TECHNICAL INFORMATION BOOKLET

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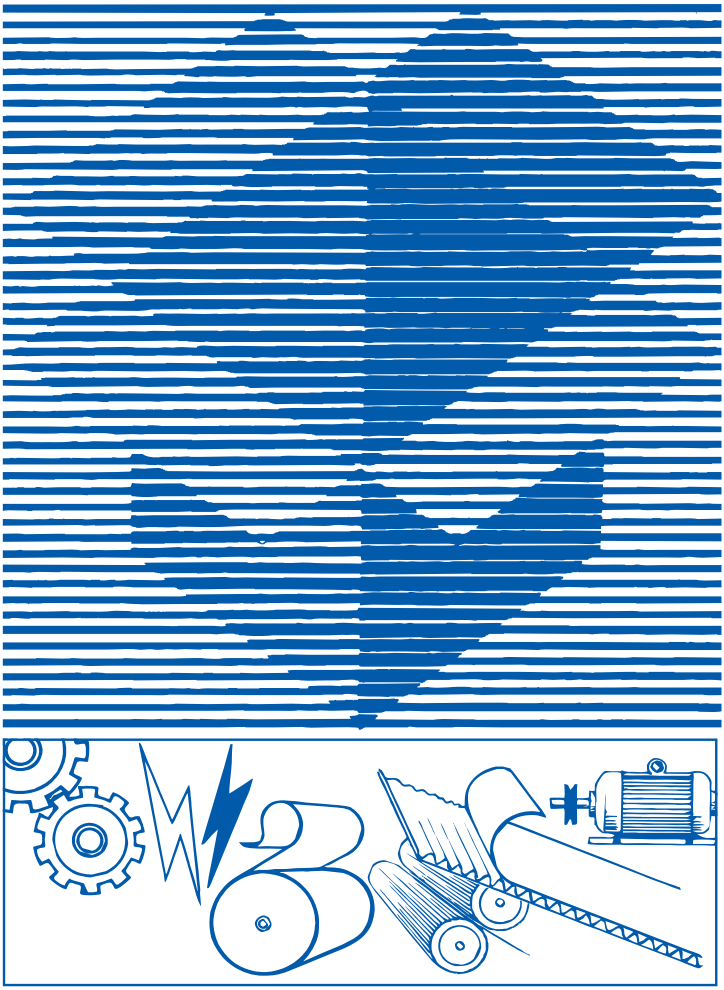
FCBM 47:14

Tolerances for Regular slotted containers (RSC)



FEDERATION OF CORRUGATED BOX MANUFACTURERS OF INDIA

Foreword

The Research and Development Sub committee of FCBM has been taking up various R&D projects from time to time. These are published in Booklet form and distributed among members for their reference and use.

Till date, 46 Standard Booklets & Technical Information Booklets on various subjects have been published.

The Chairman of R&D Committee, Shri Ramkumar Sunkara has made efforts in compiling this booklet on a very important subject of **Tolerances for Regular Slotted Containers.**

I congratulate the R&D Committee Chairman and his team for the efforts taken in getting the information and compiling the data.

I am pleased to present this booklet and I am sure that the information collected, compiled and presented in the booklet form will be found useful to all the members

Ramchanh H. Arora
President, FCBM

05-12-2014

Preface

FCBM has always been at the forefront of development related to the Corrugated Industry The Research & Development Committee of the FCBM has been instrumental in bringing out Booklets on various Topics which have been appreciated by one & all.

This year the R&D Committee has taken up yet another issue related to "Tolerances for Regular Slotted Containers". I sincerely thank my co-chairman Mr. Amit Agarwal and all members of R & D committee.

I hope this booklet will benefit the Corrugated Box Mfg Industry and also others connected with the Industry.

Ramkumar Sunkara
Chairman R&D Committee

Tolerances for Regular slotted containers (RSC)

1. Introduction

1.1. Purpose: This technical report is developed by FCBM with intent to enhance understanding between the association members and user of the member's products. This technical report is voluntary and is not intended to prevent manufacturers from furnishing corrugated fibre board boxes of any agreed upon dimensions, styles or tolerances beyond given in this technical report. In recent times, more and more end users of corrugated fibre board boxes are setting up automatic set-up, filling and closing lines. The need for CFB to properly erect on automatic set-up equipment and filled containers to stack squarely during palletisation requires tolerances. The purpose of this technical report is to provide these tolerances.

1.2. Scope: This technical report specifies tolerances for:

1.2.1. Top open regular slotted container (FEFCO code 0201)

1.2.1.1. Tolerance for the internal dimensions (Length, Width, and depth) of erected RSC.

1.2.1.2. Tolerance for the box blank dimensioning.

1.2.1.3. Tolerance for the slot dimensioning.

1.2.1.4. Tolerance for slot gap dimensioning at manufacturer's joint.

1.2.1.5. Tolerance for fish tailing of RSC container.

1.2.1.6. Tolerances on Flap Gap of erected and closed RSC

1.2.1.7. Tolerances on measured Warp

1.2.2. Made from 'B' or 'C' or 'A' flute profile single-wall CFB.

1.2.3. Made from 'BB' or 'BC' or 'BA' flute profile double wall CFB

1.2.4. For which no panel dimensions is more than 600 mm or less than 150 mm

1.2.5. That is to be erected, filled and closed on automatic packing lines.

1.2.6. Having performance parameters:

1.2.6.1. Burst strength in range 8.00 to 25.00 Kg/sq.cm and

1.2.6.2. Edge crush test (ECT) value in the range of 4.00 to 9.50 kN/meters

2. Informative references

2.1. FCBM technical book let no 7:91 – Glossary of terms

2.2. FCBM technical book let no R1:00 - Measuring box dimensions

2.3. FCBM test standards no 3:90 – Test method for determining bursting strength of corrugated board

3. Definitions

3.1. Bursting strength
The force required to rupture linerboard or combined board, using hydraulic pressure measured by a mullen tester, relates indirectly, to the box's ability to withstand external or internal forces, and to contain the contents during rough handling. This method cannot be used on triple wall combined board and is of limited reliability, on double wall, as it is difficult to force the apparatus through the multiple facings simultaneously. When using certain specifications in the carrier classifications, minimum burst strength must be certified.

3.2. Edge crush test value
The amount of force needed to crush on edge combined board is a primary factor in predicting the compression strength of the completed box. When using certain specifications in the carrier classifications, minimum edge crush values must be certified.

3.3. Flaps
Extensions of the side walls that close a box.

3.4. Knocked down corrugated container (KD)
Boxes in flat form, either before or after the joint has been formed. An article that is partially or entirely taken apart for packing and shipment.

3.5. Manufacturers Joint
The part of the box where the ends of the scored and slotted blank are fastened together by taping, stitching or gluing.

3.6. Panels
A "face" or "side" of a box.

3.7. Score

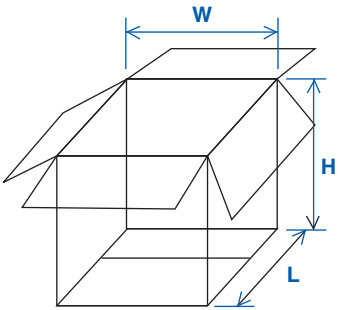
An impression or crease in corrugated or solid fiber-board, made to position and facilitate folds.

3.8. Slot

A wide cut, or pair of closely spaced parallel cuts including removal of a narrow strip of material made in a fiber-board sheet, usually to form flaps and permit folding without bulges caused by the thickness of the material. Common widths are 1/4 in. (6 mm) and 1/8 in. (9 mm).

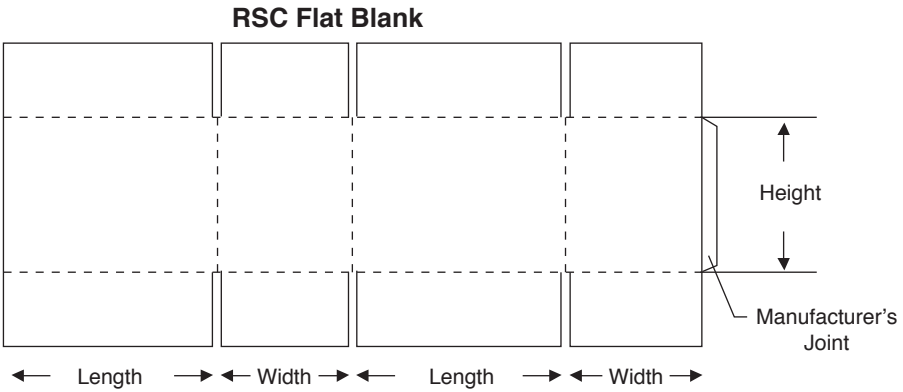
4. Scoring and slotting allowances

4.1. Tolerance for the internal dimensions (Length, Width, and depth) of erected RSC.



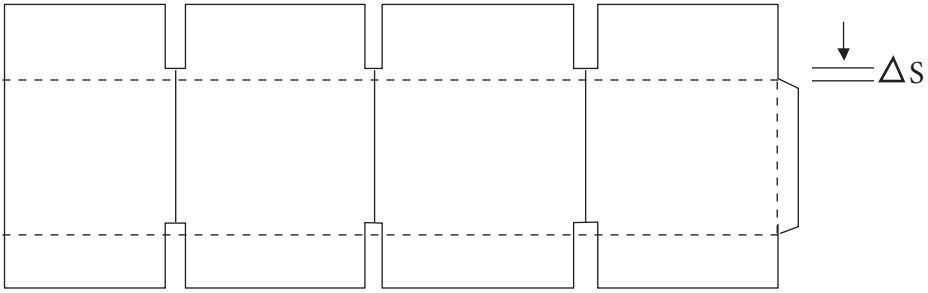
Flute Profile	Tolerances on Length	Tolerances on width	Tolerances on height
E	+/- 1.5 mm	+/- 1.5 mm	+/- 1.5 mm
B	+/- 3.0 mm	+/- 3.0 mm	+/- 3.0 mm
C	+/- 3.5 mm	+/- 3.5 mm	+/- 3.5 mm
A	+/- 4.0 mm	+/- 4.0 mm	+/- 4.0 mm
BB	+/- 3.0 mm	+/- 3.0 mm	+/- 3.0 mm
BC	+/- 3.5 mm	+/- 3.5 mm	+/- 3.5 mm
BA	+/- 4.0 mm	+/- 4.0 mm	+/- 4.0 mm

4.2. Tolerance for the box blank dimensioning.



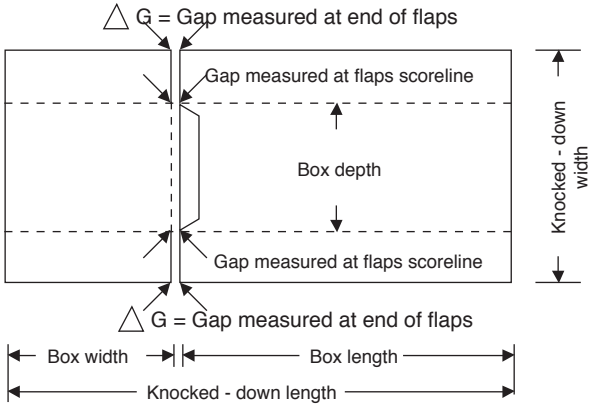
Flute Profile	Tolerances as measured score-line to score-line on the finished blank when flat (as a scored and slotted sheet)	Tolerances on overall dimensions of the flat sheet should not exceed
E	+/- 1.0 mm	+/- 2.0 mm
B	+/- 1.5 mm	+/- 3.0 mm
C	+/- 1.5 mm	+/- 3.5 mm
A	+/- 1.5 mm	+/- 4.0 mm
BB	+/- 1.5 mm	+/- 3.0 mm
BC	+/- 1.5 mm	+/- 3.5 mm
BA	+/- 1.5 mm	+/- 4.0 mm

4.3. Tolerance for the slot dimensioning.



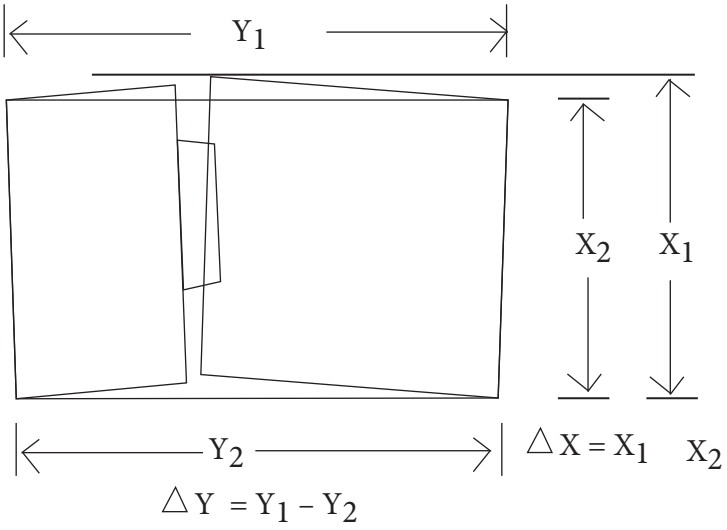
Flute profile	Variations in slot depth should be no greater than (Δ S)
E	+/- 1.5 mm
B	+/- 3.0 mm
C	+/- 3.0 mm
A	+/- 3.0 mm
BB	+/- 3.0 mm
BC	+/- 3.0 mm
BA	+/- 3.0 mm

4.4. Tolerance for slot gap dimensioning at manufacturer's joint.



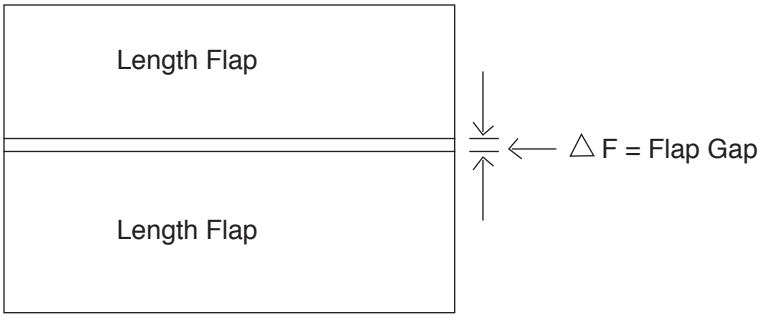
Flute profile	The amount of gap at the manufacturers' joint, measured at the (Δ G)	
	Gap measured at flap score-line not be less than	Gap measured at end of flaps not more than
E	1 mm	2 mm
B	2 mm	6 mm
C	3 mm	8 mm
A	3 mm	10 mm
BB	3 mm	8 mm
BC	3 mm	10 mm
BA	3 mm	12 mm

4.5. Tolerance for fish tailing of RSC container.



Flute profile	Variations in the width of gap at the manufacturers' joint on the same box (skew or fishtail) when measured at	
	Δ X	Δ Y
	Not more than	Not more than
E	1.5 mm	2.0 mm
B	3.0 mm	6.0 mm
C	3.0 mm	7.0 mm
A	4.0 mm	8.0 mm
BB	4.0 mm	8.0 mm
BC	5.0 mm	10.0 mm
BA	5.0 mm	10.0 mm

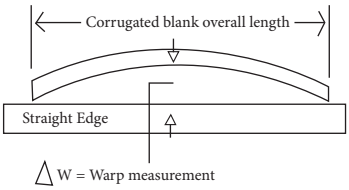
4.6. Tolerances on Flap Gap of erected and closed RSC



Top View of erected and closed RSC

Flute Profile	Major flaps of closed corrugated cartons	
E	Should not over lap	Gap between these flaps should not be more than 1.0 mm
B	Should not over lap	Gap between these flaps should not be more than 3.0 mm
C	Should not over lap	Gap between these flaps should not be more than 4.0 mm
A	Should not over lap	Gap between these flaps should not be more than 5.0 mm
BB	Should not over lap	Gap between these flaps should not be more than 4.0 mm
BC	Should not over lap	Gap between these flaps should not be more than 5.0 mm
BA	Should not over lap	Gap between these flaps should not be more than 5.0 mm

4.7. Tolerances on measured Warp



Corrugated blank overall length in mm	Amount of warp should not exceed
600 mm	12 mm
900 mm	18 mm
1200 mm	24 mm
1500 mm	30 mm
1800 mm	36 mm
2100 mm	42 mm

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