



12.Carton box inspection

1. Objective:

To ensure that the corrugated carton boxes used for secondary packaging meet the physical and strength specifications required to withstand handling, transport and storage conditions.

2. Scope:

Applicable to all types of corrugated carton boxes received for packing including 3-ply, 5-ply, and 7-ply grades.

3. Parameters to Check & Instruments Used:

S.No.	Parameter	Test Method / Instrument
1	Ply Type	Manual Layer Counting / Visual
2	GSM (g/m ²)	Cutter + Electronic Weighing Balance
3	Bursting Strength	Bursting Strength Tester (Hydraulic)
4	Moisture Content	Oven Drying Method

4. Sampling Plan:

- Randomly select 3–5 cartons per batch or lot.
- For GSM/moisture/bursting test, take at least 3 different panel samples (side, bottom, flap).

5. Test Procedures:

5.1 Ply Test (Manual/Visual)

1. Tear one corner of the box and peel the layers carefully.
2. Count the number of liners and flutes.
 - 3 Ply: 1 flute + 2 liners
 - 5 Ply: 2 flutes + 3 liners

5.2 GSM Test

1. Cut a standard circular piece (diameter 100 mm) using a cutter.
2. Weigh the sample on a digital balance (in grams).
3. Multiply weight by 100 to get GSM.

$$\text{GSM} = \text{Weight in grams} \times 100$$



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5.3 Bursting Strength Test

Procedure:

1. Sample Preparation:

- Cut 3–5 test samples (100 × 100 mm) from various box panels.

2. Setup:

- Place the sample on the metal plate with the 30 mm opening.
- Place a rubber disc / balloon over the opening.
- Apply increasing weight or press down slowly until the sample ruptures

3. Measurement:

- Record the weight (kg) at rupture.
- Calculate bursting strength using:

$$\text{Bursting Strength (kg/cm}^2\text{)} = \text{Weight (kg)} / 7.07$$

(7.07 cm² is the area of a 30 mm diaphragm)

5.4 Moisture Content Test

Oven Drying:

1. Weigh approx. 10 g of box sample.
2. Place in the oven at 105°C for 2 hours.

- Cool in desiccator and reweigh.

$$\text{Moisture (\%)} = [(Initial wt - Dry wt) / Initial wt] \times 100$$

Ply: 3 flutes + 4 liners