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BALLOT NO. _____ 04 SARG _____

DRAFT NO. _____ 03 _____

DATE _____ October 22, 2024 _____

WORKING GROUP
CHAIR _____ Sara Young _____

SUBJECT
CATEGORY
_____ Fiberboard Shipping Container Testing _____

RELATED
METHODS _____ See "Additional Information" _____

CAUTION:

This Test Method may include safety precautions which are believed to be appropriate at the time of publication of the method. The intent of these is to alert the user of the method to safety issues related to such use. The user is responsible for determining that the safety precautions are complete and are appropriate to their use of the method, and for ensuring that suitable safety practices have not changed since publication of the method. This method may require the use, disposal, or both, of chemicals which may present serious health hazards to humans. Procedures for the handling of such substances are set forth on Material Safety Data Sheets which must be developed by all manufacturers and importers of potentially hazardous chemicals and maintained by all distributors of potentially hazardous chemicals. Prior to the use of this method, the user must determine whether any of the chemicals to be used or disposed of are potentially hazardous and, if so, must follow strictly the procedures specified by both the manufacturer, as well as local, state, and federal authorities for safe use and disposal of these chemicals.

Box blank dimensioning

(Five-year review of Official Method T 827 om-17)

(Underscores, strikethroughs, and notes indicate changes from Draft 2)

1. Scope and Significance

This method can be used to determine the score-to-score dimensions of a box blank. Knowing box blank dimensions is an excellent way of determining box size, if scoring allowances are known. Accurate dimensions typically are a key specification in market transactions and are required for understanding and modeling box performance. This method may be used for solid or corrugated fiberboard containers including all box designs, both die-cut and scored and slotted.

Approved by the Standard Specific Interest Group for this Test Method
TAPPI

2. Apparatus

2.1 *Straight-edge rule, metal retractable tape rule, or Electronic Digital Caliper Gauge meeting the following precision requirements.*

- 2.1.1 Graduated in 1/16-in or decimal inch, or smaller unit.
- 2.1.2 Graduated in 1-mm or smaller unit.
- 2.2 *Marking device, pen or pencil (medium to fine point).*

3. Sampling

3.1 Obtain a sample in accordance with TAPPI T 400 "Sampling and Accepting a Single Lot of Paper, Paperboard, Containerboard, or Related Product."

- 3.2 Randomly select a minimum of two test specimens if possible from each test unit of the sample.

4. Conditioning

4.1 Precondition, condition and test specimens in atmospheres in accordance with TAPPI T 402 "Standard Conditioning and Testing Atmospheres for Paper, Board, Pulp Handsheets and Related Products."

NOTE 1: Given the natural moisture sensitivity and hygroexpansion of corrugated materials, boxes measured in some other environment, or boxes that were not preconditioned before conditioning in a TAPPI-Standard environment, can be expected to have slightly different dimensions than properly conditioned samples. Whether this will make a substantive difference to the actual measurement will depend on panel size and on how far the moisture content of the measured sample is from the equilibrium moisture content at standard conditions. Hygroexpansion impacts can be as much as 0.5-1% or greater.

5. Procedure

5.1 Lay out the blank upon a flat surface with the inside of the blank facing upward.

5.1.1 If the box being measured is a Regular Slotted Container (RSC), the box should be opened at the manufacturer's joint as follows: ~~Open the blank at the manufacturer's joint.~~

5.1.1.1a If manufacturer's joint is taped, carefully cut tape at the joint.

5.1.1.2b2 If manufacturer's joint is glued or stitched, carefully separate the glue tab from the joint without bending, creasing or otherwise damaging the sample.

5.2 Orient the blank such that the glue tab is on the right-hand side as show in Figure 1. ~~Lay out the blank upon a flat surface with the inside of the blank facing upward with the glue tab on the right hand side (see Fig. 1).~~

5.3 Carefully locate and mark the *center* of each score with the pen or pencil. Be sure the line located is the score, not a crease or wrinkle.

Commented [BL1]: Edited numbering to align with the Modified Decimal Numbering System

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5.4 Line up the 10-mm or the 1-in. mark of the straightedge rule or the left external measuring face of the electronic digital caliper with the left edge of the specimen and carefully measure to the next adjacent score mark.

NOTE 2: Round up to the nearest 1 mm on the metric scale or the nearest 1/16 in. on the English scale. For some applications or some customers, a tighter measurement may be requested. One should keep in mind that the accuracy of any measurement cannot be better than half of the smallest unit on the measurement device (see 2.1).

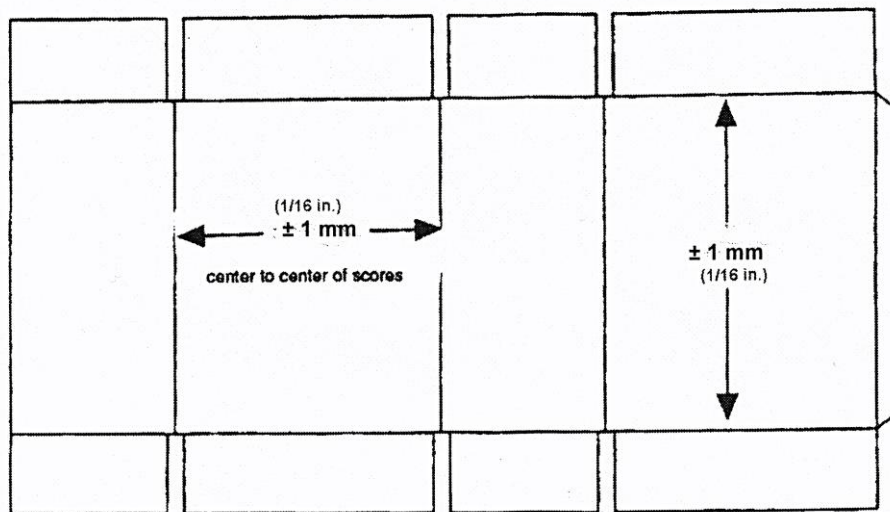


Fig. 1 Proper layout of the blank on a flat surface.

Commented [BL2]: Increased size of Figure 1 for better visual of the English/Imperial units

5.5 Line up the 10-mm or the 1-in. mark of the straightedge rule or the left external measuring face of the electronic digital caliper with the last score mark previously measured and carefully measure to next adjacent score mark.

5.6 Continue measurements until all panels have been measured.

5.7 Record all measurements on the respective panel measured.

NOTE 3: Be sure to subtract the 10-mm or the 1-in. starting point from the measured dimensions if using straightedge or tape measure.

5.8 Line up the 10-mm or the 1-in. mark of the straightedge rule with the left edge of the specimen and measure overall specimen length.

5.9 Repeat measurements from top down for flap length and box depth.

5.10 Total all panel length measurements and compare the combined total to the actual specimen length; do the same for the flap and panel depth dimensions and compare total to blank width. These should agree within twice the level impacted by rounding.

NOTE 4: The combined length of all panels should equal the total blank length within $\pm 1/8$ in. (2 mm), ~~on the metric scale or $\pm 1/8$ in. on the English scale.~~ Total of blank panel height and flap extension(s) should equal blank width within the same rounding margin. If they do not, remeasure.

NOTE 5: If the person conducting the test has any concerns regarding the clarity of the scores and/or the ability to clearly mark the centerline of scores, note any comments or deviations in the final report.

5.11 Perform the same procedure for all samples.

6. Calculation

6.1 Total all respective panel measurements from sampling and determine the mean value for each panel.

7. Report

7.1 Report mean, standard deviation and range of score to score measurements for each panel rounded to the nearest 1 mm on the metric scale or the nearest 1/16 in or decimal inch on the English scale. Where tighter measurements are requested, also report the smallest division on the straight edge rule used.

8. Precision

8.1 The repeatability below was based on separate labs, with 3 individuals at each lab measuring 2 boxes and performing 6 measurements on each box using measurement devices with 1/16 in increment markings. The reproducibility is reported below for comparisons of readings taken at each laboratory, with 7 laboratories participating in the combined round robin.

8.1.1 Repeatability (within a laboratory) = 1.6%

8.1.2 Reproducibility (between laboratories) = 2.1%

8.2 Repeatability and reproducibility represent the agreement which is expected 95% of the time when 2 test results are compared. Refer to TAPPI T-1200 "Interlaboratory Evaluation of Test Methods to Determine TAPPI Repeatability and Reproducibility" for complete definitions of these terms.

8.3 The precision data is based on tests conducted for TAPPI in 7 laboratories in 2010. Corrugated samples were produced on a precision sample table and CAD system. 6 samples were produced and numbered. Two samples

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were randomly selected and sent to each laboratory. Separate measurements were performed by 3 individuals at each laboratory. Six specific measurements were selected and evaluated from the data provided by each laboratory.

9. Additional information

9.1 Effective date of issue: **To be assigned.**

9.2 Changes to the 2022 edition include use of electronic digital calipers and clarifications of 5.10, Note 4, and section 8.2.

9.3 Changes in the 2016 edition include revision to the paragraph numbering system, removal of the reference to Appendix A (which had been moved into the precision statement in an earlier version) and inclusion of the process when measurement to a higher level of accuracy is requested.

9.4 Changes in the 2011 edition include improved precision of metric measurements and clarification of note 4.

10. Keywords

Fiberboards, Blanks, Boxes, Containers, Corrugated board

11. References

Fibre Box Association and Packaging Machinery Manufacturers Institute, “Tolerances for Regular Slotted Containers (RSCs)”, ANSI Technical Report, PMMI B155-TR2.1-2011~~81, July 17, 2011~~ |

Fibre Box Association and Packaging Machinery Manufacturers Institute, “Tolerances for Scored and Slotted Corrugated Sheets and Trays”, ANSI Technical Report, PMMI B155-TR2.2-2011~~81, July 17, 2011~~ |

Your comments and suggestions on this procedure are earnestly requested and should be sent to the TAPPI Standards Department. ■