140.6 L	139.6 L	140.4 L	140.1 L	140.2	1.03	0.7	0.4 L	137.6	0.51	0.9	2.4	12	MZ
3FMMLQ	144.2	141.7	145.4 *	140.3	142.9	1.75	4.1	2.3	144.1	1.59	4.0	3.7	12	LD
3HT6JM	138.6	136.8	132.9	141.1	137.4	0.27	4.8	3.4	118.4	-2.69	*18.2	14.9 H	12	LB
3X6LTA	122.7 *	120.3 X	122.2 XH	125.2	122.6	-3.70 X	6.0	2.0	120.8	-2.29	* 4.9	8.0	12	LD
6K9EN4	136.6	136.8	134.6	138.2	136.6	0.05	3.8	1.5	137.1	0.42	3.6	1.0 L	12	LC
78YXED	142.5	141.9	134.6	141.4	140.1	1.01	3.8	3.7	137.4	0.47	4.2	3.4	12	LD
7KPRPM	135.9 L	135.0 L	135.6 L	135.9 L	135.6	-0.21	0.7	0.4 L	137.3	0.45	0.9	3.1	12	TU
7Y7M6H	133.6	134.7	132.5	132.4	133.3	-0.82	4.5	1.1	133.6	-0.16	4.0	1.9	12	LD
88EGYB	134.9	132.8	131.4	131.0	132.5	-1.02	4.5	1.7	132.3	-0.37	4.6	2.1	12	RS
8QVNB8	132.5	132.0	133.5	131.7	132.4	-1.06	2.6	0.8	134.8	0.04	3.5	2.7	12	LC
8R2794	130.8	132.7	135.8	132.1	132.9	-0.94	5.6	2.1	132.9	-0.27	5.4	3.0	12	LD
9BCHCD	126.3	130.5	130.7	126.2	128.4	-2.13 *	3.2	2.5	123.7	-1.80	6.5	5.9	12	LC
9MPH98	141.0 L	139.4 L	139.8 L	140.2 L	140.1	1.00	0.7	0.7	137.2	0.44	0.7	2.6	12	TH
A4AT9E	135.6	143.5	139.2	148.5 *	141.7	1.43	5.0	5.5	141.9	1.22	4.7	4.5	12	LD
ACKWJJ	136.8	135.9	136.7	136.5	136.5	0.03	3.7	0.4 L	137.9	0.56	3.4	1.1 L	12	LD
AUJAU7	145.6 L	136.4	141.6	141.4	141.2	1.31	4.4	3.8	140.1	0.92	4.2	2.4	12	MB
BGAULF	137.3	136.7	134.1 L	134.6 L	135.7	-0.19	2.4	1.6	135.7	0.19	2.4	1.6	4	LZ
BGPD6D	132.9	138.4	138.7	132.4	135.6	-0.20	5.7	3.4	137.6	0.51	4.5	9.9	12	LD
BVUCF6	122.8*L	123.2 *	122.8 X	122.4 *	122.8	-3.64 X	2.3	0.3 L	124.3	-1.70	2.5	1.5	12	LD
C3B46A	132.5	134.6	133.6	133.6	133.6	-0.75	3.6	0.9	135.0	0.07	3.4	2.7	12	LD
C7BFZ9	127.3	127.2	130.4	126.9	127.9	-2.26 *	3.2	1.7	129.2	-0.89	3.6	1.6	12	LC
E4T6Z8	145.7 H	131.9	145.3 *	135.2	139.5	0.84	4.7	7.0 H	135.5	0.16	4.7	7.1	12	LD
GJG3DL	136.7 L	135.7	135.1	133.6	135.3	-0.29	2.7	1.3	134.8	0.05	3.0	2.1	12	LY
HFEJRY	133.7 H	139.1	133.2 H	135.6 H	135.4	-0.26	7.5	2.7	134.6	0.01	6.0	2.0	12	LD
K4TDAT	139.5	137.2	140.3	137.5	138.6	0.60	4.7	1.5	140.0	0.91	4.9	4.3	12	MB
KDFCZX	133.7	132.7	134.1	133.7	133.5	-0.76	3.2	0.6	135.0	0.07	3.6	1.5	12	LD
KUP433	125.2 H	139.5	144.6	140.9	137.5	0.32	6.6	8.5 H	137.9	0.56	7.8	13.1 H	12	LZ
KVG3G2	151.9 *	150.8 X	140.7	137.8	145.3	2.40 *	3.4	7.1 H	143.2	1.44	4.0	4.9	12	TU
LNDF37	140.2	138.7	137.2	138.4	138.6	0.61	3.3	1.2	135.6	0.18	3.7	3.1	12	LD
LU6MMZ	147.0	124.9 *H	144.1	148.6 *	141.1	1.28	8.2	11.0 H	145.4	1.80	6.2	7.6	12	LY
NMW3BF	132.5	127.9	129.3	131.2	130.2	-1.65	3.7	2.0	135.2	0.12	3.7	4.1	12	LC
PBBDQZ	138.1	138.5	137.9	137.2	137.9	0.42	4.7	0.5 L	138.3	0.62	4.5	0.9 L	12	LC
PD4AFU	135.3	138.0	135.1	135.5	136.0	-0.10	4.4	1.3	131.2	-0.56	3.6	5.6	12	EM
PLWGZK	110.6 X	108.2 X	108.0 X	105.4 X	108.1	-7.61 X	4.1	2.1	118.9	-2.61	* 3.8	8.1	12	EM
PYLGRM	133.9	135.8	136.8	135.4	135.5	-0.23	5.2	1.2	135.2	0.12	4.4	1.1 L	12	TH

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Containerboard Interlaboratory Testing Program
Analysis 216
Ring Crush, 56 lb Linerboard - 56G3
TAPPI Official Test Method T822

Report #648
September 2023

	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
Q4WRHW	136.3	138.8	133.4	136.4	136.2	-0.04	3.7	2.2	136.3	0.30	3.3	1.8	12	LD
QGGACL	136.3	135.9	136.1 H	135.6	136.0	-0.10	5.8	0.3 L	134.5	-0.01	4.6	2.0	12	TH
QTV4PY	132.3	130.5	133.1	135.3	132.8	-0.96	4.5	2.0	134.3	-0.04	4.3	2.0	12	LD
T6DV3Y	139.0	136.4	135.1	136.9	136.9	0.13	4.1	1.6	136.6	0.35	3.7	2.8	12	LD
TAALBV	123.9	125.5 *	107.0 XH	111.7 XH	117.0	-5.20 X	7.0	9.1 H	109.0	-4.26 X	7.2	18.4 H	12	LC
UDQ7VQ	135.8	135.6	135.3	132.4	134.7	-0.43	4.7	1.6	133.9	-0.10	4.1	1.7	12	LD
UEH3KK	114.5XH	113.6 XH	115.3 XH	116.2 XH	114.9	-5.77 X	17.2	1.1	98.7	-5.97 X	12.1	12.2 H	12	LD
VD8MNX	135.1 L	134.2 L	135.6	134.8 L	134.9	-0.39	1.7	0.6 L	136.0	0.25	1.7	1.3 L	12	MB
VHHT46	135.7	137.2	139.5	125.5 H	134.5	-0.51	5.9	6.2	127.5	-1.18	9.1	15.0 H	10	TU
YH784Q	142.6	135.9	142.0	137.7	139.6	0.86	3.7	3.3	136.4	0.31	3.8	3.6	12	LD

Consensus (All Labs) Results

Wk Mean	135.84	135.11	136.62	135.41	Month Mean	136.36	Grand Mean	134.53
Avg SDr	4.50	4.51	4.07	4.38	Avg SD	4.39	Avg SD	5.12
SD btwn Labs	6.37	4.60	4.15	5.44	SD btwn Labs	3.72	SD btwn Labs	6.01
Labs Incld	43	41	40	42	SD btwn Wks	3.50	SD btwn Wks	5.40
Labs Excld	2	4	5	3	Labs Incld	40	Labs Incld	43
Labs not Rcvd	0	0	0	0				

Key to Instrument Codes Reported by Participants

EM	Emerson 1200	LB	L&W Crush Tester 240
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	MZ	Messmer Buchel (model not specified)
RS	Regmed Digital Crush Tester CT-2000	TH	TMI Compression Tester, Model 17-76
TU	TMI Universal Crush Tester (TMI K440)		

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	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
2VM29F	26.7 *L	26.8 *L	27.0 *L	27.5 *L	27.0	2.47 *	0.4	0.3	25.7	1.87	0.3	1.2	16	LZ
3BFWHK	23.8	23.0	23.5	23.3	23.4	-0.24	2.3	0.3	23.0	-0.60	1.8	0.5	16	LY
3FMMLQ	27.1 *	25.5	26.3	26.1	26.3	1.90	2.1	0.6	26.0	2.16 *	1.8	0.5	16	LH
3HT6JM	23.0	24.4 H	22.9	23.4	23.4	-0.23	2.4	0.7	23.5	-0.10	2.2	1.2	16	LH
3X6LTA	21.7	17.9 X	22.4	22.9	21.2	-1.87	1.7	2.3 H	20.8	-2.58 *	1.7	2.1 H	12	LZ
3X6LTA_AL	44.7 XL	43.9 XL	46.6 XL	46.8 XL	45.5	16.37 X	0.0	1.4 H	45.2	19.86 X	0.0	1.0	8	AL
423JG8_AL	24.5	25.4	27.0 *	28.0 *	26.2	1.88	1.8	1.5 H	25.4	1.65	1.7	1.0	16	AL
662X2C	24.1	24.6 H	24.8 H	24.4 H	24.5	0.57	3.2	0.3	23.7	0.04	2.7	0.7	16	LY
6K9EN4	22.9	22.9	23.0	22.4	22.8	-0.69	1.8	0.2	23.1	-0.45	1.7	0.4	13	LU
6PMW6L	24.7	24.8	23.7	24.3 L	24.4	0.48	1.8	0.5	23.1	-0.47	1.9	1.0	15	LU
78ZVPA	24.4	24.1	24.6	23.9	24.2	0.39	2.1	0.3	24.3	0.58	2.0	0.3	16	LY
7KPRPM	20.7 *	21.5	22.5	21.1 *	21.5	-1.71	1.8	0.8	21.3	-2.16 *	1.7	0.8	16	XX
7Y7M6H	23.9 H	23.9 L	23.4 L	24.6	23.9	0.16	2.0	0.5	24.0	0.34	2.0	0.8	16	LA
8FAJ2M	24.4	23.4	24.3	24.3	24.1	0.25	2.2	0.5	24.0	0.37	2.3	0.8	16	LH
9BCHCD	21.1	21.5	20.8 *	20.9 *	21.1	-1.99 *	1.8	0.3	20.9	-2.53 *	1.7	1.3	12	LY
9MPH98	26.8 *L	26.8 *L	27.1 *L	27.4 *L	27.0	2.46 *	0.3	0.3	25.6	1.79	0.3	1.2	16	LZ
A4AT9E	23.6	22.9 H	23.8	22.8	23.3	-0.32	2.0	0.5	23.3	-0.29	2.0	1.4	16	LA
A7YW6R	22.1	23.7	22.7	23.6	23.0	-0.52	1.5	0.8	23.2	-0.43	1.5	0.8	16	LH
AJ2PAA	25.2	25.0 H	23.6	25.0	24.7	0.76	2.5	0.7	24.3	0.59	2.2	0.7	16	LH
AUJAU7	26.6 *H	25.1	24.9 L	24.6	25.3	1.20	2.5	0.9	24.9	1.19	1.9	1.2	16	LA
BGPD6D	24.3	23.8	24.0	24.1	24.0	0.24	2.0	0.2	24.2	0.48	2.2	0.5	16	LW
C3B46A	23.1	22.8	22.5	23.9	23.0	-0.51	1.8	0.6	23.2	-0.43	1.8	0.6	16	LU
C7BFZ9	21.7	22.1	21.6	20.8 *	21.5	-1.63	1.7	0.5	21.6	-1.89	1.7	0.6	16	LZ
CCCRYR	20.7 *L	21.4 L	20.6 *	21.7 H	21.1	-1.97 *	2.2	0.5	22.0	-1.53	2.6	2.5 H	11	LH
CMV7Z9_AL	24.1	24.1	24.4	23.4	24.0	0.21	1.7	0.4	23.5	-0.09	1.7	0.6	16	AL
E4T6Z8	24.5	24.4	23.4	22.7	23.8	0.03	1.7	0.9	23.3	-0.34	1.8	1.3	16	LU
FJ7VGK	25.7	25.3	25.1	25.3	25.3	1.22	1.3	0.3	25.4	1.58	1.5	0.4	16	LH
FQY9CE	24.9	24.1	24.2	23.7	24.2	0.38	2.1	0.5	23.5	-0.09	1.8	1.2	16	LA
GJG3DL	24.4	24.6	24.0	24.1	24.2	0.40	1.6	0.3	24.3	0.64	1.8	0.3	16	BK
GKURFY	23.8	24.2	24.9	25.4	24.6	0.63	2.0	0.7	24.6	0.85	2.0	0.7	4	XX
HFEJRY	24.6 L	24.0	24.4	25.8	24.7	0.71	1.7	0.8	24.3	0.59	1.1	0.5	16	LH
K4TDAT	23.6	23.4	23.2	23.5	23.4	-0.22	2.1	0.2	23.9	0.28	2.0	0.7	16	LA
KDFCZX	23.9	23.0	23.1	22.7	23.2	-0.42	1.7	0.5	23.1	-0.48	1.9	0.5	16	LZ
KUP433_AL	23.0	21.8	22.7	23.0	22.6	-0.82	1.7	0.6	22.7	-0.90	1.6	0.4	16	AL
KVG3G2	24.3	22.4	22.4	22.0 L	22.8	-0.71	1.8	1.0	24.1	0.45	1.8	1.4	16	LA

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Containerboard Interlaboratory Testing Program

Analysis 223

STFI, 42 lb Linerboard - 42H2

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
L46AEX	23.1	23.2	22.7	22.7	22.9	-0.60	1.6	0.3	23.9	0.29	1.6	0.8	16	LH
L899M6	21.7	21.9	22.3	No Data	22.0	-1.32	1.8	0.3	23.0	-0.59	2.0	0.9	11	LY
L899M6_AL	21.7 L	21.9	21.7 L	No Data	21.8	-1.47	1.0	0.1	22.6	-0.97	1.7	1.0	11	AL
LNDF37	24.1	24.2	23.4 L	23.6	23.8	0.09	1.6	0.4	23.5	-0.13	1.8	0.5	16	LY
LU6MMZ	24.2	47.6 XH	20.2 *	24.5	29.1	4.06 X	2.6	12.5 H	27.7	3.71 X	2.8	9.1 H	15	LZ
NMW3BF	23.5	23.7	23.4	23.1 L	23.4	-0.22	1.3	0.3	23.7	0.02	1.5	0.4	16	LA
PBBDQZ	23.3	23.0	25.3	24.6 L	24.0	0.25	1.9	1.1	23.5	-0.08	1.8	1.4	10	LU
PQR97W	23.8	24.6 L	24.4	24.7	24.4	0.48	1.8	0.4	24.5	0.83	1.7	0.5	16	LH
Q4WRHW_AI	22.8 L	23.2	23.2	23.6	23.2	-0.39	1.6	0.3	23.9	0.28	1.5	0.9	16	AL
QTV4PY_AL	24.4	24.3	23.9	24.9	24.4	0.50	1.7	0.4	24.0	0.30	2.0	0.6	16	XX
R8AREN	23.8	24.1	23.8	23.9	23.9	0.11	1.9	0.1	24.4	0.67	1.9	0.8	16	LA
T6DV3Y	23.3	23.5	23.6	23.8	23.6	-0.13	2.2	0.2	23.7	0.10	2.0	0.7	16	LA
T84WA9	24.4	24.8	25.0	24.9	24.8	0.79	1.7	0.3	24.0	0.35	1.9	0.8	16	XX
TAALBV_AL	46.6 XH	47.6 XH	43.3 XH	44.8 XH	45.6	16.45 X	20.6	1.9 H	46.0	20.53 X	21.4	2.5 H	16	AL
UDQ7VQ_AL	23.8	23.1	23.1	24.5 L	23.6	-0.06	1.9	0.7	23.6	0.00	1.9	0.6	16	AL
UEH3KK	22.5	23.6	23.1 L	24.1	23.3	-0.31	1.9	0.7	22.8	-0.75	1.9	0.6	12	LY
UEH3KK_AL	22.9	23.7	23.8	24.5	23.7	0.01	1.6	0.6	23.8	0.19	1.8	0.5	12	AL
VHHT46	21.7	21.9	22.1 H	23.1	22.2	-1.14	2.2	0.6	23.0	-0.56	2.3	0.8	15	TT
VN4QRR	23.8	23.1	23.1	23.3 L	23.3	-0.30	1.6	0.3	23.0	-0.63	1.6	0.5	16	LW
VVPLVG	23.0 L	23.5 L	23.5 L	23.3 L	23.3	-0.31	0.9	0.2	22.7	-0.87	1.4	0.7	16	XX
Y3UPA6_AL	31.0 X	29.7 X	31.3 X	26.1	29.5	4.36 X	2.1	2.4 H	29.5	5.36 X	2.2	1.5	12	AL
YDAJMJ_AL	25.1	25.0	24.4 H	25.5	25.0	0.96	2.1	0.5	24.5	0.83	2.0	0.8	16	AL
YH784Q_AL	24.6	24.2	24.9	24.4	24.5	0.60	1.7	0.3	24.3	0.63	1.8	0.6	16	AL

Consensus (All Labs) Results

Wk Mean	23.73	23.71	23.62	23.99	Month Mean	23.72	Grand Mean	23.63
Avg SDr	1.90	1.85	1.87	1.82	Avg SD	1.85	Avg SD	1.84
SD btwn Labs	1.42	1.23	1.44	1.48	SD btwn Labs	1.33	SD btwn Labs	1.09
Labs Incld	55	53	55	54	SD btwn Wks	0.64	SD btwn Wks	0.92
Labs Excld	3	5	3	2	Labs Incld	54	Labs Incld	54
Labs not Rcvd	0	0	0	2				

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Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	BK	Buchel Strip Compression Tester BK-155
LA	L&W Autoline (223 Enrollment)	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

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	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
2VM29F	38.3 L	38.2 L	38.0 L	38.3 L	38.2	1.80	0.4	0.1 L	36.0	0.85	0.5	1.7	12	LZ
3BFWHK	33.4	33.5 L	33.9	34.4	33.8	-0.25	1.8	0.4	33.8	-0.50	2.1	0.9	12	LU
3FMMLQ	35.6	35.3	34.3	34.5	34.9	0.28	2.2	0.6	35.2	0.39	2.3	0.6 L	12	LH
3X6LTA	30.6	25.2 X	32.0	32.9	30.2	-1.97 *	2.0	3.4	28.9	-3.52 X	1.9	3.3	12	LZ
3X6LTA_AL	42.2 XL	39.9 *L	42.6 XL	42.1 XL	41.7	3.45 X	0.0	1.2	39.9	3.29 X	0.0	5.0 H	8	XX
423JG8_AL	36.6	38.7	38.4	37.8	37.9	1.66	2.3	0.9	37.2	1.58	2.6	1.5	12	AL
662X2C	34.3 H	34.3 H	34.7 H	34.2 H	34.3	0.00	4.2	0.2 L	34.1	-0.29	4.5	0.3 L	12	LY
6K9EN4	33.6	33.2	33.1	34.1	33.5	-0.40	2.2	0.4	33.6	-0.61	2.3	0.4 L	12	LU
6PMW6L	40.1 *	36.7	38.6	35.0	37.6	1.52	2.5	2.2	35.2	0.37	2.4	2.2	12	LU
78ZVPA	35.3	34.9	35.5 H	35.1	35.2	0.40	3.0	0.3 L	35.2	0.36	2.9	0.2 L	12	LA
7KPRPM	31.0	32.1	31.0	31.7	31.5	-1.36	2.7	0.5	32.1	-1.51	2.7	1.7	12	XX
7Y7M6H	32.9	32.8	33.2	33.0	33.0	-0.65	1.9	0.2 L	34.1	-0.33	2.1	0.9	12	LW
8FAJ2M	34.6 H	34.3 H	33.7	33.0	33.9	-0.21	3.4	0.7	35.4	0.49	2.9	3.0	12	LZ
9BCHCD	31.8	31.9	30.2	32.4	31.5	-1.32	2.1	1.0	29.6	-3.09 X	2.3	2.5	12	LW
9MPH98	38.8 L	37.9 L	38.1 L	38.2 L	38.2	1.83	0.4	0.4 L	36.3	1.06	0.4	1.5	12	LZ
A4AT9E	34.4	34.9	33.8	36.1	34.8	0.22	2.3	0.9	35.4	0.47	2.5	1.6	12	LA
A7YW6R	32.7	33.4	33.0	33.7	33.2	-0.54	2.1	0.4	33.5	-0.66	1.9	0.8	12	LH
AJ2PAA	37.5	35.1	34.1	26.9 X	33.4	-0.45	2.7	4.6 H	35.2	0.37	2.7	2.9	12	LH
AUJAU7	38.4	35.3 L	36.4 H	35.8	36.5	1.01	2.4	1.3	37.9	2.06 *	6.5	2.9	12	LA
BGPD6D	34.4	34.1	35.0	34.3	34.4	0.05	2.9	0.4	34.8	0.13	3.0	1.1	12	LW
C3B46A	34.3	32.9	33.8	34.0	33.8	-0.27	2.1	0.6	33.9	-0.41	2.2	1.2	12	LU
C7BFZ9	31.6	31.3	31.4	31.1	31.3	-1.41	2.4	0.2 L	31.5	-1.91	2.3	0.3 L	12	LZ
CCCRYR	29.5 *L	30.9 L	30.1	30.0 *	30.1	-1.99 *	1.5	0.6	31.7	-1.81	2.3	2.8	8	LH
CMV7Z9_AL	31.7	33.0	33.2 L	33.4	32.8	-0.72	2.1	0.8	33.1	-0.89	2.2	0.6	12	AL
E4T6Z8	35.2	33.9	32.3	32.5	33.5	-0.41	2.5	1.4	34.6	0.03	2.5	1.7	12	LU
FJ7VGK	37.3	38.3	37.9	37.2	37.7	1.57	2.1	0.5	36.9	1.41	1.9	0.7	12	LH
FQY9CE	33.3	33.9 H	37.7	35.4	35.1	0.34	2.6	2.0	33.7	-0.52	2.0	2.0	12	LA
GJG3DL	35.8	34.8	35.1	35.7	35.3	0.47	2.1	0.5	35.5	0.53	2.2	0.9	12	BK
GKURFY	38.0	35.5	36.9	36.3	36.7	1.10	2.1	1.1	36.7	1.29	2.1	1.1	4	XX
HFEJRY	38.0	38.0	38.7	37.4	38.0	1.73	2.7	0.5	36.3	1.02	1.7	1.4	12	LH
K4TDAT	34.9	33.7 L	35.4	36.0	35.0	0.31	2.4	0.9	35.1	0.29	2.8	1.2	12	LA
KDFCZX	34.3	33.3	32.8	34.0	33.6	-0.36	2.1	0.7	33.6	-0.64	2.2	0.5 L	12	LZ
KUP433_AL	32.2	32.6	33.4	35.1	33.3	-0.48	2.2	1.3	34.6	0.00	2.6	2.6	12	AL
KVG3G2	37.0	38.6	37.0	37.4	37.5	1.48	2.5	0.8	37.2	1.59	2.4	0.8	12	LA
L46AEX	33.7	33.3	32.5	32.1	32.9	-0.67	2.3	0.7	34.5	-0.07	2.3	1.4	12	LH

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Containerboard Interlaboratory Testing Program

Analysis 224

STFI, 56 lb Linerboard - 56G3

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
L899M6	31.2	30.7	33.0	No Data	31.6	-1.28	2.1	1.2	31.1	-2.17 *	2.4	4.6 H	11	LY
L899M6_AL	29.8 *L	29.8 *	30.2	No Data	29.9	-2.08 *	1.4	0.2 L	30.6	-2.44 *	2.1	1.8	11	AL
LNDF37	35.0	35.0	33.8	34.6	34.6	0.12	2.2	0.6	34.0	-0.35	2.3	0.9	12	LZ
LU6MMZ	37.3	45.9 XH	27.8 *H	36.8	37.0	1.24	3.4	7.4 H	36.8	1.35	3.6	8.9 H	12	LZ
NMW3BF	34.8	33.7	32.5 L	33.6	33.7	-0.33	1.9	0.9	34.0	-0.37	2.0	0.8	12	LA
PBBDQZ	33.7	37.0	35.9	34.9	35.4	0.48	2.8	1.4	35.4	0.50	2.6	1.9	9	LU
PQR97W	13.5 XL	36.9	36.8 L	37.7 L	31.2	-1.47	1.4	11.8 H	34.9	0.22	2.0	6.8 H	12	LH
Q4WRHW_AI	33.3	34.4	35.2	34.3	34.3	-0.03	1.8	0.8	34.3	-0.15	2.0	1.0	12	XX
QTV4PY_AL	34.4	34.6	34.7	37.9	35.4	0.48	2.5	1.7	34.9	0.18	2.4	1.1	12	XX
R8AREN	36.9	37.2	37.8	37.8	37.4	1.45	2.7	0.4	37.6	1.88	2.7	0.9	12	LA
T6DV3Y	33.9	34.8	34.0	34.7	34.3	-0.01	2.2	0.5	35.2	0.39	2.3	1.3	12	LU
T84WA9	35.8	35.7	34.8	35.3	35.4	0.50	1.9	0.4	35.5	0.57	2.3	0.4 L	12	XX
TAALBV_AL	47.2 XH	47.5 XH	53.0 XH	40.9 XH	47.1	6.03 X	20.0	4.9 H	45.8	6.93 X	19.5	2.8	12	XX
UDQ7VQ_AL	35.1 L	34.6	34.8	34.3	34.7	0.16	2.0	0.3 L	34.5	-0.08	2.0	0.7	12	AL
UEH3KK	32.7	33.6	32.1	32.9	32.8	-0.71	2.2	0.6	32.1	-1.51	2.1	0.7	12	LU
UEH3KK_AL	35.0	33.9	34.5	33.6	34.2	-0.07	2.0	0.6	33.9	-0.40	2.0	0.5 L	12	AL
VHHT46	32.9	32.9 H	31.8 H	33.1	32.7	-0.80	3.2	0.6	34.1	-0.31	4.5	1.5	10	TT
VN4QRR	33.5	33.7	33.1	32.3 L	33.2	-0.56	1.6	0.6	33.0	-0.98	1.7	0.6 L	12	LW
VVPLVG	33.2 L	34.5	33.2	34.4	33.8	-0.25	2.1	0.7	33.0	-0.99	2.3	1.2	12	XX
Y3UPA6_AL	44.9 X	42.5 X	43.8 X	37.4	42.1	3.66 X	2.4	3.3	42.8	5.08 X	2.5	2.5	8	AL
YDAJMJ_AL	37.1	35.6	33.8	35.7	35.6	0.57	2.4	1.4	35.1	0.31	2.5	1.0	12	AL
YH784Q_AL	35.9	34.8	35.2	34.0	35.0	0.30	2.0	0.8	35.0	0.24	2.1	0.5 L	12	AL

Consensus (All Labs) Results

Wk Mean	34.58	34.59	34.26	34.75	Month Mean	34.35	Grand Mean	34.59
Avg SDr	2.41	2.28	2.30	2.31	Avg SD	2.32	Avg SD	2.57
SD btwn Labs	2.39	2.16	2.40	1.96	SD btwn Labs	2.12	SD btwn Labs	1.62
Labs Incld	53	53	54	52	SD btwn Wks	2.21	SD btwn Wks	2.17
Labs Excld	4	4	3	3	Labs Incld	54	Labs Incld	52
Labs not Rcvd	0	0	0	2				

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Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	BK	Buchel Strip Compression Tester BK-155
LA	L&W Autoline (224 Enrollment)	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

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	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3X6LTA	0.3	-7.93 X	0.01	L	59.5	-5.91 X	102.54 H	3	LA
3X6LTA_AL	132.9	-0.66	17.07		155.4	0.93	23.81	3	AL
423JG8_AL	121.4	-1.29	7.97	L	121.0	-1.52	10.41	4	AL
6PMW6L	135.5	-0.51	11.96		159.5	1.23	19.98	4	EV
78ZVPA	140.4	-0.25	18.58		140.7	-0.11	1.39 L	4	LS
7Y7M6H	133.6	-0.62	19.19		134.5	-0.55	3.44	4	LA
8FAJ2M	227.4	4.53 X	25.10		210.7	4.88 X	17.53	4	LS
9BCHCD	161.9	0.93	28.54		141.8	-0.03	17.98	3	LS
A4AT9E	145.4	0.03	24.29		125.2	-1.22	14.00	4	LA
AJ2PAA	135.0	-0.54	17.24		137.0	-0.37	2.88	4	EV
AUJAU7	163.5	1.02	14.36		165.8	1.68	18.55	4	LA
BGPD6D	123.6	-1.17	17.13		127.1	-1.08	3.90	4	XX
C3B46A	157.7	0.70	21.74		155.6	0.95	1.60 L	4	EV
C7BFZ9	149.3	0.24	12.17		150.1	0.56	7.02	4	EV
CMV7Z9_AL	121.1	-1.30	23.65		124.1	-1.30	14.13	4	AL
GKURFY	139.5	-0.30	23.49		139.5	-0.20	0.00	1	XX
K4TDAT	167.9	1.26	13.13		161.5	1.37	9.62	4	LA
KDFCZX	132.6	-0.67	16.04		132.6	-0.69	0.00	1	LS
KUP433_AL	116.7	-1.55	13.73		126.3	-1.14	23.18	4	AL
KVG3G2	167.9	1.26	10.43		157.3	1.07	7.22	4	LA
L899M6_AL	134.7	-0.56	16.78		125.1	-1.23	7.11	4	AL
LNDF37	147.1	0.12	15.92		148.8	0.46	3.10	4	EV
NMW3BF	168.3	1.28	10.71		156.1	0.99	13.57	3	EV
PBBDQZ	138.5	-0.35	12.00		133.2	-0.65	12.03	3	EV
TAALBV_AL	141.6	-0.18	16.07		134.5	-0.55	7.32	4	AL
UEH3KK	181.0	1.98 *	25.77		156.4	1.01	21.43	3	XX
Y3UPA6_AL	183.5	2.12 *	21.96		164.1	1.56	17.49	3	AL
YDAJMJ_AL	140.9	-0.22	31.86	H	136.4	-0.42	17.01	4	AL
YHKUDR	130.1	-0.81	18.75		132.0	-0.74	2.86	4	LS

Consensus (All Labs) Results

Month Mean	144.88	Grand Mean	142.28
Avg SD	18.70	Avg SD Months	13.29
SD btwn Labs	18.23	SD btwn Labs	14.01
Labs Incld	27	Labs Incld	27

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Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	EV	Emveco Microgage Model 210-R
LA	L&W Autoline (228 Enrollment)	LS	L&W 263
XX	Instrument make/model not specified by lab		

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Containerboard Interlaboratory Testing Program

Analysis 229

Roughness - Sheffield Method, 42 lb Linerboard - 42H2

TAPPI Official Test Method T538

	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3HT6JM	2,972.3	324.01 X	12.30	H	1,650.4	154.70 X	1,501.40 H	4	LA
3X6LTA_AL	372.6	-0.10	6.04		369.5	-0.55	2.72	3	AL
423JG8_AL	370.3	-0.39	9.37		368.6	-0.67	2.31	4	AL
6K9EN4	381.1	0.96	13.26	H	383.1	1.09	4.55	4	XX
FQY9CE	376.7	0.41	6.02		379.7	0.68	2.43	4	XX
KDFCZX	379.1	0.70	5.41		381.3	0.88	4.59	4	XX
L899M6_AL	358.6	-1.85 *	8.66		358.7	-1.87 *	0.21 L	4	AL
PLWGZK	368.8	-0.58	5.45		371.5	-0.31	12.76 H	4	TS
Q4WRHW_AL	374.6	0.14	9.36		382.7	1.04	5.55	4	AL
QTV4PY_AL	386.3	1.61	3.86		382.9	1.07	2.30	4	XX
R8AREN	413.2	4.96 X	1.23	L	413.0	4.72 X	0.28	2	XX
UDQ7VQ_AL	379.2	0.72	7.90		376.4	0.28	3.26	4	AL
UEH3KK_AL	370.4	-0.38	7.47		370.3	-0.46	0.46 L	3	AL
YDAJMJ_AL	363.1	-1.29	4.86		365.2	-1.07	2.77	4	AL
YH784Q_AL	364.6	-1.10	6.57		364.2	-1.20	0.47 L	4	AL
YHKUDR	382.8	1.17	9.54		382.8	1.06	0.00	1	LA

Consensus (All Labs) Results

Month Mean	373.44	Grand Mean	374.05
Avg SD	7.79	Avg SD Months	4.62
SD btwn Labs	8.02	SD btwn Labs	8.25
Labs Incld	14	Labs Incld	14

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	LA	L & W Autoline (229 Enrollment)
TS	TMI Monitor/Smoothness	XX	Instrument make/model not specified by lab

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	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
3TV7JL	123.2	-0.74	7.05	110.7	-1.19	8.77	4	XX
6K9EN4	149.1	1.21	5.38	148.4	1.21	2.39	4	HY
6PMW6L	126.4	-0.50	6.15	125.5	-0.25	6.98	4	TM
7Y7M6H	141.8	0.66	4.82	152.1	1.45	11.58	4	HY
9JMJXE	112.4	-1.55	9.20	116.8	-0.80	3.03	4	SC
AJ2PAA	140.8	0.59	6.98	142.9	0.86	3.19	4	TM
AWA994	152.4	1.46	7.92	146.7	1.10	4.18	4	TM
C3B46A	131.8	-0.09	5.76	129.3	-0.01	3.30	4	TM
CCCRYR	130.2	-0.21	5.50	142.5	0.83	10.64	3	HY
FQY9CE	107.6	-1.91 *	8.26	105.1	-1.55	3.08	4	SC
KUP433	123.4	-0.72	8.29	116.9	-0.79	5.36	4	TM
LNDF37	138.9	0.44	9.18	138.8	0.60	3.24	4	HZ
NMW3BF	126.0	-0.53	10.56	123.7	-0.36	2.05	4	TM
PBBDQZ	84.0	-3.68 X	3.16	91.0	-2.44 *	6.72	3	TM
Q4WRHW	154.8	1.64	5.93	126.1	-0.21	47.07 H	4	LZ
QTV4PY	153.6	1.55	10.11	143.6	0.90	8.54	4	HY
T6DV3Y	130.6	-0.18	4.56	124.4	-0.32	4.33	4	HZ
TAALBV	134.0	0.08	10.75	141.8	0.79	19.89 H	4	SC
UDQ7VQ	123.6	-0.71	6.66	123.3	-0.39	2.25	4	TM
UEH3KK	123.6	-0.71	6.73	122.6	-0.43	2.46	3	TM
VHHT46	133.7	0.05	15.19 H	127.9	-0.09	9.89	4	TM
YDAJMJ	148.2	1.14	7.60	138.7	0.59	8.14	4	TM
YH784Q	113.6	-1.45	8.37	116.1	-0.84	1.82	4	TM
YHKUDR	139.2	0.47	3.96	147.2	1.13	6.70	4	HY

Consensus (All Labs) Results

Month Mean	133.00	Grand Mean	129.38
Avg SD	7.99	Avg SD Months	7.33
SD btwn Labs	13.30	SD btwn Labs	15.72
Labs Incld	23	Labs Incld	23

Consensus By Method

Test Method	Group Mean	SD btwn Group	Difference from Grand Mean	Labs Included
Scott Bond Type	131.34	13.04	1.66	18
Modified Scott Bond Mechanics	148.55	6.51	15.55	3

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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

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	Monthly Results				Cumulative Results			
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months
423JG8	27.7	0.03	5.99	H	31.2	1.30	2.65	4
6K9EN4	27.2	-0.16	2.10		25.2	-0.99	3.02	4
6PMW6L	30.8	1.06	2.39		30.2	0.92	1.94	4
78ZVPA	27.8	0.05	0.84		27.6	-0.08	0.30 L	4
7Y7M6H	27.0	-0.21	2.55		28.4	0.23	2.34	4
8FAJ2M	22.0	-1.88	1.00		21.5	-2.38 *	0.58	4
9BCHCD	30.4	0.92	1.67		29.3	0.58	1.10	3
AJ2PAA	31.2	1.19	1.92		29.4	0.65	2.27	4
AUJAU7	28.6	0.32	2.41		28.1	0.13	1.60	4
BGPD6D	28.8	0.39	4.97		28.1	0.12	1.65	4
C3B46A	25.8	-0.61	1.30		25.9	-0.70	5.74 H	4
C7BFZ9	29.8	0.72	1.98		29.5	0.66	0.57	4
CCCRYR	27.8	0.05	0.84		98.7	27.01 X	122.40 H	3
CMV7Z9	24.4	-1.08	1.14		25.9	-0.70	2.13	4
FQY9CE	23.4	-1.42	1.14		25.8	-0.74	1.61	4
HFEJRY	26.0	-0.55	0.71		26.6	-0.44	2.78	4
KDFCZX	32.0	1.46	4.12		30.2	0.94	2.64	4
KUP433	33.6	1.99 *	2.53		32.0	1.63	1.45	4
LDT93G	26.8	-0.28	1.64		25.9	-0.72	0.68	4
LNDF37	25.6	-0.68	3.29		25.0	-1.07	1.38	4
PBBDQZ	28.0	0.12	2.00		29.4	0.63	3.52	3
PYLGRM	24.1	-1.18	7.77	H	25.0	-1.05	1.27	2
Q4WRHW	27.0	-0.21	2.76		27.8	0.03	1.73	4
QTV4PY	30.8	1.06	1.79		28.2	0.17	2.39	4
TAALBV	33.8	2.05 *	3.25		34.0	2.40 *	1.26	4
UEH3KK	26.6	-0.35	3.13		25.3	-0.94	3.03	3
Y3UPA6	26.1	-0.51	3.51		26.8	-0.35	0.67	3
YDAJMJ	28.6	0.32	4.88		30.2	0.93	1.98	4
YH784Q	24.2	-1.15	1.10		24.6	-1.22	1.20	4
YM222R	23.3	-1.46	3.44		27.9	0.06	3.44	4

Consensus (All Labs) Results

Month Mean	27.64	Grand Mean	27.75
Avg SD	3.07	Avg SD Months	2.26
SD btwn Labs	2.99	SD btwn Labs	2.63
Labs Incld	30	Labs Incld	29

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Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked

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	Monthly Results				Cumulative Results				
WebCode	Mean	CPV	SD		Mean	CPV	SD Months	Months	Inst
3FMMLQ	33.6	0.84	4.79	H	32.5	0.02	1.25	4	XX
3HT6JM	34.0	1.06	2.03		31.3	-0.88	2.35	4	LA
3X6LTA_AL	30.3	-1.10	1.64		30.9	-1.17	1.17	3	XX
423JG8_AL	29.7	-1.41	1.45		30.5	-1.48	0.82	4	AL
6K9EN4	32.3	0.10	4.10	H	32.5	0.05	1.28	4	TP
6PMW6L_AL	32.9	0.41	2.04		32.7	0.21	0.35	4	AL
78ZVPA	32.1	-0.03	2.60		32.1	-0.30	0.26	4	LP
7Y7M6H	33.7	0.90	2.11		34.3	1.43	1.54	4	LP
8FAJ2M	28.9	-1.88	2.36		30.0	-1.91	0.72	4	TD
8R2794	27.7	-2.58 *	1.77		27.8	-3.58 X	2.82 H	4	GG
9BCHCD	26.5	-3.28 X	2.27		28.4	-3.13 X	3.90 H	3	XX
9YFCHF	32.6	0.26	1.78		31.0	-1.08	1.06	4	LP
A4AT9E	31.8	-0.23	2.52		31.6	-0.66	1.24	4	LA
AJ2PAA	31.5	-0.36	2.32		31.9	-0.43	0.43	4	LP
AUJAU7	30.5	-0.99	1.20		30.3	-1.66	1.68	4	LA
BGAULF	32.8	0.37	2.66		32.8	0.27	0.00	1	XX
BGPD6D	35.9	2.15 *	3.55		35.0	2.00 *	1.28	3	LP
C3B46A	32.8	0.36	4.20	H	33.0	0.42	0.68	4	GA
CMV7Z9_AL	30.2	-1.11	1.61		30.6	-1.44	0.51	4	AL
GKURFY	31.1	-0.60	1.68		31.1	-1.02	0.00	1	XX
K4TDAT	31.0	-0.65	1.66		32.8	0.27	1.49	4	LA
KDFCZX	29.9	-1.31	3.72		32.5	0.05	1.85	4	GA
KUP433_AL	31.4	-0.43	1.43		33.2	0.60	1.86	3	AL
KVG3G2	34.0	1.09	2.55		33.7	0.99	1.00	4	LA
L899M6_AL	33.9	1.01	2.00		33.7	0.98	0.60	4	AL
LDT93G	30.6	-0.92	2.41		31.6	-0.65	0.98	4	TD
LNDF37	31.8	-0.18	2.13		34.0	1.17	2.15	4	LP
PBBDQZ_AL	32.2	0.00	1.63		32.8	0.24	0.98	4	AL
Q4WRHW_AL	34.1	1.12	1.48		34.1	1.28	0.82	4	AL
QTV4PY	33.2	0.59	3.24		31.4	-0.81	1.25	4	GG
QTV4PY_AL	31.4	-0.47	1.01	L	32.2	-0.19	0.60	4	XX
R8AREN	31.3	-0.49	0.88	L	32.5	0.06	1.39	4	LP
TAALBV_AL	34.0	1.07	1.65		32.3	-0.12	1.32	4	AL
UDQ7VQ_AL	32.8	0.37	2.04		32.5	0.08	0.32	4	AL
UEH3KK	32.8	0.38	2.77		33.1	0.49	0.37	3	LP
UEH3KK_AL	34.1	1.13	1.73		34.7	1.73	1.04	3	AL
VHHT46	31.1	-0.59	1.40		32.0	-0.38	1.69	4	GA
Y3UPA6_AL	36.5	2.51 *	2.76		35.9	2.68 *	0.59	3	AL
YDAJMJ_AL	31.4	-0.42	2.34		32.1	-0.25	1.27	4	AL

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	Monthly Results			Cumulative Results				
WebCode	Mean	CPV	SD	Mean	CPV	SD Months	Months	Inst
YH784Q_AL	32.2	0.02	3.46	31.5	-0.72	0.86	4	AL
YHKUDR	31.9	-0.15	1.70	32.1	-0.25	0.63	4	LP
YM222R_AL	32.6	0.24	2.61	32.8	0.27	1.11	4	AL
ZQUHRQ	32.1	-0.06	2.64	32.6	0.10	0.46	4	LP

Consensus (All Labs) Results

Month Mean	32.16	Grand Mean	32.44
Avg SD	2.44	Avg SD Months	1.18
SD btwn Labs	1.72	SD btwn Labs	1.30
Labs Incld	42	Labs Incld	41

Key to Instrument Codes Reported by Participants

AL	L & W Autoline 400	GA	Gurley Precision #4340 Automatic Densometer
GG	Gurley Precision #4320 Densometer	LA	L&W Autoline (237 Enrollment)
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

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	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
2VM29F	59.0 L	59.1 L	59.7 L	59.2 L	59.2	0.40	0.6	0.3	59.2	0.40	0.6	0.3	4	XX
3BFWHK	60.7	57.5	56.1	54.6 H	57.2	-0.23	4.2	2.6	57.2	-0.23	4.2	2.6	4	LD
3FMMLQ	54.8	55.6	54.3	55.6	55.1	-0.91	3.9	0.6	55.1	-0.91	3.9	0.6	4	LD
3HT6JM	56.8	54.2	55.3	57.6 H	56.0	-0.63	5.0	1.5	56.0	-0.63	5.0	1.5	4	LD
3X6LTA	56.5	55.2	55.4	55.0	55.5	-0.77	3.7	0.7	55.5	-0.77	3.7	0.7	4	LD
6K9EN4	58.6	62.9	58.4	59.7	59.9	0.61	3.7	2.1	59.9	0.61	3.7	2.1	4	LC
6MZBCX	65.0 *	61.7	63.2	64.2 *	63.5	1.76	3.5	1.4	63.5	1.76	3.5	1.4	4	LD
78ZVPA	57.9	58.1	57.7	58.0	57.9	-0.01	2.4	0.2 L	57.9	-0.01	2.4	0.2 L	4	LD
7KPRPM	53.3 L	53.7 L	52.2 L	52.9 L	53.0	-1.57	0.9	0.6	53.0	-1.57	0.9	0.6	4	TU
7UZW2D	59.0	60.8	60.8 H	57.0	59.4	0.45	4.7	1.8	59.4	0.45	4.7	1.8	4	LD
7Y7M6H	58.0	57.9	58.7	No Data	58.2	0.08	4.1	0.5	58.2	0.08	4.1	0.5	3	XX
8UVY4L	60.7 L	61.8	62.0	63.4	62.0	1.27	2.3	1.1	62.0	1.27	2.3	1.1	4	TB
8XUBZL	60.3	60.7	64.0	60.2	61.3	1.05	2.3	1.8	61.3	1.05	2.3	1.8	4	LC
9JMJXE	54.0	52.3 H	54.5	54.1	53.7	-1.35	4.3	1.0	53.7	-1.35	4.3	1.0	4	LC
9YFCHF	56.9	54.7	53.6	54.5	54.9	-0.96	3.8	1.4	54.9	-0.96	3.8	1.4	4	LD
A4AVXH	61.4	62.1	61.9	63.9 *H	62.3	1.38	5.3	1.1	62.3	1.38	5.3	1.1	4	LD
A7YW6R	56.4	56.4	57.7	56.1	56.6	-0.42	2.3	0.7	56.6	-0.42	2.3	0.7	4	EM
ACKWJJ	57.9	58.6 L	56.9	56.9	57.6	-0.13	3.2	0.8	57.6	-0.13	3.2	0.8	4	LD
AUJAU7	53.4	56.5	54.3	55.7	55.0	-0.95	4.0	1.4	55.0	-0.95	4.0	1.4	4	MB
BGPD6D	59.7	68.9 X	58.7	59.8	61.8	1.21	3.8	4.8 H	61.8	1.21	3.8	4.8 H	4	LD
C3B46A	53.0	52.1	51.8	53.6	52.6	-1.70	3.5	0.9	52.6	-1.70	3.5	0.9	4	LD
C7BFZ9	59.3	57.1	60.2	59.0	58.9	0.29	3.1	1.3	58.9	0.29	3.1	1.3	4	EN
CMV7Z9	56.9	51.5	60.5	54.5	55.9	-0.67	3.9	3.8 H	55.9	-0.67	3.9	3.8 H	4	LZ
CYRCT7	55.5	54.9	55.0 L	54.2	54.9	-0.97	2.6	0.6	54.9	-0.97	2.6	0.6	4	TH
E4T6Z8	55.0 H	58.2	58.1 H	57.4	57.2	-0.25	5.9	1.5	57.2	-0.25	5.9	1.5	4	LD
FJ7VGK	54.6	52.3	54.4	52.1	53.4	-1.46	2.4	1.3	53.4	-1.46	2.4	1.3	4	LD
G7AALA	59.6	58.6	62.6	61.3	60.5	0.81	4.2	1.8	60.5	0.81	4.2	1.8	4	LD
GJG3DL	59.0	57.3	57.7	57.7	57.9	-0.01	3.9	0.7	57.9	-0.01	3.9	0.7	4	LZ
HFEJRY	62.8	61.2	61.2	61.1	61.6	1.14	3.8	0.8	61.6	1.14	3.8	0.8	4	LD
K4TDAT	55.5	53.5	53.9	50.2 *	53.3	-1.48	3.8	2.2	53.3	-1.48	3.8	2.2	4	MB
KQ4GAF	58.5 L	58.5 L	58.6 L	58.5 L	58.5	0.17	0.7	0.1 L	58.5	0.17	0.7	0.1 L	4	LD
KVG3G2	64.3	62.8	60.0	60.2	61.8	1.22	3.4	2.1	61.8	1.22	3.4	2.1	4	TU
L46AEX	57.7	58.8	58.5	59.7	58.7	0.22	2.9	0.8	58.7	0.22	2.9	0.8	4	LD
LDT93G	59.5	55.8	56.7	58.3	57.6	-0.13	3.7	1.6	57.6	-0.13	3.7	1.6	4	LZ
LNDF37	54.8	56.1	54.8	56.4	55.5	-0.78	2.8	0.8	55.5	-0.78	2.8	0.8	4	LZ

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Containerboard Interlaboratory Testing Program

Analysis 240

Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM13

TAPPI Official Test Method T809

Report #648
September 2023

	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
LU6MMZ	60.8	60.1	No Data	61.1	60.7	0.86	3.5	0.5	60.7	0.86	3.5	0.5	3	LD
NMW3BF	60.1	60.1	59.2	60.0	59.9	0.60	2.5	0.4	59.9	0.60	2.5	0.4	4	LC
PBBDQZ	No Data	59.6	59.8	No Data	59.7	0.55	3.9	0.1	59.7	0.55	3.9	0.1	2	LC
PQR97W	61.1 H	63.9	62.2	63.0	62.5	1.45	4.9	1.2	62.5	1.45	4.9	1.2	4	LD
Q4WRHW	55.8	53.3 L	56.2	52.8	54.5	-1.09	3.3	1.7	54.5	-1.09	3.3	1.7	4	LD
QTV4PY	58.9	59.8	58.2	55.5	58.1	0.04	3.0	1.9	58.1	0.04	3.0	1.9	4	LD
T6DV3Y	54.9	55.1	54.3	55.5	55.0	-0.96	3.2	0.5	55.0	-0.96	3.2	0.5	4	LD
T84WA9	60.4	60.0	59.8	59.5	59.9	0.63	3.4	0.4	59.9	0.63	3.4	0.4	4	LD
UEH3KK	52.4	52.4	51.8	51.0 *	51.9	-1.93	2.9	0.7	51.9	-1.93	2.9	0.7	4	LD
UW3V9N	66.3 *	64.9 *H	66.3 *	68.3 XH	66.4	2.69 *	5.2	1.4	66.4	2.69 *	5.2	1.4	4	TX
VD8MNX	59.1	59.8	60.3	59.3	59.6	0.53	1.7	0.5	59.6	0.53	1.7	0.5	4	MB
VVPLVG	56.6 L	59.2 L	57.1	58.0 L	57.7	-0.08	1.3	1.1	57.7	-0.08	1.3	1.1	4	XX
WETN7Q	55.2	55.2	54.7	56.1	55.3	-0.85	2.4	0.6	55.3	-0.85	2.4	0.6	4	LD
YDAJMJ	66.1 *	66.8 *	54.3	55.6	60.7	0.87	4.1	6.7 H	60.7	0.87	4.1	6.7 H	4	LD
YHKUDR	No Data	No Data	No Data	56.9	56.9	-0.33	1.9	0.0	56.9	-0.33	1.9	0.0	1	LD
ZQUHRQ	58.8	58.6	60.1	58.2	58.9	0.30	3.4	0.8	58.9	0.30	3.4	0.8	4	LD

Consensus (All Labs) Results

Wk Mean	58.22	57.90	57.83	57.40	Month Mean	57.96	Grand Mean	57.96
Avg SDr	3.66	3.33	3.60	3.40	Avg SD	3.50	Avg SD	3.50
SD btwn Labs	3.29	3.59	3.34	3.27	SD btwn Labs	3.15	SD btwn Labs	3.15
Labs Incld	49	49	49	48	SD btwn Wks	1.74	SD btwn Wks	1.74
Labs Excld	0	1	0	1	Labs Incld	51	Labs Incld	51
Labs not Rcvd	2	1	2	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
TB	TMI Monitor/Compression Tester, 17-70	TH	TMI Compression Tester, Model 17-76
TU	TMI Universal Crush Tester (TMI K440)	TX	TMI Crush Tester (model not specified)
XX	Instrument make/model not specified by lab		

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	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
2VM29F	65.1 L	65.3 L	64.8 L	65.1 L	65.1	-0.47	0.9	0.2 L	65.1	-0.47	0.9	0.2 L	4	XX
3HT6JM	55.5 *	53.3 *H	55.8 *H	55.0 *H	54.9	-3.27 X	7.8	1.1	54.9	-3.27 X	7.8	1.1	4	LD
3X6LTA	61.9	61.1	61.2	65.1	62.3	-1.23	4.4	1.9	62.3	-1.23	4.4	1.9	4	XX
6K9EN4	71.2	71.6	63.0	65.4	67.8	0.28	3.9	4.2	67.8	0.28	3.9	4.2	4	LC
78ZVPA	68.3	68.0	69.1	69.0	68.6	0.50	2.6	0.5	68.6	0.50	2.6	0.5	4	LD
7Y7M6H	67.3	72.7	68.8	No Data	69.6	0.77	4.6	2.8	69.6	0.77	4.6	2.8	3	XX
9YFCHF	73.8	69.5	71.6	69.2	71.0	1.16	3.5	2.1	71.0	1.16	3.5	2.1	4	LD
BGAULF	67.6 L	66.5	69.5	70.6	68.5	0.48	2.1	1.9	68.5	0.48	2.1	1.9	4	LZ
BGPD6D	64.6	57.7 L	67.6	70.7	65.1	-0.45	3.7	5.6	65.1	-0.45	3.7	5.6	4	LD
CMV7Z9	63.8	62.0	63.0	57.7 *H	61.6	-1.41	4.7	2.7	61.6	-1.41	4.7	2.7	4	LZ
E4T6Z8	67.2	66.1	66.7	66.2	66.5	-0.07	3.4	0.5	66.5	-0.07	3.4	0.5	4	LD
G7AALA	68.8	72.8	68.2	67.6	69.3	0.70	3.9	2.3	69.3	0.70	3.9	2.3	4	LD
GJG3DL	63.6	65.4	62.8	66.3	64.5	-0.62	4.5	1.6	64.5	-0.62	4.5	1.6	4	LZ
PBBDQZ	No Data	70.4 H	74.8	No Data	72.6	1.60	5.5	3.1	72.6	1.60	5.5	3.1	2	LC
Q4WRHW	72.9	68.8	73.7	68.5	71.0	1.15	3.1	2.7	71.0	1.15	3.1	2.7	4	LD
QTV4PY	66.4	71.0	67.0	67.5	68.0	0.32	3.7	2.1	68.0	0.32	3.7	2.1	4	LD
UEH3KK	56.9 H	57.6 H	59.7 H	58.6	58.2	-2.36 *	7.2	1.2	58.2	-2.36 *	7.2	1.2	4	LD
VD8MNX	67.5	67.3 L	67.4 L	67.8 L	67.5	0.20	1.7	0.2 L	67.5	0.20	1.7	0.2 L	4	MB
VVPLVG	69.5 L	69.2 L	68.6 L	69.6 L	69.2	0.67	1.0	0.5 L	69.2	0.67	1.0	0.5 L	4	XX
YDAJMJ	56.6	54.8	69.8	67.0	62.1	-1.30	3.7	7.5 H	62.1	-1.30	3.7	7.5 H	4	LD
ZQUHRQ	66.9	66.5	67.9	67.0	67.1	0.09	4.0	0.6	67.1	0.09	4.0	0.6	4	LD

Consensus (All Labs) Results

Wk Mean	65.77	65.59	66.72	65.99
Avg SDr	3.56	4.04	4.09	4.72
SD btwn Labs	5.01	5.77	4.58	4.34
Labs Incld	20	21	21	19
Labs Excld	0	0	0	0
Labs not Rcvd	1	0	0	2

Month Mean	66.79
Avg SD	3.89
SD btwn Labs	3.64
SD btwn Wks	2.86
Labs Incld	20

Grand Mean	66.79
Avg SD	3.89
SD btwn Labs	3.64
SD btwn Wks	2.86
Labs Incld	20

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
XX	Instrument make/model not specified by lab	

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Containerboard Interlaboratory Testing Program

Analysis 255

Ring Crush (RCT), 26 lb Corrugating Medium - CM13

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
2VM29F	45.2 L	44.9 L	44.5 L	45.0 L	44.9	1.20	0.5	0.3	44.9	1.20	0.5	0.3	4	XX
3FMMLQ	46.5	45.8	46.3 *	45.2 H	46.0	1.63	3.6	0.6	46.0	1.63	3.6	0.6	4	LD
3X6LTA	40.3	36.7	41.0	41.0	39.8	-0.86	3.7	2.1	39.8	-0.86	3.7	2.1	4	LD
6K9EN4	41.9	45.4	41.9	42.5	42.9	0.41	3.0	1.7	42.9	0.41	3.0	1.7	4	LC
6MZBCX	40.7	38.9	38.2	42.0	39.9	-0.78	3.3	1.8	39.9	-0.78	3.3	1.8	4	LD
7KPRPM	42.1 L	41.1 L	41.0 L	41.7 L	41.5	-0.17	0.7	0.5	41.5	-0.17	0.7	0.5	4	TU
7UZW2D	39.4	38.8	41.9	36.7	39.2	-1.08	3.4	2.2	39.2	-1.08	3.4	2.2	4	LD
7Y7M6H	44.0	39.7	43.5	No Data	42.4	0.21	3.2	2.3	42.4	0.21	3.2	2.3	3	XX
8UVY4L	44.1	43.0	42.0	42.7	43.0	0.44	2.4	0.9	43.0	0.44	2.4	0.9	4	XX
8XUBZL	40.1	40.9	40.2 L	40.3 L	40.4	-0.60	1.6	0.4	40.4	-0.60	1.6	0.4	4	XX
9YFCHF	41.8	44.0	40.5	41.1	41.8	-0.02	3.1	1.5	41.8	-0.02	3.1	1.5	4	LD
A4AVXH	45.8	46.9	45.4	46.8	46.2	1.74	3.5	0.7	46.2	1.74	3.5	0.7	4	LD
ACKWJJ	41.9	43.4	43.2	44.0	43.1	0.50	3.4	0.9	43.1	0.50	3.4	0.9	4	LD
AUJAU7	43.7	45.1	42.1	43.3	43.5	0.66	3.8	1.2	43.5	0.66	3.8	1.2	4	MB
CYRCT7	36.9	35.8 *	36.4 *	34.2 *	35.8	-2.43 *	2.3	1.2	35.8	-2.43 *	2.3	1.2	4	TH
KDFCZX	40.4	41.4	40.6	41.6	41.0	-0.37	3.9	0.6	41.0	-0.37	3.9	0.6	4	LD
KQ4GAF	44.3 L	44.4 L	44.4 L	44.5 L	44.4	1.01	0.5	0.1 L	44.4	1.01	0.5	0.1 L	4	LD
LU6MMZ	40.7	44.5	No Data	44.4	43.2	0.52	3.8	2.2	43.2	0.52	3.8	2.2	3	LZ
PQR97W	38.1	39.1	41.2 H	36.8 H	38.8	-1.24	4.7	1.9	38.8	-1.24	4.7	1.9	4	LD
Q4WRHW	45.3	43.4	42.4	43.1	43.6	0.66	3.7	1.3	43.6	0.66	3.7	1.3	4	LD
QGGACL	39.4	43.3	40.6	40.0	40.8	-0.43	3.5	1.8	40.8	-0.43	3.5	1.8	4	TH
QTV4PY	42.7	41.4	44.3	41.7	42.5	0.25	3.6	1.3	42.5	0.25	3.6	1.3	4	LD
R8AREN	38.1	39.3	37.9	39.7	38.7	-1.26	3.5	0.9	38.7	-1.26	3.5	0.9	4	LD
T6DV3Y	42.2	42.2	43.1	42.5	42.5	0.24	2.5	0.4	42.5	0.24	2.5	0.4	4	LD
UW3V9N	35.2 *	36.9	41.2	37.3	37.6	-1.70	3.2	2.5	37.6	-1.70	3.2	2.5	4	LZ
VD8MNX	42.6	42.1	42.7 L	42.1	42.4	0.19	1.5	0.3	42.4	0.19	1.5	0.3	4	MB
WETN7Q	46.3	45.8	44.2	44.5	45.2	1.31	2.4	1.0	45.2	1.31	2.4	1.0	4	LC
ZQUHRQ	43.7	42.1	39.7	42.0	41.9	-0.01	3.3	1.7	41.9	-0.01	3.3	1.7	4	LD

Consensus (All Labs) Results

Wk Mean	41.91	42.01	41.86	41.73	Month Mean	41.90	Grand Mean	41.90
Avg SDr	3.10	3.33	3.26	2.65	Avg SD	3.11	Avg SD	3.11
SD btwn Labs	2.88	2.99	2.31	2.90	SD btwn Labs	2.49	SD btwn Labs	2.49
Labs Incld	28	28	27	27	SD btwn Wks	1.40	SD btwn Wks	1.40
Labs Excld	0	0	0	0	Labs Incld	28	Labs Incld	28
Labs not Rcvd	0	0	1	1				

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

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Containerboard Interlaboratory Testing Program

Analysis 261

STFI, 26 lb Corrugating Medium - CM13

TAPPI Official Test Method T826

Report #648
September 2023

	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
2VM29F	14.8 L	14.5 L	15.1 XL	15.1 *L	14.9	2.19 *	0.2	0.3	14.9	2.19 *	0.2	0.3	4	LZ
3X6LTA	13.0	10.2 X	13.0 L	12.0	12.0	-2.09 *	0.9	1.3 H	12.0	-2.09 *	0.9	1.3 H	4	LZ
6K9EN4	13.9	13.4	13.8	13.9	13.7	0.48	1.1	0.2	13.7	0.48	1.1	0.2	4	LU
A7YW6R	12.9	12.9	13.7	13.3	13.2	-0.33	1.0	0.4	13.2	-0.33	1.0	0.4	4	LH
AUJAU7	14.0	14.2	13.9	13.8	14.0	0.81	1.3	0.2	14.0	0.81	1.3	0.2	4	LA
C3B46A	13.7	13.1	13.5	13.0	13.3	-0.15	1.1	0.3	13.3	-0.15	1.1	0.3	4	LU
G7AALA	14.6	13.7 L	14.2	13.8	14.1	0.99	1.1	0.4	14.1	0.99	1.1	0.4	4	LA
GKURFY	13.8	14.1	13.1	13.2	13.5	0.19	1.0	0.5	13.5	0.19	1.0	0.5	4	XX
HFEJRY	12.5	13.5	13.8	13.2	13.2	-0.28	1.2	0.5	13.2	-0.28	1.2	0.5	4	LH
K4TDAT	13.6	12.7	13.5	13.5	13.3	-0.13	1.2	0.4	13.3	-0.13	1.2	0.4	4	LA
KDFCZX	13.3	13.9	13.2 H	12.7	13.2	-0.27	1.2	0.5	13.2	-0.27	1.2	0.5	4	LZ
KVG3G2	16.0 XL	16.2 XL	15.9 XL	16.5 X	16.1	4.05 X	0.7	0.3	16.1	4.05 X	0.7	0.3	4	LA
LU6MMZ	12.5 H	11.8 * No Data		12.1	12.1	-1.90 *	1.4	0.3	12.1	-1.90 *	1.4	0.3	3	XX
PQR97W	13.5	13.5	13.1	14.2	13.6	0.26	1.1	0.5	13.6	0.26	1.1	0.5	4	XX
PYLGRM	13.5	13.7	13.4	13.3	13.4	0.04	1.4	0.2	13.4	0.04	1.4	0.2	4	TT
Q4WRHW	13.2	13.2	12.9 L	12.2	12.9	-0.79	0.9	0.5	12.9	-0.79	0.9	0.5	4	LA
R8AREN	13.9	14.1	14.4 *	14.2	14.2	1.11	1.2	0.2	14.2	1.11	1.2	0.2	4	LH
UEH3KK	12.5	12.0 *H	12.6 *	12.0	12.2	-1.76	1.4	0.3	12.2	-1.76	1.4	0.3	4	LB
V9T47G	13.8	13.7	13.5	13.0	13.5	0.12	1.2	0.4	13.5	0.12	1.2	0.4	4	TX
VVPLVG	13.3	13.4	13.3 L	13.7	13.5	0.05	0.9	0.2	13.5	0.05	0.9	0.2	4	XX
WETN7Q	14.2 L	13.4	13.2	12.8	13.4	-0.03	1.1	0.6	13.4	-0.03	1.1	0.6	4	LH
YDAJMJ	13.7	13.8	13.8	14.3	13.9	0.72	1.1	0.3	13.9	0.72	1.1	0.3	4	LA
YH784Q	14.5	14.0	14.2	14.0	14.2	1.13	1.2	0.2	14.2	1.13	1.2	0.2	4	LA
YHKUDR	No Data	No Data	No Data	13.2	13.2	-0.37	1.1	0.0	13.2	-0.37	1.1	0.0	1	LH

Consensus (All Labs) Results

Wk Mean	13.57	13.45	13.50	13.32	Month Mean	13.42	Grand Mean	13.42
Avg SDr	1.14	1.17	1.08	1.10	Avg SD	1.12	Avg SD	1.12
SD btwn Labs	0.65	0.67	0.48	0.81	SD btwn Labs	0.67	SD btwn Labs	0.67
Labs Incld	22	21	20	23	SD btwn Wks	0.46	SD btwn Wks	0.46
Labs Excld	1	2	2	1	Labs Incld	23	Labs Incld	23
Labs not Rcvd	1	1	2	0				

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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)	TT	TMI Short Span Compression, 17-34 (MB K455)
TX	TMI (model not specified)	XX	Instrument make/model not specified by lab

End of Report

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