**Collaborative Testing Services, Inc.**

# Containerboard Interlaboratory Testing Program

## Participant Summary Report #642 - March 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 | CM12 | Flat Crush Strength (CMT), 26 lb Corrugating Medium |
| 250 | CM12 | Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium |
| 255 | CM12 | Ring Crush (RCT), 26 lb Corrugating Medium |
| 261 | CM12 | STFI, 26 lb Corrugating Medium |

## INTRODUCTION

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

For these tests samples of linerboard and corrugating medium, that each have been separately randomized from narrow rolls, are distributed for testing weekly.  One weight of medium (26 lb.) is used for Concora Flat Crush Strength, Corrugated Fluted Crush Strength, Ring Crush Strength, and STFI Compression.  Two weights of linerboard are tested each month for Mullen Burst, Ring Crush, and STFI Compression: 42 lb. - every month; 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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<h1 style="text-align:center">EXPLANATION OF TABLES</h1>

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.

<h1 style="text-align:center">Definitions of Terms Used</h1>

## 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. |

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**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:**

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**Flag**　　　　　　　　**Explanation**

Data Flags " X " and " * " indicate a laboratory's performance on an average value differed from the consensus.
Data Flags " H " and " L " indicate a laboratory's performance on a standard deviation differed from the consensus.

Flags assigned to Weekly Means, Monthly Mean and Cumulative Mean:
　　X　　　Excluded from the weekly means, monthly means and/or the cumulative mean. Immediate review of data and/or testing procedure is recommended.
　　*　　　Included in the weekly means, monthly means and/or the cumulative mean; however, lab should review testing procedure and monitor future results.

Flags assigned to Weekly Means:
　　H　　　Indicates high within-laboratory standard deviation. The laboratory SD for each week is not shown, but laboratory average SD and consensus average SD values are shown.
　　L　　　Indicates low within-laboratory standard deviation. The laboratory SD for each week is not shown, but laboratory monthly average SD and consensus average SD values are shown.

Flags assigned to Monthly SD Wks and Cumulative SD Wks:
　　H　　　Indicates high variabilty between weekly means (high week-to-week variation).
　　L　　　Indicates low variabilty between weekly means (low week-to-week variation).

Containerboard Interlaboratory Testing Program
Analysis 201
**Top to Bottom Box Compression Strength, Corrugated Boxes** - BX17
TAPPI Official Test Method T804

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| WebCode | Monthly Results | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|
| | Mean | CPV | SD | Mean | CPV | SD Months | Months | Inst |
| 2YKWAX | 868.4 | 0.41 | 28.72 | 891.7 | 0.99 | 26.84 | 3 | LG |
| 3JMY86 | 896.6 | 0.79 | 63.76 | 847.9 | 0.21 | 43.95 | 3 | LM |
| 3M443U | 952.9 | 1.55 | 71.42 | 913.6 | 1.38 | 87.76 | 3 | LN |
| 4U3BGG | 824.6 | -0.18 | 40.43 | 854.0 | 0.31 | 59.79 | 3 | ET |
| 6G7TV8 | 867.0 | 0.39 | 29.38 | 836.0 | 0.00 | 27.13 | 3 | XX |
| AVAEB7 | 816.0 | -0.30 | 91.59 | 826.6 | -0.17 | 13.00 | 3 | ER |
| CQYBUQ | 750.2 | -1.19 | 40.49 | 767.3 | -1.23 | 15.76 | 3 | EX |
| DVZ9FZ | 853.2 | 0.20 | 42.26 | 853.2 | 0.30 | 0.00 | 1 | LG |
| EYWMM3 | 875.0 | 0.50 | 66.64 | 875.1 | 0.69 | 8.90 | 3 | ER |
| GH8LZH | 918.6 | 1.08 | 77.67 | 908.7 | 1.29 | 8.73 | 3 | EX |
| HALK3X | 866.2 | 0.38 | 56.51 | 886.1 | 0.89 | 34.58 | 3 | ES |
| HGQE3K | 896.9 | 0.79 | 63.06 | 874.2 | 0.67 | 88.82 | 3 | LG |
| KYKW6K | 817.9 | -0.28 | 68.89 | 871.1 | 0.62 | 46.25 | 3 | LO |
| LCF8ZP | 764.2 | -1.00 | 83.06 | 818.9 | -0.31 | 77.45 | 2 | LH |
| MFYL4P | 883.1 | 0.60 | 80.76 | 841.7 | 0.10 | 58.52 | 2 | EX |
| NQVGNJ | 760.2 | -1.05 | 97.26 | 746.1 | -1.60 | 15.13 | 3 | ER |
| PFPW2G | 791.2 | -0.64 | 110.44 | 793.3 | -0.76 | 6.17 L | 3 | EX |
| QT84D9 | 741.8 | -1.30 | 14.13 L | 787.1 | -0.87 | 67.79 | 3 | ER |
| RC27P4 | 708.9 | -1.75 | 39.98 | 708.5 | -2.27 * | 38.05 | 3 | LL |
| TNAU98 | 728.1 | -1.49 | 40.53 | 777.8 | -1.04 | 43.39 | 3 | EX |
| TV8LG2 | 906.8 | 0.92 | 97.02 | 884.2 | 0.85 | 25.99 | 3 | EX |
| UKABXD | 916.1 | 1.05 | 109.08 | 901.4 | 1.16 | 18.74 | 3 | LM |
| V2R6UF | 732.2 | -1.43 | 10.11 L | 787.6 | -0.86 | 71.18 | 3 | LL |
| V36ML6 | 826.4 | -0.16 | 60.86 | 817.2 | -0.34 | 40.79 | 3 | LG |
| VLYT3Q | 946.8 | 1.46 | 20.56 | 935.9 | 1.77 | 20.09 | 3 | ER |
| VWFDMM | 899.5 | 0.83 | 17.45 | 836.7 | 0.01 | 91.92 | 3 | LS |
| X3T8CG | 955.1 | 1.58 | 73.77 | 855.1 | 0.33 | 87.33 | 3 | LL |
| Z3MD7F | 755.7 | -1.12 | 15.86 | 738.6 | -1.74 | 20.46 | 3 | LS |
| ZKPCTA | 791.1 | -0.64 | 27.90 | 815.8 | -0.36 | 38.49 | 3 | TB |

### Consensus (All Labs) Results

| | | | | |
|---|---|---|---|---|
| Month Mean | 838.30 | | Grand Mean | 836.25 |
| Avg SD | 63.66 | | Avg SD Months | 50.08 |
| SD btwn Labs | 74.10 | | SD btwn Labs | 56.22 |
| Labs Incld | 29 | | Labs Incld | 29 |

Containerboard Interlaboratory Testing Program
Analysis 201
**Top to Bottom Box Compression Strength, Corrugated Boxes** - BX17
TAPPI Official Test Method T804

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## Consensus By Method

| Test Method | Group Mean | SD btwn Group | Difference from Grand Mean | Labs Included |
|---|---|---|---|---|
| Hot melt adhesive sealing | 819.34 | 80.21 | 18.96 | 9 |
| Clip sealing | 841.57 | 69.54 | 3.27 | 19 |
| Staple sealing | 946.84 | 0.00 | 108.54 | 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 | LH | L.A.B. Compression Tester Model #10610 |
| 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 | | |

Containerboard Interlaboratory Testing Program
Analysis 202
**Edgewise Compressive Strength, by T811, Corrugated Board** - EC15
TAPPI Official Test Method T811

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### Monthly Results / Cumulative Results

| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
|---|---|---|---|---|---|---|---|---|---|
| 4RVQDU | 162.7 | 52.04 X | 6.31 H | | 159.7 | 65.13 X | 3.35 | 3 | LD |
| 6G7TV8 | 42.1 | -0.50 | 1.74 | | 43.9 | 0.53 | 1.51 | 3 | XX |
| CQYBUQ | 47.2 | 1.71 | 1.25 | | 44.6 | 0.94 | 2.33 | 3 | LC |
| HGQE3K | 42.9 | -0.18 | 1.76 | | 43.2 | 0.13 | 0.78 | 3 | LE |
| HZKMCW | 43.9 | 0.25 | 2.94 | | 44.3 | 0.79 | 0.65 | 2 | XX |
| PLVTKG | 40.5 | -1.22 | 1.98 | | 41.0 | -1.06 | 1.86 | 3 | XX |
| TV8LG2 | 45.4 | 0.93 | 1.27 | | 44.5 | 0.88 | 0.88 | 3 | LC |
| VWFDMM | 43.7 | 0.17 | 3.35 H | | 42.1 | -0.46 | 4.37 H | 3 | LD |
| WEUETA | 40.6 | -1.16 | 1.50 | | 39.8 | -1.76 * | 1.20 | 2 | TS |

### Consensus (All Labs) Results

| | | | | |
|---|---|---|---|---|
| Month Mean | 43.30 | | Grand Mean | 42.93 |
| Avg SD | 2.10 | | Avg SD Months | 2.05 |
| SD btwn Labs | 2.29 | | SD btwn Labs | 1.79 |
| Labs Incld | 8 | | Labs Incld | 8 |

### Key to Instrument Codes Reported by Participants

| | | | | |
|---|---|---|---|---|
| LC | L&W Crush Tester 48 | | LD | L&W Crush Tester 248 |
| LE | L&W Crush Tester 840 | | TS | TMI Digital Crush Tester, Model 17-56 |
| XX | Instrument make/model not specified by lab | | | |

Containerboard Interlaboratory Testing Program
Analysis 203
**Edgewise Compressive Strength by T839, Corrugated Board** - EC15
TAPPI Official Test Method T839

**Report #642**
**March 2023**

|  | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 3JMY86 | 46.9 | 0.22 | 0.85 | | 45.0 | -0.41 | 2.20 | 3 | TG |
| 4U3BGG | 47.0 | 0.26 | 1.06 | | 48.2 | 0.61 | 1.28 | 3 | TD |
| 6G7TV8 | 44.0 | -0.75 | 1.66 | | 49.8 | 1.15 | 5.01 H | 3 | TS |
| AVAEB7 | 48.9 | 0.91 | 1.89 | | 47.4 | 0.38 | 1.37 | 3 | EN |
| CQYBUQ | 48.9 | 0.92 | 1.50 | | 48.8 | 0.81 | 1.18 | 3 | LC |
| DVZ9FZ | 45.7 | -0.19 | 1.82 | | 45.5 | -0.25 | 0.26 L | 3 | EM |
| EYWMM3 | 45.6 | -0.21 | 1.63 | | 46.0 | -0.10 | 0.58 | 3 | LD |
| F92J2D | 49.3 | 1.03 | 1.60 | | 49.1 | 0.94 | 0.18 | 2 | EM |
| GH8LZH | 45.3 | -0.31 | 1.11 | | 45.3 | -0.33 | 0.70 | 3 | CT |
| HALK3X | 48.6 | 0.81 | 1.26 | | 47.1 | 0.28 | 2.28 | 3 | LD |
| HGQE3K | 43.0 | -1.09 | 2.06 | | 43.9 | -0.78 | 0.81 | 3 | LY |
| JKK6XH | 46.6 | 0.11 | 1.80 | | 46.4 | 0.03 | 0.50 | 3 | LD |
| KYKW6K | 44.5 | -0.60 | 1.76 | | 42.8 | -1.14 | 1.51 | 3 | LD |
| LCF8ZP | 42.1 | -1.39 | 1.17 | | 45.3 | -0.33 | 4.45 | 2 | EM |
| MFYL4P | 44.3 | -0.64 | 2.19 | | 43.8 | -0.81 | 0.72 | 2 | TL |
| NQVGNJ | 42.8 | -1.17 | 1.54 | | 42.7 | -1.18 | 0.16 L | 3 | LD |
| PFPW2G | 42.7 | -1.21 | 1.19 | | 43.2 | -1.00 | 1.67 | 3 | LD |
| PLVTKG | 40.3 | -2.02 * | 1.74 | | 41.3 | -1.65 | 2.24 | 3 | XX |
| QT84D9 | 46.2 | -0.03 | 0.99 | | 45.2 | -0.36 | 0.87 | 3 | EM |
| RC27P4 | 52.6 | 2.16 * | 2.72 H | | 50.7 | 1.44 | 1.67 | 3 | LC |
| RYEW6J | 49.2 | 1.00 | 1.33 | | 50.0 | 1.21 | 0.78 | 3 | TG |
| RZPYRH | 43.8 | -0.82 | 2.01 | | 39.0 | -2.40 * | 4.27 H | 3 | XX |
| TKAR3J | 44.3 | -0.66 | 1.43 | | 44.2 | -0.69 | 1.16 | 3 | BU |
| TV8LG2 | 50.9 | 1.57 | 1.33 | | 49.6 | 1.08 | 2.02 | 3 | LC |
| UKABXD | 44.9 | -0.46 | 1.45 | | 46.4 | 0.05 | 1.79 | 3 | EM |
| VLYT3Q | 49.0 | 0.94 | 1.23 | | 48.1 | 0.61 | 0.79 | 3 | LD |
| VWFDMM | 46.1 | -0.03 | 1.32 | | 45.6 | -0.24 | 1.21 | 3 | LD |
| WEUETA | 44.7 | -0.53 | 0.54 L | | 46.8 | 0.17 | 3.02 | 2 | TS |
| WKZRUE | 48.7 | 0.83 | 1.40 | | 49.0 | 0.88 | 0.25 L | 3 | TH |
| X3T8CG | 46.6 | 0.12 | 0.98 | | 46.5 | 0.08 | 0.91 | 3 | BU |
| XC689D | 52.5 | 2.11 * | 1.66 | | 54.1 | 2.58 * | 1.57 | 3 | LC |
| Z3MD7F | 43.1 | -1.06 | 1.20 | | 42.9 | -1.10 | 0.28 L | 3 | EM |
| ZKKZ7D | 46.8 | 0.19 | 1.83 | | 47.7 | 0.46 | 0.91 | 3 | TU |
| ZKPCTA | 55.5 | 3.16 X | 1.13 | | 55.8 | 3.13 X | 0.80 | 3 | LD |

**Containerboard Interlaboratory Testing Program**
Analysis 203
**Edgewise Compressive Strength by T839, Corrugated Board** - EC15
TAPPI Official Test Method T839

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## Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 46.23 | Grand Mean | 46.29 |
| Avg SD | 1.55 | Avg SD Months | 1.90 |
| SD btwn Labs | 2.95 | SD btwn Labs | 3.05 |
| Labs Incld | 33 | Labs Incld | 33 |

## 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 | TD | TMI Digital Crush Tester, Model 17-09 |
| TG | TMI Digital Crush Tester, 17-76 | TH | TMI Monitor/Compression Tester, Model 17-76 |
| 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 |

Containerboard Interlaboratory Testing Program
Analysis 205
**Bursting Strength (Mullen), 42 lb Linerboard** - 42H2
TAPPI Official Test Method T807

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**March 2023**

| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | |
| 2LHZX4_AL | 118.4 | 117.4 | 116.6 | 116.0 | 117.1 | 0.34 | 8.8 | 1.0 | 113.8 | -0.54 | 9.3 | 6.9 | 16 | AL |
| 2UN3YU | 111.0 | 110.0 | 104.8 | 106.6 | 108.1 | -1.69 | 8.7 | 2.9 | 107.5 | -1.99 * 9.4 | | 3.7 | 16 | RE |
| 3FRB8L | 126.8 *L | 126.5 *L | 126.0 *L | 126.3 *L | 126.4 | 2.43 * | 2.9 | 0.3 L | 126.0 | 2.32 * 3.7 | | 0.7 L | 16 | AH |
| 3ZR4X3 | 116.5 | 115.3 | 115.5 | 116.5 | 116.0 | 0.08 | 6.4 | 0.6 | 114.8 | -0.31 | 6.1 | 1.1 L | 16 | LJ |
| 42YZL6 | 112.2 | 111.5 | 113.5 | 113.7 | 112.7 | -0.65 | 6.5 | 1.0 | 112.7 | -0.79 | 7.3 | 3.6 | 16 | ME |
| 43XGAH | 121.6 | 122.8 | 121.6 | 117.3 | 120.8 | 1.17 | 8.4 | 2.4 | 117.6 | 0.35 | 9.7 | 3.3 | 16 | LC |
| 4RVQDU | 102.1 X | 104.4 * | 103.7 * | 109.2 | 104.9 | -2.42 * | 9.2 | 3.0 | 105.1 | -2.55 * 8.6 | | 3.4 | 16 | LA |
| 6E6QBD | 116.1 | 116.6 | 117.0 | 117.3 | 116.8 | 0.26 | 5.5 | 0.5 | 116.1 | 0.01 | 6.7 | 1.3 | 16 | AH |
| 7VNCEG_AL | 116.9 | 112.2 | 120.3 | 117.7 | 116.8 | 0.26 | 7.9 | 3.4 | 116.6 | 0.11 | 9.4 | 2.9 | 16 | AL |
| 8QT4AD | 121.9 | 119.0 | 123.6 | 118.3 | 120.7 | 1.14 | 7.1 | 2.5 | 119.7 | 0.85 | 9.2 | 2.0 | 16 | LA |
| 9279PU_AL | 120.5 | 117.7 | 115.4 | 112.9 | 116.6 | 0.23 | 8.7 | 3.2 | 118.0 | 0.44 | 9.5 | 3.0 | 16 | AL |
| 9M7W8V | 116.8 | 116.8 | 122.7 | 114.8 | 117.8 | 0.48 | 8.5 | 3.4 | 116.9 | 0.18 | 10.6 | 3.5 | 16 | LZ |
| 9P9K3K_AL | 116.0 | 114.4 | 109.1 | 117.9 | 114.4 | -0.28 | 8.9 | 3.8 | 114.8 | -0.31 | 9.1 | 3.1 | 16 | AL |
| 9XNUJA | 116.6 | 116.3 | 115.5 | 114.9 | 115.8 | 0.05 | 6.3 | 0.8 | 115.8 | -0.07 | 6.5 | 0.9 L | 16 | TP |
| A8P7ZF_AL | 112.5 H | 120.8 | 120.4 | 115.0 | 117.2 | 0.35 | 11.7 | 4.1 | 117.3 | 0.29 | 9.6 | 3.4 | 16 | AL |
| BFW69H | 117.7 | 114.6 | 116.5 | 115.0 | 115.9 | 0.07 | 8.8 | 1.4 | 114.3 | -0.41 | 8.8 | 2.9 | 16 | LA |
| BP38BU | 123.4 | 121.0 | 114.1 | 114.9 | 118.4 | 0.62 | 11.2 | 4.6 | 118.9 | 0.66 | 10.6 | 4.8 | 16 | LC |
| CQYBUQ | 123.2 | 115.1 | 110.4 | 117.8 | 116.6 | 0.23 | 8.8 | 5.4 | 112.5 | -0.83 | 8.6 | 7.9 | 16 | AH |
| DQPP46_AL | 125.8 | 121.7 | 123.4 | 121.8 | 123.2 | 1.70 | 6.9 | 1.9 | 121.9 | 1.36 | 7.7 | 2.3 | 16 | AL |
| E679T8 | 117.0 | 116.3 | 116.0 | 117.1 | 116.6 | 0.22 | 5.5 | 0.5 | 116.8 | 0.16 | 5.3 | 0.4 L | 16 | LA |
| EYWMM3 | 113.8 | 112.9 | 114.3 | 115.6 | 114.2 | -0.33 | 7.4 | 1.1 | 116.8 | 0.16 | 8.0 | 2.7 | 16 | AH |
| GH8LZH | 115.5 | 116.0 | 113.5 | 115.5 H | 115.1 | -0.11 | 10.5 | 1.1 | 117.4 | 0.30 | 10.3 | 2.9 | 16 | XX |
| GN926W_AL | 112.7 | 105.9 * | 110.2 | 111.6 | 110.1 | -1.24 | 5.4 | 3.0 | 113.0 | -0.72 | 6.0 | 3.6 | 12 | AL |
| HALK3X | 118.8 | 111.8 | 110.5 | 108.1 | 112.3 | -0.74 | 7.7 | 4.6 | 113.9 | -0.52 | 8.8 | 3.5 | 16 | LA |
| HD8WWG_Al | 115.3 | 113.0 H | 115.4 | 118.1 H | 115.4 | -0.04 | 12.8 | 2.1 | 115.8 | -0.08 | 10.8 | 2.1 | 14 | AL |
| HGQE3K | 127.6 * | 126.8 * | 125.8 * | 125.7 * | 126.5 | 2.44 * | 7.8 | 0.9 | 123.8 | 1.80 | 7.9 | 2.6 | 16 | AH |
| JKK6XH_AL | 124.5 | 120.9 | 118.3 | 118.8 | 120.6 | 1.13 | 6.8 | 2.8 | 120.3 | 0.99 | 7.2 | 2.5 | 16 | AK |
| JVPKWF | 120.8 | 116.5 | 116.0 | 117.3 | 117.7 | 0.46 | 7.1 | 2.2 | 118.9 | 0.64 | 6.5 | 2.0 | 16 | LA |
| JYL9AG | 122.1 | 122.1 | 118.4 | 122.0 | 121.1 | 1.24 | 9.2 | 1.8 | 120.7 | 1.08 | 9.8 | 3.3 | 16 | LJ |
| KDY4ZW | 112.4 | 118.0 | 118.3 | 113.3 | 115.5 | -0.02 | 10.2 | 3.1 | 118.6 | 0.58 | 9.8 | 3.2 | 16 | LA |
| KDY4ZW_AL | 114.6 | 115.6 | 115.3 | 114.7 | 115.0 | -0.13 | 6.4 | 0.5 | 115.7 | -0.09 | 7.1 | 2.6 | 16 | AL |
| KXPKJD_AL | 111.9 | 110.2 | 105.4 | 108.7 | 109.0 | -1.48 | 8.6 | 2.7 | 110.4 | -1.32 | 7.7 | 5.1 | 16 | AL |
| L2LQDA | 112.0 | 108.6 | 107.7 | 108.5 | 109.2 | -1.44 | 8.1 | 1.9 | 110.7 | -1.26 | 9.0 | 3.1 | 16 | LC |
| LVC7CB_AL | 110.4 | 109.7 | 107.8 | 107.0 | 108.7 | -1.55 | 7.0 | 1.6 | 110.6 | -1.27 | 6.3 | 2.4 | 16 | XX |
| M6CPYH | 115.6 | 106.4 | 114.0 | 114.8 | 112.7 | -0.66 | 7.7 | 4.3 | 112.4 | -0.87 | 9.0 | 3.9 | 16 | XX |

# Containerboard Interlaboratory Testing Program
## Analysis 205
### Bursting Strength (Mullen), 42 lb Linerboard - 42H2
TAPPI Official Test Method T807

**Report #642**
**March 2023**

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NLHJGW | 116.6 | 112.0 | 117.9 | 111.8 | 114.6 | -0.23 | 8.6 | 3.1 | 112.6 | -0.82 | 9.3 | 3.0 | 16 | LC |
| NQVGNJ | 118.1 | 116.4 | 114.2 | 110.4 H | 114.8 | -0.19 | 10.4 | 3.3 | 111.4 | -1.09 | 9.7 | 4.2 | 16 | LZ |
| PFPW2G | 118.4 | 117.2 | 115.8 | 119.6 | 117.8 | 0.48 | 8.3 | 1.6 | 118.8 | 0.63 | 8.6 | 3.6 | 16 | AH |
| PLVTKG | 113.5 | 114.1 | 114.5 | 112.7 | 113.7 | -0.43 | 7.3 | 0.8 | 114.4 | -0.39 | 6.4 | 2.2 | 16 | LC |
| PNKY6E_AL | 111.6 | 117.0 | 119.1 | 116.5 | 116.1 | 0.10 | 7.5 | 3.2 | 117.4 | 0.29 | 7.7 | 2.0 | 16 | AL |
| QNF28N | 116.2 L | 115.9 L | 117.2 L | 116.6 L | 116.5 | 0.19 | 1.4 | 0.6 | 116.6 | 0.12 | 4.1 | 2.0 | 16 | LA |
| QWQ7F8 | 106.1 * | 109.5 | 104.1 * | 102.9 * | 105.7 | -2.24 * | 8.6 | 2.9 | 112.0 | -0.95 | 8.5 | 4.9 | 16 | LA |
| QWQ7F8_AL | 125.7 H | 131.9 X | 133.7 X | 130.1 X | 130.4 | 3.31 X | 10.1 | 3.4 | 125.6 | 2.21 *10.3 | | 3.8 | 16 | AL |
| RQJKZW | 113.0 | 117.6 | 110.4 | 111.2 | 113.1 | -0.58 | 8.2 | 3.2 | 113.5 | -0.61 | 8.8 | 3.5 | 16 | LA |
| VWFDMM | 114.3 | 118.8 | 114.4 | 112.3 H | 114.9 | -0.15 | 10.3 | 2.8 | 115.3 | -0.18 | 9.8 | 3.2 | 16 | LA |
| X9WL6P | 117.2 | 113.6 | 114.7 | No Data | 115.2 | -0.10 | 8.2 | 1.9 | 118.3 | 0.51 | 7.9 | 3.8 | 15 | TB |
| XVUJYH | 127.8 * | 123.3 | 122.4 | 120.8 | 123.6 | 1.79 | 6.6 | 3.0 | 123.6 | 1.75 | 7.1 | 3.1 | 16 | AX |
| Y38UM4_AL | 113.8 | 121.0 | 118.4 | 115.1 | 117.1 | 0.33 | 8.3 | 3.3 | 118.4 | 0.53 | 8.7 | 3.1 | 16 | AL |
| Y3VMDZ | 115.7 | 113.1 | 115.9 | 120.9 | 116.4 | 0.18 | 8.6 | 3.3 | 118.6 | 0.58 | 10.3 | 6.1 | 16 | LB |
| Y8K8EV_AL | 111.6 | No Data | No Data | 116.8 | 114.2 | -0.33 | 9.2 | 3.7 | 115.6 | -0.12 | 9.7 | 4.0 | 14 | AL |
| Z4FZ9N | 116.1 | 110.5 | 110.7 | 114.3 | 112.9 | -0.61 | 9.2 | 2.8 | 110.5 | -1.31 | 9.2 | 5.7 | 16 | LC |
| ZKPCTA | 114.2 | 114.9 | 108.6 | 118.6 | 114.1 | -0.35 | 7.3 | 4.1 | 111.5 | -1.07 | 8.2 | 3.6 | 12 | XX |
| ZPFYVM_AL | 133.5 XH | 133.4 XH | 133.5 XH | 145.5 XH | 136.5 | 4.69 X | 22.1 | 6.0 H | 122.8 | 1.57 | 18.1 | 16.1 H | 8 | AL |

| Consensus (All Labs) Results | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 117.04 | 115.59 | 115.11 | 115.22 | Month Mean | 115.61 | | Grand Mean | 116.09 | |
| Avg SDr | 7.99 | 8.34 | 8.12 | 8.44 | Avg SD | 8.22 | | Avg SD | 8.78 | |
| SD btwn Labs | 4.89 | 4.94 | 5.38 | 4.63 | SD btwn Labs | 4.45 | | SD btwn Labs | 4.29 | |
| Labs Incld | 51 | 50 | 50 | 50 | SD btwn Wks | 2.74 | | SD btwn Wks | 4.13 | |
| Labs Excld | 2 | 2 | 2 | 2 | Labs Incld | 51 | | Labs Incld | 53 | |
| Labs not Rcvd | 0 | 1 | 1 | 1 | | | | | | |

## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| **AH** | Perkins Model AH | **AK** | L & W Autoline 300 |
| **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 |
| **RE** | Regmed/Mullen Tester | **TB** | TMI Monitor/Burst 1000 |
| **TP** | Technidyne PROFILE/Plus | **XX** | Instrument make/model not specified by lab |

**Bursting Strength (Mullen), 56 lb Linerboard** - 56G3

TAPPI Official Test Method T807

| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | |
| 2LHZX4_AL | 122.4 | 118.7 | 115.5 | 111.5 | 117.0 | 0.28 | 9.5 | 4.6 | 117.7 | 0.47 | 9.7 | 3.0 | 11 | AL |
| 2UN3YU | 105.6 | 100.6 **X** | 106.4 | 107.2 | 105.0 | -2.28 * | 8.0 | 3.0 | 105.8 | -3.00 **X** | 8.4 | 4.2 | 12 | RE |
| 3FRB8L | 140.2 **XL** | 140.0 **XL** | 140.4 **X** | 140.7 **XL** | 140.3 | 5.21 **X** | 3.5 | 0.3 **L** | 139.6 | 6.85 **X** | 3.7 | 0.9 **L** | 12 | AH |
| 3ZR4X3 | 116.4 | 114.1 | 115.8 | 116.0 | 115.6 | -0.03 | 7.9 | 1.0 | 115.9 | -0.06 | 6.4 | 0.7 **L** | 12 | LJ |
| 42YZL6 | 110.9 | 113.7 | NO DATA | 112.2 | 112.3 | -0.73 | 10.0 | 1.4 | 114.2 | -0.54 | 10.4 | 3.7 | 11 | LA |
| 43XGAH | 128.0 * | 132.5 **X** | 122.4 | 123.0 **H** | 126.5 | 2.27 * | 15.1 | 4.7 | 123.0 | 2.02 * | 13.0 | 5.5 | 12 | XX |
| 4RVQDU | 107.3 | 102.1 * | 107.7 | 108.4 | 106.4 | -1.98 * | 10.5 | 2.9 | 107.9 | -2.37 * | 10.3 | 3.8 | 12 | LA |
| 6E6QBD | 114.2 | 115.4 | 116.5 | 115.7 | 115.5 | -0.06 | 5.9 | 1.0 | 115.4 | -0.21 | 6.5 | 0.8 **L** | 10 | AH |
| 7VNCEG_AL | 122.2 | 111.4 | 119.0 | 120.1 | 118.2 | 0.52 | 11.0 | 4.7 | 118.6 | 0.73 | 11.2 | 3.9 | 12 | AL |
| 8QT4AD | 119.5 | 121.7 | 113.3 | 121.3 | 119.0 | 0.68 | 11.0 | 3.9 | 117.6 | 0.45 | 10.5 | 3.4 | 12 | LA |
| 9279PU_AL | 118.1 **H** | 116.5 | 121.6 | 120.8 | 119.2 | 0.74 | 13.2 | 2.4 | 118.1 | 0.60 | 12.4 | 4.4 | 12 | AL |
| 9M7W8V | 113.2 | 117.8 | 119.5 | 115.4 | 116.5 | 0.16 | 8.9 | 2.8 | 115.8 | -0.08 | 9.8 | 3.7 | 8 | LZ |
| 9P9K3K_AL | 111.4 | 115.6 | 115.1 | 117.4 | 114.9 | -0.18 | 9.5 | 2.5 | 111.4 | -1.38 | 10.1 | 4.2 | 12 | XX |
| 9XNUJA | 115.9 | 114.2 | 115.6 | 116.8 | 115.6 | -0.02 | 5.6 | 1.1 | 115.2 | -0.26 | 6.4 | 0.9 **L** | 10 | TP |
| A8P7ZF_AL | 114.4 | 113.0 | 115.8 **H** | 119.7 | 115.7 | 0.00 | 12.0 | 2.9 | 114.4 | -0.49 | 11.1 | 3.5 | 12 | AL |
| BFW69H | 118.3 | 114.2 | 123.5 | 114.5 | 117.6 | 0.40 | 13.1 | 4.3 | 113.5 | -0.74 | 11.9 | 5.5 | 12 | LA |
| BP38BU | 120.0 | 124.5 * | 117.1 | 126.1 | 121.9 | 1.31 | 11.6 | 4.1 | 118.9 | 0.83 | 11.8 | 3.9 | 12 | LC |
| CQYBUQ | 110.8 | 113.8 | 115.4 | 115.9 | 114.0 | -0.37 | 11.8 | 2.3 | 114.0 | -0.62 | 11.4 | 6.7 | 12 | AH |
| DQPP46_AL | 120.7 | 115.1 | 120.2 | 119.3 | 118.8 | 0.66 | 11.2 | 2.6 | 119.7 | 1.06 | 10.0 | 3.7 | 12 | AL |
| E679T8 | 115.8 | 115.0 | 116.1 | 115.0 | 115.5 | -0.05 | 5.6 | 0.6 **L** | 116.0 | -0.02 | 6.2 | 0.8 **L** | 12 | LA |
| EYWMM3 | 120.8 | 120.3 | 116.7 | 111.8 | 117.4 | 0.35 | 9.2 | 4.2 | 118.5 | 0.72 | 9.6 | 4.2 | 12 | AH |
| GH8LZH | 119.5 | 113.5 | 112.5 | 109.5 | 113.8 | -0.42 | 11.7 | 4.2 | 114.8 | -0.39 | 10.5 | 4.3 | 12 | XX |
| GN926W_AL | 109.3 | 109.1 | 110.8 | 116.0 | 111.3 | -0.93 | 9.0 | 3.2 | 111.3 | -1.39 | 9.0 | 3.2 | 4 | AL |
| HALK3X | 119.8 | 110.6 | 110.0 | 111.1 | 112.9 | -0.60 | 8.4 | 4.6 | 114.3 | -0.51 | 9.8 | 3.1 | 12 | LA |
| HD8WWG_AL | 118.4 | 108.1 | 113.5 | 111.0 | 112.7 | -0.63 | 12.6 | 4.3 | 114.4 | -0.49 | 12.3 | 3.5 | 12 | AL |
| HGQE3K | 126.5 | 124.3 | 128.3 * | 127.8 * | 126.7 | 2.33 * | 8.1 | 1.8 | 122.6 | 1.89 | 8.3 | 4.4 | 12 | AH |
| JKK6XH_AL | 119.2 | 115.8 **L** | 116.3 | 118.0 | 117.3 | 0.34 | 5.8 | 1.6 | 118.8 | 0.81 | 7.6 | 2.2 | 12 | AL |
| JVPKWF | 117.8 | 119.6 | 115.0 | 121.8 | 118.6 | 0.60 | 7.8 | 2.9 | 120.2 | 1.20 | 8.0 | 3.3 | 12 | LA |
| JYL9AG | 118.8 | 112.8 | 123.1 | 119.3 | 118.5 | 0.59 | 11.9 | 4.2 | 116.5 | 0.13 | 11.9 | 5.0 | 12 | LZ |
| KDY4ZW | 120.6 | 122.0 | 120.3 | 120.8 | 120.9 | 1.10 | 8.2 | 0.7 | 122.3 | 1.80 | 9.5 | 4.1 | 8 | LA |
| KDY4ZW_AL | 115.2 | 116.3 | 115.1 | 120.8 | 116.8 | 0.24 | 8.3 | 2.7 | 118.1 | 0.59 | 7.5 | 3.1 | 8 | XX |
| KXPKJD_AL | 109.5 | 108.6 | 115.0 | 111.3 | 111.1 | -0.97 | 9.9 | 2.8 | 113.1 | -0.86 | 9.6 | 4.1 | 12 | AL |
| L2LQDA | 108.4 | 103.5 * | 103.8 * | 106.1 | 105.5 | -2.17 * | 9.9 | 2.3 | 110.3 | -1.67 | 9.9 | 6.2 | 8 | LC |
| LVC7CB_AL | 112.0 | 113.4 | 110.7 | 111.1 | 111.8 | -0.83 | 7.1 | 1.2 | 111.3 | -1.39 | 7.7 | 3.1 | 12 | XX |
| M6CPYH | 117.5 | 111.4 | 109.4 | 105.4 | 110.9 | -1.01 | 11.6 | 5.1 | 121.4 | 1.55 | 12.1 | 14.7 **H** | 12 | XX |

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

**Report #642**
**March 2023**

| WebCode | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| NLHJGW | 113.0 | 117.8 | 116.2 | 121.0 H | 117.0 | 0.27 | 12.2 | 3.3 | 115.5 | -0.16 | 9.9 | 2.4 | 12 | LA |
| NQVGNJ | 113.3 | 118.6 | 114.7 | 116.3 | 115.7 | 0.00 | 12.4 | 2.3 | 113.1 | -0.87 | 12.1 | 5.1 | 12 | LZ |
| PFPW2G | 116.8 | 120.8 | 114.4 | 110.4 | 115.6 | -0.03 | 9.8 | 4.4 | 116.5 | 0.13 | 9.4 | 3.6 | 10 | AH |
| PNKY6E_AL | 108.8 H | 117.6 | 119.3 | 123.0 | 117.2 | 0.30 | 10.9 | 6.0 | 115.2 | -0.26 | 9.3 | 4.1 | 11 | AL |
| QNF28N | 122.5 L | 123.1 L | 122.0 L | 122.3 L | 122.5 | 1.43 | 2.1 | 0.5 L | 120.7 | 1.34 | 3.4 | 2.7 | 12 | LA |
| QWQ7F8 | 112.6 | 112.0 | 101.6 * | 111.6 | 109.5 | -1.33 | 10.1 | 5.2 | 113.7 | -0.70 | 10.7 | 4.8 | 12 | LA |
| QWQ7F8_AL | 110.5 | 112.5 | 110.8 | 113.3 | 111.8 | -0.84 | 8.8 | 1.3 | 113.6 | -0.72 | 9.2 | 2.9 | 12 | AL |
| RQJKZW | 107.8 | 114.9 | 110.5 | 106.3 | 109.9 | -1.24 | 9.3 | 3.8 | 111.9 | -1.20 | 10.6 | 4.5 | 12 | LA |
| VWFDMM | 127.0 * | 114.6 | 118.0 | 112.3 | 118.0 | 0.48 | 10.2 | 6.4 | 116.7 | 0.19 | 10.2 | 4.3 | 12 | LA |
| X9WL6P | 118.1 | 119.8 | 114.2 | No Data | 117.4 | 0.35 | 12.5 | 2.8 | 119.4 | 0.98 | 11.4 | 5.0 | 11 | TB |
| XVUJYH | 111.5 | 119.4 | 117.1 | 110.2 | 114.6 | -0.25 | 11.3 | 4.4 | 121.7 | 1.64 | 9.1 | 6.1 | 12 | XX |
| Y38UM4_AL | 113.6 | 115.3 | 118.0 | 120.5 | 116.9 | 0.24 | 10.7 | 3.0 | 115.7 | -0.12 | 10.2 | 4.6 | 12 | AL |
| Y3VMDZ | 109.0 | 108.6 | 121.0 | 118.2 | 114.2 | -0.33 | 9.9 | 6.3 | 116.3 | 0.05 | 10.6 | 4.8 | 12 | LB |
| Y8K8EV_AL | 108.6 | No Data | No Data | 118.7 | 113.7 | -0.44 | 9.7 | 7.1 | 117.5 | 0.43 | 11.3 | 6.8 | 9 | AL |
| Z4FZ9N | 114.4 | 117.2 | 119.9 | 119.1 | 117.6 | 0.40 | 10.3 | 2.4 | 113.2 | -0.83 | 8.7 | 4.4 | 12 | LC |
| ZKPCTA | 106.3 | 111.8 | 117.3 | 110.7 | 111.5 | -0.89 | 9.2 | 4.5 | 111.5 | -1.32 | 9.2 | 4.5 | 4 | XX |
| ZPFYVM_AL | 125.8 | 131.7 X | 126.3 * | 127.5 *H | 127.8 | 2.56 * | 14.2 | 2.7 | 127.8 | 3.42 X | 14.2 | 2.7 | 4 | XX |

### Consensus (All Labs) Results

| | Week 1 | Week 2 | Week 3 | Week 4 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 115.65 | 115.11 | 115.89 | 115.99 | Month Mean | 115.72 | Grand Mean | 116.07 | |
| Avg SDr | 10.43 | 10.57 | 9.90 | 9.77 | Avg SD | 10.17 | Avg SD | 9.93 | |
| SD btwn Labs | 5.64 | 4.82 | 5.28 | 5.60 | SD btwn Labs | 4.73 | SD btwn Labs | 3.43 | |
| Labs Incld | 51 | 47 | 49 | 50 | SD btwn Wks | 3.60 | SD btwn Wks | 4.58 | |
| Labs Excld | 1 | 4 | 1 | 1 | Labs Incld | 51 | Labs Incld | 49 | |
| Labs not Rcvd | 0 | 1 | 2 | 1 | | | | | |

### 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) | | 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** - 42H2
TAPPI Official Test Method T822

**Report #642**
**March 2023**

| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | |
| 2EUFQG | 92.1 | 90.7 * | 90.7 | 93.8 | 91.9 | -1.85 | 3.4 | 1.5 | 93.9 | -0.67 | 3.3 | 2.4 | 16 | LD |
| 2UN3YU | 84.8 XH | 85.3 XH | 86.3 *H | 85.6 XH | 85.5 | -4.65 X | 9.9 | 0.6 | 93.7 | -0.76 | 6.5 | 7.5 H | 16 | EM |
| 3FRB8L | 96.6 | 96.3 | 96.2 | 96.1 | 96.3 | 0.11 | 2.3 | 0.2 L | 96.3 | 0.15 | 2.4 | 2.6 | 16 | LD |
| 3QMLGD | 95.2 L | 97.6 L | 94.5 L | 96.1 | 95.8 | -0.09 | 1.0 | 1.4 | 94.4 | -0.50 | 2.1 | 1.3 | 16 | TH |
| 3ZR4X3 | 96.6 | 96.5 | 97.1 | 96.6 | 96.7 | 0.28 | 2.5 | 0.3 L | 96.2 | 0.12 | 2.4 | 0.5 L | 16 | LD |
| 42YZL6 | 101.1 * | 100.3 | 102.7 H | 104.0 X | 102.0 | 2.62 * | 5.3 | 1.6 | 101.9 | 2.13 * | 4.5 | 1.8 | 15 | LX |
| 43ADD2 | 105.1 X | 102.3 * | 104.1 * | 101.7 * | 103.3 | 3.20 X | 3.5 | 1.6 | 102.6 | 2.39 * | 3.1 | 2.6 | 16 | MB |
| 43XGAH | 99.1 | 97.2 | 98.0 | 99.1 | 98.4 | 1.02 | 3.7 | 0.9 | 97.9 | 0.74 | 3.3 | 2.1 | 16 | MB |
| 4RVQDU | 140.9 XH | 142.9 XH | 138.5 X | 140.4 X | 140.7 | 19.68 X | 5.3 | 1.8 | 117.8 | 7.70 X | 15.2 | 21.7 H | 16 | LB |
| 7VNCEG | 93.4 | 94.9 | 92.0 | 94.9 | 93.8 | -0.99 | 3.5 | 1.4 | 92.6 | -1.14 | 3.2 | 1.5 | 16 | LD |
| 8QT4AD | NO DATA | 95.2 | 95.7 | 96.8 | 95.9 | -0.06 | 3.6 | 0.8 | 95.9 | 0.02 | 3.6 | 0.8 | 3 | LD |
| 9279PU | 71.8 XH | 73.1 XH | 72.0 X | 71.7 XH | 72.2 | -10.53 X | 7.0 | 0.7 | 82.0 | -4.88 X | 5.6 | 11.6 H | 16 | LD |
| 9M7W8V | 93.4 | 97.2 | 88.9 | 91.9 * | 92.8 | -1.42 | 2.7 | 3.5 H | 92.4 | -1.21 | 2.9 | 2.7 | 16 | LC |
| 9P9K3K | 96.8 | 96.0 | 97.4 | 97.8 | 97.0 | 0.41 | 2.6 | 0.8 | 97.6 | 0.62 | 2.3 | 1.7 | 16 | LD |
| 9XNUJA | 96.5 | 96.3 | 95.3 | 94.3 | 95.6 | -0.19 | 3.5 | 1.0 | 94.9 | -0.34 | 2.8 | 1.2 | 16 | TH |
| A8P7ZF | 97.6 H | 99.5 | 97.9 | 97.8 | 98.2 | 0.96 | 3.8 | 0.9 | 98.5 | 0.92 | 4.1 | 2.5 | 16 | LZ |
| AVAEB7 | 93.3 | 93.8 | 93.0 | 95.0 | 93.8 | -1.01 | 3.4 | 0.8 | 93.5 | -0.83 | 3.0 | 1.5 | 16 | EN |
| BEKVBX | 101.2 * | 98.0 H | 99.0 | 99.4 | 99.4 | 1.48 | 4.6 | 1.3 | 92.9 | -1.03 | 4.7 | 8.4 H | 16 | LD |
| BP38BU | 96.5 | 92.4 | 97.4 | 95.9 | 95.6 | -0.22 | 2.8 | 2.2 | 94.1 | -0.60 | 2.6 | 1.6 | 16 | LD |
| CGNL3Q | 96.0 L | 101.7 * | 97.9 | 98.9 | 98.6 | 1.13 | 2.3 | 2.4 | 98.7 | 1.01 | 2.7 | 2.5 | 16 | LD |
| CJTYE6 | 84.8 XH | 83.7 XH | 81.6 XH | 76.7 XH | 81.7 | -6.33 X | 7.3 | 3.6 H | 81.7 | -4.98 X | 7.3 | 3.6 | 4 | LZ |
| CQYBUQ | 97.3 | 96.1 | 97.0 | 99.4 | 97.4 | 0.61 | 2.4 | 1.4 | 97.3 | 0.52 | 2.5 | 1.2 | 16 | LC |
| EYWMM3 | 97.4 | 99.1 | 92.2 | 98.2 | 96.7 | 0.28 | 2.8 | 3.1 | 95.9 | 0.01 | 2.5 | 2.6 | 16 | LD |
| F92J2D | 96.8 | 96.9 | 98.5 | 100.6 | 98.2 | 0.94 | 3.6 | 1.8 | 98.1 | 0.79 | 3.2 | 1.3 | 16 | EM |
| GTNZUP | 99.0 H | 99.4 H | 97.6 H | 101.6 *H | 99.4 | 1.48 | 6.8 | 1.7 | 101.7 | 2.06 * | 5.4 | 3.1 | 16 | TU |
| HD8WWG | 96.8 | 97.2 | 96.8 | 95.4 | 96.6 | 0.23 | 2.4 | 0.8 | 97.7 | 0.66 | 3.0 | 3.1 | 14 | LD |
| HGQE3K | 95.3 | 93.7 | 93.1 | 93.3 | 93.8 | -0.98 | 2.4 | 1.0 | 91.5 | -1.53 | 2.9 | 5.0 | 16 | LG |
| JKK6XH | 95.6 | 94.2 | 93.6 L | 94.2 | 94.4 | -0.74 | 2.2 | 0.8 | 94.4 | -0.50 | 2.5 | 2.8 | 16 | LD |
| JVPKWF | 94.7 | 93.2 | 90.1 | 98.0 | 94.0 | -0.90 | 3.7 | 3.3 H | 91.4 | -1.58 | 3.2 | 3.5 | 16 | LC |
| KDY4ZW | 97.9 | 94.9 | 95.9 | 95.3 | 96.0 | -0.02 | 2.7 | 1.3 | 95.5 | -0.13 | 3.1 | 1.7 | 16 | LD |
| L2LQDA | 92.5 | 93.3 | 93.9 | 93.6 | 93.3 | -1.21 | 2.8 | 0.6 | 92.2 | -1.28 | 2.8 | 1.5 | 16 | LZ |
| LPRBQU | 95.1 | 97.2 L | 94.8 L | 96.0 | 95.8 | -0.12 | 1.8 | 1.1 | 94.1 | -0.61 | 2.4 | 1.3 | 16 | TH |
| LVC7CB | 95.5 | 97.3 | 98.7 | 97.3 | 97.2 | 0.51 | 2.1 | 1.3 | 97.2 | 0.46 | 2.5 | 1.4 | 16 | LD |
| NLHJGW | 96.2 | 95.7 | 95.9 | 96.4 | 96.0 | 0.00 | 2.4 | 0.3 | 95.6 | -0.08 | 2.8 | 1.1 | 16 | LD |
| NQVGNJ | 92.4 | 92.6 | 90.9 | 93.8 | 92.4 | -1.61 | 3.0 | 1.2 | 95.6 | -0.10 | 2.8 | 2.4 | 16 | LD |

**Containerboard Interlaboratory Testing Program**
Analysis 215
**Ring Crush, 42 lb Linerboard** - 42H2
TAPPI Official Test Method T822

**Report #642**
**March 2023**

| WebCode | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---------|--------|--------|--------|--------|------|------|-----|--------|------|------|-----|---------|-----|------|
| | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| QNF28N | 97.0 L | 97.0 L | 97.7 L | 97.6 L | 97.3 | 0.55 | 1.1 | 0.4 | 97.3 | 0.50 | 1.3 | 1.5 | 16 | TU |
| RYEW6J | 95.5 | 94.4 | 98.6 | 97.8 | 96.6 | 0.23 | 2.3 | 1.9 | 97.1 | 0.45 | 2.5 | 2.0 | 16 | TH |
| VWFDMM | 97.6 | 97.5 | 98.0 | 96.9 | 97.5 | 0.63 | 2.6 | 0.5 | 94.6 | -0.45 | 2.7 | 3.0 | 16 | LD |
| X9WL6P | 107.9 X | 104.9 X | 103.0 | NO DATA | 105.2 | 4.05 X | 3.3 | 2.5 | 100.4 | 1.61 | 3.2 | 5.4 | 15 | LD |
| XC689D | 86.6 X | 85.7 X | 87.0 * | 85.2 X | 86.1 | -4.39 X | 2.7 | 0.8 | 92.0 | -1.34 | 3.1 | 3.7 | 16 | LC |
| XVUJYH | 90.2 * | 91.3 | 91.2 | 91.8 * | 91.1 | -2.19 * | 2.6 | 0.7 | 91.7 | -1.45 | 3.2 | 1.4 | 16 | LD |
| Y3VMDZ | 94.3 | 91.2 | 99.2 | 97.3 | 95.5 | -0.24 | 2.4 | 3.5 H | 95.8 | -0.02 | 2.9 | 2.7 | 16 | LC |
| Y8K8EV | 96.3 | 98.0 | 97.5 H | 95.2 | 96.8 | 0.31 | 5.2 | 1.3 | 97.7 | 0.65 | 4.4 | 2.4 | 16 | LC |
| Z4FZ9N | 94.2 H | 96.6 | 95.7 | 98.3 | 96.2 | 0.06 | 4.8 | 1.8 | 96.9 | 0.36 | 4.6 | 1.8 | 16 | LD |
| ZPFYVM | 80.6 XH | 71.2 XH | 81.1 X | 96.7 | 82.4 | -6.02 X | 7.2 | 10.6 H | 78.4 | -6.12 X 6.9 | | 12.5 H | 8 | LC |

### Consensus (All Labs) Results

| | Week 1 | Week 2 | Week 3 | Week 4 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 95.91 | 96.12 | 95.63 | 96.60 | Month Mean | 96.05 | Grand Mean | | 95.85 |
| Avg SDr | 3.18 | 3.31 | 3.68 | 3.06 | Avg SD | 3.26 | Avg SD | | 3.29 |
| SD btwn Labs | 2.35 | 2.75 | 3.95 | 2.40 | SD btwn Labs | 2.27 | SD btwn Labs | | 2.85 |
| Labs Incld | 36 | 38 | 41 | 38 | SD btwn Wks | 1.61 | SD btwn Wks | | 2.94 |
| Labs Excld | 8 | 7 | 4 | 6 | Labs Incld | 37 | Labs Incld | | 41 |
| Labs not Rcvd | 1 | 0 | 0 | 1 | | | | | |

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| EM | Emerson 1200 | EN | Emerson 2200 |
| 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 | TH | TMI Compression Tester, Model 17-76 |
| TU | TMI Universal Crush Tester (TMI K440) | | |

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

**Report #642**
**March 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2EUFQG | 129.2 | 129.7 | 128.0 | 128.7 | 128.9 | -1.42 | 2.8 | 0.7 | 130.7 | -0.91 | 3.6 | 2.6 | 8 | LD |
| 2UN3YU | 115.2 XH | 109.5 XH | 125.1 H | 114.2 XH | 116.0 | -4.13 X | 16.4 | 6.5 H | 132.7 | -0.50 | 10.2 | 12.9 H | 12 | EX |
| 3FRB8L | 129.4 | 129.2 L | 128.9 | 129.8 L | 129.3 | -1.33 | 2.1 | 0.4 L | 128.9 | -1.26 | 2.3 | 1.3 L | 12 | LD |
| 3QMLGD | 139.1 L | 141.4 L | 137.3 L | 138.0 L | 139.0 | 0.71 | 1.1 | 1.8 | 136.4 | 0.25 | 2.2 | 3.1 | 12 | TH |
| 3ZR4X3 | 137.8 | 138.0 | 137.5 | 138.2 | 137.9 | 0.48 | 3.4 | 0.3 L | 137.3 | 0.43 | 2.8 | 0.8 L | 12 | LD |
| 42YZL6 | 143.7 | 149.1 * | 146.2 * | 146.8 * | 146.4 | 2.28 * | 4.6 | 2.2 | 144.4 | 1.86 | 4.6 | 4.2 | 11 | LY |
| 43ADD2 | 147.2 * | 148.1 * | 145.0 | 148.4 * | 147.2 | 2.44 * | 4.2 | 1.5 | 145.1 | 2.02 * | 4.4 | 4.6 | 12 | MB |
| 43XGAH | 141.2 | 141.3 | 140.9 | 140.2 L | 140.9 | 1.12 | 2.9 | 0.5 | 139.2 | 0.82 | 4.1 | 2.6 | 12 | MB |
| 4RVQDU | 168.2 X | 165.1 X | 147.2 *H | 153.2 XH | 158.5 | 4.82 X | 7.9 | 9.9 H | 144.4 | 1.86 | 14.9 | 27.0 H | 12 | LB |
| 7VNCEG | 132.7 | 134.1 | 131.7 | 134.0 | 133.1 | -0.53 | 4.3 | 1.1 | 133.1 | -0.43 | 3.9 | 1.5 L | 12 | LD |
| 8QT4AD | NO DATA | 130.4 | 131.0 | 133.7 | 131.7 | -0.82 | 3.4 | 1.8 | 131.7 | -0.70 | 3.4 | 1.8 | 3 | LD |
| 9279PU | 91.8 XH | 95.1 X | 95.6 XH | 92.8 XH | 93.8 | -8.81 X | 9.7 | 1.8 | 109.6 | -5.17 X | 8.5 | 15.0 H | 12 | LD |
| 9M7W8V | 131.5 | 136.4 | 129.9 | 132.2 | 132.5 | -0.65 | 4.0 | 2.8 | 129.4 | -1.16 | 3.7 | 4.0 | 8 | LC |
| 9P9K3K | 136.0 | 136.6 | 137.3 | 138.6 | 137.1 | 0.32 | 2.7 | 1.1 | 134.8 | -0.08 | 3.0 | 3.2 | 12 | LD |
| 9XNUJA | 135.7 | 134.0 | 134.1 | 134.5 | 134.6 | -0.21 | 5.7 | 0.8 | 135.5 | 0.06 | 5.2 | 1.4 L | 10 | TH |
| A8P7ZF | 139.0 | 139.3 | 137.8 | 136.5 | 138.2 | 0.54 | 4.5 | 1.3 | 133.9 | -0.26 | 6.8 | 3.7 | 12 | LZ |
| AVAEB7 | 130.5 | 133.1 | 128.9 | 135.7 | 132.0 | -0.75 | 5.1 | 3.0 | 129.8 | -1.08 | 4.3 | 2.5 | 12 | EN |
| BEKVBX | 130.9 | 130.1 | 134.1 | 133.8 | 132.2 | -0.71 | 4.0 | 2.0 | 122.8 | -2.50 * | 4.5 | 7.4 | 12 | LD |
| BP38BU | 137.1 | 128.4 | 138.4 | 138.7 | 135.6 | 0.01 | 3.2 | 4.9 | 135.2 | 0.01 | 3.3 | 3.0 | 12 | LD |
| CGNL3Q | 145.2 | 143.8 | 141.8 | 138.6 | 142.3 | 1.42 | 3.3 | 2.9 | 142.6 | 1.51 | 3.3 | 2.9 | 12 | LD |
| CJTYE6 | 88.8 X | 92.6 X | 82.4 X | 84.7 X | 87.1 | -10.23 X | 5.6 | 4.5 | 87.1 | -9.72 X | 5.6 | 4.5 | 4 | LZ |
| CQYBUQ | 136.4 | 138.8 | 140.9 | 141.9 | 139.5 | 0.82 | 4.3 | 2.4 | 138.4 | 0.65 | 3.7 | 1.9 | 12 | LC |
| EYWMM3 | 140.3 L | 131.0 | 128.9 | 136.4 | 134.1 | -0.31 | 2.9 | 5.2 H | 134.5 | -0.15 | 3.3 | 4.1 | 12 | LD |
| F92J2D | 135.2 | 132.8 | 131.9 | 133.8 | 133.4 | -0.46 | 4.3 | 1.4 | 133.9 | -0.26 | 3.9 | 1.4 L | 12 | EM |
| GTNZUP | 145.4 *H | 151.5 XH | 143.2 H | 142.2 H | 145.6 | 2.10 * | 10.0 | 4.2 | 146.1 | 2.21 * | 8.0 | 4.7 | 12 | TU |
| HD8WWG | 136.4 | 136.5 | 137.0 | 132.8 | 135.7 | 0.02 | 4.1 | 1.9 | 136.0 | 0.18 | 3.6 | 2.8 | 11 | LD |
| HGQE3K | 135.3 | 131.9 | 130.8 | 134.8 | 133.2 | -0.51 | 3.1 | 2.2 | 133.9 | -0.26 | 3.2 | 2.1 | 12 | LY |
| JKK6XH | 130.2 | 128.5 | 126.1 | 127.4 | 128.1 | -1.59 | 3.0 | 1.7 | 128.5 | -1.36 | 3.2 | 2.4 | 12 | LD |
| JVPKWF | 136.0 | 134.7 | 133.4 | 142.8 | 136.7 | 0.24 | 4.7 | 4.2 | 133.3 | -0.37 | 4.8 | 4.3 | 12 | LC |
| KDY4ZW | 134.0 | 134.0 | 134.7 | 130.8 | 133.4 | -0.47 | 4.8 | 1.7 | 132.7 | -0.51 | 4.3 | 1.7 | 8 | LD |
| L2LQDA | 136.6 | 132.8 | 136.5 | 138.3 | 136.0 | 0.09 | 4.7 | 2.3 | 132.2 | -0.60 | 3.9 | 4.4 | 8 | LZ |
| LPRBQU | 138.8 L | 139.0 L | 135.3 L | 136.4 L | 137.4 | 0.38 | 1.0 | 1.8 | 136.0 | 0.17 | 2.4 | 2.8 | 12 | TH |
| LVC7CB | 134.8 | 134.2 | 134.9 | 134.9 | 134.7 | -0.19 | 4.5 | 0.4 L | 134.2 | -0.19 | 4.0 | 1.3 L | 12 | LD |
| NLHJGW | 135.7 L | 137.8 | 136.1 | 136.1 | 136.4 | 0.17 | 3.2 | 0.9 | 135.6 | 0.09 | 3.3 | 1.6 | 12 | LD |
| NQVGNJ | 130.3 | 133.7 | 128.8 | 131.7 | 131.2 | -0.94 | 4.4 | 2.1 | 132.6 | -0.53 | 3.6 | 3.0 | 12 | LD |

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

**Report #642**
**March 2023**

| WebCode | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| QNF28N | 142.7 L | 142.9 L | 143.1 L | 143.1 L | 142.9 | 1.54 | 1.0 | 0.2 L | 140.7 | 1.12 | 2.3 | 2.5 | 12 | TU |
| RYEW6J | 132.4 | 136.0 | 127.1 | 134.9 | 132.6 | -0.64 | 4.4 | 3.9 | 133.3 | -0.38 | 3.8 | 2.3 | 12 | TH |
| VWFDMM | 134.3 | 130.1 | 134.1 | 134.3 | 133.2 | -0.51 | 3.8 | 2.1 | 131.2 | -0.80 | 3.9 | 2.5 | 12 | LD |
| X9WL6P | 156.8 X | 155.7 X | 154.1 X | NO DATA | 155.5 | 4.20 X | 4.5 | 1.4 | 142.5 | 1.49 | 3.9 | 9.3 | 11 | LD |
| XC689D | 128.3 | 127.3 | 128.8 | 127.2 * | 127.9 | -1.62 | 3.7 | 0.8 | 129.3 | -1.19 | 9.5 | 6.9 | 12 | LC |
| XVUJYH | 131.5 | 134.1 | 135.9 | 136.8 | 134.5 | -0.22 | 5.8 | 2.3 | 133.8 | -0.28 | 5.7 | 2.5 | 12 | LD |
| Y3VMDZ | 137.4 | 131.2 | 139.7 L | 138.6 | 136.7 | 0.23 | 3.5 | 3.8 | 137.8 | 0.53 | 4.3 | 3.5 | 12 | LC |
| Y8K8EV | 133.4 | 134.6 | 136.0 | 136.9 | 135.2 | -0.08 | 5.2 | 1.5 | 136.4 | 0.25 | 5.0 | 2.2 | 12 | LC |
| Z4FZ9N | 129.1 | 127.8 H | 129.2 | 138.6 | 131.2 | -0.93 | 8.2 | 5.0 H | 136.2 | 0.21 | 6.8 | 5.5 | 12 | LD |
| ZPFYVM | 89.5 XH | 94.7 XH | 121.1 * | 134.7 | 110.0 | -5.40 X | 9.6 | 21.5 H | 110.0 | -5.09 X | 9.6 | 21.5 H | 4 | LC |

### Consensus (All Labs) Results

| | Week 1 | Week 2 | Week 3 | Week 4 | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 135.81 | 135.07 | 134.64 | 136.30 | Month Mean | 135.61 | Grand Mean | | 135.17 |
| Avg SDr | 4.17 | 4.53 | 4.80 | 4.34 | Avg SD | 4.32 | Avg SD | | 5.12 |
| SD btwn Labs | 4.88 | 5.32 | 6.00 | 4.66 | SD btwn Labs | 4.74 | SD btwn Labs | | 4.94 |
| Labs Incld | 38 | 38 | 42 | 40 | SD btwn Wks | 2.47 | SD btwn Wks | | 5.80 |
| Labs Excld | 6 | 7 | 3 | 4 | Labs Incld | 39 | Labs Incld | | 42 |
| Labs not Rcvd | 1 | 0 | 0 | 1 | | | | | |

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| EM | Emerson 1200 | EN | Emerson 2200 |
| EX | Emerson (model not specified) | 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 | TH | TMI Compression Tester, Model 17-76 |
| TU | TMI Universal Crush Tester (TMI K440) | | |

# Containerboard Interlaboratory Testing Program
## Analysis 223
### STFI, 42 lb Linerboard - 42H2
TAPPI Official Test Method T826

**Report #642**
**March 2023**

| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Weekly Means** | | | | **Monthly Results** | | | | **Cumulative Results** | | | | | |
| 3QMLGD | 23.1 L | 23.5 L | 22.8 L | 23.4 L | 23.2 | -0.33 | 0.5 | 0.3 | 22.7 | -0.87 | 1.0 | 0.6 | 16 | LZ |
| 42YZL6 | 23.3 | No Data | No Data | No Data | 23.3 | -0.25 | 2.1 | 0.0 | 23.2 | -0.46 | 2.4 | 1.8 H | 13 | LZ |
| 43ADD2 | 23.0 L | 22.1 | 22.8 | 23.2 | 22.8 | -0.67 | 1.8 | 0.5 | 24.3 | 0.60 | 1.4 | 1.6 | 16 | LA |
| 43XGAH | 23.8 | 23.4 | 22.8 | 23.2 | 23.3 | -0.27 | 1.7 | 0.4 | 24.6 | 0.80 | 1.7 | 2.0 H | 16 | LA |
| 4RVQDU | 22.9 | 22.7 | 24.7 | 24.5 | 23.7 | 0.03 | 1.9 | 1.0 | 24.1 | 0.41 | 2.2 | 0.8 | 16 | LH |
| 7VNCEG_AL | 23.7 | 25.1 | 23.5 | 24.0 | 24.1 | 0.31 | 1.8 | 0.7 | 24.2 | 0.48 | 1.9 | 0.8 | 16 | AL |
| 8QT4AD | 22.7 | 21.7 | 22.4 | 22.5 | 22.3 | -1.02 | 1.7 | 0.5 | 22.4 | -1.14 | 1.8 | 0.5 | 16 | LU |
| 9279PU | 21.7 | 22.3 | 22.8 | 22.8 | 22.4 | -0.97 | 1.9 | 0.5 | 22.8 | -0.79 | 2.0 | 0.5 | 16 | LY |
| 9279PU_AL | 23.4 | 23.9 | 23.4 | 23.9 | 23.7 | 0.00 | 1.6 | 0.3 | 23.7 | 0.01 | 1.7 | 0.6 | 16 | AL |
| 9M7W8V | 20.2 * | 20.5 * | 20.0 X | 20.5 *L | 20.3 | -2.55 * | 1.6 | 0.2 | 21.0 | -2.45 * | 1.7 | 1.1 | 16 | LY |
| 9P9K3K_AL | 23.9 | 24.7 | 23.5 | 24.5 | 24.1 | 0.36 | 1.3 | 0.6 | 23.4 | -0.29 | 1.4 | 1.3 | 16 | AL |
| 9XNUJA | 23.9 | 23.1 | 24.1 | 23.8 | 23.7 | 0.05 | 1.6 | 0.4 | 23.7 | -0.02 | 1.5 | 0.6 | 16 | XX |
| A8P7ZF_AL | 23.0 | 23.1 | 23.4 | 25.4 | 23.7 | 0.06 | 1.6 | 1.1 | 23.6 | -0.06 | 1.6 | 0.8 | 16 | AL |
| AVAEB7 | 21.7 | 21.7 | 22.5 | 22.0 | 22.0 | -1.27 | 1.6 | 0.4 | 22.1 | -1.42 | 1.6 | 0.5 | 16 | LY |
| BFW69H | 23.7 | 23.5 | 23.2 | 22.7 | 23.3 | -0.28 | 1.9 | 0.4 | 23.0 | -0.63 | 1.8 | 0.9 | 16 | LY |
| BP38BU | 23.4 | 23.9 | 23.5 | 24.0 | 23.7 | 0.05 | 1.8 | 0.3 | 23.7 | 0.06 | 1.7 | 0.4 | 16 | LA |
| CGNL3Q | 26.1 * | 25.6 | 26.4 * | 26.2 | 26.1 | 1.85 | 1.7 | 0.3 | 25.6 | 1.73 | 1.9 | 0.6 | 16 | LH |
| CJTYE6 | 58.2 XH | 49.8 XH | 49.4 XH | 57.7 XH | 53.8 | 22.81 X | 4.5 | 4.8 H | 53.8 | 27.10 X | 4.5 | 4.8 H | 4 | XX |
| CQYBUQ | 23.7 | 23.5 | 23.7 | 23.4 | 23.6 | -0.05 | 1.8 | 0.1 L | 23.7 | -0.01 | 1.7 | 0.3 | 16 | LU |
| DQPP46_AL | 23.9 | 24.6 | 23.8 | 24.1 | 24.1 | 0.33 | 1.8 | 0.4 | 24.2 | 0.51 | 1.9 | 0.5 | 16 | AL |
| E679T8 | 23.8 | 24.6 | 24.1 | 24.5 | 24.2 | 0.45 | 2.0 | 0.3 | 24.3 | 0.56 | 1.9 | 0.2 L | 16 | LY |
| EW8F37 | 22.8 | 23.3 | 23.5 | 24.2 | 23.4 | -0.16 | 1.6 | 0.5 | 23.0 | -0.57 | 1.7 | 0.6 | 16 | LW |
| EYWMM3 | 22.3 | 22.4 | 23.2 | 24.0 | 23.0 | -0.50 | 1.9 | 0.8 | 23.1 | -0.56 | 1.9 | 0.6 | 16 | LU |
| GN926W_AL | 24.9 | 25.3 | 25.8 | 25.0 | 25.2 | 1.20 | 1.7 | 0.4 | 24.8 | 0.97 | 1.9 | 0.8 | 12 | AL |
| GTNZUP | 24.1 L | 24.1 L | 24.8 | 24.4 L | 24.4 | 0.53 | 0.9 | 0.3 | 24.8 | 0.99 | 1.8 | 1.1 | 16 | LA |
| HD8WWG_Al | 24.9 | 25.5 | 24.7 | 25.3 | 25.1 | 1.10 | 2.1 | 0.4 | 25.5 | 1.60 | 3.1 | 0.9 | 14 | AL |
| HGQE3K | 24.4 | 24.3 | 24.6 | 24.2 | 24.4 | 0.53 | 1.7 | 0.1 | 24.3 | 0.56 | 1.9 | 0.4 | 16 | BK |
| JKK6XH_AL | 23.8 | 24.2 | 24.5 | 23.5 | 24.0 | 0.26 | 1.7 | 0.4 | 24.3 | 0.52 | 1.8 | 0.9 | 16 | AK |
| JVPKWF | 23.3 | 23.3 | 24.1 | 23.5 | 23.6 | -0.08 | 1.5 | 0.4 | 23.7 | -0.01 | 1.7 | 0.3 | 16 | LA |
| JYL9AG | 27.0 * | 26.6 * | 26.9 * | 27.1 * | 26.9 | 2.44 * | 1.9 | 0.2 | 26.7 | 2.72 * | 1.9 | 0.5 | 16 | LH |
| KDY4ZW_AL | 23.5 | 23.2 | 23.2 | 24.3 | 23.6 | -0.08 | 1.7 | 0.5 | 23.5 | -0.13 | 1.7 | 0.4 | 16 | AL |
| KXPKJD_AL | 24.5 | 24.9 | 26.7 *H | 24.4 | 25.1 | 1.12 | 2.1 | 1.1 | 24.3 | 0.60 | 2.1 | 0.9 | 16 | AL |
| KYKW6K | 25.0 L | 24.9 | 23.9 H | 26.8 * | 25.2 | 1.14 | 2.0 | 1.2 | 24.4 | 0.65 | 2.1 | 0.8 | 16 | LH |
| L2LQDA | 22.1 | 23.1 | 23.6 | 21.4 | 22.6 | -0.82 | 1.7 | 1.0 | 22.4 | -1.11 | 1.4 | 1.0 | 16 | LA |
| L6HK6J | 22.6 | 22.3 | 22.5 | 22.3 | 22.4 | -0.92 | 1.7 | 0.2 | 23.1 | -0.52 | 1.6 | 0.6 | 11 | LU |

# Containerboard Interlaboratory Testing Program
## Analysis 223
**STFI, 42 lb Linerboard** - 42H2
TAPPI Official Test Method T826

**Report #642**
**March 2023**

| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **Weekly Means** | | | | **Monthly Results** | | | | **Cumulative Results** | | | | | |
| LPRBQU | 23.6 H | 23.4 L | 23.2 L | 23.3 L | 23.4 | -0.21 | 1.5 | 0.2 | 22.9 | -0.72 | 1.3 | 0.8 | 16 | LZ |
| LVC7CB_AL | 24.1 | 23.3 | 24.1 | 25.2 | 24.2 | 0.38 | 1.8 | 0.8 | 23.9 | 0.20 | 1.8 | 0.5 | 16 | XX |
| M6CPYH | 21.9 | 22.4 | 23.2 | 22.3 | 22.5 | -0.91 | 1.5 | 0.5 | 22.6 | -0.93 | 1.4 | 0.5 | 16 | LH |
| N9V43J | 24.3 | 24.6 | 24.7 | 25.0 | 24.6 | 0.75 | 1.4 | 0.3 | 25.0 | 1.19 | 1.3 | 0.4 | 16 | LH |
| NLHJGW | 22.1 | 23.2 | 23.1 | 23.8 | 23.0 | -0.47 | 2.0 | 0.7 | 23.3 | -0.33 | 1.7 | 0.6 | 16 | LA |
| NQVGNJ | 22.2 | 21.9 | 21.9 | 22.6 | 22.2 | -1.14 | 1.8 | 0.3 | 23.1 | -0.52 | 1.5 | 0.8 | 16 | LY |
| NUAP3P | 23.1 | 23.7 H | 23.4 H | 23.3 H | 23.4 | -0.18 | 2.6 | 0.2 | 23.7 | 0.02 | 2.5 | 0.4 | 16 | LY |
| NXBNF4 | 24.0 | 23.3 | 24.3 | 23.2 | 23.7 | 0.02 | 1.5 | 0.5 | 23.9 | 0.23 | 1.6 | 0.6 | 16 | LH |
| PLVTKG | 22.8 | 23.4 H | 24.4 H | 23.2 | 23.4 | -0.16 | 2.5 | 0.7 | 24.3 | 0.53 | 1.8 | 1.1 | 16 | LA |
| PNKY6E | 22.8 | 23.1 | 22.5 | 24.2 | 23.1 | -0.40 | 1.7 | 0.8 | 23.3 | -0.33 | 1.6 | 0.7 | 16 | LU |
| QNF28N | 20.7 * | 20.6 * | 20.8 * | 21.2 | 20.8 | -2.14 * | 1.7 | 0.3 | 20.9 | -2.55 * | 1.7 | 0.4 | 12 | XX |
| QWQ7F8 | 19.8 * | 21.3 | 24.3 | 21.2 | 21.6 | -1.53 | 1.6 | 1.9 H | 22.0 | -1.51 | 1.8 | 1.1 | 16 | LH |
| QWQ7F8_AL | 20.1 * | 20.8 *H | 23.9 | 19.2 X | 21.0 | -2.01 * | 1.9 | 2.0 H | 21.7 | -1.81 | 1.8 | 1.4 | 16 | AL |
| RQJKZW | 23.6 | 23.9 | 25.4 | 24.5 | 24.4 | 0.54 | 2.1 | 0.8 | 24.0 | 0.31 | 2.1 | 1.1 | 16 | LH |
| RZPYRH | 23.2 | 23.5 | 23.0 | 23.1 | 23.2 | -0.34 | 1.8 | 0.2 | 23.3 | -0.34 | 1.5 | 0.7 | 16 | XX |
| VLYT3Q | 24.3 | 24.9 | 23.2 | 24.5 L | 24.2 | 0.42 | 1.5 | 0.7 | 23.9 | 0.19 | 1.7 | 0.5 | 16 | LA |
| VWFDMM | 23.3 | 22.5 | 23.3 | 22.8 | 23.0 | -0.52 | 1.8 | 0.4 | 23.0 | -0.60 | 1.7 | 0.4 | 16 | LZ |
| X9WL6P | 23.9 H | 27.8 XH | 29.0 XH | No Data | 26.9 | 2.47 * | 3.0 | 2.7 H | 24.4 | 0.68 | 2.4 | 1.8 H | 15 | LW |
| XVUJYH | 23.8 L | 24.1 L | 24.7 | 23.9 L | 24.1 | 0.36 | 0.9 | 0.4 | 23.9 | 0.22 | 0.7 | 0.4 | 16 | LH |
| Y38UM4_AL | 25.5 | 26.5 * | 26.5 * | 26.9 *H | 26.3 | 2.02 * | 2.2 | 0.6 | 26.4 | 2.41 * | 2.0 | 0.3 | 16 | AL |
| Y3VMDZ | 22.2 | 23.6 | 23.4 | 23.3 | 23.1 | -0.41 | 1.7 | 0.7 | 28.5 | 4.32 X | 2.3 | 9.8 H | 16 | LW |
| Y8K8EV | 25.3 | No Data | No Data | 23.8 | 24.5 | 0.66 | 2.3 | 1.1 | 24.4 | 0.68 | 2.0 | 1.4 | 13 | LU |
| Z4FZ9N | 24.3 | 25.1 | 25.2 | 26.6 * | 25.3 | 1.24 | 1.3 | 1.0 | 24.0 | 0.28 | 1.9 | 1.3 | 16 | LA |
| ZPFYVM_AL | 47.3 XL | 47.3 XL | 48.6 XL | 49.5 XL | 48.1 | 18.55 X | 0.0 | 1.1 | 48.1 | 22.03 X | 0.0 | 1.1 | 4 | AL |

### Consensus (All Labs) Results

| | Week 1 | Week 2 | Week 3 | Week 4 | | Monthly | | Grand | |
|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 23.35 | 23.51 | 23.84 | 23.83 | Month Mean | 23.65 | Grand Mean | 23.68 |
| Avg SDr | 1.82 | 1.72 | 1.71 | 1.83 | Avg SD | 1.79 | Avg SD | 1.81 |
| SD btwn Labs | 1.35 | 1.36 | 1.20 | 1.40 | SD btwn Labs | 1.32 | SD btwn Labs | 1.11 |
| Labs Incld | 57 | 54 | 53 | 54 | SD btwn Wks | 0.77 | SD btwn Wks | 0.88 |
| Labs Excld | 2 | 3 | 4 | 3 | Labs Incld | 57 | Labs Incld | 56 |
| Labs not Rcvd | 0 | 2 | 2 | 2 | | | | |

Containerboard Interlaboratory Testing Program
Analysis 223
**STFI, 42 lb Linerboard** - 42H2
TAPPI Official Test Method T826

**Report #642**
**March 2023**

## Key to Instrument Codes Reported by Participants

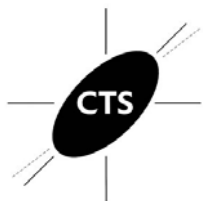| | | | |
|---|---|---|---|
| **AK** | L & W Autoline 300 | **AL** | L & W Autoline 400 |
| **BK** | Buchel Strip Compression Tester BK-155 | **LA** | L&W Autoline (223 Enrollment) |
| **LH** | L&W 282 | **LU** | L&W 52 without moisture correction(was 53) |
| **LW** | L&W 53 with moisture correction (was 53M) | **LY** | L&W 152 without moisture correction |
| **LZ** | L&W (model not specified) | **XX** | Instrument make/model not specified by lab |

Containerboard Interlaboratory Testing Program

Analysis 224

**STFI, 56 lb Linerboard** - 56G3

TAPPI Official Test Method T826

**Report #642**
**March 2023**

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3QMLGD | 31.8 L | 32.0 L | 31.7 L | 32.2 L | 31.9 | -1.40 | 0.9 | 0.2 | 31.8 | -1.57 | 1.7 | 0.7 | 12 | XX |
| 42YZL6 | 32.9 | NO DATA | 28.8 * | 35.1 | 32.3 | -1.18 | 2.8 | 3.2 H | 32.9 | -0.82 | 3.7 | 3.2 | 11 | LZ |
| 43ADD2 | 34.8 | 35.9 | 34.7 | 36.7 | 35.5 | 0.80 | 2.2 | 0.9 | 32.0 | -1.40 | 2.1 | 4.7 H | 12 | LA |
| 43XGAH | 34.3 | 32.9 | 33.3 | 33.7 | 33.6 | -0.39 | 2.3 | 0.6 | 35.4 | 0.85 | 2.5 | 1.6 | 12 | LA |
| 4RVQDU | 33.7 | 34.9 | 34.2 | 35.5 H | 34.5 | 0.22 | 3.2 | 0.8 | 35.9 | 1.19 | 2.7 | 1.8 | 12 | LH |
| 7VNCEG_AL | 34.4 | 33.1 | 34.5 | 35.4 | 34.4 | 0.10 | 2.0 | 1.0 | 35.0 | 0.56 | 2.2 | 0.9 | 12 | AL |
| 8QT4AD | 32.7 | 31.9 | 31.7 | 32.4 | 32.2 | -1.24 | 2.4 | 0.5 | 32.3 | -1.25 | 2.4 | 0.6 | 12 | LU |
| 9279PU | 31.3 | 32.7 | 32.5 | 33.7 | 32.5 | -1.01 | 2.4 | 1.0 | 32.7 | -0.93 | 2.3 | 0.6 | 12 | LY |
| 9279PU_AL | 33.6 | 33.2 | 34.4 | 34.9 | 34.0 | -0.10 | 2.4 | 0.7 | 33.9 | -0.18 | 2.2 | 0.6 | 12 | AL |
| 9M7W8V | 30.8 * | 31.0 | 29.2 * | 28.9 X | 30.0 | -2.58 * | 2.2 | 1.1 | 29.6 | -3.06 X | 2.0 | 1.0 | 8 | LW |
| 9P9K3K_AL | 34.1 | 33.7 L | 32.8 L | 35.1 | 33.9 | -0.16 | 1.8 | 1.0 | 33.8 | -0.25 | 1.4 | 1.0 | 12 | XX |
| 9XNUJA | 34.8 | 34.7 | 34.5 | 34.3 L | 34.6 | 0.24 | 1.5 | 0.2 | 34.4 | 0.19 | 1.7 | 0.6 | 10 | XX |
| A8P7ZF_AL | 33.2 | 32.7 | 31.1 | 33.8 | 32.7 | -0.91 | 2.2 | 1.2 | 33.6 | -0.37 | 2.1 | 1.1 | 12 | AL |
| AVAEB7 | 33.1 | 31.8 | 32.7 | 33.7 | 32.8 | -0.84 | 2.1 | 0.8 | 32.2 | -1.27 | 2.1 | 0.8 | 12 | LY |
| BFW69H | 32.5 L | 34.6 | 34.1 | 32.7 | 33.5 | -0.45 | 2.0 | 1.0 | 34.4 | 0.20 | 2.1 | 1.0 | 12 | LU |
| BP38BU | 34.6 | 35.0 | 34.0 | 35.7 | 34.8 | 0.39 | 2.1 | 0.7 | 35.0 | 0.55 | 2.2 | 0.7 | 12 | LU |
| CGNL3Q | 35.8 | 34.2 | 35.8 | 36.3 | 35.5 | 0.82 | 2.3 | 0.9 | 35.4 | 0.81 | 2.2 | 0.6 | 12 | LH |
| CJTYE6 | 51.8 XH | 48.5 XH | 54.1 XH | 50.9 XH | 51.3 | 10.46 X | 3.9 | 2.3 H | 51.3 | 11.50 X | 3.9 | 2.3 | 4 | XX |
| CQYBUQ | 34.0 | 33.9 | 34.4 | 34.5 L | 34.2 | 0.01 | 2.3 | 0.3 | 34.0 | -0.12 | 2.1 | 0.4 L | 12 | LU |
| DQPP46_AL | 34.0 | 34.9 L | 33.6 | 34.2 | 34.2 | -0.02 | 2.0 | 0.5 | 33.9 | -0.14 | 2.1 | 0.7 | 12 | AL |
| E679T8 | 35.2 | 36.0 | 34.9 | 35.3 | 35.4 | 0.71 | 2.6 | 0.5 | 35.2 | 0.73 | 2.8 | 0.3 L | 12 | LA |
| EW8F37 | 32.2 | 32.4 L | 33.7 | 33.0 | 32.8 | -0.84 | 2.0 | 0.6 | 32.7 | -0.99 | 1.8 | 0.6 | 12 | LW |
| EYWMM3 | 32.6 | 33.0 | 32.4 | 32.8 | 32.7 | -0.92 | 2.6 | 0.3 | 32.6 | -1.01 | 2.6 | 0.8 | 12 | LU |
| GN926W_AL | 35.9 | 37.6 | 35.5 | 35.4 | 36.1 | 1.16 | 2.3 | 1.1 | 36.1 | 1.31 | 2.3 | 1.1 | 4 | AL |
| GTNZUP | 37.4 * | 36.7 L | 37.1 | 37.8 * | 37.3 | 1.87 | 1.4 | 0.5 | 32.4 | -1.14 | 2.0 | 7.4 H | 12 | LA |
| HD8WWG_Al | 34.8 | 37.7 | 37.0 | 37.2 | 36.7 | 1.51 | 2.1 | 1.3 | 37.3 | 2.10 * | 2.3 | 1.2 | 12 | XX |
| HGQE3K | 37.2 * | 36.2 | 36.8 | 36.5 | 36.7 | 1.52 | 2.6 | 0.4 | 35.7 | 1.05 | 2.5 | 0.9 | 12 | BK |
| JKK6XH_AL | 35.0 | 35.4 | 36.4 | 34.5 L | 35.3 | 0.69 | 2.0 | 0.8 | 35.2 | 0.72 | 1.9 | 1.2 | 11 | XX |
| JVPKWF | 34.9 | 34.0 | 35.1 | 34.4 | 34.6 | 0.25 | 2.5 | 0.5 | 33.8 | -0.21 | 2.3 | 1.2 | 12 | LA |
| JYL9AG | 39.7 X | 40.0 X | 40.6 * | 39.6 X | 40.0 | 3.53 X | 2.6 | 0.5 | 39.1 | 3.33 X | 2.7 | 3.3 | 12 | LZ |
| KDY4ZW_AL | 34.2 H | 33.8 | 34.5 | 33.9 | 34.1 | -0.06 | 2.3 | 0.3 | 34.0 | -0.09 | 2.5 | 0.3 L | 8 | AL |
| KXPKJD_AL | 35.4 H | 35.9 | 37.6 | 36.2 | 36.3 | 1.27 | 2.4 | 0.9 | 35.8 | 1.10 | 2.4 | 1.5 | 12 | AL |
| KYKW6K | 35.7 | 37.9 * | 35.5 | 34.3 | 35.8 | 1.01 | 2.7 | 1.5 | 35.7 | 1.01 | 2.7 | 1.0 | 12 | LH |
| L2LQDA | 33.2 | 32.2 | 36.0 | 35.3 | 34.2 | -0.03 | 2.8 | 1.8 | 33.5 | -0.45 | 2.7 | 1.4 | 8 | LA |
| L6HK6J | 32.9 | 33.1 | 34.2 | 32.9 | 33.3 | -0.55 | 2.9 | 0.6 | 34.1 | 0.00 | 2.8 | 1.1 | 8 | LU |

# Containerboard Interlaboratory Testing Program
## Analysis 224
### STFI, 56 lb Linerboard - 56G3
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 |
| LPRBQU | 31.4 L | 31.0 L | 31.6 L | 32.0 L | 31.5 | -1.64 | 0.9 | 0.4 | 31.4 | -1.83 | 1.6 | 0.6 | 12 | LU |
| LVC7CB_AL | 34.7 | 33.5 | 34.4 | 34.7 | 34.3 | 0.09 | 2.1 | 0.5 | 34.1 | -0.04 | 2.1 | 0.6 | 12 | XX |
| M6CPYH | 32.7 | 31.1 L | 32.0 | 32.4 | 32.1 | -1.31 | 1.6 | 0.7 | 32.3 | -1.26 | 1.9 | 0.6 | 12 | LH |
| N9V43J | 37.1 * | 36.8 | 37.0 L | 36.7 | 36.9 | 1.64 | 1.6 | 0.2 | 36.8 | 1.79 | 1.8 | 0.5 L | 12 | LH |
| NLHJGW | 34.0 L | 33.8 | 34.0 | 35.5 L | 34.3 | 0.07 | 1.8 | 0.8 | 34.2 | 0.05 | 1.9 | 1.0 | 12 | LW |
| NQVGNJ | 32.1 L | 32.8 | 32.1 | 34.0 | 32.8 | -0.88 | 2.1 | 0.9 | 33.2 | -0.64 | 1.8 | 0.7 | 12 | LZ |
| NUAP3P | 33.2 H | 34.5 H | 33.4 H | 34.1 H | 33.8 | -0.23 | 4.5 | 0.6 | 33.9 | -0.16 | 3.7 | 1.4 | 12 | LY |
| NXBNF4 | 35.3 | 34.5 | 34.5 | 34.3 | 34.7 | 0.28 | 2.3 | 0.5 | 35.2 | 0.71 | 2.4 | 1.1 | 8 | LH |
| PLVTKG | 31.8 | 34.5 | 34.5 | 32.9 | 33.4 | -0.48 | 1.7 | 1.3 | 34.0 | -0.11 | 1.8 | 2.0 | 12 | LA |
| PNKY6E | 33.0 | 34.8 | 33.2 | 35.0 | 34.0 | -0.13 | 2.7 | 1.1 | 34.4 | 0.15 | 2.7 | 1.5 | 12 | LU |
| QNF28N | 32.6 L | 32.1 | 31.1 | 32.0 | 32.0 | -1.37 | 2.3 | 0.6 | 32.0 | -1.46 | 2.3 | 0.6 | 4 | XX |
| QWQ7F8 | 28.4 X | 30.5 H | 35.9 H | 32.1 | 31.7 | -1.51 | 2.8 | 3.2 H | 32.9 | -0.86 | 2.5 | 2.1 | 12 | LH |
| QWQ7F8_AL | 28.1 X | 30.9 L | 32.4 | 25.5 X | 29.2 | -3.03 X | 1.7 | 3.1 H | 30.6 | -2.35 * | 2.3 | 2.0 | 12 | AL |
| RQJKZW | 33.1 L | 35.5 H | 35.8 H | 35.0 | 34.8 | 0.40 | 2.9 | 1.2 | 34.9 | 0.51 | 2.7 | 1.2 | 12 | LH |
| RZPYRH | 33.2 | 34.9 | 35.4 | 34.3 | 34.4 | 0.16 | 3.0 | 0.9 | 34.5 | 0.24 | 2.5 | 1.2 | 12 | XX |
| VLYT3Q | 35.9 | 37.1 | 37.5 | 37.8 * | 37.1 | 1.76 | 2.9 | 0.8 | 36.2 | 1.41 | 2.4 | 1.3 | 12 | LA |
| VWFDMM | 33.0 | 33.7 | 32.6 | 34.4 | 33.4 | -0.48 | 2.3 | 0.8 | 33.7 | -0.29 | 2.2 | 0.5 | 12 | LZ |
| X9WL6P | 35.5 | 42.5 X | 40.6 *H | No Data | 39.5 | 3.26 X | 3.1 | 3.6 H | 35.4 | 0.88 | 2.9 | 3.5 H | 11 | LW |
| XVUJYH | 33.8 L | 34.3 L | 36.1 L | 35.2 L | 34.9 | 0.40 | 1.0 | 1.1 | 34.8 | 0.44 | 0.9 | 0.7 | 12 | LH |
| Y38UM4_AL | 38.0 * | 37.6 | 36.9 | 38.5 * | 37.8 | 2.17 * | 2.5 | 0.7 | 37.7 | 2.36 * | 2.5 | 1.2 | 12 | AL |
| Y3VMDZ | 32.8 L | 32.8 | 33.9 | 35.5 | 33.7 | -0.27 | 1.9 | 1.3 | 33.3 | -0.54 | 1.8 | 0.9 | 12 | ID |
| Y8K8EV | 34.7 | No Data | No Data | 36.4 | 35.5 | 0.82 | 2.6 | 1.2 | 34.9 | 0.53 | 2.6 | 1.0 | 8 | LU |
| Z4FZ9N | 34.8 | 34.4 | 35.1 | 36.6 H | 35.2 | 0.62 | 3.3 | 1.0 | 34.5 | 0.25 | 2.7 | 1.5 | 12 | LA |
| ZPFYVM_AL | 45.9 XL | 42.9 XL | 44.9 XL | 41.6 XL | 43.8 | 5.87 X | 0.0 | 1.9 | 43.8 | 6.47 X | 0.0 | 1.9 | 4 | XX |

### Consensus (All Labs) Results

| | Week 1 | Week 2 | Week 3 | Week 4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 33.99 | 34.08 | 34.37 | 34.69 | Month Mean | 34.19 | Grand Mean | 34.14 | | |
| Avg SDr | 2.35 | 2.27 | 2.45 | 2.37 | Avg SD | 2.36 | Avg SD | 2.33 | | |
| SD btwn Labs | 1.60 | 1.90 | 2.30 | 1.58 | SD btwn Labs | 1.64 | SD btwn Labs | 1.50 | | |
| Labs Incld | 54 | 53 | 56 | 53 | SD btwn Wks | 1.05 | SD btwn Wks | 1.70 | | |
| Labs Excld | 5 | 4 | 2 | 5 | Labs Incld | 54 | Labs Incld | 55 | | |
| Labs not Rcvd | 0 | 2 | 1 | 1 | | | | | | |

Containerboard Interlaboratory Testing Program
Analysis 224
**STFI, 56 lb Linerboard** - 56G3
TAPPI Official Test Method T826

**Report #642**
**March 2023**

## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| AL | L & W Autoline 400 | BK | Buchel Strip Compression Tester BK-155 |
| ID | IDM Compression Tester | 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) | XX | Instrument make/model not specified by lab |

# Containerboard Interlaboratory Testing Program
## Analysis 228
**Roughness - Stylus Method, 42 lb Linerboard** - 42H
### TAPPI Official Test Method T575

**Report #642**
**March 2023**

| WebCode | Monthly Results Mean | CPV | SD | | Cumulative Results Mean | CPV | SD Months | Months | Inst |
|---|---|---|---|---|---|---|---|---|---|
| 43ADD2 | 170.6 | 1.48 | 27.13 | | 174.9 | 1.43 | 7.04 | 4 | LA |
| 43XGAH | 187.4 | 2.35 * | 32.33 H | | 177.1 | 1.54 | 12.14 | 3 | LA |
| 8QT4AD | 146.9 | 0.26 | 9.32 | | 144.2 | -0.10 | 2.35 | 4 | EV |
| 9279PU | 150.6 | 0.45 | 14.60 | | 170.1 | 1.19 | 32.93 H | 4 | XX |
| 9279PU_AL | 138.9 | -0.16 | 12.00 | | 136.1 | -0.50 | 8.13 | 4 | AL |
| 9M7W8V | 154.7 | 0.66 | 12.45 | | 150.8 | 0.23 | 13.02 | 4 | LS |
| A8P7ZF_AL | 115.6 | -1.36 | 16.06 | | 123.6 | -1.13 | 5.48 | 4 | XX |
| AVAEB7 | 149.4 | 0.38 | 19.18 | | 145.2 | -0.05 | 3.43 | 4 | EV |
| DQPP46_AL | 120.6 | -1.11 | 19.36 | | 128.7 | -0.87 | 16.23 | 4 | AL |
| E679T8 | 136.6 | -0.28 | 22.46 | | 137.7 | -0.42 | 2.29 | 4 | LS |
| EYWMM3 | 139.7 | -0.12 | 9.19 | | 148.0 | 0.09 | 6.26 | 4 | EV |
| GN926W_AL | 136.9 | -0.26 | 23.82 | | 142.2 | -0.20 | 5.35 | 3 | AL |
| GTNZUP | 164.5 | 1.16 | 21.70 | | 197.7 | 2.58 * | 33.44 H | 4 | LA |
| JKK6XH | 135.6 | -0.33 | 24.23 | | 143.8 | -0.12 | 6.54 | 4 | EV |
| JVPKWF | 121.4 | -1.06 | 13.35 | | 121.5 | -1.23 | 5.02 | 4 | EV |
| JYL9AG | 180.2 | 1.98 * | 32.77 H | | 182.7 | 1.82 | 5.67 | 4 | LS |
| KXPKJD_AL | 121.3 | -1.07 | 20.36 | | 121.3 | -1.24 | 4.66 | 4 | AL |
| NLHJGW | 137.1 | -0.25 | 15.43 | | 131.3 | -0.75 | 6.16 | 4 | LA |
| NQVGNJ | 144.3 | 0.12 | 16.34 | | 147.9 | 0.09 | 3.44 | 4 | EV |
| PNKY6E | 138.0 | -0.21 | 20.49 | | 153.8 | 0.38 | 11.73 | 4 | EV |
| QWQ7F8_AL | 150.1 | 0.42 | 14.07 | | 149.9 | 0.18 | 12.64 | 4 | AL |
| RQJKZW | 132.1 | -0.51 | 10.35 | | 138.2 | -0.40 | 7.72 | 4 | EV |
| VWFDMM | 136.6 | -0.28 | 10.54 | | 138.2 | -0.40 | 7.55 | 4 | LS |
| WD2VZ2 | 134.5 | -0.39 | 15.44 | | 139.1 | -0.35 | 15.12 | 4 | LS |
| X9WL6P | 140.3 | -0.09 | 21.33 | | 128.1 | -0.91 | 9.44 | 4 | XX |
| Y38UM4_AL | 119.5 | -1.16 | 14.64 | | 120.6 | -1.28 | 3.83 | 4 | AL |
| Y8K8EV | 151.3 | 0.48 | 16.73 | | 150.2 | 0.20 | 7.97 | 4 | EV |
| Z4FZ9N | 99.1 | -2.22 * | 13.49 | | 124.5 | -1.09 | 31.90 H | 4 | LA |
| ZPFYVM_AL | 163.7 | 1.12 | 23.90 | | 171.9 | 1.29 | 11.57 | 2 | AL |

### Consensus (All Labs) Results

| | | | | |
|---|---|---|---|---|
| Month Mean | 141.98 | | Grand Mean | 146.17 |
| Avg SD | 19.07 | | Avg SD Months | 13.33 |
| SD btwn Labs | 19.35 | | SD btwn Labs | 20.01 |
| Labs Incld | 29 | | Labs Incld | 29 |

Containerboard Interlaboratory Testing Program
Analysis 228
**Roughness - Stylus Method, 42 lb Linerboard** - 42H2
TAPPI Official Test Method T575

**Report #642**
**March 2023**

## 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 | | |

**Containerboard Interlaboratory Testing Program**
Analysis 229
**Roughness - Sheffield Method, 42 lb Linerboard** - 42H2
TAPPI Official Test Method T538

**Report #642**
**March 2023**

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 4RVQDU | 345.5 | -1.98 * | 2.31 | L | 346.1 | -2.23 * | 0.70 L | 4 | LA |
| 7VNCEG_AL | 360.8 | -0.72 | 4.83 | | 365.6 | -0.45 | 4.20 | 4 | AL |
| 9279PU_AL | 368.8 | -0.07 | 6.89 | | 366.4 | -0.39 | 1.86 | 4 | AL |
| 9P9K3K_AL | 382.7 | 1.08 | 8.98 | | 387.8 | 1.56 | 4.94 | 4 | AL |
| CQYBUQ | 380.3 | 0.88 | 7.13 | | 378.2 | 0.69 | 2.11 | 4 | XX |
| HD8WWG | 368.3 | -0.11 | 7.82 | | 357.4 | -1.20 | 8.42 | 4 | PP |
| JKK6XH | 374.9 | 0.44 | 6.85 | | 373.3 | 0.25 | 1.32 | 4 | LA |
| JKK6XH_AL | 365.2 | -0.36 | 7.80 | | 370.4 | -0.02 | 5.12 | 4 | AK |
| KDY4ZW_AL | 379.3 | 0.80 | 10.89 | | 378.0 | 0.67 | 2.45 | 4 | AL |
| KXPKJD_AL | 350.7 | -1.56 | 28.74 | H | 361.0 | -0.88 | 8.65 | 4 | AL |
| LVC7CB_AL | 383.6 | 1.15 | 4.13 | L | 384.0 | 1.21 | 0.62 L | 4 | XX |
| QWQ7F8_AL | 358.4 | -0.92 | 8.69 | | 369.8 | -0.07 | 18.99 H | 4 | AL |
| VWFDMM | 380.8 | 0.92 | 11.84 | | 378.8 | 0.74 | 2.40 | 4 | XX |
| Y38UM4_AL | 375.0 | 0.45 | 8.06 | | 372.0 | 0.13 | 2.91 | 4 | AL |

### Consensus (All Labs) Results

| | | | | |
|---|---|---|---|---|
| Month Mean | 369.59 | | Grand Mean | 370.62 |
| Avg SD | 10.76 | | Avg SD Months | 6.58 |
| SD btwn Labs | 12.15 | | SD btwn Labs | 11.02 |
| Labs Incld | 14 | | Labs Incld | 14 |

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| AK | L & W Autoline 300 | AL | L & W Autoline 400 |
| LA | L & W Autoline (229 Enrollment) | PP | Technidyne Profile/Plus |
| XX | Instrument make/model not specified by lab | | |

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

**Report #642**
**March 2023**

| WebCode | Monthly Results Mean | CPV | SD | | Cumulative Results Mean | CPV | SD Months | Months | Inst |
|---|---|---|---|---|---|---|---|---|---|
| 3ZAMV3 | 134.0 | 0.32 | 9.14 | | 125.4 | -0.15 | 6.87 | 4 | XX |
| 7VNCEG | 125.5 | -0.17 | 4.36 | | 124.8 | -0.19 | 0.47 L | 4 | TM |
| 9279PU | 139.6 | 0.64 | 8.91 | | 127.2 | -0.05 | 8.30 | 4 | TM |
| 9P9K3K | 60.5 | -3.90 X | 1.65 L | | 58.8 | -4.23 X | 1.35 | 4 | LZ |
| A8P7ZF | 107.8 | -1.19 | 10.21 | | 110.7 | -1.06 | 3.55 | 4 | TM |
| BP38BU | 122.2 | -0.36 | 5.54 | | 126.6 | -0.08 | 4.40 | 4 | HZ |
| CQYBUQ | 145.4 | 0.97 | 6.42 | | 148.9 | 1.29 | 2.96 | 4 | HY |
| EYWMM3 | 122.0 | -0.37 | 6.44 | | 123.5 | -0.27 | 2.24 | 4 | TM |
| HD8WWG | 146.4 | 1.03 | 7.16 | | 145.2 | 1.06 | 2.45 | 4 | HY |
| JFR7JM | 143.0 | 0.84 | 3.74 | | 143.1 | 0.93 | 3.13 | 4 | TM |
| JKK6XH | 118.2 | -0.59 | 1.79 L | | 115.7 | -0.75 | 3.73 | 4 | TM |
| JVPKWF | 126.6 | -0.11 | 6.23 | | 123.4 | -0.28 | 3.10 | 4 | TM |
| KDY4ZW | 118.8 | -0.55 | 7.58 | | 123.6 | -0.26 | 3.28 | 4 | TM |
| KXPKJD | 140.4 | 0.69 | 3.05 | | 145.8 | 1.09 | 8.60 | 4 | TM |
| LVC7CB | 149.6 | 1.21 | 4.67 | | 143.8 | 0.98 | 5.05 | 4 | HY |
| NLHJGW | 170.2 | 2.40 * | 7.26 | | 164.7 | 2.26 * | 4.62 | 4 | HY |
| NQVGNJ | 144.0 | 0.89 | 5.05 | | 142.8 | 0.91 | 4.34 | 4 | HZ |
| PLVTKG | 108.4 | -1.15 | 6.63 | | 108.4 | -1.19 | 7.83 | 4 | SC |
| PNKY6E | 117.8 | -0.61 | 11.58 | | 119.8 | -0.50 | 5.29 | 4 | TM |
| RQJKZW | 131.4 | 0.17 | 3.21 | | 136.8 | 0.55 | 4.33 | 4 | TM |
| U76EEC | 115.5 | -0.74 | 5.35 | | 120.2 | -0.47 | 3.61 | 4 | SC |
| WD2VZ2 | 143.2 | 0.85 | 6.94 | | 136.8 | 0.54 | 4.57 | 4 | HY |
| Y8K8EV | 100.4 | -1.61 | 5.50 | | 103.0 | -1.53 | 2.62 | 4 | TM |
| ZMQTBQ | 103.4 | -1.44 | 2.88 | | 112.9 | -0.92 | 6.98 | 4 | XX |
| ZPFYVM | 108.8 | -1.13 | 28.94 H | | 96.7 | -1.91 * | 17.11 | 2 | SC |

## Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 128.44 | Grand Mean | 127.89 |
| Avg SD | 8.70 | Avg SD Months | 5.92 |
| SD btwn Labs | 17.42 | SD btwn Labs | 16.32 |
| Labs Incld | 24 | Labs Incld | 24 |

## Consensus By Method

| Test Method | Group Mean | SD btwn Group | Difference from Grand Mean | Labs Included |
|---|---|---|---|---|
| Scott Bond Type | 126.48 | 15.29 | 1.97 | 19 |
| Modified Scott Bond Mechanics | 157.80 | 17.54 | 29.36 | 2 |

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

**Report #642**
**March 2023**

## Analysis Notes

9P9K3K - 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 |

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

**Report #642**
**March 2023**

| | Monthly Results | | | | Cumulative Results | | | |
|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months |
| 2LHZX4 | 33.0 | 2.01 * | 1.00 | | 31.2 | 1.23 | 1.95 | 4 |
| 43XGAH | 29.0 | 0.42 | 2.92 | | 28.7 | 0.37 | 0.95 | 4 |
| 7VNCEG | 26.4 | -0.62 | 2.07 | | 25.6 | -0.74 | 1.67 | 4 |
| 8QT4AD | 26.8 | -0.46 | 1.30 | | 26.8 | -0.31 | 1.16 | 4 |
| 9279PU | 28.4 | 0.18 | 2.70 | | 26.2 | -0.55 | 1.88 | 4 |
| | | | | | | | | |
| 9M7W8V | 29.8 | 0.74 | 0.84 | | 31.7 | 1.41 | 2.06 | 4 |
| 9P9K3K | 23.8 | -1.66 | 2.51 | | 22.2 | -1.96 * | 1.26 | 4 |
| A8P7ZF | 30.0 | 0.83 | 3.37 | | 30.4 | 0.97 | 0.72 | 4 |
| AVAEB7 | 30.4 | 0.98 | 1.79 | | 29.2 | 0.53 | 1.13 | 4 |
| CQYBUQ | 27.7 | -0.10 | 0.70 L | | 25.6 | -0.73 | 1.94 | 4 |
| | | | | | | | | |
| DQPP46 | 25.4 | -1.02 | 2.70 | | 26.1 | -0.58 | 1.89 | 4 |
| E679T8 | 27.2 | -0.30 | 1.30 | | 27.4 | -0.10 | 0.28 L | 4 |
| EYWMM3 | 29.4 | 0.58 | 5.90 H | | 28.5 | 0.29 | 1.15 | 4 |
| J3LHJJ | 27.4 | -0.22 | 2.30 | | 25.8 | -0.67 | 1.43 | 4 |
| JKK6XH | 31.9 | 1.58 | 5.62 | | 30.2 | 0.90 | 1.23 | 4 |
| | | | | | | | | |
| JYL9AG | 27.2 | -0.30 | 2.59 | | 22.9 | -1.71 | 3.37 | 4 |
| KXPKJD | 27.0 | -0.38 | 2.83 | | 30.1 | 0.86 | 3.31 | 4 |
| LVC7CB | 29.6 | 0.66 | 1.52 | | 28.7 | 0.36 | 1.16 | 4 |
| NLHJGW | 25.6 | -0.94 | 3.44 | | 26.6 | -0.41 | 1.32 | 4 |
| NQVGNJ | 21.8 | -2.46 * | 3.17 | | 20.7 | -2.50 * | 2.41 | 4 |
| | | | | | | | | |
| PLVTKG | 27.2 | -0.30 | 0.45 L | | 27.8 | 0.02 | 0.89 | 4 |
| PNKY6E | 30.8 | 1.14 | 3.11 | | 31.5 | 1.36 | 1.09 | 4 |
| RQJKZW | 29.2 | 0.50 | 2.86 | | 30.1 | 0.84 | 1.23 | 4 |
| VWFDMM | 27.1 | -0.34 | 6.99 H | | 30.7 | 1.06 | 2.84 | 4 |
| WD2VZ2 | 28.2 | 0.10 | 0.84 | | 28.4 | 0.25 | 0.28 L | 4 |
| | | | | | | | | |
| X9WL6P | 27.2 | -0.30 | 4.76 | | 26.0 | -0.62 | 4.71 H | 4 |
| XVUJYH | 24.6 | -1.34 | 0.82 | | 25.0 | -0.96 | 1.57 | 4 |
| Y38UM4 | 28.3 | 0.12 | 1.77 | | 29.0 | 0.45 | 0.91 | 4 |
| Y8K8EV | 25.0 | -1.18 | 4.30 | | 27.1 | -0.23 | 3.32 | 4 |
| YAPT72 | 28.6 | 0.26 | 2.19 | | 26.6 | -0.41 | 1.75 | 4 |
| | | | | | | | | |
| ZPFYVM | 32.6 | 1.85 | 2.12 | | 32.1 | 1.55 | 0.78 | 2 |

### Consensus (All Labs) Results

| | | | | |
|---|---|---|---|---|
| Month Mean | 27.96 | | Grand Mean | 27.69 |
| Avg SD | 3.04 | | Avg SD Months | 1.93 |
| SD btwn Labs | 2.50 | | SD btwn Labs | 2.81 |
| Labs Incld | 31 | | Labs Incld | 31 |

Containerboard Interlaboratory Testing Program
**Report #642**

Analysis 234
**March 2023**

**COF Inclined Plane (Slide Angle), 42 lb Linerboard** - 42H

TAPPI Official Test Method T815

## Key to Instrument Codes Reported by Participants

ZZ     Instruments No Longer Tracked

# Containerboard Interlaboratory Testing Program
## Analysis 237
### Air Resistance, 42 lb Linerboard - 42H2
TAPPI Official Test Method T460

**Report #642**
**March 2023**

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 2LHZX4_AL | 31.7 | -0.27 | 2.28 | | 25.2 | -6.56 X | 14.04 H | 4 | AL |
| 43ADD2 | 31.8 | -0.24 | 2.72 | | 32.8 | 0.45 | 1.97 | 4 | LA |
| 43XGAH | 32.1 | 0.00 | 1.81 | | 30.6 | -1.51 | 1.54 | 4 | LA |
| 4RVQDU | 26.8 | -3.87 X | 2.11 | | 27.8 | -4.14 X | 0.73 | 4 | LA |
| 7VNCEG_AL | 31.1 | -0.70 | 1.71 | | 32.3 | 0.02 | 1.69 | 4 | AL |
| 8QT4AD | 31.9 | -0.13 | 2.97 | | 32.0 | -0.30 | 0.75 | 4 | LP |
| 9279PU | 31.9 | -0.16 | 1.86 | | 32.4 | 0.10 | 0.75 | 4 | LP |
| 9279PU_AL | 34.5 | 1.74 | 1.77 | | 34.4 | 1.98 * | 0.92 | 4 | AL |
| 9M7W8V | 31.8 | -0.22 | 1.62 | | 31.3 | -0.92 | 1.49 | 4 | XX |
| 9P9K3K_AL | 31.9 | -0.17 | 1.09 | | 32.6 | 0.30 | 1.04 | 4 | AL |
| A8P7ZF_AL | 32.9 | 0.59 | 1.91 | | 33.6 | 1.17 | 0.88 | 4 | XX |
| BEKVBX | 31.8 | -0.22 | 5.01 H | | 31.6 | -0.64 | 0.56 | 4 | GG |
| CGNL3Q | 30.4 | -1.24 | 2.50 | | 29.7 | -2.36 * | 1.96 | 4 | XX |
| CQYBUQ | 32.2 | 0.10 | 2.57 | | 32.1 | -0.13 | 0.26 L | 4 | TP |
| DQPP46_AL | 31.4 | -0.50 | 1.34 | | 30.8 | -1.38 | 0.47 | 4 | AL |
| E679T8 | 32.6 | 0.37 | 1.64 | | 32.5 | 0.15 | 0.35 | 4 | LP |
| EYWMM3 | 36.4 | 3.13 X | 2.61 | | 33.7 | 1.25 | 3.31 | 4 | GA |
| GN926W_AL | 33.6 | 1.10 | 3.60 | | 33.4 | 1.06 | 0.61 | 3 | AL |
| GTNZUP | 33.8 | 1.23 | 3.51 | | 33.1 | 0.74 | 1.41 | 4 | LA |
| HD8WWG | 30.3 | -1.29 | 2.71 | | 31.4 | -0.82 | 0.84 | 4 | TP |
| J3LHJJ | 29.8 | -1.67 | 2.90 | | 30.9 | -1.24 | 2.17 | 4 | XX |
| JKK6XH_AL | 31.6 | -0.38 | 1.50 | | 32.1 | -0.18 | 1.00 | 4 | AK |
| JYL9AG | 29.4 | -2.00 * | 2.89 | | 26.2 | -5.56 X | 2.13 | 4 | TD |
| KDY4ZW_AL | 32.8 | 0.50 | 1.70 | | 32.5 | 0.23 | 1.00 | 4 | AL |
| KXPKJD_AL | 32.9 | 0.58 | 1.99 | | 32.3 | -0.03 | 0.91 | 4 | AL |
| LVC7CB | 31.6 | -0.38 | 2.37 | | 31.8 | -0.48 | 0.81 | 4 | TP |
| LVC7CB_AL | 32.2 | 0.07 | 1.21 | | 31.6 | -0.59 | 0.64 | 4 | XX |
| NLHJGW | 30.6 | -1.09 | 2.12 | | 32.5 | 0.19 | 1.73 | 4 | LP |
| NQVGNJ | 31.8 | -0.21 | 2.63 | | 32.4 | 0.09 | 0.92 | 4 | LP |
| PNKY6E_AL | 33.8 | 1.23 | 1.79 | | 32.8 | 0.42 | 1.64 | 4 | AL |
| PR24Y3 | 29.8 | -1.65 | 2.48 | | 34.6 | 2.10 * | 6.68 H | 4 | LP |
| QWQ7F8_AL | 32.5 | 0.27 | 2.07 | | 33.7 | 1.27 | 1.01 | 4 | AL |
| RKVCJ4 | 34.7 | 1.92 | 1.21 | | 32.4 | 0.10 | 1.63 | 4 | LP |
| RQJKZW | 33.7 | 1.18 | 2.40 | | 31.5 | -0.76 | 1.57 | 4 | LP |
| VLYT3Q | 33.2 | 0.78 | 2.58 | | 31.8 | -0.47 | 0.98 | 4 | LP |
| VWFDMM | 34.1 | 1.47 | 5.17 H | | 34.2 | 1.75 | 1.18 | 4 | GA |
| WD2VZ2 | 32.6 | 0.32 | 3.11 | | 31.9 | -0.38 | 0.69 | 4 | LP |
| X9WL6P | 32.7 | 0.43 | 1.32 | | 31.9 | -0.38 | 1.97 | 4 | LP |
| Y38UM4_AL | 28.6 | -2.55 * | 1.71 | | 30.2 | -1.97 * | 1.24 | 4 | AL |

**Containerboard Interlaboratory Testing Program**
Analysis 237
**Air Resistance, 42 lb Linerboard** - 42H2
TAPPI Official Test Method T460

**Report #642**
**March 2023**

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| Y8K8EV_AL | 32.2 | 0.07 | 1.90 | | 33.0 | 0.62 | 0.80 | 4 | AL |
| Z4FZ9N | 33.1 | 0.75 | 1.70 | | 32.2 | -0.13 | 0.68 | 4 | LA |
| ZPFYVM_AL | 32.6 | 0.40 | 2.14 | | 33.1 | 0.69 | 0.57 | 2 | AL |

### Consensus (All Labs) Results

| | | | | |
|---|---|---|---|---|
| Month Mean | 32.10 | | Grand Mean | 32.29 |
| Avg SD | 2.45 | | Avg SD Months | 1.67 |
| SD btwn Labs | 1.37 | | SD btwn Labs | 1.09 |
| Labs Incld | 40 | | Labs Incld | 39 |

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| AK | L & W Autoline 300 | 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 | | |

# Containerboard Interlaboratory Testing Program
## Analysis 240
### Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM12
TAPPI Official Test Method T809

**Report #642**
**March 2023**

| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Weekly Means | | | Monthly Results | | | | Cumulative Results | | | | |
| 2UN3YU | 54.0 | 54.4 | 52.8 | 51.8 | 53.2 | -1.62 | 3.2 | 1.2 | 54.7 | -1.44 | 2.6 | 1.9 | 16 | EM |
| 3ZR4X3 | 60.3 | 59.3 | 58.0 | 58.5 | 59.0 | 0.53 | 3.2 | 1.0 | 59.0 | 0.38 | 3.0 | 0.6 | 16 | LD |
| 42YZL6 | 62.1 | 61.6 | 58.8 | 55.8 | 59.6 | 0.73 | 3.1 | 2.9 | 59.9 | 0.74 | 3.4 | 2.3 | 16 | LD |
| 43ADD2 | 58.0 | 60.3 | 56.3 | 58.5 | 58.3 | 0.25 | 3.1 | 1.6 | 58.0 | -0.04 | 3.5 | 1.8 | 16 | MB |
| 43XGAH | 53.6 | 53.9 | 51.9 | 52.8 | 53.1 | -1.69 | 4.7 | 0.9 | 53.7 | -1.88 | 4.3 | 1.8 | 16 | MB |
| 4RVQDU | 52.1 | 52.3 | 54.9 | 52.7 | 53.0 | -1.72 | 4.2 | 1.3 | 42.7 | -6.51 X | 3.3 | 10.6 H | 16 | LD |
| 8D2DQU | 60.9 | 62.0 | 63.9 | 63.5 * | 62.6 | 1.84 | 2.8 | 1.3 | 61.6 | 1.45 | 2.7 | 1.9 | 12 | TB |
| 9279PU | 54.6 | 54.8 | 56.1 | 54.4 | 55.0 | -0.98 | 2.7 | 0.8 | 53.5 | -1.97 * | 3.5 | 1.6 | 16 | LD |
| 9P9K3K | 58.1 | 54.7 | 54.4 | 53.9 | 55.3 | -0.86 | 2.7 | 1.9 | 55.9 | -0.93 | 3.0 | 1.7 | 16 | LD |
| 9U7RFA | 55.0 | 52.8 | 56.7 | 56.8 | 55.3 | -0.85 | 3.2 | 1.9 | 55.9 | -0.96 | 2.9 | 1.5 | 16 | TH |
| 9XNUJA | 56.5 | 57.4 H | 58.9 H | 58.4 | 57.8 | 0.07 | 5.3 | 1.1 | 57.7 | -0.18 | 5.8 | 1.0 | 16 | TH |
| AFZVVM | 63.8 * | 60.0 | 66.2 * | 66.5 X | 64.1 | 2.42 * | 3.4 | 3.0 | 63.4 | 2.23 * | 3.9 | 2.1 | 16 | TX |
| AVAEB7 | 57.0 | 58.5 | 60.8 | 59.6 | 59.0 | 0.51 | 3.2 | 1.6 | 59.2 | 0.43 | 4.2 | 2.1 | 16 | EN |
| BFW69H | 54.0 H | 59.5 | 59.5 | 61.2 | 58.6 | 0.35 | 5.7 | 3.1 | 57.8 | -0.14 | 4.7 | 1.9 | 16 | LD |
| BP38BU | 56.0 | 56.5 | 59.6 | 55.6 | 56.9 | -0.26 | 3.9 | 1.8 | 56.7 | -0.60 | 3.2 | 1.4 | 16 | LD |
| CGNL3Q | 54.7 | 53.3 | 52.1 | 53.8 | 53.5 | -1.54 | 2.6 | 1.1 | 55.5 | -1.12 | 3.1 | 2.2 | 16 | LD |
| CQYBUQ | 56.8 | 60.1 | 53.2 | 56.4 | 56.6 | -0.36 | 3.8 | 2.8 | 57.9 | -0.08 | 3.8 | 2.3 | 16 | LC |
| DQPP46 | 61.5 | 62.7 | 60.4 | 57.8 | 60.6 | 1.11 | 3.9 | 2.1 | 59.4 | 0.54 | 4.4 | 1.9 | 16 | LZ |
| E679T8 | 57.8 | 57.7 | 58.0 L | 57.9 | 57.9 | 0.09 | 1.8 | 0.1 L | 58.3 | 0.06 | 1.7 | 0.4 L | 16 | LD |
| EYWMM3 | 58.8 | 57.7 | 54.3 | 53.4 | 56.1 | -0.58 | 3.3 | 2.6 | 56.8 | -0.56 | 3.8 | 2.7 | 16 | LD |
| GTNZUP | 61.0 | 60.6 | 60.5 | 60.3 | 60.6 | 1.11 | 4.4 | 0.3 L | 60.4 | 0.94 | 3.9 | 2.0 | 16 | TU |
| HD8WWG | 57.7 | 56.1 | 54.6 | 55.6 | 56.0 | -0.60 | 3.1 | 1.3 | 57.8 | -0.16 | 3.3 | 1.7 | 13 | LD |
| HGQE3K | 58.0 | 59.3 | 55.5 | 56.8 | 57.4 | -0.08 | 3.4 | 1.6 | 58.1 | 0.00 | 3.8 | 1.8 | 16 | LZ |
| J3LHJJ | 51.5 * | 51.6 * | 52.5 | 51.4 * | 51.7 | -2.18 * | 4.0 | 0.5 | 56.3 | -0.76 | 4.4 | 3.5 | 16 | LZ |
| JVPKWF | 58.8 | 59.5 | 59.6 | 59.6 | 59.4 | 0.66 | 2.7 | 0.4 | 59.0 | 0.37 | 3.3 | 2.0 | 16 | LC |
| KXPKJD | 55.4 | 59.0 | 54.9 | 57.3 | 56.7 | -0.35 | 3.7 | 1.9 | 55.8 | -0.97 | 3.9 | 2.1 | 16 | LD |
| KYKW6K | 59.7 | 58.8 | 61.7 | 57.1 | 59.3 | 0.64 | 3.4 | 1.9 | 61.8 | 1.56 | 4.4 | 2.2 | 16 | LD |
| LPRBQU | 61.6 | 61.7 L | 62.9 L | 60.8 | 61.7 | 1.53 | 1.4 | 0.9 | 59.7 | 0.67 | 2.0 | 1.9 | 16 | TH |
| LQ4KLT | 60.9 | 60.7 | 60.1 | 59.2 | 60.2 | 0.98 | 3.7 | 0.8 | 59.6 | 0.62 | 3.8 | 3.6 | 16 | LD |
| LVC7CB | 57.3 | 56.7 | 57.2 | 55.4 | 56.6 | -0.37 | 3.2 | 0.8 | 56.7 | -0.60 | 3.3 | 1.2 | 16 | LD |
| M6CPYH | 56.8 | 57.0 | 56.5 | 56.4 | 56.7 | -0.35 | 2.7 | 0.3 | 56.9 | -0.50 | 3.0 | 0.9 | 16 | EN |
| N9V43J | 55.3 | 54.2 L | 56.4 | 56.4 | 55.6 | -0.76 | 2.6 | 1.0 | 55.4 | -1.14 | 3.6 | 1.4 | 16 | LD |
| NLHJGW | 57.7 | 57.6 | 61.0 | 59.4 | 58.9 | 0.50 | 3.5 | 1.6 | 59.2 | 0.44 | 3.4 | 1.0 | 16 | XX |
| NQVGNJ | 56.8 | 60.4 | 59.9 | 56.7 | 58.5 | 0.31 | 3.7 | 2.0 | 56.3 | -0.78 | 3.5 | 2.3 | 16 | LZ |
| NXBNF4 | 60.3 | 59.4 | 58.4 | 57.1 | 58.8 | 0.45 | 2.6 | 1.4 | 60.5 | 0.98 | 4.0 | 1.9 | 16 | LD |

## Containerboard Interlaboratory Testing Program
### Analysis 240
### Flat Crush Strength (CMT), 26 lb Corrugating Medium - CM12
TAPPI Official Test Method T809

**Report #642**
**March 2023**

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PHE4LE | 61.2 | 58.4 L | 60.4 | 58.6 | 59.6 | 0.76 | 3.0 | 1.4 | 61.3 | 1.34 | 3.2 | 1.9 | 16 | LC |
| PR24Y3 | 59.6 | 56.7 | 62.0 | 62.3 | 60.2 | 0.95 | 4.1 | 2.6 | 58.9 | 0.31 | 3.6 | 3.2 | 16 | LD |
| QNF28N | 58.1 L | 57.7 L | 57.9 L | 58.4 L | 58.0 | 0.15 | 0.9 | 0.3 | 57.5 | -0.26 | 1.2 | 0.5 L | 16 | TU |
| RKVCJ4 | 56.9 | 57.9 | 59.8 | 58.0 | 58.1 | 0.20 | 3.0 | 1.2 | 58.0 | -0.07 | 3.2 | 1.5 | 16 | LD |
| RZPYRH | 58.5 L | 58.2 L | 58.9 L | 57.9 L | 58.4 | 0.29 | 0.9 | 0.4 | 59.8 | 0.72 | 0.9 | 1.3 | 16 | XX |
| TMYYMF | 58.5 L | 58.4 L | 58.4 L | 58.3 L | 58.4 | 0.30 | 0.9 | 0.1 L | 58.2 | 0.01 | 0.6 | 0.2 L | 16 | LD |
| U76EEC | 50.9 * | 53.8 | 54.6 | 56.9 | 54.0 | -1.32 | 3.4 | 2.5 | 54.0 | -1.73 | 3.4 | 2.3 | 16 | LC |
| VWFDMM | 57.0 | 58.0 | 56.1 | 53.6 | 56.2 | -0.53 | 4.5 | 1.9 | 57.8 | -0.15 | 3.5 | 2.1 | 16 | LZ |
| VZUMFX | 55.6 L | 55.9 | 56.1 | 55.0 | 55.6 | -0.73 | 2.4 | 0.5 | 55.9 | -0.94 | 3.4 | 0.6 | 16 | LD |
| WD2VZ2 | NO DATA | NO DATA | NO DATA | 55.4 | 55.4 | -0.80 | 2.1 | 0.0 | 57.4 | -0.30 | 2.8 | 1.6 | 4 | LD |
| X9WL6P | 68.0 X | 65.7 * | 70.5 X | NO DATA | 68.1 | 3.88 X | 3.6 | 2.4 | 63.8 | 2.40 * | 3.5 | 3.9 | 15 | LD |
| XVUJYH | 62.9 | 64.7 * | 62.9 | 62.5 H | 63.2 | 2.09 * | 4.9 | 1.0 | 62.7 | 1.93 | 4.0 | 1.3 | 16 | LD |
| Y3VMDZ | 59.8 | 54.5 H | 56.6 | 54.6 | 56.4 | -0.45 | 5.0 | 2.5 | 58.1 | -0.01 | 4.4 | 2.7 | 16 | LD |
| Y8K8EV | 58.8 | 56.0 | 57.7 | 59.9 | 58.1 | 0.18 | 2.8 | 1.7 | 58.6 | 0.18 | 3.3 | 1.7 | 16 | LC |

### Consensus (All Labs) Results

| | Week 1 | Week 2 | Week 3 | Week 4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 57.71 | 57.87 | 57.86 | 57.10 | Month Mean | | 57.61 | Grand Mean | | 58.13 |
| Avg SDr | 3.63 | 3.65 | 3.14 | 3.29 | Avg SD | | 3.42 | Avg SD | | 3.50 |
| SD btwn Labs | 2.94 | 3.10 | 3.25 | 2.79 | SD btwn Labs | | 2.69 | SD btwn Labs | | 2.37 |
| Labs Incld | 47 | 48 | 47 | 47 | SD btwn Wks | | 1.64 | SD btwn Wks | | 1.98 |
| Labs Excld | 1 | 0 | 1 | 1 | Labs Incld | | 48 | Labs Incld | | 48 |
| Labs not Rcvd | 1 | 1 | 1 | 1 | | | | | | |

### 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 | | | |

**Fluted Edge Crush Strength (CFC), 26 lb Corrugating Medium** - CM12
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 |
| 4RVQDU | 56.2 *H | 55.3 XH | 55.4 *H | 56.7 *H | 55.9 | -5.49 X | 7.9 | 0.7 | 64.7 | -1.60 | 7.0 | 15.4 H | 16 | LD |
| 9279PU | 58.1 *H | 58.5 X | 59.5 | 59.7 | 58.9 | -4.23 X | 5.0 | 0.8 | 57.4 | -4.43 X | 4.6 | 3.5 | 16 | LD |
| 9P9K3K | 71.1 | 70.7 | 71.9 | 69.8 | 70.9 | 0.72 | 2.7 | 0.8 | 70.6 | 0.70 | 3.0 | 1.7 | 16 | LD |
| CQYBUQ | 67.5 | 69.4 | 70.3 L | 68.6 L | 68.9 | -0.08 | 2.3 | 1.2 | 69.6 | 0.33 | 3.0 | 2.5 | 16 | LC |
| DQPP46 | 65.8 | 68.4 | 59.0 H | 62.0 | 63.8 | -2.22 * | 4.3 | 4.1 H | 63.7 | -1.97 * | 4.5 | 2.7 | 16 | LZ |
| E679T8 | 68.1 | 68.1 | 68.2 | 68.9 | 68.3 | -0.34 | 2.3 | 0.4 | 68.7 | -0.02 | 1.8 | 0.4 L | 16 | LD |
| HD8WWG | 69.4 | 71.4 | 70.9 | 68.1 | 70.0 | 0.35 | 4.1 | 1.5 | 70.2 | 0.57 | 4.1 | 1.4 | 13 | LD |
| HGQE3K | 67.2 | 66.9 | 67.2 | 69.5 | 67.7 | -0.59 | 3.3 | 1.2 | 67.1 | -0.66 | 3.6 | 1.5 | 16 | LZ |
| KXPKJD | 70.2 | 68.9 | 70.4 | 66.7 | 69.1 | -0.04 | 3.8 | 1.7 | 70.2 | 0.55 | 3.6 | 1.8 | 16 | LD |
| LPRBQU | 63.7 L | 64.8 L | 64.8 L | 67.8 H | 65.3 | -1.59 | 4.5 | 1.8 | 64.1 | -1.81 | 3.0 | 1.3 | 16 | TH |
| LVC7CB | 70.1 | 70.1 | 70.6 | 74.6 | 71.4 | 0.92 | 4.0 | 2.2 | 71.6 | 1.11 | 3.9 | 1.6 | 16 | LD |
| NLHJGW | 71.0 | 69.0 | 68.8 | 71.2 | 70.0 | 0.36 | 3.5 | 1.3 | 70.1 | 0.53 | 3.6 | 1.2 | 16 | XX |
| PR24Y3 | 73.6 | 74.7 * | 75.4 | 71.8 | 73.9 | 1.97 * | 3.7 | 1.6 | 72.6 | 1.49 | 3.5 | 2.2 | 16 | LD |
| RKVCJ4 | 69.3 | 68.3 | 67.9 | 66.1 | 67.9 | -0.51 | 3.8 | 1.3 | 68.4 | -0.17 | 3.3 | 1.5 | 16 | LD |
| RZPYRH | 69.5 L | 70.6 | 69.7 | 69.6 L | 69.8 | 0.29 | 2.0 | 0.5 | 71.1 | 0.91 | 1.3 | 1.2 | 16 | XX |
| X9WL6P | 72.0 | 70.7 | 69.2 | No Data | 70.6 | 0.61 | 2.9 | 1.4 | 68.9 | 0.07 | 3.7 | 1.5 | 15 | LD |
| Y3VMDZ | 65.7 | 64.6 H | 70.6 | 70.0 | 67.7 | -0.59 | 3.7 | 3.0 | 68.5 | -0.11 | 3.2 | 3.1 | 16 | LD |
| Y8K8EV | 71.9 | 69.3 | 71.9 | 70.5 | 70.9 | 0.73 | 3.9 | 1.3 | 69.0 | 0.09 | 5.6 | 2.0 | 16 | LC |

### Consensus (All Labs) Results

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 67.80 | 69.12 | 67.89 | 67.74 | Month Mean | 69.14 | Grand Mean | | 68.78 |
| Avg SDr | 4.00 | 3.03 | 3.92 | 4.67 | Avg SD | 3.51 | Avg SD | | 3.84 |
| SD btwn Labs | 4.61 | 2.45 | 5.12 | 4.51 | SD btwn Labs | 2.41 | SD btwn Labs | | 2.57 |
| Labs Incld | 18 | 16 | 18 | 17 | SD btwn Wks | 1.81 | SD btwn Wks | | 4.13 |
| Labs Excld | 0 | 2 | 0 | 0 | Labs Incld | 16 | Labs Incld | | 17 |
| Labs not Rcvd | 0 | 0 | 0 | 1 | | | | | |

### 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) | | TH | TMI Compression Tester, Model 17-76 |
| XX | Instrument make/model not specified by lab | | | |

# Containerboard Interlaboratory Testing Program
## Analysis 255
### Ring Crush (RCT), 26 lb Corrugating Medium - CM12
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 |
| 2UN3YU | 41.4 H | 39.2 *H | 42.2 H | 40.0 H | 40.7 | -1.89 | 5.9 | 1.3 | 44.1 | -0.26 | 4.2 | 3.3 | 16 | EM |
| 3ZR4X3 | 44.4 | 44.3 | 44.8 | 44.7 | 44.6 | 0.16 | 2.7 | 0.3 | 44.1 | -0.26 | 2.6 | 0.5 | 16 | LD |
| 42YZL6 | 44.8 | 46.5 | 45.9 | 47.6 | 46.2 | 1.03 | 3.2 | 1.2 | 46.5 | 1.15 | 3.4 | 1.7 | 16 | LZ |
| 43XGAH | 45.5 | 45.4 H | 44.8 | 44.7 | 45.1 | 0.44 | 4.8 | 0.4 | 46.7 | 1.21 | 3.9 | 4.4 H | 16 | MB |
| 8D2DQU | 39.1 * | 39.3 * | 40.5 * | 39.5 | 39.6 | -2.48 * | 1.9 | 0.6 | 40.9 | -2.12 * | 2.8 | 1.6 | 12 | XX |
| 9P9K3K | 45.4 | 42.4 | 43.5 | 45.6 | 44.2 | -0.01 | 2.8 | 1.5 | 44.4 | -0.10 | 2.5 | 1.1 | 16 | LD |
| 9U7RFA | 35.3 X | 35.1 X | 38.0 X | 37.5 * | 36.5 | -4.14 X | 2.3 | 1.5 | 35.7 | -5.08 X | 2.3 | 1.9 | 16 | TH |
| AFZVVM | 43.5 | 46.8 | 48.5 *H | 48.4 | 46.8 | 1.33 | 3.6 | 2.3 | 47.9 | 1.93 * | 3.4 | 2.0 | 16 | LZ |
| BP38BU | 42.4 L | 43.8 | 46.5 | 45.0 | 44.4 | 0.08 | 3.0 | 1.8 | 44.5 | -0.03 | 2.9 | 1.1 | 16 | LD |
| CGNL3Q | 45.2 | 46.0 | 47.6 | 46.5 | 46.3 | 1.09 | 3.0 | 1.0 | 46.0 | 0.84 | 3.0 | 0.7 | 16 | LD |
| CQYBUQ | 46.5 | 45.1 | 42.9 | 47.5 | 45.5 | 0.65 | 3.1 | 2.0 | 45.1 | 0.32 | 3.0 | 2.0 | 16 | LC |
| HD8WWG | 44.0 | 43.7 | 45.7 | 47.2 | 45.2 | 0.48 | 2.7 | 1.6 | 46.2 | 0.94 | 3.3 | 1.4 | 14 | LD |
| KYKW6K | 44.1 | 45.5 H | 42.3 | 45.0 | 44.2 | -0.02 | 3.2 | 1.4 | 44.6 | 0.00 | 3.3 | 1.3 | 16 | LD |
| LPRBQU | 44.8 L | 42.9 L | 42.9 L | 43.3 L | 43.5 | -0.41 | 0.8 | 0.9 | 43.8 | -0.46 | 2.0 | 0.8 | 16 | TH |
| LQ4KLT | 45.2 | 45.0 | 48.0 | 48.8 | 46.7 | 1.31 | 3.2 | 1.9 | 46.4 | 1.08 | 3.6 | 1.9 | 16 | EM |
| LVC7CB | 47.0 | 45.4 | 45.6 | 45.5 | 45.9 | 0.85 | 3.0 | 0.8 | 46.7 | 1.27 | 3.0 | 1.1 | 16 | LD |
| NLHJGW | 43.5 | 44.5 | 43.2 | 43.1 | 43.6 | -0.37 | 2.8 | 0.6 | 43.8 | -0.42 | 3.4 | 1.1 | 16 | XX |
| PHE4LE | 39.1 *L | 41.5 | 41.6 | 39.2 | 40.3 | -2.08 * | 2.3 | 1.4 | 41.1 | -1.99 * | 2.6 | 1.2 | 16 | XX |
| PR24Y3 | 44.5 | 46.8 | 44.9 | 47.6 | 45.9 | 0.89 | 3.3 | 1.5 | 44.7 | 0.11 | 3.2 | 1.7 | 16 | LD |
| QNF28N | 44.5 | 43.7 L | 44.4 L | 44.1 L | 44.2 | -0.05 | 1.0 | 0.4 | 44.5 | -0.05 | 0.9 | 0.3 L | 16 | TU |
| RKVCJ4 | 42.3 | 42.5 | 42.3 | 40.8 | 42.0 | -1.20 | 4.1 | 0.8 | 42.0 | -1.48 | 3.6 | 1.1 | 16 | LD |
| RYEW6J | 43.7 | 42.3 | 45.0 H | 44.5 | 43.9 | -0.21 | 4.0 | 1.2 | 44.1 | -0.28 | 3.5 | 1.3 | 16 | TH |
| TMYYMF | 44.6 L | 44.5 L | 44.3 L | 44.4 L | 44.4 | 0.10 | 0.5 | 0.1 L | 44.6 | 0.05 | 0.4 | 0.2 L | 16 | LD |
| VLYT3Q | 45.6 | 44.8 | 42.8 | 43.7 | 44.2 | -0.02 | 2.6 | 1.2 | 43.9 | -0.38 | 3.1 | 1.5 | 16 | LD |
| VWFDMM | 47.4 | 42.0 | 45.5 | 43.7 | 44.7 | 0.21 | 3.5 | 2.3 | 42.4 | -1.26 | 2.8 | 2.5 | 16 | LD |
| VZUMFX | 44.3 | 44.6 | 44.8 | 44.4 | 44.5 | 0.12 | 2.1 | 0.2 L | 44.9 | 0.18 | 2.5 | 1.1 | 16 | LC |

### Consensus (All Labs) Results

| | Week 1 | Week 2 | Week 3 | Week 4 | | Monthly | | Grand | |
|---|---|---|---|---|---|---|---|---|---|
| Wk Mean | 44.11 | 43.93 | 44.42 | 44.32 | Month Mean | 44.26 | Grand Mean | 44.55 | |
| Avg SDr | 3.37 | 3.05 | 3.22 | 2.88 | Avg SD | 3.14 | Avg SD | 3.02 | |
| SD btwn Labs | 2.04 | 2.04 | 2.02 | 2.95 | SD btwn Labs | 1.89 | SD btwn Labs | 1.74 | |
| Labs Incld | 25 | 25 | 25 | 26 | SD btwn Wks | 1.32 | SD btwn Wks | 1.73 | |
| Labs Excld | 1 | 1 | 1 | 0 | Labs Incld | 25 | Labs Incld | 25 | |
| Labs not Rcvd | 0 | 0 | 0 | 0 | | | | | |

Containerboard Interlaboratory Testing Program
Analysis 255
**Ring Crush (RCT), 26 lb Corrugating Medium** - CM12
TAPPI Official Test Method T822

**Report #642**
**March 2023**

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

# Containerboard Interlaboratory Testing Program
## Analysis 261
### STFI, 26 lb Corrugating Medium - CM12
TAPPI Official Test Method T826

**Report #642**
**March 2023**

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3ZAMV3 | 14.1 H | 13.9 | 14.6 H | 14.0 | 14.2 | 0.29 | 1.4 | 0.3 | 14.1 | 0.09 | 1.4 | 0.5 | 16 | LA |
| 43ADD2 | 13.8 | 13.1 | 14.0 | 14.7 | 13.9 | -0.17 | 1.1 | 0.7 | 14.7 | 1.16 | 1.2 | 2.3 H | 16 | LA |
| 43XGAH | 14.4 | 14.6 | 14.5 | 14.2 | 14.4 | 0.80 | 0.8 | 0.2 | 14.3 | 0.42 | 2.8 | 0.9 | 16 | LA |
| 7VNCEG | 13.7 | 14.6 | 14.3 | 15.3 | 14.5 | 0.85 | 1.0 | 0.7 | 14.5 | 0.72 | 1.0 | 0.4 | 16 | LA |
| 9279PU | 13.4 | 13.1 | 13.0 H | 13.6 | 13.3 | -1.33 | 1.5 | 0.3 | 13.5 | -0.88 | 1.3 | 0.4 | 16 | LB |
| 9P9K3K | 13.3 | 14.7 | 14.0 | 14.3 | 14.1 | 0.16 | 1.0 | 0.6 | 13.9 | -0.34 | 0.9 | 0.6 | 16 | LA |
| 9XNUJA | 13.4 | 12.7 | 13.7 | 14.1 | 13.5 | -0.97 | 1.1 | 0.6 | 13.6 | -0.74 | 1.1 | 0.5 | 16 | TX |
| CQYBUQ | 13.9 | 14.1 | 13.7 | 14.3 | 14.0 | -0.01 | 1.0 | 0.3 | 14.1 | 0.12 | 1.1 | 0.3 | 16 | LU |
| E679T8 | 14.0 | 14.9 | 14.2 | 14.5 | 14.4 | 0.75 | 1.3 | 0.4 | 14.4 | 0.59 | 1.2 | 0.2 L | 16 | LB |
| EYWMM3 | 13.5 | 13.9 | 13.4 | 13.6 | 13.6 | -0.78 | 1.2 | 0.2 | 13.7 | -0.53 | 1.3 | 0.3 | 16 | LU |
| GTNZUP | 15.7 X | 15.5 * | 14.7 | 15.5 * | 15.3 | 2.49 * | 0.9 | 0.4 | 15.2 | 1.93 * | 1.5 | 0.5 | 16 | LA |
| HD8WWG | 13.4 | 13.2 | 14.0 | 14.0 | 13.6 | -0.65 | 1.1 | 0.4 | 13.7 | -0.67 | 1.0 | 0.4 | 15 | LB |
| K4Q3RX | 14.7 | 14.6 | 14.9 | 14.1 | 14.6 | 1.08 | 1.0 | 0.4 | 15.4 | 2.34 * | 1.0 | 2.6 H | 16 | XX |
| KXPKJD | 15.0 * | 13.5 | 14.7 | 13.7 | 14.2 | 0.42 | 1.0 | 0.7 | 14.1 | 0.07 | 1.1 | 0.5 | 16 | LA |
| KYKW6K | 14.4 H | 14.7 | 14.1 | 14.4 | 14.4 | 0.80 | 1.3 | 0.3 | 14.4 | 0.59 | 1.2 | 0.3 | 16 | XX |
| L2LQDA | 14.2 L | 14.0 | 14.6 | 14.4 | 14.3 | 0.58 | 1.0 | 0.3 | 13.7 | -0.58 | 1.3 | 0.6 | 16 | LA |
| L6HK6J | 13.7 | 13.2 | 14.4 | 13.8 | 13.8 | -0.41 | 1.0 | 0.5 | 13.9 | -0.34 | 0.9 | 0.4 | 11 | LU |
| LPRBQU | 13.2 L | 13.3 L | 13.0 L | 13.1 L | 13.1 | -1.59 | 0.3 | 0.1 | 13.1 | -1.70 | 0.7 | 0.2 L | 16 | LZ |
| M6CPYH | 13.0 | 13.3 | 13.8 | 13.0 | 13.3 | -1.33 | 0.9 | 0.4 | 13.4 | -1.14 | 0.9 | 0.3 | 16 | LH |
| RZPYRH | 13.1 | 14.0 | 13.1 | 13.6 | 13.4 | -1.03 | 1.1 | 0.5 | 13.3 | -1.30 | 0.9 | 0.6 | 16 | XX |
| VLYT3Q | 13.8 | 14.3 H | 14.3 | 14.8 | 14.3 | 0.56 | 1.2 | 0.4 | 14.6 | 0.86 | 1.1 | 0.7 | 16 | LH |
| VWFDMM | 13.5 | 13.8 | 13.4 | 13.6 L | 13.6 | -0.76 | 1.0 | 0.1 | 13.5 | -0.99 | 1.0 | 0.6 | 16 | LZ |
| VZUMFX | 14.8 | 14.9 | 13.9 | 13.9 | 14.4 | 0.72 | 1.2 | 0.5 | 14.4 | 0.58 | 1.2 | 0.5 | 16 | LH |
| WD2VZ2 | No Data | No Data | No Data | 13.3 | 13.3 | -1.38 | 0.8 | 0.0 | 13.5 | -0.99 | 0.8 | 0.3 | 3 | LH |
| XVUJYH | 14.2 L | 14.2 L | 14.4 | 15.3 | 14.5 | 0.93 | 0.6 | 0.5 | 14.5 | 0.73 | 0.6 | 0.3 | 16 | LH |

## Consensus (All Labs) Results

| | Week 1 | Week 2 | Week 3 | Week 4 | | Monthly | | Cumulative |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 13.84 | 14.00 | 14.03 | 14.12 | Month Mean | 14.00 | Grand Mean | 14.05 |
| Avg SDr | 1.09 | 1.05 | 1.14 | 0.99 | Avg SD | 1.06 | Avg SD | 1.20 |
| SD btwn Labs | 0.56 | 0.73 | 0.56 | 0.65 | SD btwn Labs | 0.54 | SD btwn Labs | 0.59 |
| Labs Incld | 23 | 24 | 24 | 25 | SD btwn Wks | 0.44 | SD btwn Wks | 0.83 |
| Labs Excld | 1 | 0 | 0 | 0 | Labs Incld | 25 | Labs Incld | 25 |
| Labs not Rcvd | 1 | 1 | 1 | 0 | | | | |

Containerboard Interlaboratory Testing Program
Analysis 261
**STFI, 26 lb Corrugating Medium** - CM12
TAPPI Official Test Method T826

**Report #642**
**March 2023**

## 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) | | **TX** | TMI (model not specified) |
| **XX** | Instrument make/model not specified by lab | | | |

End of Report