Collaborative Testing Services, Inc.

# Containerboard Interlaboratory Testing Program

## Participant Summary Report #589 (L) - October 2018

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Introduction to the Containerboard Program

Explanation of Tables and Definitions of Terms

| Analysis | Sample | Analysis Name |
|---|---|---|
| 201 | BX12 | Box Compression Strength, Corrugated Boxes |
| 202 | EC11 | Edgewise Compressive Strength, Wax (T811), Corrugated Board |
| 203 | EC11 | Edgewise Compressive Strength by Clamp (T839), Corrugated Board |
| 205 | 42D3 | Mullen Burst of Linerboard, 42 lb Linerboard |
| 207 | 35E1 | Mullen Burst of Linerboard, 35 lb Linerboard |
| 215 | 42D3 | Ring Crush of Linerboard, Rigid Platen Type, 42 lb Linerboard |
| 217 | 35E1 | Ring Crush of Linerboard, Rigid Platen Type, 35 lb Linerboard |
| 223 | 42D3 | STFI of Linerboard, 42 lb Linerboard |
| 225 | 35E1 | STFI of Linerboard, 35 lb Linerboard |
| 228 | 56A | Roughness - Stylus Method, 56 lb Linerboard |
| 229 | 42D3 | Roughness - Sheffield Method, 42 lb Linerboard |
| 231 | 35E | Internal Bond Strength, Linerboard, 35 lb Linerboard |
| 234 | 56A | Coefficient of Static Friction - Inclined Plane, 56 lb Linerboard |
| 237 | 35E | Air Resistance - Gurley Method, Linerboard, 35 lb Linerboard |
| 240 | CM92 | Flat Crush Strength (CMT) of Medium, 26 lb Corrugating Medium |
| 250 | CM92 | Fluted Crush of Medium, 26 lb Corrugating Medium |
| 255 | CM92 | Ring Crush of Medium, 26 lb Corrugating Medium |
| 261 | CM92 | STFI of Medium, 26 lb Corrugating Medium |

Collaborative Testing Services, Inc.
CONTAINERBOARD INTERLABORATORY TESTING PROGRAM

## INTRODUCTION

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

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

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

### USE OF AVERAGE MEAN AS A COLLABORATIVE REFERENCE VALUE

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

| Material | Lot Code | Dates in Use |
|---|---|---|
| 26 lb Corrugating Medium | CM92 | January 2018-Current |
| | CM91 | October 2016-December 2017 |
| 35 lb Linerboard | 35E1 | June 2017-Current |
| 42 lb Linerboard | 42D3 | November 2017-Current |
| | 42D2 | August 2016-October 2017 |
| 56 lb Linerboard | 56A2 | January 2018-Current |
| | 56A1 | July 2016-November 2017 |

## ABOUT CTS

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

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## EXPLANATION OF TABLES

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

## Definitions of Terms Used

### Weekly Results

#### Laboratory Data

WebCode - A six character laboratory identifier used to maintain information on a confidential basis. The WebCode is unique for each cycle and will change for each report. Your WebCode can be found in your Individual Report (Current Month Performance Report) and your datasheet.

Weekly Means - The average of the test results obtained by the participant for each week that data were reported.

#### Consensus Data

Wk Mean - For each week, the average of the Means for all the participants, excluding those laboratories flagged with an 'X'.

Avg SD - For each week, the average of the within-laboratory standard deviations (SD's) for all the participants, excluding those laboratories flagged with an 'X'. The Avg SD is an indication of the variation of measurements within an average laboratory.

SD btwn Labs - For each week, the standard deviation of the laboratory Means about the Wk Mean, excluding those laboratories flagged with an 'X'. The SD LABS is an indication of the precision of measurement between the laboratories.

Labs Incld - The number of laboratory Means included in the Wk Mean for that week.

Labs Excld - The number of laboratory Means reported but excluded from the Wk Mean for that week because of outlying results ('X' following Mean).

Labs not rcvd - The number of laboratories failing to report for that week.

### Monthly Results

#### Laboratory Data

Mean - For each laboratory, the average of all the weekly Means reported for this month.

CPV - Comparative Performance Value, an indication of how well a laboratory's Mean agrees with the other participants. The CPV is a ratio indicating the number of standard deviations from the consensus mean (Monthly Mean). The closer a laboratory's CPV is to zero, the more consistent its results are with the other participants' data.

SD - For each laboratory, the average of the weekly within-lab standard deviations (SD's) for all reported Weekly Means this month.

SD Wk - The standard deviation among the laboratory's weekly Means, including those Means flagged with an 'X'. The SD Wks is an indication of that laboratory's ability to obtain constant results from week to week.

#### Consensus Data

Month Mean - The average of the Means for all the participants, excluding those laboratories flagged with an 'X,' reporting data for this month.

Avg SD - For the current month, the average of the within-laboratory standard deviations (SD's) for all the participants, excluding those laboratories flagged with an 'X'.

SD btwn Labs - For the current month, the standard deviation of the laboratory Means about the Month Mean, excluding those laboratories flagged with an 'X'.

SD btwn Group - For the current month, the standard deviation of the laboratory Means within the group about the Month Mean, excluding those laboratories flagged with an 'X'.

SD btwn Wks - For the current month, the average of the laboratory between week standard deviations (SD Wks') for all the participants, excluding those laboratories flagged with an 'X'.

## Cumulative Results

### Laboratory Data

| | | |
|---|---|---|
| Mean | - | For each lab, the average of all the monthly Means reported for the weeks shown. |
| CPV | - | Comparative Performance Value, an indication of how well a laboratory's cumulative mean agrees with the other participants. The CPV is a ratio indicating the number of standard deviations from the consensus mean (Monthly Mean). |
| SDr | - | For each laboratory, the average of the weekly within-lab standard deviations (SD's) for the weeks shown. |
| SD Wk | - | The standard deviation among the laboratory's weekly Means for the weeks shown, including those Means flagged with an 'X'. The SD Wks is an indication of that laboratory's ability to obtain constant results from week to week. |
| Wks | - | The number of weeks included in the cumulative period. |
| Inst | - | The two letter instrument code. Codes are summarized at the bottom of the last analysis page. |

### Consensus Data

| | | |
|---|---|---|
| Grand Mean | - | The average of the Means for all the participants, excluding those laboratories flagged with an 'X,' reporting data for the number of weeks included in the cumulative period. |
| Avg SD | - | For the cumulative period, the average of the within-laboratory standard deviations (SD's) for all the participants, excluding those laboratories flagged with an 'X'. |
| SD btwn Labs | - | For the cumulative period, the standard deviation of the laboratory Means about the Month Mean, excluding those laboratories flagged with an 'X'. |
| SD btwn Wks | - | For the cumulative period, the average of the laboratory between week standard deviations for all the participants, excluding those laboratories flagged with an 'X'. |
| Labs Incld | - | The number of laboratory Means included in the Grand Mean. |

**Any laboratory that receives a 'flag' following a mean or standard deviation should refer to the chart below for an explanation of the data flag symbol:**

| Flag | Explanation |
|---|---|

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

Flags assigned to Weekly Means, Monthly Mean and Cumulative Mean:

| | |
|---|---|
| X | Excluded from the weekly means, monthly means and/or the cumulative mean. Immediate review of data and/or testing procedure is recommended. |
| * | Included in the weekly means, monthly means and/or the cumulative mean; however, lab should review testing procedure and monitor future results. |

Flags assigned to Weekly Means:

| | |
|---|---|
| H | Indicates high within-laboratory standard deviation. The laboratory SD for each week is not shown, but laboratory average SD and consensus average SD values are shown. |
| L | Indicates low within-laboratory standard deviation. The laboratory SD for each week is not shown, but laboratory monthly average SD and consensus average SD values are shown. |

Flags assigned to Monthly SD Wks and Cumulative SD Wks:

| | |
|---|---|
| H | Indicates high variabilty between weekly means (high week-to-week variation). |
| L | Indicates low variabilty between weekly means (low week-to-week variation). |

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 3A7A9L | 546.0 | -0.92 | 12.98 | | 539.4 | -1.11 | 12.86 | 4 | LL |
| 98WK24 | 636.5 | 1.97 * | 60.76 | H | 598.7 | 0.77 | 31.52 | 4 | LS |
| 9HL6QB | 675.0 | 3.20 X | 31.10 | | 651.6 | 2.45 * | 16.91 | 4 | ER |
| EQBW9B | 571.3 | -0.11 | 14.17 | | 571.4 | -0.10 | 56.43 H | 4 | ET |
| EUT3YJ | 578.7 | 0.12 | 43.04 | | 559.8 | -0.47 | 23.06 | 4 | LM |
| FHWEJA | 565.2 | -0.31 | 45.48 | | 581.7 | 0.23 | 13.86 | 4 | LG |
| FLFFH3 | 565.5 | -0.30 | 14.19 | | 577.3 | 0.09 | 16.87 | 4 | ER |
| FPHALY | 548.4 | -0.85 | 12.78 | | 546.5 | -0.89 | 5.47 | 4 | LG |
| JNDTZC | 551.9 | -0.73 | 21.52 | | 543.2 | -1.00 | 18.14 | 4 | ER |
| JY6QAP | 590.4 | 0.50 | 8.53 | | 588.5 | 0.44 | 10.69 | 4 | ET |
| K3M2AE | 572.1 | -0.09 | 67.67 | H | 552.8 | -0.69 | 22.65 | 4 | LS |
| L2784X | 580.0 | 0.17 | 13.02 | | 565.7 | -0.28 | 20.88 | 4 | LM |
| LUN28Q | 522.2 | -1.68 | 25.54 | | 520.7 | -1.71 | 17.00 | 4 | LS |
| NDDYMN | 568.3 | -0.21 | 12.70 | | 574.2 | -0.01 | 33.23 | 3 | LL |
| PMBGCG | 637.3 | 2.00 * | 30.89 | | 614.1 | 1.25 | 21.23 | 4 | LG |
| Q3PYQ3 | 572.8 | -0.07 | 7.76 | | 590.7 | 0.51 | 15.80 | 4 | ES |
| QQBPGR | 587.4 | 0.40 | 35.35 | | 590.5 | 0.51 | 7.88 | 4 | EX |
| UUFVYU | 567.3 | -0.24 | 14.91 | | 540.9 | -1.07 | 52.04 H | 4 | LS |
| V9UGYD | 556.4 | -0.59 | 19.96 | | 563.4 | -0.35 | 6.70 | 4 | LG |
| VE4L2Y | 558.0 | -0.54 | 15.92 | | 575.1 | 0.02 | 18.91 | 4 | ER |
| VGBN7H | 562.0 | -0.41 | 24.24 | | 563.3 | -0.36 | 11.99 | 4 | TE |
| WKKKQA | 592.4 | 0.56 | 15.21 | | 592.4 | 0.57 | 13.65 | 3 | EX |
| X284GP | 539.6 | -1.13 | 26.85 | | 544.3 | -0.96 | 9.14 | 4 | LS |
| XZVFWQ | 651.7 | 2.46 * | 13.02 | | 643.1 | 2.17 * | 7.43 | 3 | TC |

## Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 574.84 | Grand Mean | 574.53 |
| Avg SD | 28.96 | Avg SD Months | 23.09 |
| SD btwn Labs | 31.27 | SD btwn Labs | 31.52 |
| Labs Incld | 23 | Labs Incld | 24 |

## Consensus By Method

| Test Method | Group Mean | SD btwn Group | Difference from Grand Mean | Labs Included |
|---|---|---|---|---|
| Hot melt adhesive sealing | 568.54 | 35.50 | 6.30 | 6 |
| Clip sealing | 577.06 | 30.50 | 2.22 | 17 |


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## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| ER | Emerson 6200 Series | ES | Emerson 8510 |
| ET | Emerson 7200 | EX | Emerson Apparatus (Model not specified) |
| LG | TLS / L.A.B. Validator Series | LL | Lansmont 76-5K |
| LM | Lansmont 122-15k | LS | Lansmont Squeezer |
| TC | TMI Monitor/Compression Tester, Model 17-37 | TE | Testometric M500 - 25 KN |


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# Containerboard Interlaboratory Testing Program

Analysis 202

## **Edgewise Compressive Strength, by T811, Corrugated Board** - EC11

TAPPI Official Test Method T811

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 98WK24 | 28.6 | -5.10 X | 2.21 | | 31.0 | -5.55 X | 1.99 | 4 | EM |
| DMUBZW | 40.0 | -0.66 | 1.15 | | 40.3 | -0.66 | 0.39 | 4 | TD |
| FHWEJA | 43.1 | 0.55 | 1.45 | | 43.3 | 0.88 | 0.71 | 4 | LE |
| FPHALY | 43.8 | 0.81 | 0.90 | L | 43.7 | 1.11 | 0.55 | 4 | TH |
| GKXP9H | 36.4 | -2.08 * | 3.56 | H | 39.5 | -1.09 | 3.83 H | 4 | XX |
| JNDTZC | 39.4 | -0.91 | 3.62 | H | 38.9 | -1.40 | 0.57 | 4 | EN |
| MYWQ3K | 43.0 | 0.50 | 1.46 | | 41.7 | 0.06 | 1.21 | 4 | LC |
| TT8CND | 43.6 | 0.75 | 1.97 | | 43.0 | 0.75 | 1.31 | 4 | LC |
| UUFVYU | 42.4 | 0.28 | 2.15 | | 40.1 | -0.77 | 2.06 | 4 | LD |
| X284GP | 43.6 | 0.75 | 1.48 | | 43.7 | 1.12 | 0.52 | 4 | LC |

### Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 41.69 | Grand Mean | 41.58 |
| Avg SD | 2.18 | Avg SD Months | 1.62 |
| SD btwn Labs | 2.56 | SD btwn Labs | 1.91 |
| Labs Incld | 9 | Labs Incld | 9 |

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| EM | Emerson 1200 Series | EN | Emerson 2200 |
| LC | L&W Crush Tester 48 | LD | L&W Crush Tester 248 |
| LE | L&W Crush Tester 840 | TD | TMI Digital Crush Tester, Model 17-09 |
| TH | TMI Monitor/Compression Tester, Model 17-76 | XX | Instrument make/model not specified by lab |


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| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 3A7A9L | 43.8 | 0.14 | 1.40 | | 43.8 | -0.04 | 0.13 L | 4 | LC |
| 4U73JH | 42.7 | -0.33 | 1.20 | | 43.3 | -0.29 | 0.56 | 4 | EM |
| 6ULJEC | 39.2 | -1.85 | 2.56 | | 41.5 | -1.08 | 3.04 | 4 | TK |
| 86U3NH | 42.7 | -0.33 | 1.36 | | 42.4 | -0.67 | 1.76 | 4 | LC |
| 98WK24 | 40.6 | -1.25 | 1.69 | | 41.2 | -1.21 | 0.64 | 4 | EM |
| 9HL6QB | 42.2 | -0.55 | 2.09 | | 41.8 | -0.95 | 0.83 | 4 | EM |
| 9Y7NEH | 45.1 | 0.67 | 2.39 | | 45.9 | 0.88 | 0.64 | 4 | LD |
| C7T2PD | 43.4 | -0.05 | 1.47 | | 43.7 | -0.10 | 0.78 | 4 | EX |
| CDERET | 53.5 | 4.31 X | 0.26 L | | 48.9 | 2.25 * | 4.72 H | 4 | LD |
| DMUBZW | 42.0 | -0.65 | 0.67 L | | 42.6 | -0.61 | 0.43 | 4 | TD |
| EMCEGA | 46.7 | 1.40 | 2.05 | | 48.4 | 2.00 * | 1.11 | 4 | TG |
| EQBW9B | 41.2 | -1.01 | 1.66 | | 41.6 | -1.05 | 0.33 | 4 | TD |
| EUT3YJ | 49.2 | 2.44 * | 1.76 | | 49.3 | 2.39 * | 1.82 | 4 | EM |
| FHWEJA | 44.4 | 0.41 | 1.30 | | 44.5 | 0.26 | 0.97 | 4 | LY |
| FPHALY | 44.9 | 0.60 | 0.66 L | | 44.8 | 0.40 | 0.62 | 4 | TH |
| JNDTZC | 41.6 | -0.82 | 3.09 H | | 41.5 | -1.07 | 1.13 | 4 | EN |
| JXWAJ7 | 44.2 | 0.28 | 3.45 H | | 42.9 | -0.46 | 1.24 | 4 | TD |
| JY6QAP | 41.5 | -0.87 | 1.04 | | 43.1 | -0.39 | 1.85 | 4 | EM |
| L2784X | 44.0 | 0.22 | 1.77 | | 46.1 | 0.99 | 1.57 | 4 | TG |
| LQM2LZ | 39.4 | -1.77 | 1.66 | | 41.7 | -1.01 | 1.68 | 4 | TD |
| LUN28Q | 42.6 | -0.39 | 0.97 | | 41.9 | -0.93 | 1.08 | 4 | TB |
| MYWQ3K | 43.3 | -0.07 | 1.62 | | 43.1 | -0.37 | 0.45 | 4 | LC |
| NDDYMN | 43.9 | 0.15 | 1.05 | | 43.0 | -0.40 | 1.27 | 3 | BU |
| NDUYJY | 42.0 | -0.64 | 1.10 | | 41.4 | -1.15 | 0.55 | 4 | LD |
| PKPC3Y | 44.5 | 0.43 | 1.18 | | 44.0 | 0.02 | 0.55 | 4 | LD |
| PMBGCG | 44.8 | 0.55 | 2.63 | | 44.7 | 0.33 | 1.25 | 4 | EM |
| Q3PYQ3 | 42.2 | -0.58 | 1.56 | | 44.8 | 0.40 | 1.85 | 4 | LD |
| QQAY4H | 40.2 | -1.42 | 2.09 | | 39.2 | -2.13 * | 1.75 | 3 | XX |
| QQBPGR | 47.4 | 1.67 | 1.75 | | 45.5 | 0.72 | 1.30 | 4 | LD |
| RKGCUU | 43.7 | 0.10 | 1.58 | | 45.0 | 0.47 | 2.35 | 4 | CT |
| RWE4LT | 85.0 | 17.91 X | 3.92 H | | 62.7 | 8.43 X | 22.55 H | 4 | LC |
| TAWDL4 | 40.8 | -1.17 | 2.01 | | 42.2 | -0.78 | 1.47 | 4 | LD |
| TT8CND | 46.5 | 1.29 | 2.03 | | 45.4 | 0.64 | 0.97 | 4 | LC |
| TULQ7U | 44.4 | 0.37 | 1.26 | | 44.8 | 0.41 | 0.34 | 4 | EM |
| UUFVYU | 47.9 | 1.91 | 2.02 | | 45.6 | 0.75 | 2.31 | 4 | LD |
| V9UGYD | 38.6 | -2.10 * | 1.26 | | 40.6 | -1.48 | 2.83 | 4 | TJ |
| V9XWFK | 46.5 | 1.27 | 2.06 | | 47.6 | 1.65 | 2.35 | 3 | TD |
| VE4L2Y | 44.0 | 0.19 | 0.95 | | 43.9 | 0.00 | 0.82 | 4 | LD |
| VGBN7H | 45.8 | 1.00 | 1.48 | | 45.5 | 0.69 | 0.75 | 4 | LD |


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# Containerboard Interlaboratory Testing Program

Analysis 203

## **Edgewise Compressive Strength by T839, Corrugated Board** - EC11

TAPPI Official Test Method T839

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| W786RK | 43.7 | 0.09 | 1.73 | | 41.7 | -0.99 | 1.94 | 4 | LD |
| WKKKQA | 43.7 | 0.11 | 0.88 | | 43.9 | 0.00 | 0.16 L | 3 | TL |
| X284GP | 44.6 | 0.48 | 1.98 | | 45.0 | 0.46 | 0.39 | 4 | LC |
| XEDC6Z | 43.1 | -0.16 | 3.40 H | | 29.1 | -6.65 X | 12.15 H | 3 | LD |
| YMPQMV | 44.0 | 0.23 | 1.81 | | 44.6 | 0.31 | 0.39 | 4 | LD |

### Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 43.50 | Grand Mean | 43.93 |
| Avg SD | 1.82 | Avg SD Months | 1.57 |
| SD btwn Labs | 2.32 | SD btwn Labs | 2.23 |
| Labs Incld | 42 | Labs Incld | 41 |

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| BU | Buchel Digital Crush Tester | CT | Con-Ten |
| EM | Emerson 1200 Series | EN | Emerson 2200 |
| EX | Emerson (model not specified) | LC | L&W Crush Tester 48 |
| LD | L&W Crush Tester 248 | LY | L&W 830 |
| TB | TMI Monitor/Compression Tester, Model 17-70 | TD | TMI Digital Crush Tester, Model 17-09 |
| TG | TMI Digital Crush Tester, 17-76 | TH | TMI Monitor/Compression Tester, Model 17-76 |
| TJ | TLS Compression Tester, Model CDM-5 | TK | TLS Compression Tester, Model 5184 |
| TL | Tech-Lab Systems Compression | XX | Instrument make/model not specified by lab |


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| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 2AP434 | 101.1 * | 108.3 | 110.1 | 111.3 | 107.7 | -0.54 | 8.0 | 4.6 | 112.5 | 1.03 | 8.2 | 4.4 | 16 | AH |
| 2Z4RXJ | 104.9 | 107.7 | 107.3 | 109.5 | 107.4 | -0.66 | 11.0 | 1.9 | 107.1 | -0.78 | 10.7 | 2.5 | 8 | LC |
| 34GUGT | 105.6 | 106.1 | 111.2 | 112.5 | 108.9 | -0.15 | 12.2 | 3.5 | 109.4 | -0.02 | 11.6 | 4.9 | 16 | LC |
| 3H467K | 98.8 * | 96.5 X | 101.7 | 93.3 X | 97.6 | -3.97 X | 8.5 | 3.6 | 97.6 | -3.94 X | 8.5 | 3.6 | 4 | XX |
| 4AMVAB | 107.8 | 107.4 | 108.0 | 110.8 | 108.5 | -0.27 | 8.5 | 1.6 | 108.5 | -0.30 | 7.7 | 1.2 | 16 | AH |
| 8MK2ZB | 113.9 | 109.6 | 108.6 | 111.7 | 110.9 | 0.55 | 13.2 | 2.3 | 110.9 | 0.48 | 12.1 | 3.1 | 16 | TB |
| 9G9JVF | 121.1 X | 112.0 | 109.4 | 111.6 | 113.5 | 1.43 | 12.4 | 5.2 | 112.4 | 0.99 | 11.0 | 3.5 | 16 | LC |
| 9MQZAB | 109.6 L | 109.7 L | 109.8 L | 109.3 L | 109.6 | 0.11 | 4.2 | 0.2 L | 109.5 | 0.02 | 4.3 | 0.4 L | 8 | LA |
| 9XWQCL | 107.9 | 105.7 | 108.8 | 106.2 | 107.1 | -0.74 | 13.4 | 1.4 | 105.9 | -1.18 | 10.8 | 4.0 | 16 | LC |
| 9Y7NEH | 111.2 | 111.8 | 112.4 | 112.2 | 111.9 | 0.87 | 7.4 | 0.5 L | 111.7 | 0.77 | 8.0 | 0.7 L | 16 | LA |
| ABFUWM | 110.2 | 112.9 | 116.0 | 110.1 | 112.3 | 1.01 | 10.8 | 2.8 | 111.7 | 0.77 | 11.3 | 2.5 | 16 | AX |
| C8MKTZ | 112.4 L | 112.0 L | 110.6 | 107.8 L | 110.7 | 0.47 | 3.1 | 2.1 | 110.0 | 0.19 | 5.8 | 3.9 | 16 | RE |
| CMY68X | 114.1 | 107.7 | 122.5 XH | 106.0 | 112.6 | 1.10 | 12.9 | 7.5 H | 114.6 | 1.71 | 13.2 | 7.8 H | 16 | LC |
| DLNFP8 | 110.8 | 108.3 | 108.2 | 112.8 | 110.0 | 0.24 | 10.2 | 2.2 | 109.8 | 0.12 | 11.5 | 3.9 | 16 | LA |
| DMUBZW | 108.4 | 107.8 | 108.4 | 108.6 | 108.3 | -0.34 | 11.7 | 0.3 L | 110.2 | 0.27 | 13.6 | 4.2 | 12 | XX |
| E2V8Q3 | 108.4 H | 101.2 * | 114.9 | 111.8 | 109.1 | -0.08 | 13.3 | 5.9 | 107.5 | -0.64 | 12.0 | 3.5 | 12 | XX |
| EE4TE2 | 110.4 | 109.8 | 112.6 | 109.9 | 110.7 | 0.46 | 12.1 | 1.3 | 108.1 | -0.46 | 10.5 | 3.3 | 16 | LA |
| EY9HK4 | 110.1 | 110.0 | 110.2 L | 111.0 | 110.3 | 0.34 | 6.4 | 0.4 L | 111.9 | 0.82 | 7.1 | 1.6 | 16 | LC |
| FALYT2 | 109.3 L | 110.2 L | 109.3 | 109.2 L | 109.5 | 0.06 | 4.0 | 0.5 L | 109.4 | -0.01 | 6.5 | 0.3 L | 12 | LJ |
| FCQHYA | 105.7 | 106.9 | 104.0 | 106.1 | 105.7 | -1.22 | 9.2 | 1.2 | 106.1 | -1.11 | 10.6 | 2.5 | 16 | LB |
| FFAKX3 | 112.0 | 107.5 | 109.5 | 110.9 | 110.0 | 0.23 | 11.7 | 1.9 | 109.9 | 0.14 | 11.2 | 3.9 | 16 | LJ |
| FHWEJA | 110.8 | 117.8 * | 115.1 | 108.7 | 113.1 | 1.28 | 14.3 | 4.1 | 112.8 | 1.11 | 13.0 | 2.8 | 16 | LZ |
| FLFFH3 | 103.0 | 108.1 | 106.2 | 107.1 | 106.1 | -1.09 | 11.0 | 2.2 | 105.2 | -1.39 | 11.6 | 3.0 | 16 | LZ |
| GD2U9X | 109.8 | No Data | 110.0 | 105.0 | 108.3 | -0.35 | 13.4 | 2.9 | 111.5 | 0.69 | 12.1 | 4.7 | 13 | LC |
| GYEQHT | 105.8 | 104.4 | 115.1 | 107.1 | 108.1 | -0.41 | 11.7 | 4.8 | 106.8 | -0.88 | 10.3 | 3.5 | 16 | AA |
| JL7FAX | 107.4 L | 106.3 L | 106.7 L | 106.9 L | 106.8 | -0.84 | 3.4 | 0.5 L | 107.4 | -0.68 | 4.2 | 1.4 | 16 | LA |
| JYNL3C | 110.1 | 105.5 | 107.6 | 109.0 | 108.1 | -0.42 | 8.2 | 2.0 | 108.1 | -0.44 | 8.1 | 1.8 | 16 | LA |
| KMUE22 | 109.7 L | 108.1 | No Data | 108.7 L | 108.8 | -0.16 | 4.2 | 0.8 | 109.2 | -0.08 | 4.2 | 1.1 | 9 | XX |
| MYKZ42 | 112.3 | 114.3 | 119.0 * | 115.3 | 115.2 | 2.00 * | 8.6 | 2.8 | 111.6 | 0.71 | 9.6 | 4.7 | 16 | TB |
| NGEX49 | 95.5 X | 118.8 * | 117.3 | 115.5 | 111.8 | 0.83 | 11.8 | 10.9 H | 115.2 | 1.93 | 12.2 | 7.2 H | 16 | LA |
| P4LV3R | 104.8 | 104.8 | 103.0 | 104.1 | 104.2 | -1.74 | 7.5 | 0.9 | 105.8 | -1.20 | 9.9 | 3.1 | 14 | LC |
| P9FWVU | 116.8 * | 119.3 * | 116.5 H | 112.2 | 116.2 | 2.33 * | 14.9 | 3.0 | 117.0 | 2.52 * | 13.8 | 3.5 | 16 | LA |
| PKPC3Y | 108.7 | 110.4 | 111.7 | 104.9 | 108.9 | -0.13 | 9.9 | 3.0 | 108.9 | -0.19 | 10.3 | 2.4 | 16 | LC |
| Q3PYQ3 | 105.8 | 105.5 H | 104.9 | 108.6 | 106.2 | -1.05 | 13.0 | 1.6 | 108.2 | -0.42 | 11.1 | 3.1 | 16 | LA |
| QQBPGR | 107.6 | 112.0 | 108.8 | 109.2 | 109.4 | 0.03 | 11.7 | 1.9 | 109.3 | -0.05 | 10.7 | 2.4 | 16 | AH |


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# Containerboard Interlaboratory Testing Program

Analysis 205

**Bursting Strength (Mullen), 42 lb Linerboard** - 42D3

TAPPI Official Test Method T807

**Report #589 (L)**
**October 2018**

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| QTFCWG | 115.1 | 109.5 | 108.4 | 105.8 | 109.7 | 0.13 | 11.7 | 3.9 | 110.9 | 0.50 | 12.1 | 3.5 | 16 | LC |
| RKGCUU | 112.0 | 111.0 | 106.9 | 113.3 | 110.8 | 0.50 | 11.7 | 2.8 | 112.2 | 0.91 | 11.9 | 3.1 | 16 | XX |
| RWE4LT | 114.6 | 106.2 | 114.9 | 119.1 * | 113.7 | 1.48 | 9.8 | 5.4 | 111.3 | 0.64 | 12.5 | 3.7 | 16 | LA |
| TAWDL4 | 105.3 | 103.6 | 102.7 | 101.5 * | 103.3 | -2.04 * | 8.4 | 1.6 | 105.9 | -1.15 | 8.5 | 3.1 | 16 | LA |
| TLB93N | 105.6 | 107.0 | 107.4 L | 106.6 | 106.6 | -0.90 | 10.6 | 0.7 | 106.6 | -0.92 | 12.8 | 4.1 | 16 | LC |
| TPXR9T | 109.9 | 108.8 | 114.8 | 112.0 | 111.3 | 0.69 | 8.9 | 2.6 | 111.3 | 0.64 | 11.2 | 3.2 | 16 | LA |
| U93P6U | 109.3 | 110.1 | 103.9 | 109.0 | 108.1 | -0.42 | 13.6 | 2.8 | 108.0 | -0.46 | 12.3 | 3.3 | 16 | LC |
| UDFP2K | 107.8 | 105.2 | 108.6 | 101.9 * | 105.9 | -1.15 | 11.7 | 3.0 | 105.4 | -1.33 | 10.5 | 3.3 | 16 | LA |
| UMY433 | 109.1 | 107.0 | 106.6 | 109.4 | 108.0 | -0.43 | 11.5 | 1.4 | 109.6 | 0.07 | 11.3 | 2.8 | 16 | TB |
| UP6NQ3 | 112.5 | 112.4 | 117.1 | 118.9 * | 115.2 | 2.00 * | 13.5 | 3.3 | 115.4 | 1.99 | *12.4 | 3.4 | 16 | LZ |
| UUFVYU | 107.2 | 109.6 | 103.6 | 101.8 * | 105.6 | -1.27 | 10.3 | 3.5 | 105.6 | -1.26 | 10.0 | 4.4 | 16 | LA |
| UUHE9Q | 114.5 | 116.5 | 108.1 | 112.5 | 112.9 | 1.21 | 11.9 | 3.6 | 111.6 | 0.73 | 11.7 | 3.7 | 13 | LZ |
| V22UKZ | 106.4 | 107.8 | 104.6 | 108.8 | 106.9 | -0.82 | 12.9 | 1.8 | 107.2 | -0.73 | 12.9 | 2.4 | 16 | LC |
| VCX333 | 112.1 | 106.3 | 107.0 | 109.4 | 108.7 | -0.21 | 12.9 | 2.7 | 105.8 | -1.22 | 12.0 | 3.6 | 16 | LC |
| VE4L2Y | 115.0 | 116.4 | 109.7 | 114.3 | 113.9 | 1.54 | 10.3 | 2.9 | 112.7 | 1.07 | 10.6 | 3.0 | 16 | AH |
| W786RK | 109.9 | 112.9 | 98.8 * | 109.2 | 107.7 | -0.55 | 9.8 | 6.2 | 107.2 | -0.74 | 10.3 | 4.3 | 16 | LC |
| WMUD6H | 109.0 | 107.1 | 105.2 | 106.0 | 106.8 | -0.84 | 7.9 | 1.6 | 107.0 | -0.82 | 7.6 | 1.3 | 16 | TP |
| WR6EAM | 115.0 | 111.8 | 111.8 | 115.6 | 113.6 | 1.44 | 10.5 | 2.0 | 115.6 | 2.05 | *11.1 | 2.6 | 16 | AH |
| X284GP | 104.4 | 104.1 | 100.9 | 103.8 | 103.3 | -2.03 * | 10.2 | 1.6 | 103.9 | -1.82 | 10.4 | 2.6 | 16 | AH |
| YWCMQH | 102.8 | 111.3 | 105.5 | 110.8 | 107.6 | -0.58 | 10.4 | 4.1 | 107.9 | -0.49 | 11.6 | 3.0 | 16 | LC |
| Z3XY3P | 100.9 * | 110.5 | 111.9 | 107.0 | 107.6 | -0.58 | 10.9 | 4.9 | 106.3 | -1.03 | 10.7 | 3.5 | 16 | LC |
| ZDFPHL | 109.6 | 107.0 | No Data | No Data | 108.3 | -0.34 | 8.6 | 1.9 | 106.1 | -1.09 | 10.3 | 3.6 | 6 | LJ |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 108.97 | 109.27 | 109.10 | 109.42 | Month Mean | 109.31 | Grand Mean | 109.42 |
| Avg SDr | 10.57 | 10.36 | 10.80 | 10.73 | Avg SD | 10.68 | Avg SD | 10.66 |
| SD btwn Labs | 3.88 | 3.81 | 4.47 | 3.81 | SD btwn Labs | 2.96 | SD btwn Labs | 3.01 |
| Labs Incld | 55 | 55 | 54 | 55 | SD btwn Wks | 3.35 | SD btwn Wks | 3.45 |
| Labs Excld | 2 | 1 | 1 | 1 | Labs Incld | 56 | Labs Incld | 56 |
| Labs not Rcvd | 0 | 1 | 2 | 1 | | | | |


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## Key to Instrument Codes Reported by Participants

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


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| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 2AP434 | 92.4 | 94.8 | 93.1 | 93.6 | 93.5 | 0.46 | 7.2 | 1.0 | 94.3 | 0.77 | 7.2 | 2.9 | 12 | AH |
| 2Z4RXJ | 99.7 * | 96.9 | 89.0 | 91.9 | 94.4 | 0.77 | 7.3 | 4.8 | 94.4 | 0.81 | 7.3 | 4.8 | 4 | LC |
| 34GUGT | 93.5 | 97.4 | 87.7 | 94.6 | 93.3 | 0.41 | 9.8 | 4.1 | 92.6 | 0.21 | 9.0 | 2.8 | 12 | LC |
| 3H467K | 90.7 | 83.8 * | 85.2 | 84.7 | 86.1 | -1.92 | 6.7 | 3.2 | 86.1 | -1.96 * | 6.7 | 3.2 | 4 | XX |
| 4AMVAB | 91.5 | 89.4 | 87.9 | 89.4 | 89.6 | -0.80 | 7.1 | 1.5 | 89.8 | -0.73 | 6.3 | 1.1 | 12 | AH |
| 8MK2ZB | 93.4 | 92.3 | 89.9 | 89.7 | 91.3 | -0.22 | 9.6 | 1.8 | 93.2 | 0.40 | 8.9 | 3.6 | 12 | TB |
| 9G9JVF | 92.8 | 91.1 | 94.2 | 91.3 | 92.4 | 0.10 | 7.5 | 1.4 | 93.6 | 0.54 | 9.0 | 2.2 | 12 | LC |
| 9MQZAB | 92.2 | 92.1 L | 92.5 | 92.7 L | 92.4 | 0.11 | 3.7 | 0.3 L | 92.3 | 0.10 | 3.9 | 0.4 L | 12 | LA |
| 9XWQCL | 92.4 | 86.9 | 86.9 | 91.9 | 89.5 | -0.81 | 8.5 | 3.0 | 89.4 | -0.88 | 8.3 | 2.5 | 12 | LC |
| 9Y7NEH | 92.8 | 93.1 | 92.7 | 92.9 | 92.8 | 0.26 | 4.6 | 0.2 L | 92.2 | 0.09 | 6.3 | 0.8 L | 12 | LA |
| ABFUWM | 89.4 | 93.6 | 98.3 | 98.6 | 95.0 | 0.95 | 6.7 | 4.4 | 93.9 | 0.66 | 8.1 | 4.0 | 12 | AX |
| C8MKTZ | 96.8 | 99.2 * | 98.4 | 98.6 | 98.3 | 2.01 * | 5.4 | 1.0 | 95.8 | 1.28 | 5.6 | 1.9 | 12 | RE |
| CMY68X | 89.2 | 89.9 | 99.9 H | 90.1 | 92.3 | 0.08 | 9.5 | 5.1 | 92.8 | 0.27 | 8.9 | 3.4 | 12 | LC |
| DLNFP8 | 95.6 | 94.1 | 90.9 | 96.6 | 94.3 | 0.73 | 7.1 | 2.5 | 92.2 | 0.06 | 8.3 | 4.3 | 12 | LA |
| DMUBZW | 90.4 | 90.2 | 89.2 | 90.8 | 90.2 | -0.61 | 9.3 | 0.7 | 90.7 | -0.44 | 8.5 | 1.7 | 8 | XX |
| E2V8Q3 | 89.9 | 94.9 | 92.5 | 94.6 | 93.0 | 0.30 | 8.4 | 2.3 | 92.0 | 0.01 | 8.2 | 2.2 | 8 | XX |
| EE4TE2 | 96.1 | 89.5 | 90.4 | 91.2 | 91.8 | -0.07 | 9.4 | 2.9 | 91.0 | -0.31 | 8.1 | 2.2 | 12 | LA |
| FALYT2 | 92.3 L | 92.5 L | 92.3 L | 92.3 L | 92.3 | 0.10 | 2.0 | 0.1 L | 91.9 | -0.04 | 4.6 | 0.6 L | 12 | LJ |
| FCQHYA | 87.7 | 87.1 | 86.7 | 86.6 | 87.0 | -1.62 | 6.1 | 0.5 | 87.6 | -1.47 | 6.5 | 2.3 | 12 | LB |
| FFAKX3 | 91.3 | 85.9 | 88.1 | 93.3 | 89.6 | -0.77 | 8.2 | 3.3 | 91.7 | -0.11 | 8.8 | 3.0 | 12 | LJ |
| FHWEJA | 92.6 | 95.2 | 97.3 | 93.8 | 94.7 | 0.87 | 9.9 | 2.0 | 95.6 | 1.19 | 9.2 | 2.7 | 12 | LZ |
| FLFFH3 | 88.7 | 91.3 | 87.3 | 86.1 | 88.4 | -1.19 | 7.6 | 2.2 | 87.1 | -1.62 | 8.3 | 2.6 | 12 | LA |
| GD2U9X | 98.2 | 91.2 | 94.2 | 94.1 | 94.4 | 0.77 | 8.2 | 2.9 | 93.2 | 0.41 | 9.1 | 3.5 | 11 | LC |
| GYEQHT | 93.6 | 94.1 | 87.0 | 91.2 | 91.5 | -0.18 | 8.1 | 3.2 | 90.7 | -0.41 | 8.2 | 2.4 | 12 | AA |
| JL7FAX | 93.8 | 92.4 L | 93.7 | 93.1 L | 93.3 | 0.39 | 3.4 | 0.6 | 91.7 | -0.10 | 4.0 | 1.5 | 12 | LA |
| JYNL3C | 84.7 * | 91.7 | 91.2 | 22.6 XL | 72.5 | -6.31 X | 5.0 | 33.5 H | 85.2 | -2.24 * | 6.4 | 19.9 H | 12 | LA |
| KMUE22 | 90.0 | 90.5 | No Data | 89.8 | 90.1 | -0.62 | 4.4 | 0.4 L | 90.0 | -0.65 | 4.6 | 0.7 L | 8 | XX |
| MYKZ42 | 103.4 X | 89.5 | 99.0 | 100.2 | 98.0 | 1.94 * | 7.1 | 6.0 H | 98.5 | 2.17 * | 8.0 | 4.8 | 12 | TB |
| NGEX49 | 93.2 H | 108.2 X | 102.9 * | 102.9 * | 101.8 | 3.16 X | 11.2 | 6.3 H | 99.4 | 2.49 * | 10.0 | 4.3 | 12 | LA |
| P4LV3R | 88.2 | 87.7 | 91.8 | 87.1 | 88.7 | -1.08 | 7.2 | 2.1 | 90.5 | -0.51 | 6.9 | 2.2 | 10 | LA |
| P9FWVU | 99.3 * | 99.2 * | 95.9 | 96.2 | 97.7 | 1.82 | 9.7 | 1.9 | 97.0 | 1.69 | 9.6 | 3.4 | 12 | LA |
| PKPC3Y | 94.0 | 94.7 | 92.3 | 92.2 | 93.3 | 0.41 | 7.8 | 1.2 | 93.4 | 0.46 | 8.3 | 2.0 | 12 | LC |
| Q3PYQ3 | 88.2 | 90.2 | 86.7 | 87.5 | 88.2 | -1.26 | 8.3 | 1.5 | 89.2 | -0.93 | 8.3 | 1.7 | 12 | LA |
| QQBPGR | 91.6 | 94.4 | 96.4 | 87.6 | 92.5 | 0.15 | 7.5 | 3.8 | 94.0 | 0.68 | 7.9 | 2.8 | 12 | AH |
| QTFCWG | 96.1 | 95.1 | 93.4 | 97.5 | 95.5 | 1.12 | 7.4 | 1.7 | 93.0 | 0.34 | 8.7 | 3.2 | 12 | LC |


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# Containerboard Interlaboratory Testing Program

Analysis 207

**Bursting Strength (Mullen), 35 lb Linerboard** - 35E1

TAPPI Official Test Method T807

**Report #589 (L)**
**October 2018**

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| RKGCUU | 92.7 | 95.4 | 95.4 | 97.6 | 95.3 | 1.05 | 9.1 | 2.0 | 95.5 | 1.16 | 9.1 | 3.8 | 12 | XX |
| RWE4LT | 94.9 | 96.0 | 92.8 | 97.7 | 95.4 | 1.08 | 7.4 | 2.1 | 94.7 | 0.92 | 8.6 | 2.3 | 12 | LA |
| TAWDL4 | 90.5 | 88.3 | 85.7 | 86.7 L | 87.8 | -1.37 | 5.3 | 2.1 | 87.7 | -1.42 | 6.5 | 4.1 | 12 | LA |
| TLB93N | 89.0 | 90.5 | 95.9 | 86.7 | 90.5 | -0.49 | 7.9 | 3.9 | 89.8 | -0.73 | 9.4 | 3.5 | 12 | LC |
| TPXR9T | 88.6 | 91.9 | 88.9 | 88.0 | 89.3 | -0.87 | 9.3 | 1.7 | 93.1 | 0.38 | 9.2 | 3.2 | 12 | LA |
| U93P6U | 86.3 | 89.9 | 93.7 | 95.9 | 91.5 | -0.19 | 8.4 | 4.2 | 90.1 | -0.63 | 7.7 | 2.8 | 12 | LC |
| UDFP2K | 85.5 | 91.1 | 85.1 | 85.1 | 86.7 | -1.72 | 7.4 | 3.0 | 89.7 | -0.77 | 7.4 | 3.7 | 12 | LA |
| UMY433 | 93.7 | 96.3 | 89.5 | 96.1 | 93.9 | 0.61 | 9.8 | 3.2 | 92.3 | 0.09 | 10.0 | 3.6 | 12 | TB |
| UP6NQ3 | 96.8 | 99.1 * | 94.1 | 99.1 | 97.3 | 1.70 | 10.0 | 2.4 | 97.4 | 1.83 | 8.8 | 2.2 | 12 | LZ |
| UUFVYU | 93.0 | 86.5 | 88.1 | 93.8 L | 90.4 | -0.54 | 7.1 | 3.6 | 91.4 | -0.19 | 7.4 | 2.5 | 12 | LA |
| UUHE9Q | 94.9 | 89.6 | 95.8 | 91.3 | 92.9 | 0.28 | 8.9 | 2.9 | 93.2 | 0.41 | 9.3 | 2.4 | 12 | LZ |
| V22UKZ | 92.7 | 86.9 | 87.8 | 89.3 H | 89.2 | -0.93 | 9.8 | 2.5 | 90.1 | -0.64 | 8.7 | 2.2 | 12 | LC |
| VCX333 | 88.4 | 89.2 | 88.1 | 89.2 | 88.7 | -1.07 | 10.6 | 0.5 | 91.4 | -0.20 | 9.0 | 2.8 | 12 | LC |
| VE4L2Y | 94.3 | 96.7 | 93.0 | 92.5 | 94.1 | 0.68 | 8.8 | 1.9 | 90.1 | -0.64 | 8.4 | 3.8 | 12 | AH |
| W786RK | 92.1 | 91.0 | 92.7 | 88.3 | 91.0 | -0.32 | 6.5 | 1.9 | 91.2 | -0.26 | 7.7 | 2.4 | 12 | LC |
| WMUD6H | 89.0 | 88.5 | 89.7 | 90.8 | 89.5 | -0.82 | 7.0 | 1.0 | 89.1 | -0.95 | 6.5 | 0.9 L | 12 | TP |
| WR6EAM | 97.5 | 98.4 | 99.6 | 100.3 | 99.0 | 2.24 * | 8.6 | 1.2 | 98.2 | 2.09 * | 8.5 | 2.7 | 12 | AH |
| X284GP | 85.5 * | 87.6 | 84.8 | 91.1 | 87.3 | -1.55 | 8.3 | 2.8 | 88.4 | -1.19 | 8.2 | 2.2 | 12 | AH |
| YWCMQH | 93.3 | 91.9 | 92.8 | 91.5 | 92.4 | 0.11 | 8.1 | 0.8 | 91.6 | -0.13 | 8.6 | 3.1 | 12 | LC |
| Z3XY3P | 91.4 | 93.5 | 96.1 | 90.6 | 92.9 | 0.28 | 9.5 | 2.4 | 90.1 | -0.62 | 8.1 | 3.2 | 12 | LA |
| ZDFPHL | 91.3 | 88.1 | No Data | No Data | 89.7 | -0.75 | 6.5 | 2.3 | 89.7 | -0.76 | 6.5 | 2.3 | 2 | LJ |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 92.07 | 91.97 | 91.93 | 92.34 | Month Mean | 92.03 | Grand Mean | 91.98 |
| Avg SDr | 8.20 | 7.70 | 8.24 | 7.67 | Avg SD | 7.89 | Avg SD | 7.97 |
| SD btwn Labs | 3.39 | 3.67 | 4.30 | 4.22 | SD btwn Labs | 3.09 | SD btwn Labs | 3.00 |
| Labs Incld | 55 | 55 | 54 | 54 | SD btwn Wks | 2.62 | SD btwn Wks | 3.90 |
| Labs Excld | 1 | 1 | 0 | 1 | Labs Incld | 54 | Labs Incld | 56 |
| Labs not Rcvd | 0 | 0 | 2 | 1 | | | | |


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## Key to Instrument Codes Reported by Participants

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


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| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 29DDRE | 68.1 XL | 68.0 X | 69.1 X | 70.1 X | 68.8 | -3.07 X | 3.5 | 1.0 | 71.8 | -2.57 * | 3.8 | 3.3 | 8 | TJ |
| 2AP434 | 91.0 | 95.4 | 94.4 | 94.3 | 93.8 | 0.97 | 4.7 | 1.9 | 93.6 | 1.08 | 4.6 | 2.4 | 16 | LZ |
| 3JAM6F | 92.3 | 93.1 | 93.1 | 91.6 | 92.5 | 0.77 | 4.3 | 0.7 | 92.2 | 0.84 | 3.7 | 1.3 | 16 | LD |
| 3MCDPA | 69.7 X | 70.5 X | 72.5 X | 75.3 * | 72.0 | -2.56 * | 3.9 | 2.5 | 72.0 | -2.54 * | 3.6 | 1.5 | 12 | TH |
| 6ULJEC | 75.4 * | 78.4 | 73.2 XH | 74.5 * | 75.4 | -2.01 * | 6.4 | 2.2 | 72.7 | -2.42 * | 5.1 | 4.2 | 16 | MZ |
| 8MK2ZB | 92.3 | 90.0 | 91.6 | 85.7 | 89.9 | 0.34 | 4.0 | 3.0 | 89.5 | 0.38 | 4.0 | 2.8 | 16 | LD |
| 9MQZAB | 88.1 L | 88.1 | 87.6 | 88.4 | 88.0 | 0.04 | 2.7 | 0.3 L | 88.3 | 0.19 | 2.3 | 0.4 L | 8 | LZ |
| 9XWQCL | 92.6 | 89.4 | 92.0 | 89.9 L | 91.0 | 0.52 | 3.8 | 1.6 | 91.0 | 0.64 | 4.6 | 2.7 | 16 | LD |
| 9Y7NEH | 91.8 | 90.9 | 91.9 | 92.2 | 91.7 | 0.63 | 3.6 | 0.6 L | 91.6 | 0.73 | 3.5 | 0.6 L | 16 | LD |
| ABFUWM | 77.7 | 78.0 H | 70.9 X | 77.0 * | 75.9 | -1.93 | 6.7 | 3.4 | 75.8 | -1.90 | 5.5 | 4.7 | 16 | LC |
| C8MKTZ | 87.8 | 86.5 | 86.1 | 85.4 | 86.4 | -0.22 | 3.1 | 1.0 | 88.4 | 0.20 | 3.0 | 1.8 | 16 | LZ |
| DAP38L | 90.0 | 90.1 | 88.9 | 90.3 | 89.8 | 0.33 | 4.5 | 0.6 L | 92.0 | 0.81 | 4.4 | 3.4 | 12 | TH |
| DFG3R9 | 83.8 | 84.7 | 86.4 | No Data | 85.0 | -0.46 | 4.3 | 1.3 | 84.6 | -0.43 | 3.9 | 1.3 | 7 | EX |
| DLNFP8 | 67.0 XH | 98.7 | 99.6 * | 70.4 XH | 83.9 | -0.63 | 7.9 | 17.6 H | 86.1 | -0.18 | 6.6 | 12.7 H | 16 | LC |
| EE4TE2 | 91.1 H | 90.8 | 91.3 | 89.9 | 90.8 | 0.48 | 5.3 | 0.6 L | 90.8 | 0.61 | 4.3 | 0.7 L | 16 | LD |
| EMCEGA | 86.7 | 88.9 | 89.4 | 89.4 | 88.6 | 0.13 | 3.8 | 1.3 | 89.5 | 0.39 | 3.3 | 2.4 | 16 | TH |
| FALYT2 | 88.4 L | 88.0 L | 88.0 L | 87.8 L | 88.1 | 0.05 | 0.9 | 0.3 L | 88.1 | 0.15 | 3.0 | 0.4 L | 12 | LD |
| FCQHYA | 94.0 | 92.2 | 91.0 | 93.1 | 92.6 | 0.78 | 4.5 | 1.3 | 92.2 | 0.84 | 4.2 | 2.1 | 16 | LC |
| FFAKX3 | 91.1 | 89.8 | 89.2 | 87.8 | 89.5 | 0.27 | 3.7 | 1.4 | 89.9 | 0.45 | 4.5 | 1.9 | 16 | LD |
| FHWEJA | 83.8 | 82.5 | 82.5 | 82.7 | 82.9 | -0.80 | 4.2 | 0.6 L | 85.6 | -0.26 | 3.5 | 2.3 | 16 | LG |
| FLFFH3 | 83.8 | 86.2 | 88.6 | 87.8 | 86.6 | -0.19 | 4.0 | 2.1 | 85.2 | -0.34 | 3.9 | 2.2 | 16 | LD |
| GD2U9X | 92.2 | 90.8 | 100.3 * | 91.2 | 93.6 | 0.95 | 4.7 | 4.5 | 91.1 | 0.66 | 4.0 | 3.2 | 15 | LD |
| HGBRTQ | 78.3 | 77.9 | 91.2 | 88.6 H | 84.0 | -0.62 | 6.1 | 6.9 | 83.6 | -0.59 | 8.4 | 5.6 | 15 | MB |
| HUGKK3 | 76.6 * | 77.2 * | 78.8 * | 76.2 * | 77.2 | -1.72 | 3.2 | 1.1 | 76.9 | -1.73 | 4.5 | 1.5 | 12 | LC |
| JL7FAX | 84.9 L | 85.3 L | 84.3 | 84.5 L | 84.7 | -0.50 | 1.9 | 0.4 L | 84.1 | -0.52 | 2.0 | 0.9 L | 16 | TU |
| JNDTZC | 82.8 | 81.8 | 84.1 | 79.5 | 82.0 | -0.93 | 3.7 | 1.9 | 81.7 | -0.92 | 3.8 | 1.4 | 16 | EN |
| JXWAJ7 | 95.8 L | 94.8 L | 92.3 L | 93.7 L | 94.1 | 1.03 | 1.2 | 1.5 | 92.7 | 0.92 | 1.2 | 1.9 | 16 | TD |
| JYNL3C | 87.4 | 86.1 | 88.4 | 88.8 | 87.7 | -0.02 | 3.3 | 1.2 | 86.7 | -0.08 | 2.9 | 1.3 | 16 | LD |
| KD4ZQ4 | 94.9 | 92.5 | 95.3 | 94.7 | 94.4 | 1.06 | 4.7 | 1.2 | 95.0 | 1.30 | 4.5 | 2.6 | 16 | LD |
| KMUE22 | 74.9 * | 73.9 * | No Data | 66.2 X | 71.7 | -2.61 * | 3.9 | 4.8 | 77.2 | -1.67 | 3.7 | 6.1 | 12 | LD |
| MYKZ42 | 101.7 * | 99.8 * | 103.7 X | 106.5 X | 102.9 | 2.45 * | 4.4 | 2.8 | 101.5 | 2.39 * | 4.5 | 3.5 | 16 | LX |
| NGEX49 | 79.3 H | 88.1 | 94.5 | 93.7 | 88.9 | 0.18 | 6.0 | 7.0 | 91.8 | 0.77 | 4.7 | 4.0 | 16 | LZ |
| P4LV3R | 88.3 | 90.7 | 87.9 | 87.1 | 88.5 | 0.11 | 3.8 | 1.6 | 88.3 | 0.19 | 3.4 | 2.0 | 16 | LD |
| P9FWVU | 96.7 | 98.7 * | 97.2 | 97.8 | 97.6 | 1.59 | 3.9 | 0.9 | 98.5 | 1.89 | 4.3 | 1.6 | 16 | LD |
| PKPC3Y | 86.0 | 87.9 | 86.6 | 90.5 | 87.8 | 0.00 | 3.7 | 2.0 | 86.0 | -0.20 | 7.3 | 2.8 | 16 | LD |


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# Containerboard Interlaboratory Testing Program

Analysis 215

**Ring Crush, 42 lb Linerboard** - 42D3

TAPPI Official Test Method T822

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| PMBGCG | 83.1 | 84.0 | 86.1 | 86.2 | 84.9 | -0.48 | 3.9 | 1.5 | 83.9 | -0.55 | 3.9 | 2.4 | 16 | EM |
| RWE4LT | 87.4 H | 90.8 H | 92.1 H | 86.5 H | 89.2 | 0.23 | 8.2 | 2.7 | 85.7 | -0.25 | 7.0 | 11.1 H | 16 | LC |
| TAWDL4 | 82.8 | 84.7 | 84.9 | 85.2 | 84.4 | -0.55 | 3.5 | 1.1 | 85.2 | -0.33 | 3.3 | 2.2 | 16 | LD |
| TLB93N | 90.1 | 91.5 | 90.6 | 89.7 | 90.5 | 0.44 | 4.2 | 0.8 | 91.5 | 0.72 | 4.3 | 1.9 | 16 | LC |
| TT8CND | 84.5 | 86.1 | 85.1 | 86.2 | 85.5 | -0.37 | 2.6 | 0.8 | 85.6 | -0.26 | 2.9 | 1.2 | 16 | LC |
| TULQ7U | 81.7 | 83.7 | 81.4 | 82.0 | 82.2 | -0.90 | 4.7 | 1.0 | 82.1 | -0.85 | 4.1 | 1.6 | 16 | EM |
| UDFP2K | 89.2 | 92.1 | 80.3 | 87.8 | 87.3 | -0.08 | 4.0 | 5.0 | 87.7 | 0.09 | 4.4 | 3.7 | 16 | LZ |
| UP6NQ3 | 86.7 | 88.4 | 88.1 | 88.8 | 88.0 | 0.04 | 3.4 | 0.9 | 86.2 | -0.16 | 3.9 | 2.0 | 16 | LC |
| UUFVYU | 89.6 | 88.0 | 89.0 | 90.3 | 89.2 | 0.23 | 3.6 | 0.9 | 88.2 | 0.16 | 4.0 | 1.8 | 16 | LD |
| V22UKZ | 85.8 | 81.5 H | 86.5 | 87.0 | 85.2 | -0.42 | 6.5 | 2.5 | 85.8 | -0.23 | 4.2 | 1.6 | 16 | LD |
| VE4L2Y | 83.1 | 83.7 | 81.4 | 85.3 | 83.4 | -0.71 | 3.6 | 1.6 | 85.1 | -0.35 | 3.7 | 1.8 | 16 | LD |
| VGBN7H | 90.9 | 90.4 | 91.1 | 92.2 | 91.1 | 0.54 | 3.4 | 0.7 | 91.1 | 0.65 | 2.5 | 0.7 L | 16 | LD |
| W786RK | 83.8 | 85.6 | 86.6 | 89.3 | 86.3 | -0.24 | 4.3 | 2.3 | 86.1 | -0.18 | 4.1 | 1.8 | 16 | LD |
| WMUD6H | 88.6 | 89.2 | 88.4 | 88.6 | 88.7 | 0.15 | 3.8 | 0.4 L | 88.5 | 0.21 | 3.6 | 2.1 | 16 | TH |
| X284GP | 89.0 | 91.5 | 90.4 | 93.6 | 91.1 | 0.54 | 3.8 | 1.9 | 91.6 | 0.73 | 4.3 | 1.8 | 16 | LC |
| YWCMQH | 88.1 | 88.8 | 89.7 | 92.2 | 89.7 | 0.31 | 4.9 | 1.8 | 89.6 | 0.40 | 4.5 | 1.6 | 16 | LD |
| Z3XY3P | 86.9 | 86.8 | 84.6 | 82.2 | 85.1 | -0.43 | 2.9 | 2.2 | 84.1 | -0.51 | 3.2 | 2.1 | 16 | LC |
| ZBJG2P | 120.8 X | No Data | 97.2 | 90.0 | 102.7 | 2.41 * | 4.0 | 16.1 H | 92.8 | 0.95 | 4.2 | 11.4 H | 13 | XX |
| ZDFPHL | 94.9 | 95.8 | No Data | No Data | 95.4 | 1.23 | 4.9 | 0.6 | 93.8 | 1.11 | 4.1 | 1.5 | 6 | LD |
| ZNCPEY | 90.2 H | 91.7 | 89.9 | 93.4 | 91.3 | 0.56 | 4.9 | 1.6 | 84.4 | -0.47 | 6.2 | 7.5 | 8 | MB |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 87.41 | 88.11 | 89.08 | 87.87 | Month Mean | 87.79 | Grand Mean | 87.18 |
| Avg SDr | 4.31 | 4.55 | 3.76 | 4.34 | Avg SD | 4.39 | Avg SD | 4.30 |
| SD btwn Labs | 5.60 | 5.48 | 4.71 | 5.14 | SD btwn Labs | 6.17 | SD btwn Labs | 5.98 |
| Labs Incld | 51 | 52 | 48 | 49 | SD btwn Wks | 3.98 | SD btwn Wks | 3.79 |
| Labs Excld | 4 | 2 | 5 | 4 | Labs Incld | 54 | Labs Incld | 55 |
| Labs not Rcvd | 0 | 1 | 2 | 2 | | | | |


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## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| EM | Emerson 1200 | EN | Emerson 2200 |
| EX | Emerson (model not specified) | LC | L&W Crush Tester 48 |
| LD | L&W Crush Tester 248 | LG | L&W 753 |
| LX | L&W 506 | LZ | L&W Crush Tester (model not specified) |
| MB | Messmer Buchel K440 | MZ | Messmer Buchel (model not specified) |
| TD | TMI Digital Crush Tester, Model 17-09 | TH | TMI Compression Tester, Model 17-76 |
| TJ | TLS Compression Tester, Model CDM-5 | TU | TMI Universal Crush Tester (TMI K440) |
| XX | Instrument make/model not specified by lab | | |


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| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 29DDRE | 63.5 * | 63.9 * | 62.5 * | 62.8 * | 63.2 | -2.36 * | 2.1 | 0.7 | 63.2 | -2.54 * | 2.1 | 0.7 L | 4 | XX |
| 2AP434 | 79.4 | 82.4 | 82.3 H | 82.0 | 81.5 | 0.57 | 4.3 | 1.4 | 81.1 | 0.63 | 4.5 | 1.3 | 12 | LZ |
| 3JAM6F | 81.8 | 80.3 | 83.2 | 83.6 | 82.2 | 0.68 | 3.2 | 1.5 | 81.7 | 0.73 | 2.9 | 1.5 | 12 | LD |
| 3MCDPA | 64.1 | 66.2 | 66.1 * | 66.9 | 65.8 | -1.94 * | 3.2 | 1.2 | 65.9 | -2.06 * | 2.8 | 1.0 | 8 | TH |
| 6ULJEC | 60.1 * | 61.9 * | 66.4 * | 63.2 * | 62.9 | -2.41 * | 2.7 | 2.7 | 62.9 | -2.59 * | 3.6 | 3.2 | 12 | MB |
| 8MK2ZB | 80.5 | 77.4 | 80.6 H | 76.4 | 78.7 | 0.12 | 5.5 | 2.1 | 79.9 | 0.41 | 4.9 | 2.4 | 12 | LC |
| 9MQZAB | 79.9 | 78.3 | 77.8 | 78.1 | 78.5 | 0.09 | 2.0 | 0.9 | 79.5 | 0.35 | 2.4 | 1.2 | 12 | LZ |
| 9XWQCL | 81.6 | 81.3 | 80.1 | 80.6 | 80.9 | 0.47 | 4.2 | 0.7 | 81.3 | 0.66 | 4.4 | 1.6 | 12 | LD |
| 9Y7NEH | 80.3 | 81.1 | 80.6 | 80.8 | 80.7 | 0.44 | 3.2 | 0.4 L | 81.1 | 0.63 | 3.3 | 0.5 L | 12 | LD |
| ABFUWM | 69.0 | 64.6 * | 65.8 * | 64.9 * | 66.0 | -1.90 | 3.6 | 2.0 | 66.1 | -2.02 * | 3.8 | 2.2 | 12 | LC |
| C8MKTZ | 82.3 | 83.0 | 79.9 | 78.5 | 80.9 | 0.48 | 2.7 | 2.1 | 80.6 | 0.54 | 3.0 | 2.5 | 12 | LZ |
| DAP38L | 75.9 | 76.5 | 75.4 | 77.6 | 76.3 | -0.26 | 3.6 | 0.9 | 77.9 | 0.07 | 3.5 | 2.0 | 8 | TH |
| DFG3R9 | 77.1 | 76.2 | 77.9 | No Data | 77.1 | -0.14 | 3.2 | 0.8 | 76.4 | -0.20 | 3.1 | 1.1 | 5 | EX |
| DLNFP8 | 64.0 H | 90.5 * | 91.7 * | 67.3 H | 78.4 | 0.07 | 6.8 | 14.8 H | 82.2 | 0.82 | 5.2 | 10.9 H | 12 | LC |
| EE4TE2 | 79.4 | 79.8 H | 80.0 | 80.2 | 79.9 | 0.30 | 4.8 | 0.3 L | 79.5 | 0.34 | 4.0 | 0.8 L | 12 | LD |
| EMCEGA | 80.0 | 79.3 | 80.6 | 78.2 | 79.5 | 0.25 | 2.6 | 1.0 | 78.7 | 0.21 | 2.8 | 1.2 | 12 | TH |
| FALYT2 | 77.7 L | 77.5 L | 77.7 L | 77.5 L | 77.6 | -0.05 | 0.9 | 0.1 L | 78.3 | 0.13 | 3.3 | 1.0 | 12 | LD |
| FCQHYA | 86.7 | 83.6 | 84.4 | 86.7 | 85.3 | 1.18 | 3.8 | 1.6 | 85.6 | 1.42 | 3.9 | 1.8 | 12 | LC |
| FFAKX3 | 81.6 | 80.4 | 82.2 | 83.0 L | 81.8 | 0.61 | 2.2 | 1.1 | 80.5 | 0.52 | 2.8 | 2.6 | 12 | LD |
| FHWEJA | 77.1 | 72.3 | 74.7 | 73.8 | 74.5 | -0.56 | 3.9 | 2.0 | 78.1 | 0.09 | 3.6 | 3.0 | 12 | LG |
| FLFFH3 | 77.2 | 78.3 | 78.9 | 77.4 | 77.9 | 0.00 | 3.9 | 0.8 | 77.7 | 0.03 | 3.7 | 1.5 | 12 | LD |
| GD2U9X | 79.8 | 79.1 | 85.0 | 81.7 | 81.4 | 0.55 | 3.2 | 2.6 | 79.7 | 0.37 | 2.9 | 2.4 | 11 | LD |
| HGBRTQ | 70.6 | 71.3 | 79.2 H | 78.0 | 74.8 | -0.51 | 6.4 | 4.4 | 76.0 | -0.28 | 6.1 | 5.4 | 12 | MB |
| HUGKK3 | 65.7 | 68.9 | 69.3 | 69.3 | 68.3 | -1.54 | 3.8 | 1.7 | 67.8 | -1.73 | 4.1 | 1.5 | 12 | LC |
| JL7FAX | 75.1 L | 74.5 L | 74.4 L | 74.5 L | 74.6 | -0.53 | 1.3 | 0.3 L | 74.1 | -0.60 | 1.7 | 0.7 L | 12 | TU |
| JNDTZC | 74.6 | 76.6 | 77.1 | 74.9 | 75.8 | -0.34 | 2.8 | 1.2 | 75.3 | -0.40 | 3.4 | 1.4 | 12 | EN |
| JXWAJ7 | 79.0 L | 80.9 | 80.3 L | 77.9 L | 79.5 | 0.25 | 1.2 | 1.3 | 76.2 | -0.23 | 1.5 | 4.1 | 12 | TD |
| JYNL3C | 78.5 | 79.5 | 79.1 | 79.1 | 79.1 | 0.18 | 3.6 | 0.5 L | 78.9 | 0.23 | 3.0 | 1.2 | 12 | LD |
| KD4ZQ4 | 84.9 | 84.0 | 85.9 | 85.5 | 85.1 | 1.14 | 3.4 | 0.8 | 85.3 | 1.37 | 3.3 | 0.8 L | 12 | LD |
| KMUE22 | 63.9 | 62.4 * | No Data | 59.7 X | 62.0 | -2.55 * | 3.1 | 2.1 | 68.2 | -1.66 | 3.1 | 5.3 | 9 | LD |
| MYKZ42 | 86.0 | 86.6 | 89.3 H | 96.0 X | 89.5 | 1.84 | 4.5 | 4.6 | 89.7 | 2.15 * | 4.9 | 3.5 | 12 | LX |
| NGEX49 | 61.4 *H | 84.0 | 85.7 | 86.2 | 79.3 | 0.22 | 5.4 | 12.0 H | 82.1 | 0.80 | 4.3 | 6.7 | 12 | LZ |
| P4LV3R | 79.9 | 81.4 | 79.4 | 79.8 L | 80.1 | 0.35 | 2.1 | 0.9 | 80.4 | 0.50 | 2.7 | 1.3 | 12 | LD |
| P9FWVU | 88.6 | 88.9 | 87.7 | 86.4 | 87.9 | 1.59 | 2.8 | 1.1 | 87.5 | 1.76 | 3.7 | 1.6 | 12 | LD |
| PKPC3Y | 76.1 L | 79.4 | 78.7 | 78.5 | 78.2 | 0.04 | 3.0 | 1.4 | 77.1 | -0.08 | 2.7 | 1.1 | 12 | LD |


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# Containerboard Interlaboratory Testing Program

Analysis 217

**Ring Crush, 35 lb Linerboard** - 35E1

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 |
| PMBGCG | 74.0 | 76.6 | 77.0 | 77.3 | 76.2 | -0.28 | 3.6 | 1.5 | 76.4 | -0.21 | 3.7 | 2.0 | 12 | EM |
| RWE4LT | 67.0 H | 69.6 H | 75.8 H | 79.6 H | 73.0 | -0.79 | 9.5 | 5.7 | 69.9 | -1.35 | 8.1 | 8.2 H | 12 | LC |
| TAWDL4 | 77.5 | 79.1 | 77.2 | 77.7 | 77.9 | -0.02 | 3.0 | 0.8 | 76.8 | -0.14 | 2.9 | 1.7 | 12 | LD |
| TLB93N | 82.0 | 83.7 | 85.6 | 83.7 | 83.8 | 0.93 | 2.7 | 1.5 | 80.6 | 0.53 | 3.2 | 2.9 | 12 | LC |
| TT8CND | 77.9 | 76.9 | 77.5 | 78.0 | 77.6 | -0.06 | 2.6 | 0.5 L | 76.9 | -0.12 | 2.7 | 1.3 | 12 | LC |
| TULQ7U | 69.4 | 72.6 | 69.3 | 71.8 | 70.8 | -1.15 | 3.5 | 1.7 | 71.4 | -1.09 | 4.2 | 1.4 | 12 | EM |
| UDFP2K | 78.5 | 76.3 | 72.8 | 76.0 | 75.9 | -0.33 | 3.2 | 2.4 | 75.7 | -0.32 | 3.9 | 3.9 | 12 | LZ |
| UP6NQ3 | 75.5 | 76.3 | 75.6 | 75.9 | 75.8 | -0.34 | 4.1 | 0.4 L | 75.3 | -0.40 | 3.7 | 2.1 | 12 | LC |
| UUFVYU | 78.6 | 75.6 | 76.3 | 72.1 | 75.6 | -0.37 | 2.9 | 2.7 | 76.8 | -0.14 | 3.2 | 2.4 | 12 | LD |
| V22UKZ | 78.6 | 79.4 | 78.6 | 77.1 | 78.4 | 0.07 | 2.3 | 0.9 | 78.3 | 0.12 | 2.3 | 1.2 | 12 | LD |
| VE4L2Y | 75.0 | 76.6 | 77.1 | 76.4 | 76.3 | -0.27 | 3.1 | 0.9 | 75.5 | -0.36 | 3.1 | 1.1 | 12 | LD |
| VGBN7H | 83.1 | 84.0 | 82.5 | 82.9 | 83.1 | 0.83 | 3.0 | 0.6 | 82.8 | 0.92 | 2.5 | 0.6 L | 12 | LD |
| W786RK | 74.4 | 76.9 | 77.2 | 76.5 | 76.3 | -0.27 | 3.6 | 1.3 | 75.9 | -0.29 | 3.6 | 1.5 | 12 | LD |
| WMUD6H | 78.6 | 78.6 | 77.6 | 78.6 | 78.3 | 0.06 | 3.6 | 0.5 L | 78.2 | 0.12 | 3.3 | 1.2 | 12 | TH |
| X284GP | 83.2 | 80.5 | 81.1 | 83.0 | 82.0 | 0.64 | 3.6 | 1.3 | 82.2 | 0.82 | 3.3 | 1.1 | 12 | LC |
| YWCMQH | 81.4 | 82.9 | 79.3 | 82.7 | 81.6 | 0.58 | 4.2 | 1.7 | 81.9 | 0.76 | 3.4 | 1.7 | 12 | LD |
| Z3XY3P | 78.1 | 77.4 | 76.0 | 75.5 | 76.8 | -0.19 | 2.9 | 1.2 | 74.8 | -0.48 | 3.0 | 2.1 | 12 | LC |
| ZBJG2P | 111.8 X | No Data | 89.9 | 82.6 | 94.7 | 2.68 * | 3.4 | 15.2 H | 82.6 | 0.89 | 3.8 | 12.0 H | 9 | XX |
| ZDFPHL | 86.8 | 83.9 | No Data | No Data | 85.4 | 1.19 | 3.3 | 2.1 | 85.4 | 1.38 | 3.3 | 2.1 | 2 | LD |
| ZNCPEY | 82.8 | 84.1 | 81.9 | 82.8 | 82.9 | 0.79 | 4.8 | 0.9 | 71.8 | -1.01 | 6.2 | 9.1 H | 12 | MB |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 76.77 | 77.84 | 78.65 | 77.67 | Month Mean | 77.96 | Grand Mean | 77.55 |
| Avg SDr | 3.98 | 3.55 | 3.82 | 3.67 | Avg SD | 3.75 | Avg SD | 3.69 |
| SD btwn Labs | 6.79 | 6.23 | 5.97 | 5.65 | SD btwn Labs | 6.26 | SD btwn Labs | 5.66 |
| Labs Incld | 54 | 54 | 53 | 51 | SD btwn Wks | 3.73 | SD btwn Wks | 3.55 |
| Labs Excld | 1 | 0 | 0 | 2 | Labs Incld | 55 | Labs Incld | 55 |
| Labs not Rcvd | 0 | 1 | 2 | 2 | | | | |


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## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| EM | Emerson 1200 | EN | Emerson 2200 |
| EX | Emerson (model not specified) | LC | L&W Crush Tester 48 |
| LD | L&W Crush Tester 248 | LG | L&W 753 |
| LX | L&W 506 | LZ | L&W Crush Tester (model not specified) |
| MB | Messmer Buchel K440 | TD | TMI Digital Crush Tester, Model 17-09 |
| TH | TMI Compression Tester, Model 17-76 | TU | TMI Universal Crush Tester (TMI K440) |
| XX | Instrument make/model not specified by lab | | |


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| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 2Z4RXJ | 24.3 | 23.8 | 24.4 | 24.3 | 24.2 | 1.46 | 2.2 | 0.3 | 23.8 | 1.29 | 2.0 | 0.5 | 16 | XX |
| 34GUGT | 23.1 | 22.8 | 22.4 | 23.2 | 22.9 | 0.21 | 2.0 | 0.4 | 23.1 | 0.58 | 2.0 | 0.7 | 16 | LA |
| 3JAM6F | 21.9 | 22.1 | 22.7 | 21.9 | 22.2 | -0.48 | 1.9 | 0.4 | 22.3 | -0.28 | 1.9 | 0.7 | 16 | LY |
| 3MCDPA | 22.0 | 21.5 | 21.0 | 21.8 | 21.6 | -1.01 | 1.7 | 0.4 | 21.1 | -1.57 | 1.7 | 0.7 | 12 | LH |
| 4AMVAB | 22.3 | 22.6 L | 22.7 | 22.2 | 22.4 | -0.21 | 1.2 | 0.3 | 22.4 | -0.16 | 1.2 | 0.4 | 16 | TT |
| 8MK2ZB | 24.0 | 23.5 | 23.8 | 23.4 | 23.7 | 0.96 | 2.0 | 0.3 | 23.5 | 0.96 | 2.0 | 0.4 | 16 | LW |
| 9G9JVF | 22.5 | 22.7 | 22.3 | 24.3 | 23.0 | 0.28 | 2.4 | 0.9 | 22.2 | -0.37 | 1.9 | 0.7 | 16 | LA |
| 9XWQCL | 24.9 | 23.0 | 22.1 | 22.2 | 23.1 | 0.37 | 2.0 | 1.3 | 23.2 | 0.71 | 2.0 | 1.0 | 16 | LA |
| 9Y7NEH | 22.9 | 22.7 | 22.7 | 22.6 | 22.7 | 0.07 | 1.5 | 0.1 | 22.6 | 0.05 | 1.4 | 0.1 L | 16 | LA |
| ABFUWM | 24.6 | 25.1 * | 22.6 | 25.1 * | 24.3 | 1.59 | 1.9 | 1.2 | 23.5 | 0.99 | 1.7 | 1.5 | 16 | LZ |
| CMY68X | 23.1 | 22.7 | 23.7 | 22.0 | 22.9 | 0.21 | 1.8 | 0.7 | 22.5 | -0.09 | 1.9 | 0.6 | 16 | LA |
| DAP38L | 20.1 * | 20.7 | 22.3 | 20.5 L | 20.9 | -1.66 | 1.6 | 1.0 | 21.2 | -1.49 | 2.2 | 0.8 | 12 | LH |
| DFG3R9 | 23.8 L | 22.7 L | 23.5 L | No Data | 23.3 | 0.62 | 0.0 | 0.6 | 23.1 | 0.54 | 0.0 | 1.1 | 7 | TT |
| EE4TE2 | 21.9 | 21.6 | 22.7 | 23.8 | 22.5 | -0.17 | 2.0 | 1.0 | 22.6 | 0.08 | 1.8 | 0.7 | 16 | LY |
| EY9HK4 | 24.0 | 23.5 | 23.8 | 25.3 * | 24.2 | 1.41 | 2.1 | 0.8 | 22.9 | 0.38 | 1.8 | 1.0 | 16 | LA |
| FCQHYA | 23.9 | 22.7 | 22.6 | 23.0 | 23.0 | 0.36 | 1.8 | 0.6 | 23.8 | 1.37 | 1.8 | 3.2 H | 16 | ID |
| FFAKX3 | 23.4 | 23.5 | 23.6 | 23.2 | 23.4 | 0.74 | 2.0 | 0.2 | 23.2 | 0.66 | 2.0 | 0.7 | 16 | LA |
| FHWEJA | 21.4 | 22.2 | 21.9 | 21.3 | 21.7 | -0.91 | 1.8 | 0.4 | 21.5 | -1.11 | 1.7 | 0.4 | 16 | LU |
| FLFFH3 | 21.8 | 21.5 | 22.3 | 22.6 | 22.0 | -0.59 | 1.9 | 0.5 | 22.1 | -0.46 | 1.8 | 0.5 | 16 | LY |
| GD2U9X | 22.7 | 21.3 | 23.5 | 21.7 | 22.3 | -0.36 | 2.0 | 1.0 | 21.3 | -1.36 | 2.1 | 1.1 | 15 | LZ |
| GYEQHT | 22.8 | 21.8 | 22.1 | 22.2 | 22.2 | -0.44 | 2.2 | 0.4 | 22.9 | 0.41 | 2.1 | 1.0 | 16 | LH |
| HGBRTQ | 22.0 | 23.1 | 21.6 | 23.1 | 22.5 | -0.20 | 1.8 | 0.8 | 22.7 | 0.19 | 1.8 | 0.8 | 15 | LA |
| JNDTZC | 21.0 | 20.7 | 21.4 | 20.9 | 21.0 | -1.59 | 1.8 | 0.3 | 21.0 | -1.65 | 1.9 | 0.5 | 16 | LY |
| JYNL3C | 22.0 | 22.9 | 23.2 | 22.5 | 22.7 | -0.01 | 2.1 | 0.5 | 22.5 | -0.06 | 1.8 | 0.8 | 16 | LA |
| KD4ZQ4 | 24.0 | 23.3 | 23.1 | 23.4 | 23.5 | 0.75 | 1.5 | 0.4 | 23.6 | 1.11 | 1.6 | 0.9 | 16 | LH |
| KUEPX3 | 23.4 | 24.4 | 24.7 *H | 24.5 | 24.3 | 1.50 | 2.2 | 0.6 | 24.3 | 1.81 | 2.2 | 0.6 | 4 | LU |
| NDUYJY | 22.2 | 22.1 | 22.1 | 21.9 | 22.1 | -0.56 | 1.8 | 0.1 L | 21.2 | -1.45 | 1.9 | 0.8 | 16 | LH |
| NGEX49 | 22.1 | 22.2 | 21.2 | 22.0 | 21.9 | -0.75 | 1.4 | 0.4 | 21.8 | -0.79 | 1.9 | 0.4 | 16 | LW |
| NMWE7H | 23.4 | 21.6 L | 23.6 L | 24.2 | 23.2 | 0.50 | 1.6 | 1.1 | 23.0 | 0.41 | 1.8 | 1.1 | 12 | LA |
| P4LV3R | 23.5 | 22.0 | 23.1 | 22.5 | 22.8 | 0.09 | 1.9 | 0.7 | 22.5 | -0.03 | 4.3 | 0.6 | 14 | LA |
| PKPC3Y | 22.7 L | 22.6 | 22.5 | 22.5 | 22.6 | -0.08 | 1.4 | 0.1 L | 21.8 | -0.83 | 1.7 | 0.9 | 16 | LA |
| QTFCWG | 22.5 | 22.4 | 22.2 | 23.4 | 22.6 | -0.07 | 1.8 | 0.5 | 23.0 | 0.46 | 1.8 | 0.6 | 16 | LU |
| RWE4LT | 24.4 | 23.8 | 24.4 | 24.3 | 24.2 | 1.48 | 2.1 | 0.3 | 23.7 | 1.26 | 2.1 | 0.8 | 16 | LU |
| TAWDL4 | 21.0 | 21.1 L | 22.1 L | 21.6 L | 21.4 | -1.19 | 1.1 | 0.5 | 21.6 | -1.10 | 1.4 | 0.5 | 16 | BK |
| TLB93N | 21.0 | 21.0 | 21.9 | 20.5 L | 21.1 | -1.48 | 1.7 | 0.6 | 22.7 | 0.16 | 2.0 | 2.9 H | 16 | LA |


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# Containerboard Interlaboratory Testing Program

Analysis 223

**STFI, 42 lb Linerboard** - 42D3

TAPPI Official Test Method T826

**Report #589 (L)**
**October 2018**

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| TPXR9T | 24.6 | 26.1 X | 25.7 XH | 23.9 | 25.1 | 2.30 * | 2.5 | 1.0 | 24.2 | 1.75 | 2.1 | 1.1 | 16 | LU |
| U93P6U | 24.3 | 24.4 | 24.0 | 23.2 | 24.0 | 1.24 | 2.2 | 0.5 | 23.9 | 1.48 | 2.3 | 0.8 | 16 | LA |
| UDFP2K | 21.3 | 20.0 * | 19.6 X | 21.2 | 20.5 | -2.05 * | 1.4 | 0.9 | 20.9 | -1.85 | 1.7 | 0.7 | 16 | LA |
| UMY433 | 22.0 | 22.1 | 20.9 * | 21.4 | 21.6 | -1.03 | 2.0 | 0.6 | 21.4 | -1.23 | 1.8 | 0.5 | 16 | LZ |
| UP6NQ3 | 21.4 | 21.5 | 21.9 | 21.9 | 21.7 | -0.96 | 1.6 | 0.2 | 21.7 | -0.91 | 1.8 | 0.7 | 16 | LW |
| UUFVYU | 22.0 L | 22.7 | 22.8 | 21.3 | 22.2 | -0.44 | 1.9 | 0.7 | 22.9 | 0.37 | 2.0 | 1.2 | 16 | LZ |
| UUHE9Q | 25.2 * | 24.1 H | 22.7 | 24.1 | 24.0 | 1.27 | 2.6 | 1.0 | 25.7 | 3.40 X | 2.6 | 4.5 H | 13 | LZ |
| VCX333 | 24.6 | 23.7 | 24.6 * | 22.9 | 24.0 | 1.22 | 1.9 | 0.8 | 23.3 | 0.79 | 1.9 | 1.5 | 16 | LA |
| VE4L2Y | 20.8 | 21.7 | 21.3 | 20.6 | 21.1 | -1.47 | 1.8 | 0.5 | 21.2 | -1.53 | 1.8 | 0.6 | 16 | LU |
| VGBN7H | 22.5 | 21.6 | 22.0 | 22.2 | 22.1 | -0.56 | 1.9 | 0.4 | 21.0 | -1.74 | 1.6 | 0.8 | 16 | LY |
| W786RK | 22.6 | 22.7 | 22.7 | 23.1 | 22.8 | 0.09 | 1.9 | 0.2 | 22.5 | -0.10 | 1.7 | 0.6 | 16 | LA |
| WMUD6H | 22.2 | 22.2 | 22.1 | 22.6 | 22.3 | -0.36 | 1.5 | 0.2 | 22.3 | -0.31 | 1.3 | 0.3 L | 16 | TT |
| WR6EAM | 25.6 * | 25.3 *H | 24.8 * | 23.0 | 24.7 | 1.91 | 2.4 | 1.2 | 24.4 | 1.96 * | 2.2 | 1.2 | 16 | LU |
| X284GP | 23.1 | 22.4 | 22.9 | 22.6 | 22.8 | 0.10 | 2.1 | 0.3 | 22.3 | -0.24 | 2.0 | 0.6 | 16 | LU |
| XEDC6Z | 23.5 | 24.3 | 23.9 | 22.8 | 23.6 | 0.91 | 1.8 | 0.6 | 23.8 | 1.29 | 2.2 | 1.0 | 16 | LH |
| YWCMQH | 22.2 | 22.8 | 22.8 | 23.0 H | 22.7 | 0.03 | 2.3 | 0.3 | 23.0 | 0.48 | 2.0 | 0.6 | 16 | LA |
| Z3XY3P | 21.7 | 22.9 | 22.4 | 21.3 L | 22.1 | -0.56 | 1.4 | 0.7 | 22.0 | -0.61 | 1.4 | 0.6 | 16 | LA |
| Z7F7HC | 22.3 | 17.7 X | 21.8 | 21.3 | 20.8 | -1.79 | 2.1 | 2.1 H | 21.6 | -0.99 | 2.0 | 1.8 | 16 | XX |
| ZBJG2P | 42.6 X | No Data | 22.3 | 21.7 | 28.9 | 5.88 X | 1.9 | 11.9 H | 27.4 | 5.26 X | 2.6 | 9.5 H | 13 | XX |
| ZDFPHL | 22.7 | 22.0 | No Data | No Data | 22.3 | -0.31 | 2.1 | 0.5 | 22.2 | -0.35 | 1.9 | 0.5 | 6 | LY |
| ZNCPEY | 22.2 | 22.0 | 22.6 | 22.2 | 22.3 | -0.39 | 2.1 | 0.2 | 22.3 | -0.32 | 2.2 | 0.9 | 12 | BK |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 22.79 | 22.56 | 22.72 | 22.59 | Month Mean | 22.66 | Grand Mean | 22.57 |
| Avg SDr | 1.93 | 1.97 | 1.79 | 1.89 | Avg SD | 1.91 | Avg SD | 1.95 |
| SD btwn Labs | 1.22 | 1.11 | 0.96 | 1.15 | SD btwn Labs | 1.06 | SD btwn Labs | 0.93 |
| Labs Incld | 55 | 53 | 53 | 54 | SD btwn Wks | 0.70 | SD btwn Wks | 1.01 |
| Labs Excld | 1 | 2 | 2 | 0 | Labs Incld | 55 | Labs Incld | 53 |
| Labs not Rcvd | 0 | 1 | 1 | 2 | | | | |


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## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| BK | Buchel Strip Compression Tester BK-155 | ID | IDM Compression Tester |
| LA | L&W Autoline | LH | L&W 282 |
| LU | L&W 52 without moisture correction(was 53) | LW | L&W 53 with moisture correction (was 53M) |
| LY | L&W 152 without moisture correction | LZ | L&W (model not specified) |
| TT | TMI Short Span Compression, 17-34 (MB K455) | XX | Instrument make/model not specified by lab |


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| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 2Z4RXJ | 24.7 * | 23.8 | 23.6 | 23.8 | 24.0 | 1.29 | 1.7 | 0.5 | 23.5 | 1.21 | 1.6 | 0.7 | 12 | XX |
| 34GUGT | 22.9 | 22.2 | 22.4 | 22.5 | 22.5 | 0.05 | 1.8 | 0.3 | 22.5 | 0.19 | 1.7 | 0.5 | 12 | LA |
| 3JAM6F | 22.4 | 21.8 | 22.9 | 22.5 | 22.4 | -0.05 | 1.8 | 0.5 | 22.1 | -0.28 | 1.6 | 0.5 | 12 | LY |
| 3MCDPA | 20.7 | 20.8 L | 20.6 | 21.2 | 20.8 | -1.40 | 1.3 | 0.3 | 20.7 | -1.69 | 1.4 | 0.4 | 8 | LH |
| 4AMVAB | 22.2 L | 22.2 L | 21.6 | 21.1 | 21.8 | -0.57 | 1.0 | 0.5 | 21.9 | -0.47 | 1.0 | 0.4 | 12 | TT |
| 8MK2ZB | 23.0 | 23.3 | 24.6 | 24.0 | 23.7 | 1.09 | 1.7 | 0.7 | 23.1 | 0.84 | 1.7 | 0.7 | 12 | LW |
| 9G9JVF | 22.9 | 22.1 | 23.4 | 23.1 | 22.8 | 0.33 | 1.7 | 0.6 | 22.7 | 0.37 | 1.7 | 0.5 | 12 | LA |
| 9XWQCL | 22.7 | 22.6 | 23.0 | 22.3 | 22.6 | 0.14 | 1.8 | 0.3 | 22.4 | 0.07 | 2.0 | 0.8 | 12 | LA |
| 9Y7NEH | 22.3 | 22.3 | 22.3 | 22.2 | 22.3 | -0.16 | 1.7 | 0.1 L | 22.2 | -0.14 | 1.5 | 0.1 L | 12 | LA |
| ABFUWM | 24.6 | 26.2 X | 23.2 | 23.0 | 24.2 | 1.52 | 1.7 | 1.5 | 23.8 | 1.60 | 1.6 | 0.9 | 12 | XX |
| CMY68X | 22.2 | 22.9 | 22.4 | 21.7 H | 22.3 | -0.15 | 1.7 | 0.5 | 22.1 | -0.25 | 1.6 | 0.4 | 12 | LA |
| DAP38L | 18.8 X | 19.0 X | 19.6 * | 20.0 * | 19.3 | -2.66 * | 1.6 | 0.6 | 20.4 | -2.06 * | 1.6 | 1.2 | 8 | LH |
| DFG3R9 | 21.9 L | 24.7 L | 21.7 L | No Data | 22.8 | 0.27 | 0.0 | 1.7 | 22.6 | 0.26 | 0.0 | 1.3 | 5 | LZ |
| EE4TE2 | 23.5 | 22.1 | 23.2 | 22.8 | 22.9 | 0.36 | 1.8 | 0.6 | 22.6 | 0.32 | 1.7 | 0.5 | 12 | LU |
| EY9HK4 | 21.6 | 22.8 L | 22.9 L | 24.3 | 22.9 | 0.37 | 1.6 | 1.1 | 22.1 | -0.25 | 1.6 | 1.1 | 12 | LA |
| FCQHYA | 23.3 | 22.8 | 22.0 | 22.8 | 22.7 | 0.23 | 1.7 | 0.5 | 22.9 | 0.59 | 1.5 | 0.4 | 12 | ID |
| FFAKX3 | 22.7 | 22.7 | 23.6 | 23.0 | 23.0 | 0.45 | 1.4 | 0.4 | 23.0 | 0.73 | 1.7 | 0.5 | 12 | LU |
| FHWEJA | 21.2 | 20.8 | 20.8 L | 22.7 L | 21.4 | -0.93 | 1.3 | 0.9 | 21.4 | -0.99 | 1.4 | 0.5 | 12 | LW |
| FLFFH3 | 22.2 | 20.5 | 23.1 | 22.8 | 22.1 | -0.28 | 1.8 | 1.1 | 21.9 | -0.39 | 1.6 | 0.7 | 12 | LY |
| GD2U9X | 21.6 | 22.0 | 23.9 | 21.2 | 22.2 | -0.23 | 1.6 | 1.2 | 21.5 | -0.83 | 1.6 | 0.9 | 11 | LZ |
| GYEQHT | 22.4 | 22.9 | 22.7 | 22.5 | 22.7 | 0.17 | 1.8 | 0.2 | 22.8 | 0.56 | 1.9 | 0.5 | 12 | LH |
| HGBRTQ | 21.7 | 20.0 * | 17.2 XL | 22.1 | 20.2 | -1.88 | 1.3 | 2.2 | 21.1 | -1.33 | 1.6 | 1.4 | 12 | LA |
| JNDTZC | 20.6 | 21.3 | 21.2 | 20.9 | 21.0 | -1.24 | 1.6 | 0.3 | 21.0 | -1.35 | 1.6 | 0.3 | 12 | LY |
| JYNL3C | 22.5 | 21.5 | 22.6 | 22.5 | 22.3 | -0.15 | 1.8 | 0.5 | 22.1 | -0.19 | 1.7 | 0.5 | 12 | LA |
| KD4ZQ4 | 22.5 | 22.4 | 22.8 L | 22.9 | 22.7 | 0.18 | 1.4 | 0.2 | 22.8 | 0.56 | 1.4 | 0.3 L | 12 | LH |
| KUEPX3 | 24.3 | 24.4 | 24.9 | 23.5 | 24.3 | 1.56 | 1.9 | 0.5 | 24.3 | 2.07 * | 1.9 | 0.5 | 4 | LU |
| NDUYJY | 22.5 H | 22.0 | 22.1 H | 22.0 H | 22.1 | -0.26 | 2.4 | 0.2 | 21.4 | -0.94 | 1.8 | 0.7 | 12 | LH |
| NGEX49 | 20.7 | 21.9 | 21.9 | 22.2 | 21.7 | -0.67 | 1.7 | 0.7 | 21.5 | -0.89 | 1.7 | 0.5 | 12 | LW |
| NMWE7H | 22.9 L | 24.2 H | 24.7 H | 24.7 * | 24.1 | 1.42 | 1.9 | 0.9 | 23.0 | 0.70 | 1.8 | 1.4 | 8 | LA |
| P4LV3R | 22.9 | 23.0 | 22.0 | 22.5 L | 22.6 | 0.13 | 1.8 | 0.5 | 22.5 | 0.20 | 1.6 | 0.6 | 10 | LW |
| PKPC3Y | 21.9 L | 22.6 | 22.2 | 22.3 | 22.3 | -0.17 | 1.4 | 0.3 | 22.1 | -0.28 | 1.5 | 0.5 | 12 | LA |
| QTFCWG | 22.5 | 21.7 | 22.9 | 23.0 | 22.5 | 0.03 | 1.5 | 0.6 | 23.1 | 0.80 | 1.6 | 0.6 | 12 | LA |
| RWE4LT | 24.2 | 23.2 | 23.6 | 23.8 | 23.7 | 1.08 | 1.7 | 0.4 | 23.4 | 1.17 | 1.7 | 0.6 | 12 | LU |
| TAWDL4 | 20.1 * | 21.3 | 21.3 L | 20.6 | 20.8 | -1.42 | 1.1 | 0.6 | 21.1 | -1.34 | 1.3 | 0.5 | 12 | BK |
| TLB93N | 20.1 * | 21.2 | 21.3 | 22.1 | 21.2 | -1.09 | 1.3 | 0.8 | 22.8 | 0.47 | 1.9 | 2.2 H | 12 | LA |


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# Containerboard Interlaboratory Testing Program

Analysis 225

**STFI, 35 lb Linerboard** - 35E1

TAPPI Official Test Method T826

**Report #589 (L)**
**October 2018**

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| TPXR9T | 24.4 | 25.3 * | 24.1 | 24.4 | 24.5 | 1.78 | 1.8 | 0.5 | 23.9 | 1.65 | 1.9 | 0.7 | 12 | LU |
| U93P6U | 22.9 | 23.8 H | 22.9 | 22.3 | 23.0 | 0.44 | 2.2 | 0.6 | 23.0 | 0.68 | 1.7 | 0.5 | 12 | LA |
| UDFP2K | 20.2 | 21.2 L | 19.8 * | 20.4 | 20.4 | -1.75 | 1.5 | 0.6 | 21.0 | -1.41 | 1.7 | 0.9 | 12 | LA |
| UMY433 | 21.9 | 22.2 | 21.4 | 21.3 | 21.7 | -0.66 | 1.8 | 0.4 | 21.3 | -1.09 | 1.6 | 0.6 | 12 | LZ |
| UP6NQ3 | 22.0 H | 21.3 | 21.4 | 22.1 | 21.7 | -0.64 | 2.0 | 0.4 | 21.9 | -0.42 | 1.8 | 0.7 | 12 | LW |
| UUFVYU | 21.3 | 22.0 | 20.7 | 22.9 | 21.7 | -0.62 | 1.7 | 0.9 | 22.0 | -0.32 | 1.7 | 0.7 | 12 | LZ |
| UUHE9Q | 24.9 * | 23.3 | 23.6 | 24.0 | 24.0 | 1.28 | 1.8 | 0.7 | 24.0 | 1.75 | 1.9 | 1.1 | 12 | LZ |
| VCX333 | 23.4 | 24.4 | 24.4 | 24.4 | 24.2 | 1.44 | 1.7 | 0.5 | 23.7 | 1.47 | 1.8 | 0.8 | 12 | LA |
| VE4L2Y | 21.3 | 21.0 | 21.4 | 21.5 | 21.3 | -1.00 | 1.4 | 0.2 | 21.2 | -1.16 | 1.4 | 0.2 L | 12 | LU |
| VGBN7H | 21.9 | 22.8 | 22.7 | 21.9 | 22.3 | -0.12 | 1.6 | 0.5 | 21.0 | -1.36 | 1.5 | 1.1 | 12 | LY |
| W786RK | 22.3 | 22.1 | 21.6 | 22.6 | 22.1 | -0.28 | 1.7 | 0.4 | 21.9 | -0.44 | 1.5 | 0.6 | 12 | LA |
| WMUD6H | 21.7 | 21.8 | 21.4 | 21.3 | 21.6 | -0.76 | 1.4 | 0.2 | 21.6 | -0.74 | 1.2 | 0.2 L | 12 | TT |
| WR6EAM | 23.7 | 24.5 | 25.6 *H | 22.8 | 24.1 | 1.44 | 2.0 | 1.2 | 23.8 | 1.57 | 2.0 | 0.9 | 12 | LU |
| X284GP | 22.7 | 22.9 | 22.3 | 22.3 | 22.5 | 0.07 | 1.8 | 0.3 | 22.3 | 0.01 | 1.7 | 0.4 | 12 | LU |
| XEDC6Z | 23.8 | 23.9 | 23.5 | 23.7 | 23.7 | 1.09 | 1.4 | 0.2 L | 23.8 | 1.51 | 1.5 | 0.4 | 12 | LH |
| YWCMQH | 22.9 | 22.0 | 23.5 | 23.5 | 23.0 | 0.44 | 1.6 | 0.7 | 22.7 | 0.42 | 1.6 | 0.7 | 12 | LA |
| Z3XY3P | 20.9 | 23.5 | 21.5 L | 20.7 L | 21.7 | -0.68 | 1.2 | 1.3 | 21.2 | -1.16 | 1.4 | 0.9 | 12 | LA |
| Z7F7HC | 22.9 | 18.3 X | 23.6 L | 20.4 | 21.3 | -0.99 | 1.4 | 2.4 | 22.5 | 0.21 | 1.7 | 1.7 | 12 | LY |
| ZBJG2P | 33.5 XH | No Data | 21.8 | 20.8 | 25.4 | 2.48 * | 2.0 | 7.0 H | 23.3 | 1.02 | 2.0 | 3.9 H | 9 | XX |
| ZDFPHL | 22.6 | 22.1 | No Data | No Data | 22.4 | -0.06 | 1.6 | 0.4 | 22.4 | 0.06 | 1.6 | 0.4 | 2 | LY |
| ZNCPEY | 21.6 | 22.0 | 22.6 | 22.6 | 22.2 | -0.24 | 2.0 | 0.5 | 21.1 | -1.30 | 1.8 | 1.3 | 12 | BK |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 22.39 | 22.46 | 22.52 | 22.42 | Month Mean | 22.45 | Grand Mean | 22.32 |
| Avg SDr | 1.71 | 1.69 | 1.62 | 1.67 | Avg SD | 1.68 | Avg SD | 1.65 |
| SD btwn Labs | 1.17 | 1.15 | 1.26 | 1.12 | SD btwn Labs | 1.17 | SD btwn Labs | 0.95 |
| Labs Incld | 54 | 52 | 54 | 54 | SD btwn Wks | 1.23 | SD btwn Wks | 0.95 |
| Labs Excld | 2 | 3 | 1 | 0 | Labs Incld | 56 | Labs Incld | 56 |
| Labs not Rcvd | 0 | 1 | 1 | 2 | | | | |


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## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| BK | Buchel Strip Compression Tester BK-155 | ID | IDM Compression Tester |
| LA | L&W Autoline | LH | L&W 282 |
| LU | L&W 52 without moisture correction (was 53) | LW | L&W 53 with moisture correction (was 53M) |
| LY | L&W 152 (was 52M) | LZ | L&W (model not specified) |
| TT | TMI Short Span Compression, 17-34 (MB K455) | XX | Instrument make/model not specified by lab |


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# Containerboard Interlaboratory Testing Program

Analysis 228

**Roughness - Stylus Method, 56 lb Linerboard** - 56A

TAPPI Official Test Method T575

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 9G9JVF | 171.7 | 0.62 | 22.91 | | 168.8 | 0.22 | 7.23 | 4 | LA |
| 9XWQCL | 151.3 | -0.89 | 17.07 | | 158.0 | -0.53 | 7.96 | 4 | LA |
| 9Y7NEH | 164.3 | 0.07 | 15.49 | | 165.2 | -0.03 | 1.64 | 4 | XX |
| FLFFH3 | 182.2 | 1.39 | 15.22 | | 182.5 | 1.17 | 2.45 | 4 | EV |
| GD2U9X | 157.3 | -0.45 | 19.64 | | 158.8 | -0.47 | 15.07 | 4 | LA |
| HGBRTQ | 172.2 | 0.65 | 32.00 | H | 183.4 | 1.23 | 9.66 | 4 | LA |
| JNDTZC | 181.9 | 1.37 | 16.33 | | 173.0 | 0.51 | 6.44 | 4 | EV |
| NGEX49 | 159.3 | -0.30 | 12.13 | | 167.0 | 0.10 | 15.63 | 4 | EV |
| P4LV3R | 172.4 | 0.67 | 21.71 | | 172.5 | 0.48 | 1.65 | 4 | LA |
| P9FWVU | 149.0 | -1.06 | 20.17 | | 150.2 | -1.07 | 5.49 | 4 | EV |
| RWE4LT | 141.4 | -1.62 | 7.88 | L | 137.4 | -1.96 * | 6.04 | 4 | EV |
| TLB93N | 179.9 | 1.22 | 15.55 | | 183.5 | 1.24 | 5.97 | 4 | LA |
| TPXR9T | 153.5 | -0.73 | 20.08 | | 154.7 | -0.76 | 3.75 | 4 | EV |
| U93P6U | 162.0 | -0.10 | 22.26 | | 157.4 | -0.57 | 5.01 | 4 | LA |
| UDFP2K | 178.6 | 1.13 | 19.65 | | 167.5 | 0.13 | 14.73 | 4 | EV |
| UJ2MRT | 147.0 | -1.21 | 21.73 | | 147.2 | -1.28 | 1.65 | 3 | EV |
| UMY433 | 163.0 | -0.02 | 13.73 | | 157.6 | -0.55 | 4.67 | 3 | LA |
| UP6NQ3 | 168.1 | 0.35 | 11.68 | | 167.3 | 0.12 | 7.37 | 4 | XX |
| UUHE9Q | 166.9 | 0.26 | 20.01 | | 167.4 | 0.13 | 2.64 | 3 | XX |
| VCX333 | 134.5 | -2.13 * | 11.78 | | 148.8 | -1.17 | 13.56 | 4 | LA |
| VE4L2Y | 173.5 | 0.75 | 13.52 | | 175.3 | 0.67 | 2.66 | 4 | EV |
| ZBJG2P | 232.5 | 5.11 X | 24.67 | | 232.7 | 4.66 X | 21.63 H | 4 | EV |
| ZNCPEY | 210.7 | 3.50 X | 18.12 | | 200.3 | 2.41 * | 9.40 | 3 | EV |

## Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 163.33 | Grand Mean | 165.62 |
| Avg SD | 18.38 | Avg SD Months | 8.14 |
| SD btwn Labs | 13.53 | SD btwn Labs | 14.40 |
| Labs Incld | 21 | Labs Incld | 22 |

## Key to Instrument Codes Reported by Participants

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


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# Containerboard Interlaboratory Testing Program

Analysis 229

## **Roughness - Sheffield Method, 42 lb Linerboard** - 42D3

TAPPI Official Test Method T538

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 2AP434 | 353.0 | -1.72 | 4.78 | | 347.2 | -1.81 * | 15.73 H | 4 | TS |
| E2V8Q3 | 358.5 | -0.93 | 9.56 | | 355.6 | -0.93 | 3.82 | 4 | LA |
| EY9HK4 | 366.2 | 0.15 | 4.49 | | 365.4 | 0.09 | 0.79 L | 4 | XX |
| JYNL3C | 366.6 | 0.21 | 6.52 | | 372.4 | 0.83 | 3.90 | 4 | LA |
| UUFVYU | 372.4 | 1.04 | 8.13 | | 371.6 | 0.75 | 5.69 | 4 | XX |
| W786RK | 361.0 | -0.58 | 10.42 | | 359.3 | -0.54 | 3.66 | 4 | LA |
| X284GP | 372.2 | 1.01 | 8.05 | | 372.4 | 0.84 | 1.23 | 4 | XX |
| YWCMQH | 370.9 | 0.82 | 17.70 H | | 371.9 | 0.78 | 2.51 | 4 | LA |

### Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 365.11 | Grand Mean | 364.47 |
| Avg SD | 9.55 | Avg SD Months | 6.44 |
| SD btwn Labs | 7.05 | SD btwn Labs | 9.52 |
| Labs Incld | 8 | Labs Incld | 8 |

### Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| LA | L & W Roughness Sheffield - Autoline | TS | TMI Monitor/Smoothness |
| XX | Instrument make/model not specified by lab | | |


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# Containerboard Interlaboratory Testing Program

Analysis 231

**Internal Bond, 35 lb Linerboard** - 35E

TAPPI Official Test Method T569

| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| ABFUWM | 146.8 | -1.42 | 6.59 | | 144.1 | -1.56 | 3.77 | 2 | SC |
| AVM6VY | 170.4 | -0.30 | 6.66 | | 166.9 | -0.39 | 5.01 | 2 | TM |
| EY9HK4 | 162.6 | -0.66 | 4.83 | | 165.6 | -0.45 | 4.24 | 2 | SC |
| FFAKX3 | 188.0 | 0.54 | 7.42 | | 187.2 | 0.66 | 1.13 | 2 | HZ |
| FLFFH3 | 183.5 | 0.33 | 13.30 | | 162.0 | -0.64 | 30.41 | 2 | XX |
| JYNL3C | 181.2 | 0.22 | 10.38 | | 180.7 | 0.32 | 0.69 | 2 | SC |
| P4LV3R | 198.2 | 1.02 | 23.07 | H | 202.0 | 1.42 | 5.37 | 2 | HY |
| P9FWVU | 204.8 | 1.33 | 0.84 | L | 197.6 | 1.19 | 10.18 | 2 | HY |
| PKPC3Y | 165.6 | -0.52 | 8.14 | | 164.6 | -0.51 | 1.41 | 2 | TM |
| QTFCWG | 164.6 | -0.57 | 6.35 | | 169.0 | -0.28 | 6.22 | 2 | TM |
| RWE4LT | 165.4 | -0.53 | 12.34 | | 160.6 | -0.71 | 6.79 | 2 | TM |
| TLB93N | 227.0 | 2.39 * | 3.81 | | 214.5 | 2.06 * | 17.68 | 2 | SC |
| TPXR9T | 146.8 | -1.41 | 7.92 | | 156.4 | -0.93 | 13.58 | 2 | TM |
| UDFP2K | 169.2 | -0.35 | 10.43 | | 162.4 | -0.62 | 9.62 | 2 | TM |
| UUHE9Q | 177.2 | 0.03 | 6.22 | | 169.8 | -0.24 | 10.47 | 2 | TM |
| V22UKZ | 172.1 | -0.21 | 11.53 | | 179.1 | 0.24 | 9.91 | 2 | SC |
| VE4L2Y | 159.8 | -0.80 | 9.28 | | 154.2 | -1.04 | 7.92 | 2 | TM |
| X284GP | 205.4 | 1.36 | 9.51 | | 203.5 | 1.49 | 2.69 | 2 | HY |
| YWCMQH | 55.7 | -5.73 X | 0.26 | L | 55.8 | -6.10 X | 0.17 | 2 | LZ |
| Z3XY3P | 151.6 | -1.19 | 9.24 | | 154.4 | -1.03 | 3.96 | 2 | TM |
| ZDFPHL | 192.6 | 0.76 | 11.41 | | 194.3 | 1.02 | 2.40 | 2 | HY |

## Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 176.64 | Grand Mean | 174.44 |
| Avg SD | 9.98 | Avg SD Months | 10.23 |
| SD btwn Labs | 21.11 | SD btwn Labs | 19.46 |
| Labs Incld | 20 | Labs Incld | 20 |

## Consensus By Method

| Test Method | Group Mean | SD btwn Group | Difference from Grand Mean | Labs Included |
|---|---|---|---|---|
| Scott Bond Type | 175.15 | 20.18 | 1.49 | 17 |
| Modified Scott Bond Mechanics | 201.78 | 5.06 | 25.14 | 2 |

## Analysis Notes

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


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## Key to Instrument Codes Reported by Participants

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


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| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | | Months |
| 2Z4RXJ | 24.5 | -0.74 | 1.41 | | 26.9 | 0.09 | 3.50 | | 4 |
| 8MK2ZB | 29.2 | 0.72 | 4.66 | | 29.4 | 1.03 | 1.12 | | 4 |
| 9G9JVF | 28.5 | 0.49 | 1.41 | | 28.1 | 0.53 | 1.26 | | 4 |
| 9Y7NEH | 26.0 | -0.28 | 1.58 | | 26.3 | -0.14 | 0.25 | L | 4 |
| CMY68X | 30.6 | 1.15 | 3.05 | | 29.0 | 0.88 | 2.11 | | 4 |
| DLNFP8 | 29.0 | 0.65 | 2.00 | | 29.1 | 0.90 | 2.10 | | 3 |
| EY9HK4 | 27.6 | 0.22 | 0.89 | | 26.4 | -0.09 | 2.16 | | 4 |
| FLFFH3 | 22.6 | -1.33 | 2.63 | | 20.1 | -2.42 * | 1.68 | | 4 |
| GYEQHT | 28.6 | 0.53 | 2.41 | | 27.1 | 0.17 | 1.52 | | 4 |
| JNDTZC | 29.2 | 0.72 | 2.40 | | 26.3 | -0.14 | 2.96 | | 4 |
| NGEX49 | 19.8 | -2.20 * | 5.59 | H | 23.0 | -1.37 | 4.49 | H | 4 |
| P4LV3R | 23.8 | -0.96 | 2.28 | | 24.2 | -0.90 | 0.63 | | 4 |
| PKPC3Y | 24.7 | -0.69 | 2.42 | | 24.8 | -0.68 | 2.72 | | 4 |
| RWE4LT | 26.9 | 0.00 | 4.89 | | 28.1 | 0.53 | 1.18 | | 4 |
| TLB93N | 31.4 | 1.40 | 1.14 | | 31.3 | 1.74 | 0.26 | L | 4 |
| TPXR9T | 26.9 | 0.00 | 2.07 | | 27.4 | 0.28 | 1.99 | | 4 |
| UDFP2K | 30.2 | 1.03 | 6.06 | H | 29.9 | 1.21 | 2.84 | | 4 |
| UMY433 | 25.2 | -0.52 | 1.10 | | 24.4 | -0.85 | 0.75 | | 4 |
| UP6NQ3 | 25.4 | -0.46 | 3.58 | | 26.0 | -0.23 | 1.81 | | 4 |
| UUFVYU | 34.1 | 2.24 * | 1.29 | | 30.5 | 1.42 | 3.08 | | 4 |
| UUHE9Q | 24.3 | -0.80 | 0.58 | L | 23.6 | -1.11 | 0.63 | | 3 |
| VCX333 | 21.8 | -1.58 | 1.48 | | 21.5 | -1.93 * | 0.30 | L | 4 |
| VE4L2Y | 29.4 | 0.78 | 1.34 | | 27.3 | 0.24 | 2.02 | | 4 |
| X284GP | 25.8 | -0.34 | 2.81 | | 26.6 | -0.02 | 0.94 | | 4 |
| YWCMQH | 29.2 | 0.72 | 1.92 | | 26.7 | 0.02 | 1.82 | | 4 |
| ZDFPHL | 27.8 | 0.28 | 1.79 | | 25.9 | -0.29 | 2.76 | | 2 |
| ZPQBPL | 23.6 | -1.02 | 3.42 | | 29.7 | 1.13 | 4.21 | | 4 |

## Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 26.89 | Grand Mean | 26.63 |
| Avg SD | 2.83 | Avg SD Months | 2.21 |
| SD btwn Labs | 3.22 | SD btwn Labs | 2.69 |
| Labs Incld | 27 | Labs Incld | 27 |

## Key to Instrument Codes Reported by Participants

ZZ Instruments No Longer Tracked


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| | Monthly Results | | | | Cumulative Results | | | | |
|---|---|---|---|---|---|---|---|---|---|
| WebCode | Mean | CPV | SD | | Mean | CPV | SD Months | Months | Inst |
| 2Z4RXJ | 28.0 | -0.11 | 1.34 | | 27.7 | -0.43 | 0.43 | 2 | LA |
| 4Y4CZC | 27.0 | -0.68 | 2.58 | | 27.7 | -0.43 | 1.07 | 2 | LP |
| 8MK2ZB | 26.9 | -0.72 | 3.25 | | 28.1 | -0.26 | 1.63 | 2 | LP |
| 9MQZAB | 30.6 | 1.28 | 1.90 | | 30.6 | 1.15 | 0.00 | 1 | XX |
| 9XWQCL | 29.3 | 0.60 | 2.56 | | 29.0 | 0.28 | 0.45 | 2 | LA |
| 9Y7NEH | 29.3 | 0.56 | 1.60 | | 29.6 | 0.62 | 0.50 | 2 | LA |
| B66YRD | 28.6 | 0.20 | 1.76 | | 28.6 | 0.05 | 0.00 | 1 | XX |
| FLFFH3 | 30.9 | 1.42 | 1.85 | | 30.2 | 0.92 | 0.97 | 2 | LP |
| FPHALY | 28.9 | 0.37 | 3.08 | | 28.5 | -0.02 | 0.62 | 2 | TL |
| JYNL3C | 28.9 | 0.38 | 0.64 | L | 29.7 | 0.64 | 1.03 | 2 | LA |
| KMUE22 | 26.2 | -1.10 | 2.82 | | 27.3 | -0.70 | 1.48 | 2 | GG |
| NGEX49 | 25.8 | -1.32 | 2.39 | | 25.2 | -1.86 | 0.92 | 2 | XX |
| P4LV3R | 32.1 | 2.10 * | 1.52 | | 32.3 | 2.07 * | 0.21 | 2 | LP |
| PKPC3Y | 27.5 | -0.40 | 1.86 | | 27.9 | -0.33 | 0.59 | 2 | LA |
| RWE4LT | 28.3 | 0.04 | 2.00 | | 28.8 | 0.17 | 0.73 | 2 | LA |
| TLB93N | 28.0 | -0.11 | 1.63 | | 27.9 | -0.35 | 0.23 | 2 | LA |
| TPXR9T | 28.8 | 0.29 | 2.30 | | 29.5 | 0.54 | 1.02 | 2 | LA |
| UDFP2K | 28.6 | 0.18 | 1.78 | | 28.5 | 0.01 | 0.05 | 2 | LP |
| UMY433 | 42.2 | 7.59 X | 5.00 | H | 35.1 | 3.67 X | 10.02 | 2 | LP |
| UUFVYU | 29.2 | 0.53 | 4.00 | H | 29.9 | 0.77 | 0.97 | 2 | GA |
| UUHE9Q | 24.4 | -2.09 * | 2.88 | | 24.7 | -2.09 * | 0.48 | 2 | TD |
| VCX333 | 24.3 | -2.13 * | 2.00 | | 25.3 | -1.80 | 1.34 | 2 | LA |
| VGBN7H | 26.7 | -0.83 | 0.82 | L | 26.7 | -1.03 | 0.07 | 2 | LP |
| X284GP | 28.5 | 0.15 | 4.00 | H | 28.7 | 0.11 | 0.28 | 2 | TP |
| YWCMQH | 29.3 | 0.59 | 1.92 | | 30.4 | 1.07 | 1.59 | 2 | LA |
| ZBJG2P | 27.6 | -0.35 | 2.06 | | 27.6 | -0.53 | 0.06 | 2 | LW |
| ZNCPEY | 52.0 | 12.88 X | 1.11 | | 52.0 | 12.98 X | 0.00 | 1 | XX |
| ZPQBPL | 30.4 | 1.15 | 3.06 | | 31.1 | 1.43 | 1.05 | 2 | GA |

## Consensus (All Labs) Results

| | | | |
|---|---|---|---|
| Month Mean | 28.23 | Grand Mean | 28.51 |
| Avg SD | 2.36 | Avg SD Months | 0.88 |
| SD btwn Labs | 1.84 | SD btwn Labs | 1.81 |
| Labs Incld | 26 | Labs Incld | 26 |


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## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| GA | Gurley Precision #4340 Automatic Densometer | GG | Gurley Precision #4320 Densometer |
| LA | L&W Autoline | LP | L&W Air Permeance Tester SE 166 |
| LW | L&W Gurley Densometer, Oil Flotation | TD | TMI Gurley Densometer |
| TL | Teledyne Gurley Densometer #4110, Oil Flotation | TP | Technidyne Profile/ plus Roughness & Porosity |
| XX | Instrument make/model not specified by lab | | |


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| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 2W4LHD | 60.4 | 61.0 | 60.5 | 60.3 | 60.6 | 0.14 | 1.7 | 0.3 | 60.5 | 0.03 | 1.4 | 0.3 L | 16 | LD |
| 34GUGT | 63.7 | 64.5 H | 68.3 *H | 67.3 *H | 65.9 | 1.87 | 5.8 | 2.2 | 62.4 | 0.85 | 6.7 | 9.7 H | 16 | XX |
| 3JAM6F | 59.6 | 61.2 | 62.0 | 59.8 | 60.6 | 0.17 | 3.1 | 1.1 | 60.8 | 0.16 | 3.0 | 0.9 | 16 | LD |
| 3MCDPA | 53.6 | 52.8 * | 52.6 * | 51.2 * | 52.6 | -2.44 * | 2.9 | 1.0 | 52.9 | -3.11 X | 2.7 | 1.3 | 12 | TH |
| 4AMVAB | 57.9 | 58.0 | 59.3 H | 57.0 | 58.0 | -0.67 | 5.6 | 0.9 | 59.2 | -0.50 | 4.9 | 1.9 | 16 | TG |
| 4LFEQ2 | 59.7 L | 59.1 | 59.5 L | 60.7 | 59.8 | -0.12 | 1.7 | 0.7 | 60.3 | -0.02 | 1.9 | 0.8 | 8 | TM |
| 4Y4CZC | 58.2 | 60.2 | 56.9 | 58.2 | 58.4 | -0.56 | 2.6 | 1.4 | 60.7 | 0.13 | 2.9 | 1.8 | 16 | LD |
| 6D2V4G | 62.8 | 60.9 | 62.2 | 62.9 | 62.2 | 0.67 | 4.1 | 0.9 | 61.7 | 0.56 | 3.6 | 1.2 | 14 | LC |
| 6ULJEC | 74.8 X | 69.7 * | 76.9 X | 73.0 X | 73.6 | 4.32 X | 4.6 | 3.0 H | 72.4 | 4.97 X | 4.3 | 3.7 | 16 | MB |
| 7ZPXJD | 67.0 * | 67.2 | 65.8 | 66.1 | 66.5 | 2.06 * | 3.7 | 0.7 | 66.3 | 2.47 * | 3.6 | 1.2 | 16 | LC |
| 8MK2ZB | 67.6 *H | 67.4 | 68.2 * | 66.8 * | 67.5 | 2.37 * | 4.6 | 0.6 | 64.1 | 1.55 | 3.6 | 2.6 | 16 | LD |
| 8T2TUH | 60.3 | 57.0 | 57.1 | 58.0 | 58.1 | -0.65 | 2.9 | 1.6 | 59.6 | -0.31 | 2.4 | 1.3 | 16 | TH |
| 9Y7NEH | 60.5 | 60.8 | 60.6 | 61.4 | 60.8 | 0.22 | 2.3 | 0.4 | 61.1 | 0.29 | 2.1 | 0.3 L | 16 | LD |
| ABFUWM | 58.5 | 57.7 | 55.6 L | 56.3 | 57.0 | -1.00 | 2.5 | 1.3 | 57.5 | -1.19 | 3.1 | 1.0 | 16 | LC |
| B3JCVJ | 61.2 | 60.7 | 59.7 | 60.2 | 60.5 | 0.10 | 3.4 | 0.6 | 60.4 | 0.00 | 3.2 | 0.5 L | 16 | LD |
| B66YRD | 57.9 | No Data | 60.3 | 59.9 | 59.4 | -0.24 | 2.6 | 1.3 | 60.1 | -0.11 | 3.0 | 1.5 | 12 | LD |
| CMY68X | 63.2 | 63.9 | 66.2 | 62.1 | 63.9 | 1.20 | 2.9 | 1.7 | 63.4 | 1.25 | 2.9 | 1.8 | 16 | LD |
| DAP38L | 55.8 | 55.8 L | 55.7 | 57.3 | 56.1 | -1.28 | 2.7 | 0.8 | 56.3 | -1.68 | 2.6 | 0.6 L | 12 | TH |
| DFG3R9 | 58.0 | 57.0 | 57.5 | No Data | 57.5 | -0.86 | 3.1 | 0.5 | 56.2 | -1.72 | 3.1 | 1.4 | 7 | LZ |
| EE4TE2 | 60.5 | 62.4 | 61.6 | 60.7 H | 61.3 | 0.38 | 4.9 | 0.9 | 61.2 | 0.33 | 3.9 | 1.2 | 16 | LD |
| EL4E4F | 60.8 | 60.3 | 59.5 | 61.2 | 60.5 | 0.10 | 2.9 | 0.7 | 60.5 | 0.04 | 3.3 | 0.5 L | 16 | LC |
| FALYT2 | 60.3 L | 60.4 L | 60.5 L | 60.7 L | 60.5 | 0.10 | 1.0 | 0.2 L | 60.5 | 0.05 | 2.8 | 0.2 L | 12 | LD |
| FCQHYA | 72.0 X | 69.4 *L | 70.2 X | 70.9 X | 70.6 | 3.37 X | 1.5 | 1.1 | 64.6 | 1.77 | 2.9 | 3.7 | 16 | LD |
| FFAKX3 | 66.1 H | 61.9 | 60.8 | 64.8 | 63.4 | 1.05 | 5.3 | 2.5 | 62.3 | 0.82 | 6.0 | 2.4 | 16 | LC |
| FHWEJA | 58.7 | 57.8 | 57.4 | 56.4 | 57.6 | -0.83 | 2.4 | 0.9 | 59.9 | -0.18 | 3.2 | 2.2 | 16 | LZ |
| FLFFH3 | No Data | No Data | 59.8 | 60.0 | 59.9 | -0.08 | 4.2 | 0.2 | 59.8 | -0.26 | 3.5 | 1.7 | 9 | LZ |
| GD2U9X | 54.2 | 54.7 | 57.7 | 57.5 | 56.0 | -1.32 | 2.7 | 1.8 | 55.6 | -1.99 * | 3.6 | 2.2 | 15 | LD |
| H4CGTY | 61.8 | 61.0 | 61.9 | 61.0 | 61.4 | 0.41 | 2.7 | 0.5 | 60.9 | 0.22 | 2.7 | 0.9 | 16 | EM |
| HGBRTQ | 58.5 | 58.4 | 58.6 | 56.2 | 57.9 | -0.71 | 2.4 | 1.1 | 57.6 | -1.17 | 2.8 | 2.2 | 15 | MB |
| JL7FAX | 61.7 L | 61.3 | 61.5 | 62.0 | 61.6 | 0.48 | 2.1 | 0.3 | 62.4 | 0.85 | 1.9 | 0.7 | 16 | TU |
| JNDTZC | 61.1 | 60.1 | 60.5 | 59.0 | 60.2 | 0.02 | 2.9 | 0.9 | 59.5 | -0.38 | 2.9 | 1.6 | 16 | EN |
| JXWAJ7 | 65.5 L | 64.6 L | 66.4 L | 64.9 L | 65.3 | 1.67 | 0.9 | 0.8 | 63.5 | 1.29 | 1.1 | 2.2 | 16 | TD |
| KD4ZQ4 | 62.4 | 62.1 | 59.6 | 61.1 | 61.3 | 0.37 | 3.0 | 1.3 | 61.5 | 0.45 | 3.0 | 1.6 | 16 | LD |
| MYKZ42 | 58.7 | 60.2 | 60.4 | 57.9 | 59.3 | -0.26 | 3.0 | 1.2 | 58.3 | -0.85 | 2.7 | 2.0 | 12 | LD |
| P4LV3R | 58.1 | 57.0 | 56.0 | 57.3 | 57.1 | -0.98 | 2.5 | 0.8 | 58.1 | -0.97 | 3.0 | 1.3 | 16 | LD |


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# Containerboard Interlaboratory Testing Program

Analysis 240

**Flat Crush Strength (CMT), 26 lb Corrugating Medium** - CM92

TAPPI Official Test Method T809

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| QTFCWG | 59.5 | 62.2 | 60.0 | 57.5 | 59.8 | -0.11 | 3.3 | 2.0 | 61.4 | 0.42 | 3.0 | 2.1 | 16 | LC |
| RWE4LT | 57.5 | 59.1 | 60.8 | 59.8 | 59.3 | -0.27 | 2.9 | 1.4 | 60.7 | 0.12 | 3.5 | 2.9 | 16 | LC |
| TPXR9T | 62.0 | 61.9 | 62.8 | 59.8 | 61.6 | 0.48 | 3.5 | 1.3 | 61.5 | 0.46 | 3.4 | 2.4 | 16 | XX |
| UMY433 | 55.8 | 63.0 H | 59.5 | 65.3 | 60.9 | 0.24 | 4.5 | 4.1 H | 60.0 | -0.17 | 3.4 | 2.9 | 16 | LZ |
| UUFVYU | 60.4 | 60.7 | 59.3 L | 59.7 | 60.0 | -0.04 | 2.1 | 0.7 | 59.4 | -0.39 | 2.7 | 1.0 | 16 | LZ |
| VE4L2Y | 59.1 | 60.3 | 59.9 | 58.7 | 59.5 | -0.20 | 2.3 | 0.7 | 59.2 | -0.51 | 3.2 | 1.2 | 16 | LD |
| X284GP | No Data | 65.1 | 60.2 | 64.2 | 63.2 | 0.98 | 3.0 | 2.6 | 62.3 | 0.79 | 3.7 | 1.8 | 10 | LC |
| XEDC6Z | 59.8 | 63.6 | 64.2 | 59.5 | 61.8 | 0.53 | 3.0 | 2.5 | 62.0 | 0.67 | 3.5 | 1.4 | 16 | LD |
| YWCMQH | 52.7 * | 56.2 | 55.5 | 54.9 | 54.8 | -1.71 | 3.2 | 1.5 | 54.3 | -2.52 * | 2.7 | 1.8 | 16 | LD |
| Z3XY3P | 63.4 | 59.3 | 60.6 L | 60.5 | 61.0 | 0.26 | 2.9 | 1.7 | 59.2 | -0.48 | 2.6 | 3.0 | 16 | LC |
| ZBJG2P | 33.1 X | No Data | 57.8 | 54.7 | 48.5 | -3.73 X | 3.8 | 13.5 H | 49.0 | -4.74 X | 3.9 | 9.6 H | 13 | XX |
| ZDFPHL | 62.6 | 61.4 | No Data | No Data | 62.0 | 0.60 | 3.7 | 0.8 | 63.1 | 1.13 | 3.7 | 2.7 | 10 | LD |
| ZNCPEY | 51.9 *H | 54.6 H | 54.1 H | 53.4 | 53.5 | -2.13 * | 5.3 | 1.2 | 57.3 | -1.28 | 5.1 | 3.6 | 12 | MB |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 59.97 | 60.75 | 60.10 | 59.86 | Month Mean | 60.13 | Grand Mean | 60.38 |
| Avg SDr | 3.42 | 3.15 | 3.36 | 3.32 | Avg SD | 3.31 | Avg SD | 3.34 |
| SD btwn Labs | 3.49 | 3.66 | 3.38 | 3.47 | SD btwn Labs | 3.11 | SD btwn Labs | 2.41 |
| Labs Incld | 43 | 45 | 45 | 44 | SD btwn Wks | 1.39 | SD btwn Wks | 2.33 |
| Labs Excld | 3 | 0 | 2 | 2 | Labs Incld | 45 | Labs Incld | 45 |
| Labs not Rcvd | 2 | 3 | 1 | 2 | | | | |

## Key to Instrument Codes Reported by Participants

| | | | |
|---|---|---|---|
| EM | Emerson 1200 Series | EN | Emerson 2200 Series |
| LC | L&W Crush Tester 48 | LD | L&W Crush Tester 248 |
| LZ | L&W Crush Tester (model not specified) | MB | Messmer Buchel K440 |
| TD | TMI Digital Crush Tester, Model 17-09 | TG | TMI Compression Tester, Model 17-10 |
| TH | TMI Compression Tester, Model 17-76 | TM | TMI/Hinde & Dauch |
| TU | TMI Universal Crush Tester (TMI K440) | XX | Instrument make/model not specified by lab |


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Containerboard Interlaboratory Testing Program

Analysis 250

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

TAPPI Official Test Method T843

**Report #589 (L)**
**October 2018**

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 2W4LHD | 73.3 | 73.4 L | 73.2 | 73.1 | 73.3 | 0.04 | 1.5 | 0.1 L | 73.4 | 0.14 | 1.2 | 0.2 L | 16 | LD |
| 4Y4CZC | 74.2 | 75.9 | 76.3 | 74.3 | 75.2 | 0.60 | 2.4 | 1.1 | 75.7 | 0.87 | 2.5 | 1.2 | 16 | LD |
| 6ULJEC | 71.3 | 67.6 | 65.5 * | 65.7 | 67.5 | -1.62 | 2.6 | 2.7 H | 67.9 | -1.65 | 3.0 | 2.8 | 16 | MB |
| 8MK2ZB | 80.5 | 77.1 | 76.4 | 78.8 | 78.2 | 1.47 | 2.3 | 1.8 | 77.0 | 1.29 | 2.9 | 1.9 | 16 | LD |
| 9MQZAB | 72.9 | 69.8 | 70.3 L | 72.8 L | 71.4 | -0.49 | 1.5 | 1.6 | 71.4 | -0.52 | 1.4 | 1.7 | 8 | LZ |
| 9Y7NEH | 74.0 | 73.5 | 72.8 | 73.4 | 73.4 | 0.08 | 1.8 | 0.5 | 73.3 | 0.09 | 2.3 | 0.4 L | 16 | LD |
| B66YRD | 71.8 | No Data | 72.0 | 71.9 | 71.9 | -0.36 | 2.6 | 0.1 L | 72.5 | -0.15 | 3.0 | 0.7 | 12 | XX |
| EL4E4F | 73.5 | 73.0 | 72.7 | 73.8 | 73.3 | 0.04 | 3.6 | 0.5 | 73.2 | 0.06 | 3.4 | 0.6 | 16 | LD |
| FCQHYA | 61.3 * | 60.0 X | 59.9 X | 61.2 * | 60.6 | -3.64 X | 2.4 | 0.8 | 68.6 | -1.43 | 2.1 | 4.8 H | 16 | LD |
| FHWEJA | 72.3 | 73.8 | 72.2 | 71.1 | 72.3 | -0.23 | 2.5 | 1.1 | 73.1 | 0.04 | 2.4 | 1.6 | 16 | LZ |
| JXWAJ7 | 74.1 L | 73.1 L | 71.4 L | 74.0 L | 73.1 | 0.00 | 1.0 | 1.3 | 72.3 | -0.23 | 1.0 | 2.0 | 16 | TD |
| P4LV3R | 79.6 L | 80.2 | 78.2 | 78.3 | 79.1 | 1.73 | 2.4 | 1.0 | 78.3 | 1.73 | 2.7 | 0.8 | 16 | LD |
| RWE4LT | 61.2 *H | 65.1 *H | 66.4 H | 66.2 H | 64.7 | -2.44 * | 7.7 | 2.4 | 66.7 | -2.04 * | 7.1 | 5.0 H | 16 | XX |
| TAWDL4 | 73.5 | 73.0 | 71.3 | 71.8 | 72.4 | -0.21 | 2.6 | 1.0 | 72.0 | -0.32 | 2.4 | 1.4 | 16 | LD |
| UMY433 | 74.2 | 73.5 | 73.9 | 72.5 | 73.5 | 0.12 | 2.4 | 0.7 | 73.5 | 0.17 | 2.6 | 0.9 | 16 | LZ |
| X284GP | No Data | 77.4 | 77.4 | 76.9 | 77.2 | 1.19 | 2.5 | 0.3 | 77.3 | 1.41 | 2.4 | 1.1 | 10 | LC |
| YWCMQH | 73.8 | 75.3 | 72.9 | 72.6 | 73.7 | 0.16 | 2.6 | 1.2 | 74.3 | 0.41 | 2.5 | 1.6 | 16 | LD |
| ZDFPHL | 71.7 | 74.2 | No Data | No Data | 72.9 | -0.05 | 2.0 | 1.8 | 73.4 | 0.13 | 2.3 | 1.3 | 10 | LD |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 72.54 | 73.49 | 72.68 | 72.26 | Month Mean | 73.13 | Grand Mean | 72.98 |
| Avg SDr | 2.61 | 3.07 | 3.22 | 2.93 | Avg SD | 2.94 | Avg SD | 2.90 |
| SD btwn Labs | 4.91 | 3.66 | 3.49 | 4.45 | SD btwn Labs | 3.45 | SD btwn Labs | 3.10 |
| Labs Incld | 17 | 16 | 16 | 17 | SD btwn Wks | 1.35 | SD btwn Wks | 2.11 |
| Labs Excld | 0 | 1 | 1 | 0 | Labs Incld | 17 | Labs Incld | 18 |
| Labs not Rcvd | 1 | 1 | 1 | 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) | MB | Messmer Buchel K440 |
| TD | TMI Digital Crush Tester, Model 17-09 | XX | Instrument make/model not specified by lab |


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# Containerboard Interlaboratory Testing Program

Analysis 255

**Ring Crush (RCT), 26 lb Corrugating Medium** - CM92

TAPPI Official Test Method T822

**Report #589 (L)**
**October 2018**

| | Weekly Means | | | | Monthly Results | | | | Cumulative Results | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WebCode | Week 1 | Week 2 | Week 3 | Week 4 | Mean | CPV | SD | SD Wks | Mean | CPV | SD | SD Wks | Wks | Inst |
| 4Y4CZC | 45.5 | 45.6 | 45.0 | 45.4 L | 45.4 | 0.24 | 1.6 | 0.3 L | 45.5 | 0.38 | 1.8 | 0.7 | 16 | LD |
| 6D2V4G | 47.4 | 46.7 | 45.9 | 47.2 | 46.8 | 0.56 | 2.8 | 0.6 | 46.6 | 0.80 | 2.4 | 2.0 | 14 | LC |
| 6ULJEC | 34.3 * | 33.8 * | 37.4 | 32.9 XL | 34.6 | -2.15 * | 1.6 | 1.9 | 33.7 | -4.09 X | 2.1 | 2.6 | 16 | MB |
| 7ZPXJD | 34.2 * | 33.3 * | 33.4 * | 33.6 X | 33.6 | -2.36 * | 3.0 | 0.4 L | 33.2 | -4.29 X | 2.5 | 0.9 | 16 | XX |
| 8T2TUH | 41.4 | 38.2 | 39.0 | 40.6 | 39.8 | -0.99 | 2.6 | 1.4 | 40.7 | -1.46 | 2.2 | 1.1 | 16 | TH |
| 9Y7NEH | 45.1 | 44.1 | 44.2 | 43.2 | 44.2 | -0.02 | 2.8 | 0.8 | 43.7 | -0.31 | 2.8 | 0.5 L | 16 | LD |
| B66YRD | 43.1 | No Data | 42.0 H | 40.9 | 42.0 | -0.51 | 3.9 | 1.1 | 41.6 | -1.10 | 3.8 | 1.3 | 12 | LD |
| DFG3R9 | 43.2 | 43.5 | 42.2 | No Data | 43.0 | -0.29 | 2.7 | 0.7 | 42.0 | -0.95 | 2.5 | 1.1 | 7 | EM |
| EMCEGA | 44.2 | 42.7 | 43.2 | 42.5 | 43.1 | -0.25 | 2.5 | 0.8 | 43.4 | -0.41 | 2.1 | 1.3 | 16 | TH |
| EWXQE9 | 43.8 | 43.7 H | 43.4 | 44.4 H | 43.8 | -0.10 | 4.1 | 0.5 | 42.8 | -0.66 | 4.8 | 1.1 | 16 | TX |
| EX8R9U | 36.9 | 35.9 | 37.1 | 41.4 | 37.8 | -1.43 | 2.3 | 2.4 | 37.8 | -2.56 * | 2.5 | 2.9 | 16 | LZ |
| FALYT2 | 44.3 L | 44.2 L | 44.2 L | 44.4 L | 44.3 | 0.00 | 0.9 | 0.1 L | 43.9 | -0.26 | 2.8 | 0.4 L | 12 | LD |
| FFAKX3 | 46.2 L | 44.1 | 46.3 | 45.7 | 45.6 | 0.29 | 2.7 | 1.0 | 45.7 | 0.44 | 2.5 | 0.8 | 16 | LD |
| GD2U9X | 45.1 H | 45.1 | 48.0 | 46.5 | 46.2 | 0.42 | 3.4 | 1.4 | 44.8 | 0.09 | 2.9 | 1.7 | 15 | LD |
| H4CGTY | 45.7 | 45.3 | 45.4 | 44.7 | 45.3 | 0.22 | 1.9 | 0.4 | 45.9 | 0.53 | 1.4 | 0.7 | 16 | LC |
| JL7FAX | 42.0 L | 42.7 | 41.4 | 41.2 L | 41.8 | -0.54 | 1.7 | 0.7 | 41.6 | -1.10 | 1.6 | 0.7 | 16 | TU |
| KD4ZQ4 | 46.8 | 44.4 | 46.5 | 47.1 | 46.2 | 0.43 | 2.1 | 1.2 | 47.0 | 0.92 | 2.3 | 1.0 | 12 | LD |
| MYKZ42 | 53.9 * | 50.1 | 53.5 * | 50.8 * | 52.1 | 1.73 | 2.0 | 1.9 | 49.8 | 2.00 * | 2.4 | 2.7 | 12 | LZ |
| RZDGDY | 46.0 | 47.2 | 45.1 | 46.3 | 46.1 | 0.42 | 1.9 | 0.9 | 45.1 | 0.22 | 2.1 | 1.5 | 12 | LZ |
| UUFVYU | 42.9 | 43.3 | 43.6 | 42.5 | 43.1 | -0.27 | 2.4 | 0.5 | 42.5 | -0.77 | 2.4 | 1.4 | 16 | LD |
| VL7EEF | 46.1 L | 46.9 | 46.4 | 46.2 L | 46.4 | 0.47 | 1.0 | 0.4 L | 45.0 | 0.16 | 1.1 | 1.2 | 16 | WK |
| X284GP | 45.7 | 45.4 | 46.7 | 48.0 | 46.4 | 0.48 | 2.7 | 1.2 | 45.9 | 0.53 | 2.9 | 1.0 | 16 | LC |
| XEDC6Z | 45.4 | 46.8 | 45.5 | 46.4 | 46.0 | 0.39 | 2.7 | 0.7 | 46.5 | 0.74 | 2.8 | 0.9 | 16 | LD |
| YWCMQH | 46.5 | 45.9 | 45.2 H | 45.1 | 45.7 | 0.31 | 3.1 | 0.7 | 46.4 | 0.72 | 2.9 | 1.5 | 16 | LD |
| ZBJG2P | 67.1 XH | No Data | 52.8 * | 46.0 | 55.3 | 2.45 * | 4.0 | 10.8 H | 47.7 | 1.18 | 3.4 | 8.7 H | 13 | XX |
| ZDFPHL | 48.6 | 44.6 | No Data | No Data | 46.6 | 0.51 | 2.6 | 2.8 | 46.9 | 0.88 | 2.5 | 2.0 | 10 | LD |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 44.16 | 43.47 | 44.14 | 44.84 | Month Mean | 44.27 | Grand Mean | 44.54 |
| Avg SDr | 2.58 | 2.40 | 2.50 | 2.71 | Avg SD | 2.62 | Avg SD | 2.65 |
| SD btwn Labs | 4.20 | 4.16 | 4.40 | 2.57 | SD btwn Labs | 4.51 | SD btwn Labs | 2.65 |
| Labs Incld | 25 | 24 | 25 | 22 | SD btwn Wks | 2.42 | SD btwn Wks | 2.27 |
| Labs Excld | 1 | 0 | 0 | 2 | Labs Incld | 26 | Labs Incld | 24 |
| Labs not Rcvd | 0 | 2 | 1 | 2 | | | | |


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## 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) | TX | TMI Digital Crush Tester (model not specified) |
| WK | Zwick Z005 Crush Tester | XX | Instrument make/model not specified by lab |


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# Containerboard Interlaboratory Testing Program

Analysis 261

**STFI, 26 lb Corrugating Medium** - CM92

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 |
| 2W4LHD | 14.4 L | 14.6 | 14.3 L | 14.4 | 14.4 | -0.26 | 0.6 | 0.1 | 14.5 | -0.12 | 0.7 | 0.1 L | 16 | LA |
| 34GUGT | 14.6 | 14.5 | 15.2 | 15.1 | 14.8 | 0.60 | 0.9 | 0.3 | 14.9 | 0.72 | 1.0 | 0.3 | 16 | LA |
| 3MCDPA | 13.5 * | 13.3 X | 13.8 | 13.7 | 13.6 | -2.00 * | 0.8 | 0.2 | 13.5 | -2.11 * | 0.8 | 0.3 | 12 | LH |
| 4LFEQ2 | 15.0 | 15.6 * | 15.8 *L | 15.6 | 15.5 | 1.87 | 0.6 | 0.4 | 15.6 | 2.04 * | 0.8 | 0.3 | 8 | LA |
| 4Y4CZC | 14.6 | 14.7 | 14.7 | 14.1 | 14.5 | -0.06 | 1.0 | 0.3 | 14.4 | -0.31 | 0.9 | 0.2 | 16 | LZ |
| 9Y7NEH | 14.9 | 14.9 | 14.9 | 14.8 | 14.9 | 0.63 | 0.9 | 0.1 | 14.7 | 0.25 | 0.8 | 0.2 | 16 | LB |
| B3JCVJ | 14.5 | 15.1 | 14.0 | 14.7 | 14.6 | 0.07 | 0.9 | 0.4 | 14.6 | 0.05 | 0.9 | 0.4 | 16 | LB |
| CMY68X | 14.9 | 14.7 | 15.0 | 15.0 | 14.9 | 0.73 | 0.9 | 0.2 | 14.8 | 0.48 | 0.9 | 0.3 | 16 | LA |
| DAP38L | 13.7 | 14.0 | 13.9 L | 13.4 | 13.8 | -1.57 | 0.9 | 0.3 | 14.5 | -0.13 | 1.1 | 0.6 | 12 | LH |
| EL4E4F | 14.7 | 14.9 | 14.1 | 15.0 | 14.7 | 0.22 | 0.8 | 0.4 | 14.6 | -0.01 | 0.9 | 0.4 | 16 | LB |
| EWXQE9 | 14.3 | 14.0 | 13.8 | 13.6 | 13.9 | -1.26 | 0.9 | 0.3 | 13.8 | -1.52 | 1.0 | 0.3 | 16 | TT |
| FLFFH3 | 14.6 | 13.9 | 15.1 | 15.1 | 14.6 | 0.17 | 1.1 | 0.6 | 14.4 | -0.28 | 1.0 | 0.4 | 16 | LB |
| GD2U9X | 14.4 | 13.9 | 15.0 H | 14.2 | 14.3 | -0.42 | 1.1 | 0.5 | 14.0 | -1.03 | 1.0 | 0.5 | 15 | LZ |
| H4CGTY | 13.6 | 14.5 | 13.6 | 13.4 | 13.8 | -1.54 | 0.9 | 0.5 | 14.2 | -0.68 | 1.0 | 0.5 | 16 | LB |
| HGBRTQ | 14.0 | 14.3 | 14.3 | 14.7 | 14.3 | -0.46 | 1.0 | 0.3 | 14.4 | -0.39 | 1.0 | 0.3 | 15 | LA |
| KD4ZQ4 | 15.3 | 15.1 | 15.2 | 15.4 | 15.3 | 1.43 | 1.0 | 0.1 | 15.5 | 1.90 | 1.0 | 0.6 | 16 | LH |
| NMWE7H | 15.1 | 14.9 L | 15.2 | 16.7 X | 15.5 | 1.86 | 0.9 | 0.8 H | 15.0 | 0.85 | 1.0 | 0.8 | 12 | LA |
| QTFCWG | 15.2 | 14.9 | 14.6 | 15.0 | 14.9 | 0.77 | 1.0 | 0.3 | 15.0 | 0.93 | 1.0 | 0.3 | 16 | LU |
| RZDGDY | 14.1 | 14.8 | 14.3 | 13.9 | 14.3 | -0.58 | 1.0 | 0.4 | 14.1 | -1.01 | 1.1 | 0.3 | 12 | LA |
| UUFVYU | 14.7 | 15.0 | 14.1 L | 14.9 | 14.7 | 0.25 | 1.0 | 0.4 | 14.9 | 0.62 | 1.0 | 0.4 | 16 | LZ |
| VE4L2Y | 14.2 | 14.2 | 13.5 | 13.8 | 13.9 | -1.22 | 1.0 | 0.3 | 14.0 | -1.18 | 1.0 | 0.4 | 16 | LU |
| W786RK | 15.2 | 14.4 | 14.0 | 15.0 | 14.7 | 0.21 | 1.0 | 0.6 | 14.7 | 0.23 | 0.9 | 0.4 | 16 | LA |
| WMUD6H | 14.2 | 14.5 | 14.4 | 14.8 | 14.5 | -0.17 | 1.0 | 0.2 | 14.6 | 0.02 | 0.9 | 0.4 | 16 | TT |
| X284GP | 14.7 | 14.6 | 14.7 | 14.5 | 14.6 | 0.12 | 0.9 | 0.1 | 14.7 | 0.17 | 0.9 | 0.3 | 16 | LU |
| YWCMQH | 14.9 | 15.2 | 15.6 L | 15.0 | 15.2 | 1.26 | 0.7 | 0.3 | 15.3 | 1.49 | 0.9 | 0.6 | 16 | LA |
| ZBJG2P | 24.7 X | No Data | 14.8 | 14.0 | 17.9 | 6.65 X | 1.1 | 6.0 H | 16.4 | 3.59 X | 2.0 | 4.1 H | 12 | XX |
| ZDFPHL | 14.8 H | 14.5 | No Data | No Data | 14.6 | 0.14 | 1.3 | 0.2 | 14.8 | 0.39 | 1.0 | 0.4 | 10 | LB |
| ZNCPEY | 14.0 | 14.3 | 14.1 | 14.2 | 14.2 | -0.79 | 0.9 | 0.2 | 13.9 | -1.38 | 1.0 | 1.0 H | 12 | BK |

## Consensus (All Labs) Results

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Wk Mean | 14.51 | 14.61 | 14.51 | 14.52 | Month Mean | 14.55 | Grand Mean | 14.57 |
| Avg SDr | 0.95 | 0.96 | 0.92 | 0.91 | Avg SD | 0.94 | Avg SD | 0.95 |
| SD btwn Labs | 0.50 | 0.43 | 0.60 | 0.62 | SD btwn Labs | 0.50 | SD btwn Labs | 0.51 |
| Labs Incld | 27 | 26 | 27 | 26 | SD btwn Wks | 0.36 | SD btwn Wks | 0.45 |
| Labs Excld | 1 | 1 | 0 | 1 | Labs Incld | 27 | Labs Incld | 27 |
| Labs not Rcvd | 0 | 1 | 1 | 1 | | | | |


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| Key to Instrument Codes Reported by Participants | | | |
|---|---|---|---|
| BK | Buchel Strip Compression Tester BK-155 | LA | L&W Autoline |
| LB | L&W Model 152 | LH | L&W 282 |
| LU | L&W 52 without moisture correction (was 53) | LZ | L&W (model not specified) |
| TT | TMI Short Span Compression, 17-34 (MB K455) | XX | Instrument make/model not specified by lab |

End of Report


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