Box+Foam Workmanship Standards - Packaging

Document 105 Rev. A

REVISION HISTORY

105 Rev. A	11/10/2017	Original Edited Version that replaces PAS100, PAS101, and PAS102

Table of Contents

1. Purpose

Define the required quality characteristics for Box+Foam materials and packaged products relevant to the scope of this document. To be used jointly with component specifications and assembly instructions.

2. Scope

These standards are intended for use as a reference document. This document will provide criteria for identification of defects for packaging materials, packaged assemblies, and packaged products.

2.1. References

This Workmanship Standards document references the following specifications and guidelines:

- 25-GS0009 - Boards and Systems Environmental Standards Governing Spec
- EU Packaging and Packaging Waste Directive 94/62/EC
- CEN/TR 13695-2:2004 - Requirements for measuring and verifying the four heavy metals and other dangerous substances present in packaging
- European Union's REACH Regulation number 1907/2006
- Box+Foam Environmental Packaging Guidelines
- Industry standard: Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices
- ASTM D1004 - Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting
- ASTM D1185 - Standard Test Methods for Pallets and Related Structures Employed in Materials Handling and Shipping
- ASTM D2582 - Standard Test Method for Puncture-Propagation Tear Resistance of Plastic Film and Thin Sheeting
- ASTM D638 Standard Test Method for Tensile Properties of Plastics
- ANSI/ESD-S541 Packaging Material Standards for ESD Sensitive Items
- International Standards for Phytosanitary Measures Publication No. 15 (ISPM 15) Guidelines for Regulating Wood Packaging Material in International Trade
- MIL-PRF-81705E Amendment 1, TYPE III, CLASS 1 – Performance Specification: Barrier Materials, Flexible, Electrostatic Protective, Heat Sealable.
- ANSI/ESD STM11.11-, Surface Resistance Measurement of Static Dissipative Planar Materials.
- ANSI/ISO 15416 – Bar Code Print Quality Guideline
- International Plant Protection Convention (IPPC) website: http://www.ippc.int

3. Inspection (General)

In instances of conflict between workmanship standards criteria and component specifications or assembly instructions; component specifications and assembly instructions criteria take precedence.

Unless otherwise specified, to conduct inspections for defects, view the specimen at arm's length (approximately 457mm [18"]) for 3-4 seconds. Where noted, a "Class A" surface is the front panel of a printed component or as defined on a component specification.

3.1. Non-conformance Corrective Action Process

When discrepant or non-compliant components or assemblies are identified, the supplier is required to perform varying degrees of containment and corrective action, dependent on the severity and frequency of the occurrence. This may include, but is not limited to, crediting Box+Foam for discrepant or non-compliant items, performing 100% inspection at the supplier's and/or a Box+Foam or 3rd party's facility, recalling distributed product, or other corrective action determined at Box+Foam's discretion.

4. Component Printing Criteria

4.1. Box+Foam supplied print information

4.1.1. Use ONLY the Box+Foam supplied files, swatches and press proofs provided for reference during each print run.
4.1.2. Swatches and press proof sheets should be kept in a dark envelope in a climate controlled room, which shall not exceed 23.9°C [75°F].
4.1.3. Sheets and swatches shall be stored in a low humidity environment to prevent color degradation. Average humidity in the environment of the stored sheets shall not exceed 45%.
4.1.4. Swatches and press proof sheets may be kept up to one year if stored properly.

4.2. Color

4.2.1. Visual matches should be made using 5000 Kelvin industry standard lighting. If that's not available, view under a full-spectrum light source (e.g. sunlight).
4.2.2. For FAI, preferred ink and coating drying time before color matching is a minimum of 8 hours for color accuracy.
4.2.3. When performing a press-check at a print vendor, minimum time required for ink drying is at the discretion of the on-site Box+Foam representative.
4.2.4. Visually match all print specifications supplied to ensure consistency throughout the print run. Colors shall match proof after the specified coating is applied to the sheet.

4.2.5. Box+Foam color swatches (if applicable), are a critical match after the specified coatings are applied to the sheet.

4.3. Artwork Color Registration

4.3.1. Flexographic Printing (i.e. used on corrugated, 1-2 colors)

- Dimensional tolerance: +/- 2mm [0.08”] unless otherwise specified by Box+Foam.

4.3.2. Offset Printing (i.e. used on folding cartons, CD packs, multicolor)

- Dimensional tolerance: +/- 0.50mm [0.02”] unless otherwise specified by Box+Foam.

4.3.3. Thermal Transfer (i.e. label printing)

- Dimensional tolerance: +/- 0.59mm [0.02”] unless otherwise specified by Box+Foam.

4.3.4. Ink-jet (i.e. label printing)

- Dimensional tolerance: +/- 0.50mm [0.02”] unless otherwise specified by Box+Foam.

4.3.5. Coating (i.e. spot UV, aqueous)

- Dimensional tolerance: +/- 1mm [0.04”] unless otherwise specified by Box+Foam.

4.3.6. Foil Stamp

- Dimensional tolerance: +/- 1mm [0.04”] unless otherwise specified by Box+Foam.

4.4. Artwork Placement Registration to Dieline

4.4.1. Flexographic Printing (i.e. used on corrugated, 1-2 colors)

- Dimensional tolerance: +/- 3mm [0.12”] unless otherwise specified by Box+Foam.

4.4.2. Offset Printing (i.e. used on folding cartons, displays, multicolor)

- Dimensional tolerance: +/-1mm [0.04”] unless otherwise specified by Box+Foam.

4.4.3. Thermal Transfer (i.e. label printing)

- Dimensional tolerance: +/- 2mm [0.08”] unless otherwise specified by Box+Foam.

4.4.4. Ink-jet (i.e. label printing)

- Dimensional tolerance: +/- 2mm [0.08”] unless otherwise specified by Box+Foam.

4.5. Barcodes and Text

- Clarity: Consistent with all printing specifications supplied.
- Fading: Consistent with all printing specifications supplied.
- Broken or filled-in characters shall not render text illegible.

- No broken or filled-in characters allowed within a corporate name or product title.
- Bar codes shall meet ANSI/ISO 15416, grade B or better.

4.6. Ink Rub Resistance

- Offset Printing
  - Shall withstand a minimum of 100 strokes (or rubs) per a Sutherland Ink Rub test using a 1.8 kg [4 lb.] weight.

4.7. Hickeys/Glitches

- No more than one appearing within 13mm [0.51”] in any one direction of any company logo (Box+Foam or customer).
- No defect should appear within the corporate name or logo.
- No more than two of any size appearing on any “Class A” page or panel.
- No more than three 3mm [0.12”] in size appearing on any other page or panel.
- Shall not render any copy illegible.
- May appear as spots, specks or patterns in the component.

4.8. Smudges, Smears, Roller Marks, Ghosting or Streaks

- No more than one, greater than 1.5mm [0.06”] in width and 3mm [0.12”] in length appearing within 13mm [0.51”] of the product title, corporate name or logo on any page or panel.
- No defect should appear within the corporate name or logo.
- No more than two less than 3mm [0.12”] in width and 5mm [0.20”] in length appearing on any page or panel.
- Shall not render any copy illegible.

4.9. Coating

- No imperfections in the surface such as, cracks, wrinkles, blistering, or peeling.
- Coating shall not render any copy illegible.
- Coating cannot impact final functionality of the part.
- Coating material (i.e. aqueous and/or UV coating) shall be applied per individual component or printing specifications and cannot be substituted.

5. Incoming Packaging Component Mechanical and Cosmetic Criteria

The following criterion applies to incoming materials from Box+Foam packaging suppliers. Some packaging components may arrive fully assembled, while others may require assembly on the product pack-out line. The following criterion shall always be followed, unless otherwise specified by Box+Foam.

5.1. Paperboard Components and Light Weight Corrugated

(Including folding cartons and single face litho-laminated E and F-flute corrugated)

5.1.1. Scoring

- Dimensional tolerance: +/- 2mm [0.08”] of score unless otherwise specified by Box+Foam.
- Cannot cut material.
- Scores shall fold cleanly (crisp).

5.1.2. Warpage

- Shall not exceed 13mm [0.51”] per 300mm [11.8”].

5.1.3. Die-Cuts and Perforations

- Dimensional tolerance: +/- 2mm [0.08”] unless otherwise specified by Box+Foam.
- Die-cut edges shall be clean.
- Die-cut areas shall be stripped of excess material.
- Slots must be, at minimum, 95% stripped (not interfere with box set-up).

5.1.4. Dents, Punctures, Scratches, or Voids

- No punctures allowed.
- No more than one 6mm [0.24”] in size appearing within 13mm [0.51”] of the product title, corporate name or logo on any page or panel.
- No more than two 10mm [0.39”] in size appearing on any Class A surface.
- Scratches shall not render any copy illegible.
- Dents not to exceed 10mm [0.39”] per 203mm [8.0”] on any external surface (as viewed assembled).
- Shall not exceed 4 defects on the entire component.
- Dents are only considered a defect if they deform the internal corrugation more than 50% of its thickness and are on an external surface (as viewed assembled).
- Dents and punctures shall not impact the cartons’ structural integrity or ability to close.

5.1.5. Adhesive/Joints

- Adhesive shall not extend beyond the joint on external or internal surfaces.
- The allowable gap between the joint edges shall be within 2mm [0.08”].
- Adhesive coverage requires 80% or greater fiber tear of the entire manufacturer’s joint.
- Adhesive shall penetrate into glue-assisted perforations, but not penetrate through and onto panel surface.

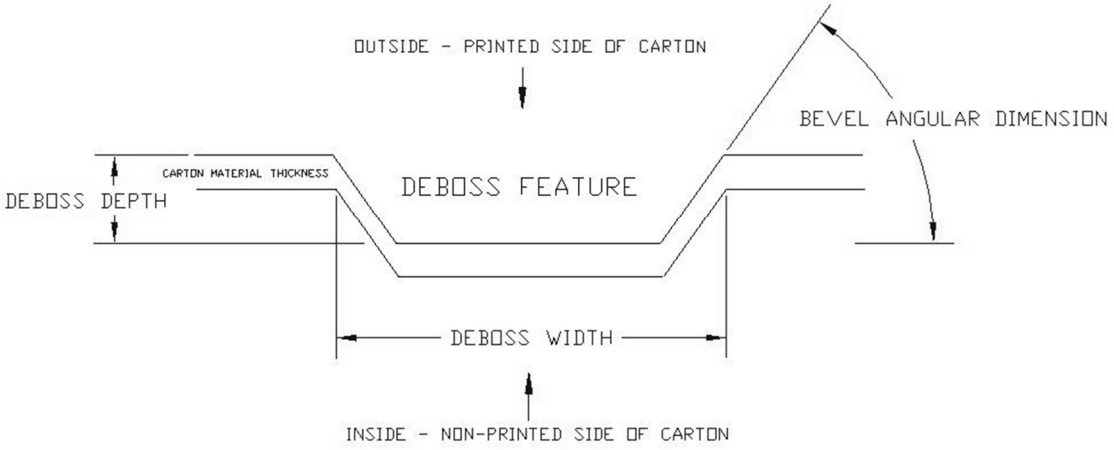
5.1.6. Tear Strips

- Tear strip shall be intact with no visible or mechanical tearing.
- Tear strip tape shall be applied and completely adhered consistently across flap/panel surface with no lifting.

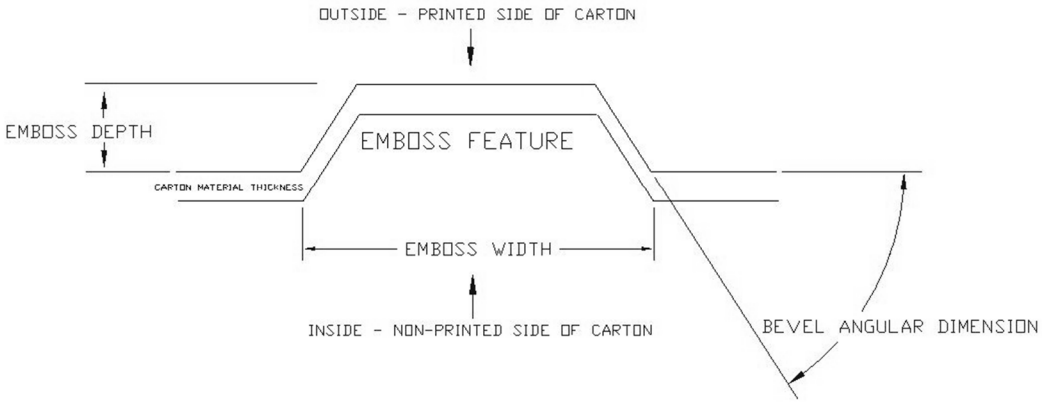
5.1.7. Embossing/Debossing

- Depth dimensional tolerance: +/- 0.08mm [0.003”]
- Bevel angular dimension is a reference dimension only
- Emboss/deboss width to be sized appropriate to artwork features

- Registration to artwork dimensional tolerance: +/- 0.25mm [0.01”].
- Deboss dimensional measurement criteria:



- Emboss dimensional measurement criteria:



5.1.8. Cracked or Burst Folds

- No more than 2 cracked or burst folds adjacent to a Class A surface.
- No more than 8 cracked or burst folds on entire component.
- No cracked or burst folds greater than 0.4mm [0.02”] in width.
- No cracked or burst folds longer than one-fourth of the overall fold length.
- No crack breaking through material.

5.1.9. Non-specified Creases or Folds

- None allowed of any size on a Class A surface.
- None greater than one-fourth of the panel size.
- Crease shall not render any text illegible.

5.2. Rigid Boxes

5.2.1. Construction

- Corners shall be flush without any gaps.

- Liner material shall be adhered completely. No bubbles or lifting of the liner material allowed.
- Outside dimensional tolerance: +/- 1mm [0.04”] unless otherwise specified by Box+Foam.
- Rigid box walls shall be perpendicular +/- 1º to allow proper fit between rigid box components.
- No core material should be visible on exterior panels or edges unless exposed by secondary die-cut.
- If the interior of the rigid box is wrapped, two areas of exposed core material 3mm [0.12”] in size are permitted.

5.3. Corrugated Components

(Including single face litho-laminated B-flute corrugated)

5.3.1. Scoring

- Dimensional tolerance: +/- 3mm [0.12”] unless otherwise specified by Box+Foam.
- Cannot cut material.
- Scores shall fold cleanly.

5.3.2. Warpage

- Shall not exceed 13mm [0.51”] per 300mm [11.8”].

5.3.3. Die-Cut Components

- Dimensional tolerance: +/- 1mm [0.04”] unless otherwise specified by Box+Foam.
- Die-cut edges shall be clean.
- Die-cut areas shall be stripped of excess material.

5.3.4. Slotted Containers

- Flap slots shall be centered +/-1.5mm [0.06”] to the scores.
- Slot width requirements for slotted-type boxes by corrugated material:

Material:	Slot Width
A flute	10mm (0.38”)
B flute	6mm (0.25”)
C flute	8mm (0.31”)
BC flute	13mm (0.51”)
AB flute	16mm (0.63”)
E flute	5mm (0.19”)
F flute	5mm (0.19”)

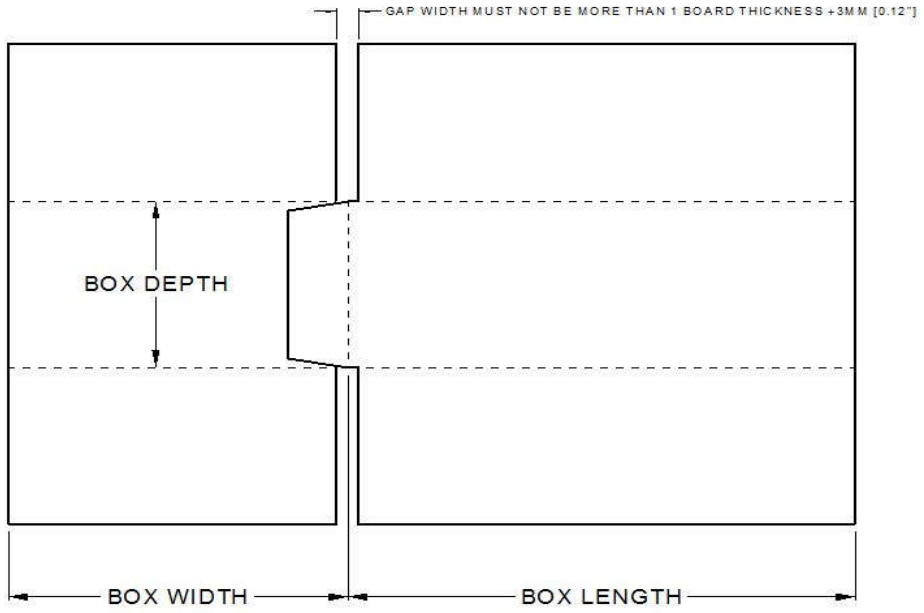
5.3.5. Dents, Punctures, Scratches, or Voids

- No more than one, 6mm [0.24”] in size appearing within 13mm [0.51”] of the product title, corporate name or logo on any page or panel.
- No more than two 10mm [0.39”] in size appearing on any Class A surface.
- Scratches shall not render any copy illegible.

- Dents not to exceed 10mm [0.39”] per 203mm [8.0”] on any external surface (as viewed assembled).
- Shall not exceed 4 defects on the entire component.
- Punctures not to exceed 3mm [0.12”] in diameter or length per 203mm [8.0”] on any external surface (as viewed assembled).
- Dents are only considered a defect if they deform the internal corrugation more than 50% of its thickness and are on an external surface (as viewed assembled).
- Dents and punctures shall not impact the cartons’ structural integrity or ability to close.

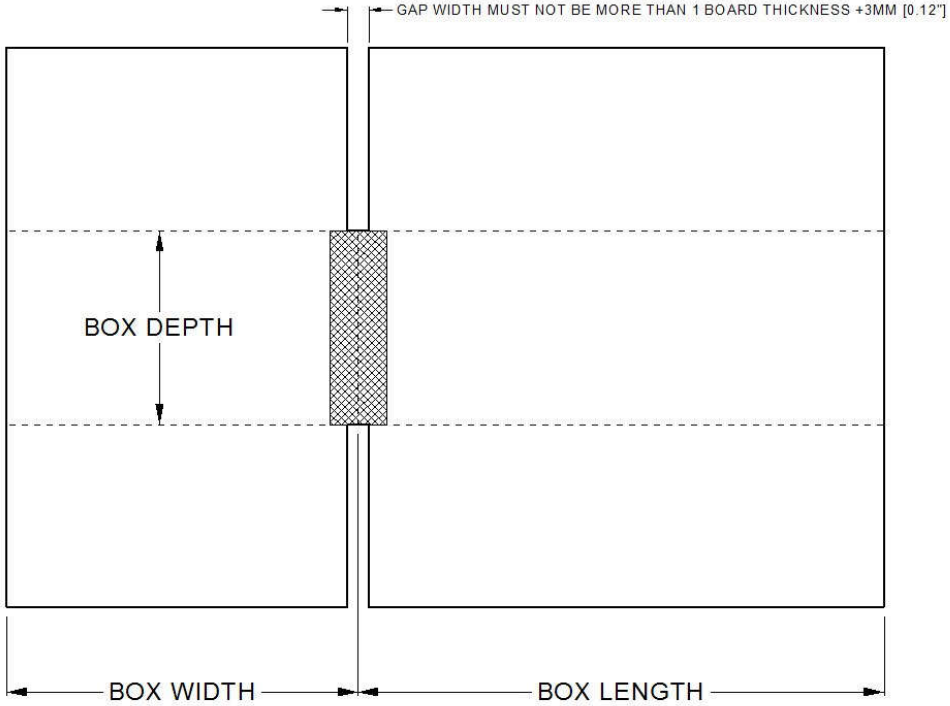
5.3.6. Adhesive Manufacturing Joints

- Adhesive shall not extend beyond the joint on external or internal surfaces.
- Adhesive coverage requires 80% or greater fiber tear of the entire manufacturer’s joint.
- The allowable gap between the manufacturing joint edges shall not be more than 1 board thickness + 3mm [0.12”]
- Manufacturing glued joints shall be per the drawing below:



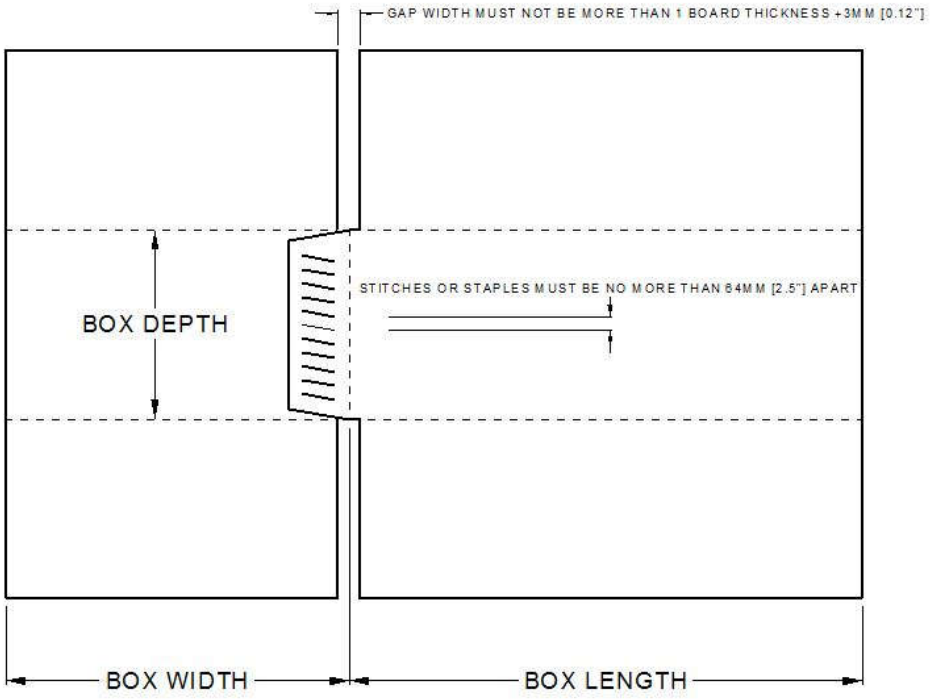
5.3.7. Taped Manufacturing Joints

- Box joint tape shall not be less than 2” wide. 3” tape is recommended.
- Manufacturing taped joints shall be per the drawing below:



5.3.8. Stitched Manufacturing Joints

- Manufacturing stitched joints shall be per the drawing below:



5.3.9. Liner Lamination

- Liner board shall be fully laminated to the corrugated medium.

5.3.10. Cracked or Burst Fold Seams

- No more than 2 cracked or burst folds adjacent to a Class A surface.
- No more than 8 cracked or burst folds on entire component.
- No cracked or burst folds greater than 2mm [0.08”] in width.
- No cracked or burst folds longer than one-fourth of the overall fold length.
- No crack breaking through material.

5.4. Molded Fiber Components

5.4.1. General

- No unspecified holes which light can be seen through.
- No unspecified materials visible in component.
- Material shall be free of mold, and cannot have mildew odor.
- No discolored areas or material deformations on or within 30mm [1.18”] of any Box+Foam or customer logo emboss.

5.4.2. Rough Molded (for parts 5-10mm [0.20” – 0.39”] thick)

- Dimensional tolerance: +/- 3mm [0.12”] of specified material thickness.
- Warping permitted up to 3mm [0.12”] per 300mm [11.8”] of length.
- No more than 4 visible cracks are permitted per component.
- Cracks shall not be greater than 80mm [3.15”] in length.
- Cracks on hinged components are allowable up to one-fourth of the feature length.

5.4.3. Transfer Molded

- Dimensional tolerance: +/- 1mm [0.04”] of specified material thickness.
- Warping permitted up to 2mm [0.08”] per 300mm [11.8”] of length.
- No unspecified visible cracks which light can be seen through.
- No more than 5 wrinkles allowed per part.
- Wrinkles shall not be greater than 20mm [0.79”] in size.

5.4.4. Thermoformed

- Dimensional tolerance: +/- 0.5mm [0.02”] of specified material thickness
- Warping permitted up to 1mm [0.04”] per 300mm [11.8”] of length.
- Discolorations larger than 3mm [0.12”] are not acceptable.
  - No more than 5 discolored areas on “Class A” surface.
  - No more than 10 discolored areas on the entire component.
- No more than 5 wrinkles allowed per part.
- Wrinkles shall not be greater than 10mm [0.39”] in size.
- No areas of unclean trimmed edges larger than 10mm [0.4”] in length permitted.
- No more than 1 unclean trimmed edge when exposed in finished package configuration.
- No unspecified visible cracks which light can be seen through.

5.5. Plastic Thermoformed and Injection Molded Components

- Thermoformed dimensional tolerance: +/- the material thickness dimension unless otherwise specified by Box+Foam.
- Injection molded dimensional tolerance: +/- 0.3mm [0.01”] unless otherwise specified by Box+Foam.
- No unspecified cracks, chips or breaks in the material.
- No burns, holes, void or unspecified materials molded into the component.
- No deformation or warping of finished parts that impact the function of the part.
- No inconsistent material color greater than 13mm [0.51”] in length or diameter.
- Formed static protective components shall be in conformance with ANSI/ESD-S541.

5.6. Non-molded Rigid Plastic Components

5.6.1. Scratches, Punctures and Dents

- No punctures allowed.
- No more than one 6mm [0.24”] in size appearing within 13mm [0.51”] of the product title, corporate name or logo on any page or panel.
- No more than two 10mm [0.39”] in size appearing on any Class A surface.
- Scratches shall not render any copy illegible.
- Shall not exceed 4 defects on the entire component.

5.6.2. Plastic Cartons

5.6.2.1. Construction

- Manufacturing joint and/or glued features on auto-bottom shall be fully adhered.
- Adhesives shall not extend beyond the joint on external or internal surfaces.
- No unspecified materials allowed between adhered surfaces.

5.6.2.2. Scoring

- Dimensional tolerance: +/- 2mm [0.08”] of score unless otherwise specified by Box+Foam.
- Cannot cut through material.
- Scores shall not break.

5.6.2.3. Die-Cuts and Perforations

- Dimensional tolerance: +/- 2mm [0.08”] unless otherwise specified by Box+Foam.
- Die-cut edges shall be clean.
- Die-cut areas shall be stripped of excess material.
- Perforations shall break cleanly.

5.7. Cushion Parts

5.7.1. Fabricated/ Die-Cut Foam Materials and Planks

- Dimensional tolerance: +/- 7mm [0.25”] immediately following die-cut and/or fabrication unless otherwise specified by Box+Foam.
- No deformation of finished part from excess heat bonding greater than +/- 7mm [0.25”] or as specified by Box+Foam.
- No greater than 1 deformation per heat welded joint.
- Heat weld shall have minimum 80% adherence.
- No adhesive extending beyond adhered surfaces more than +/- 7mm [0.25”].
- No adhesive stringing allowed.
- Die-cut areas shall be stripped of excess material unless otherwise specified.
- No dirt or discoloration acceptable.
- Static dissipative and/or conductive foam shall be in conformance with ANSI/ESD-S541.
- Acceptable density tolerance +/- 10% of specification.
- Delamination shall not exceed 2% of surface area where lamination is critical.
- Plank foam shall have markings to indicate foam density.
- Measured density will be within 5% indicated on BOL or as marked on planks.

5.7.2. Molded Foam materials

- Dimensional tolerance: +/- 7mm [0.25”] unless otherwise specified by Box+Foam.
- Unspecified materials molded into component shall not exceed 3mm [0.12”] in size.
- No holes or voids greater than 3mm [0.12”].
- No more than 5 holes, voids and/or unspecified materials in completed component, of any size.
- No cracked or broken pieces acceptable.
- No dirt or discoloration acceptable.
- Maximum density deviation not to exceed 10% of specification.

5.8. Bags

5.8.1. Static Shielding and Static Dissipative Bags

- Shall be free of holes or tears
- Dimensional tolerance: +/- 3mm [0.12”] unless otherwise specified by Box+Foam.
- Material shall be in compliance with MIL-PRF-81705E Amendment 1, TYPE III, CLASS 1
- Resistance of conductive layer: per ANSI/ESD S11.11.
- Tensile strength: 3.5 kg/m [30 pounds/in] minimum per ASTM D638
- Puncture resistance: 4.5 kg [10 lbs.] minimum per ASTM D2582
- Surface resistance of static dissipative bag non-triboelectric layers: At least 1 x 10^5 and less than or equal to 1 x 10^9 ohms and non-triboelectric material, per ANSI/ESD S11.11.
- Surface resistance of static shielding bags: per ANSI/ESD-S541.
- Shall be non-corrosive
- If required, heat seam seal test: 1 kg [2.2 lbs.] minimum, per ASTM D1004
- Light transmissibility: Shall allow human readability of 10 pt. black letters on a white background at a distance of 13mm [0.51"] below the surface of the material.
- Shielding bag effectiveness: Assembled bags shall attenuate an electrostatic field of 1000 volts to less than 200 volts when measured per ANSI/ESD-S541.

5.8.2. ESD Protective Moisture Barrier Bag (MBB)

- Shall be free of holes or tears.
- Dimensional tolerance: +/- 3mm [0.12”] unless otherwise specified by Box+Foam.
- Material shall be in compliance with MIL-PRF-81705E Amendment 1, TYPE III, CLASS 1
- Tensile strength: 3.5kg/m [30 pounds/in.] minimum per ASTM D638
- Puncture resistance: 4.5 kg [10 lbs.] minimum per ASTM D2582
- Shall be non-corrosive
- Shall have a water vapor transmission rate not to exceed .0003gms/100sq.in./24 hrs.

- Materials shall be capable of being heat sealed. Seal shall be impermeable to moisture.
    - Heat seam seal test: 1 kg [2.2 lbs.] minimum, per ASTM D1004

5.8.3. Non-static Bags

- No dirt or debris in material.
- Shall be free of holes or tears.

5.9. Labels

5.9.1. Labels/Cling Films

- Shall not be ripped, torn, scratched, or discolored.
- Die-cuts must be clean and must not extend into liner.
- No unspecified materials allowed on the component.
- Required slits within labels shall be intact.
- Adhesives/glue shall not go beyond designated/specified area.
- Labels shall firmly adhere to liner material. No lifting of labels on roll is acceptable.

5.11. Desiccant pouches

- Desiccant pouches shall meet material and performance criteria including absorption capacity, corrosive limits, and dusting per IPC/JEDEC J-STD 033C.
- Desiccant pouches shall not be used if punctures, tears, or holes are present.
- Incoming desiccant pouches shall be packaged in a moisture impervious container.
- Desiccant pouches shall only be used in a sealed bag.

5.12. Humidity Indicator Cards (HIC)

- HIC shall meet material and performance criteria and be capable of distinguishing humidity changes.
- Incoming raw HICs shall be packaged in a moisture impervious container.
- HICs shall only be used in a sealed bag.

5.13. Pallets

5.13.1. ISPM-15 Directive

- All pallets shall conform to the International Standards for Phytosanitary Measures Publication No. 15 (ISPM 15) Guidelines for Regulating Wood Packaging Material in International Trade.

5.13.2. Pallet Quality Requirements

- Overall length x width of pallet shall be within +/- 5mm [0.20”] unless otherwise specified by Box+Foam.
- The following are acceptable manufacturing tolerances allowed on established target dimensions:
    - Deck boards and stringer boards:
        - Thickness: +/- 3mm [0.12”] unless otherwise specified by Box+Foam.
        - Plywood decking thickness: +/-1.5mm [0.062”]
        - Width: +/-3mm [0.12”] unless otherwise specified by Box+Foam.
        - Length: +3mm [0.12”], -6mm [0.24”] unless otherwise specified by Box+Foam.
    - Stringers and blocks dimensional tolerances:
        - Width: +/- 3mm [0.12”] unless otherwise specified by Box+Foam.
        - Height: +/- 3mm [0.12”] unless otherwise specified by Box+Foam.
        - Length: +3mm [0.12”], -7mm [0.25”] unless otherwise specified by Box+Foam.
- Minimum pallet deck board width: 76mm [3.0”]
- Pallet shall be rectangular / square when comparing diagonal measurements to within 7mm [0.25”].
- No more than 2 knots per 150mm [6.0”] of length per component.
- Fastener heads shall be driven flush or below the applicable component surface.
- Pallets shall be free of the following damage:
    - Missing deck boards, stringers or blocks
    - Broken deck boards, stringers or blocks
        - Broken implies that the component is in two or more pieces, or as a result of the break, has negligible residual strength.
    - Splits in deck boards or stringer boards of more than half the length or width, which cannot be securely fastened.
    - Missing wood on more than two connections of the same component that exposes the shanks of the fasteners.
        - A connection implies each fastener on a component.
    - Missing wood of more than 25% of the component width and 50% of the component length on no more than two components.

5.13.3. Pallet Minimum Performance Criteria

- Racking performance per ASTM D1185 (rack across length + width): 454kg [1000 lbs.], maximum deflection 13mm [0.51”]
- Forklift tine performance per ASTM D1185: 454kg. [1000 lbs.], maximum deflection 13mm [0.51”]
- Static stacking performance (warehouse) per ASTM D1185 stacked 4 high, 454kg. [1000 lbs.] per pallet: 1800kg [4000 lbs.], maximum deflection 6mm [0.25”]

- Conveyor performance per ASTM D1185: 454kg [1000 lbs.], maximum deflection 6mm [0.25”]
- Durability: Shall meet each of these requirements:
    - Corner drop per ASTM D1185: 12 drops at 1 meter [40”]. Max, diagonal deformation of 1.5%
    - Tine tip impacts on block ends per ASTM D1185: 3 impacts at 300mm [12”], no failures
    - Tine heel impacts on leading ends per ASTM D1185: 3 impacts at 1200mm [48”], no failures

5.13.4. Pallet Mold Prevention and Moisture Content Requirements

- Pallets shall be mold-free. Pallets with mold on the surface of the wood shall not be used for delivery or shipment of components, semi-finished goods and finished goods.
- The surface moisture content of wood pallets shall be 20% or less.

6. Set Up Criteria

The criterion in this section will serve as the quality requirements during packaging set up. This section shall be used in conjunction with section 5. The following criterion should always be used, unless otherwise specified by Box+Foam.

6.2. Package Label Application

- No damaged, torn, scratched, or discolored labels are allowed.
- Multiple labels shall not overlap.
- Labels shall not have poor adhesion, lifting, wrinkles, turned up edges or bubbles that affect the readability of bar codes and text.
- Labels shall be applied in a uniform layer and free from bubbles.
- Unspecified material (i.e. dirt and debris):
    - Shall be less than 13mm [0.51”] in length on the label perimeter.
    - Shall not be larger than 3mm [0.12”] in diameter.
    - No more than two instances allowed on adhesive when applied.

6.2.1. Consumer Unit Labels (including promotional labels)

- No double labeling allowed.
- Cannot be skewed or misaligned more than +/- 3mm [0.12”] in each direction.
- Must firmly adhere to a boxes panel with no more than 13mm [0.51”] of the label lifted off of the panel.

6.2.2. Outer Case Labels

- No double labeling allowed.
- Labels shall not be misaligned or skewed > 6mm [0.24”] from the defined placement location unless otherwise specified. If the label is to be placed on a larger box panel, tolerances may be relaxed – refer to the product specific assembly instructions for clarification.
- Label shall not hang over any box edge.

- Skew tolerance: +/- 3mm [0.12”] from label center.
- Horizontal and vertical placement tolerance: +/- 13mm [0.51”] from label target.

6.3. Product Containment

- Product and internal packaging components shall be completely contained within the outer box.
- Shipping box panels shall not bulge or be deformed due to packing.
- No more than one product code is allowed per bulk or outer case.
- Unspecified packing material is not allowed.
- All product cartons must be placed in the same orientation in the outer case.
- Consumer unit labels must be facing up and readable when the outer case is opened.

6.3.1. Bags

- Tears less than 6mm [0.24”] in length are acceptable.
- Holes less than 3mm [0.12”] in diameter are acceptable.
- No more than 2 tears or holes allowed.
- If zip bags are used, ensure zipper engagement is complete.
- If bags are heat sealed, no unspecified holes or burn marks are allowable.
- If bags need to be folded, bags shall be folded in this manner:
  - Fold excess material on non-opening side underneath the item.
  - Fold excess material on opening side underneath the item.
  - If applicable, seal with tape or label.

6.4. Package Closure

6.4.1. Security Labels and Factory Seals

- No double labeling allowed.
- Cannot be skewed or misaligned more than +/- 3mm [0.12”] in each direction.
- No damaged, torn, scratched, or discolored labels are allowed.
- Labels shall not have poor adhesion, lifting, wrinkles, turned up edges or bubbles that affect the readability of bar codes and text.
- Labels shall be applied in a uniform layer and free from bubbles.
- Unspecified material (i.e. dirt and debris):
  - Shall be less than 13mm [0.51”] in length on the label perimeter.
  - Shall not be larger than 3mm [0.12”] in diameter.
  - No more than two instances allowed on adhesive when applied.
- Label adhesive performance:
  - When removing a previously applied label, a minimum of 25% fiber tear of the attached-to substrate is considered acceptable.
  - Label must be applied for 24 hours prior to performing label fiber tear test to ensure adhesive is fully set.

6.4.2. Staples

- Staples shall not be used to seal any container. Staples are used for trays and FTC assembly.

6.4.3. Tape

- Tape shall be centered along the box opening with a minimum of 51mm [2.0”] of tape on leading and trailing box panels on center slotted containers.
- Tape shall be centered along the box opening for sealing RETF and FOL containers. Tape may or may not extend the length of the entire opening.
- No more than one additional layer of tape due to resealing allowed unless otherwise specified.
- No dirt or unspecified material is allowed inside tape seal area.
- No more than 5 tape bubbles larger than 8mm [0.31”] or any bubbles which limit the tapes ability to adhere.
- No bubbles allowed under tape larger than 13mm [0.51”]
- Tape adhesion shall be such that if removed, it will tear at least 50% of the surface area under the tape.
- Seal with minimum 51mm [2.0”] wide, 2.3 mil thick clear / transparent tape.
- Avoid covering labels with tape. When necessary, the tape shall be transparent.

6.4.4. Security Tape

- Only 1 piece of tape allowed per seam.
- For rework purposes only, 2 pieces of tape are allowed per seam. The second piece of tape shall be placed next to first piece, not over it.

6.4.5. Shrink Wrap

- Film ripples on flat surfaces shall not exceed 25mm [1.0”] in length.
- Shrink wrap wrinkles or ripples on flat surfaces extending from edges where a seam is present shall not exceed the width of the panel.
- Dog ears shall not extrude more than 5mm [0.20”] off component surfaces.
- No split seams or tears allowed on any surface.
- No seams on any Class A surfaces.
- No more than 2mm [0.08”] warping of shrink wrapped component(s) per 100mm [4.0”].
- No burned or clouded image on the wrapping.
- Film shall be uniform and tight around component(s).
- No excess material or debris pressed into seam or hanging from seal point.
- Depending on shrink wrap equipment:
  - Perf Style: No perfs larger than 3mm [0.12”] allowed.
  - Hole Punch Style: Air holes not to exceed 6mm [0.24”] in diameter after shrinking.

6.4.6. Rigid Boxes

- Corners shall be flush without any gaps.

- Outside dimensional tolerance: +/- 1mm [0.04”] unless otherwise specified by Box+Foam.
- Rigid box walls shall be perpendicular +/- 1^{o} to allow proper fit between rigid box components.

6.4.7. Tuck Style Containers (i.e. RETF and STE cartons)

- Dust flaps and minor flaps shall be tucked inside of finished container.

6.4.8. Slotted Container Box Flaps

- Gap between major flaps on Regular Slotted Containers (RSC) for single wall corrugated containers shall not exceed 3mm [0.12”].
- Gap between major flaps on RSCs for double wall or triple wall corrugated containers shall not exceed 6mm [0.24”].
- Major flaps on RSCs shall not overlap when closed.
- Minor flaps must be tucked into the container.
- Skewing tolerance of box flaps is acceptable up to 6mm [0.24”].

6.5. Palletization

- Pallet overhang is not allowed.
- Boxes shall always be stacked with graphic arrows pointing up.
  - If box caution graphics do not exist, care should be taken to load boxes with the corrugated flutes running in the vertical direction.
- Boxes shall always be column stacked and never be interlocked.
- Whenever possible, boxes shall be placed on the pallet in a manner where box corners are supported by the pallet deck boards.
- During palletization, orient boxes in a manner which allows for as many outer case labels to face the outer edges of the pallet.

6.5.1. Stretch Wrap

Pallet load shall be stretch wrapped per the following methods:

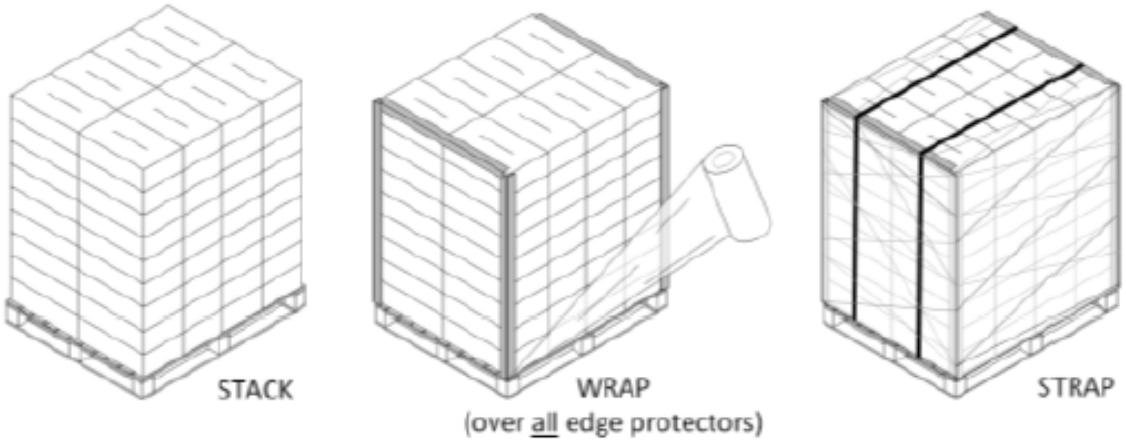
- Tie the leading end of the stretch wrap to a corner block of the pallet.
- Begin to wrap the stretch wrap around the top half of the pallet & bottom layer of the load a minimum of 2 times.
- Start at the bottom of the load, applying the stretch wrap upwards to the top.
- Overlap each layer of wrap over the next one by a minimum of 50mm [2.0”].
- Overlap the edges over the top of the pallet with at least half the width of the stretch wrap.
- Wrap downwards to the bottom of the load.
- Wrap until a minimum of 2 layers of stretch wrap have been applied to the pallet load.
- Once applied, the stretch wrap should be under enough tension that it cannot be pulled away from the pallet more than 100mm [4.0”].

- Stretch wrap shall not be so tight as to cause inward bulging of the loaded boxes.

6.5.3. Banding

- Only plastic banding shall be used for pallet loads.
- 2 total banding straps (in the direction parallel to the deck boards or the length direction on a plywood deck).
- Banding shall be centered in forklift tine openings.

Palletization Process



GLOSSARY

A

A-Flute

One of the undulations of a piece of corrugated fibre material, usually classified as follows:
A-Flute: height including facing = 4.8mm [0.19”], generally spaced about 33 to 39 flutes per 305mm [12”].
(See FLUTE, CORRUGATION)

adhesive

1. (noun) Any material used to adhere one surface to another.
2. A general term including: cement, glue, mucilage, paste, thermoplastic adhesives, etc.

The term *adhesive* may be modified by adjectives which describe: (a) it’s physical state, e.g., *liquid adhesive, tape adhesive,* (b) it’s chemical type, e.g., silicate adhesive, resin adhesive, dextrin adhesive, (c) the materials bonded together, e.g., paper adhesive, label adhesive, (d) the condition of use, e.g., hot-setting adhesive, thermoplastic adhesive, label pick-up adhesive or gum.

1. (adj.) Having the qualities of an adhesive; being sticky, etc.

aqueous coating

Coating materials which contain polymeric components suspended, emulsified, or dissolved, in an aqueous carrier. Volatile portion contains a minimum of 80% by weight water. Environmentally friendly.

artwork

Materials used in preparing a job for printing, including illustration/photography and mechanical/disk.
Electronic: Final designer’s conception of the copy and artwork or design laid out to scale in a page layout software application usually supplied on a disk or FTP.
Color Proof: A pre-press proof made by photomechanical or digital means to check color and imposition before going on press.

assembly

A group of materials, parts, or units, including the container, adhesive, or other fastening devices, which have been brought together to form a single unit.

B

B-Flute

One of the undulations of a piece of corrugated fibre material, usually classified as follows:
B-Flute: height including the facing = 3.2mm [0.13”], generally spaced about 47 to 53 flutes per 305mm [12”].
(See FLUTE, CORRUGATION)

bleed

(verb) To print an area beyond the cut edge or score so that the design is either cut off or, as in the case of a folding carton, the extension of the design is folded under an outside flap, resulting in printed areas that extend completely to the edge of the finished package, label, or wrapper.
(adjective) A term qualifying the type of printing ordered, such as bleed-border, in which the printing is to extend beyond the normal edge obtained by cutting and scoring as in above.

board

A heavy weight thick sheet of paper or other fiber substance from .3mm to .76mm [0.012” to 0.030”] and up. Variations: cardboard (non-specific term), chipboard, fibreboard, paperboard, containerboard, boxboard, tagboard. (See PAPERBOARD)

box

1. A rigid container having closed faces.
2. A complete set-up paper box, including base and lid.

box, corrugated and solid fibre

A rectangular three-dimensional shipping container, made either of solid fibreboard or of corrugated fiberboard. Distinguished from *carton* which is not designed as an outer shipping container.

box, folding paper

A paper box, called a carton in domestic commerce, made of bending grade paperboard, delivered by box manufacturers to the user in a flat or collapsed body-form ready for mechanical or hand set-up and use. Suitable for a package weighing not more than 4.5kg. [10lb.] (as defined in Federal Specifications).
(See CARTON, FOLDING)

boxboard

A general term designating the grades of paperboard used for fabrication of folding and set-up boxes (cartons). Customarily shipped in sheets. Principal types: bending and non-bending.

box maker

1. Fibre box, set-up (rigid) box and folding carton manufacturing establishments which have equipment to print, score, cut, slot, and form fibreboard and paperboard into boxes.

2. A machine for manufacturing boxes from fibreboard blanks.

Bulk Product or Consolidated Single Unit Product Packaging Criteria

Bulk packaging contains a bulk quantity of items not individually labeled for resale. Consolidated single unit product packaging refers to outer cases containing multiple single units which are individually labeled for resale.

C

C-flute

One of the undulations of a piece of corrugated fibre material, classified as follows:
C-flute: height including the facing = 4.4mm [0.17], generally spaced about 39 to 45 flutes per 305mm [12”].
(See FLUTE, CORRUGATION)

caliper

1. Thickness of a material such as paper, film, foil, etc., measured under specific conditions expressed in thousandths of an inch. Thousandths of an inch are sometimes termed “points” or mils.
2. The precision instrument used to measure thickness.

cardboard

Term erroneously used by some as a synonym for paperboard. Not a recognized term in container materials.

carton

Folding boxes generally made from boxboard, for merchandising consumer quantities of products (e.g., shelf packages or prime packages). In domestic commerce, the term *carton* is generally recognized as the acceptable designation for folding paperboard boxes - never for a shipping container - although in Maritime and Export usage the term *carton* refers to a corrugated or solid fibre shipping container. (The term carton conveys several meanings to several people, particularly when incorrectly used to designate a shipping container. Unless it is properly qualified, the term *carton*, standing alone, can lead to misunderstandings.) (See CARTON, FOLDING)

carton, folding

A container made of bending grades of paperboard, plain or printed, cut and creased, in a variety of sizes and shapes, folded and delivered flat, or glued and collapsed. Formed by the maker, and to be set-up, filled and closed by the user. Folding cartons are made in a multitude of styles, a few of which are: tuck-end carton, seal-end carton, reverse tuck, straight tuck, two-piece, display cartons, and many others. A general class of paperboard container, distinct from set-up boxes and corrugated and fibre boxes.

certificate, box maker's	A statement printed on a corrugated fibreboard box or a solid fibreboard box testifying that all applicable construction requirements of the carriers have been observed and identifying and locating the box maker.
chipboard (chip)	A low quality non-test paperboard made of waste paper for use where specified strength or quality is not necessary. May be bending or non-bending, used for corrugated pads or as dividers, or as filler in thicker paperboards. Also used in the manufacture of spiral-wound cans.
"Class A" surface	The front panel of a printed component or as defined on a component specification.
coating	A layer or covering of a substance which has been deposited while in fluid form, and hardened, united with or adhered to the surface of a material or product. Distinct from a layer, ply, or sheet which has been laminated to a base stock.
color control	The measures taken in the steps involved in the production of a printed material to insure matching as well as uniformity of color of the result.
color proof	A pre-press proof made by photomechanical or digital means to check color and imposition before going on press.
color separation	The process of separating color originals into the subtractive primary colors used for printing -cyan, magenta, yellow (and black).
colorfastness	Ability of a pigment in inks, dyes, stains, coatings, and plastics to retain its original hue, chroma, and value under conditions of storage and use. Generally refers to action by light, but when modified, the term may refer to other agents, e.g., colorfastness to alkali, to acid, to ultraviolet light, etc.
compliance	An affirmative indication or judgment that he supplier of a product or service has met the requirements of the relevant specifications, contract or regulation; also a state of meeting the requirements.
consumer unit	Items packaged and labeled for individual resale. May be barcoded with UPC and/or EAN for an individual item.
convert	A physical transformation from one material or state to another. Generally referring to taking a raw material, such as corrugated board, and manufacturing it into a printed container or finished packaging component.

corrugated board

1. A packaging material consisting of a central member (medium) which has been fluted on a corrugator and to which one or two flat sheets of paperboard have been glued to from a single-faced corrugated board or double-faced (single wall) corrugated fibreboard. The combination of two mediums and three facings is called double wall and the combination of three mediums and four facings is called triple wall.
2. Corrugated board is generally made in four flute sizes, designated A, B, C, and E. (See FLUTE)

corrugation

A flute, furrow, ridge, or groove.

corrugator

Machine which takes containerboard from roll stock and combines it into corrugated board.

crease

1. Line or mark made by folding any pliable material, hence a similar mark, however produced.
2. (verb) To form a crease in a sheet of any material, usually for the purpose of providing a bending line. (See SCORE)

cross grain

The direction at right angles to that taken by the majority of fibres in paper or board. The direction at right angles to the direction taken by the web through the paper or board machine.

crossover

Image that continues from one page of a publication across the gutter to the opposite page or an image that continues over separate adjoining seams or folds.

D

defect

A departure of a quality characteristic from its intended level or state that occurs with a severity sufficient to cause an associated product or service not to satisfy intended normal, or reasonably foreseeable, usage requirements.

density

1. Regarding ink, the relative thickness of a layer of printed ink.
2. Regarding color, the relative ability of a color to absorb light reflected from it or block light passing through it.

desiccant

A drying agent used to lower the moisture content of air inside a closed space.

die

1. A form, usually of hard metal, but may be of another suitable material for shaping, cutting, or stamping out parts and blanks, or
2. Of soft rubber or other material for impressing a design into a part or imprinting a design on a surface.
3. The heated metal part used to form plastic melt into films, sheets, rods, tubing filaments, or various shapes.

die-cutting

The cutting of metal, paperboard, plastic or other material by dies. (adj.) Die-cut; having been shaped, cut, blanked, punched (for holes), etc., on a die-cutting operation.

dielectric

A non-conducting substance, i.e. an insulator

dog ears

Excess film material which collects on the edges of a finished shrink wrapped component after the component exits the heat tunnel.

E

E-flute

One of the undulations of a piece of corrugated fibre material, usually classified as follows:
E-flute: height including the facing = 1.6mm [0.06”], generally spaced about 90 to 98 flutes per 305mm [12”], is used mainly in corrugated board for folding cartons. (See FLUTE, CORRUGATION)

F

F-flute

One of the undulations of a piece of corrugated fibre material, usually classified as follows:
F-flute: height including the facing = 0.8mm [0.03”], generally spaced about 128 flutes per 305mm [12”], is used mainly in corrugated board for folding cartons. (See FLUTE, CORRUGATION)

fibreboard

1. Fibre sheets which have been produced or laminated to a thickness which provides a degree of stiffness. Fibreboard used for container production may be corrugated board; or solid board, the thickness of which are most commonly 1.5mm, 2.0mm, 2.5mm, 3.0mm or 3.6mm [0.060”, 0.080”, 0.100”, 0.120”, or 0.140”].
2. A generic name applied to many products made of fibreboard. (See CORRUGATED BOARD)

fish eyes

Un dissolved particles in coating composition or ink. (See HICKEY)

flexography — A method of printing using raised type or plates made of rubber or plastic. The ink is transferred directly from the raised type or plate to the substrate.

flood — To cover a sheet with ink or varnish.

flute, corrugation — One of the undulations of a piece of corrugated fibreboard. Classified by the number of undulations or wave shapes per linear foot and approximate height not including thickness of facings or linerboard.
A-flute - 33 to 39 flutes per 305mm [12”]; 4.8mm [0.19”]
B-flute - 47 to 53 flutes per 305mm [12”]; 2.3mm [0.09”]
C-flute - 39 to 45 flutes per 305mm [12”]; 3.6mm [0.09”]
E-flute - 90 to 98 flutes per 305mm [12”]; 1.2mm [0.05”]
F-flute - 124 to 132 flutes per 305mm [12”]; 0.74mm [0.03”]

folder-gluer — A machine for folding a scored and slotted corrugated single sheet (blank box) and completing the manufacturer’s joint by gluing it.

folding paper box — (See CARTON, FOLDING)

4-color process — Technique of printing that uses the four process colors of ink (cyan, magenta, yellow, black) to simulate color photographs or illustrations.

G

ghosting — The appearance of unwanted images, usually only faintly discernible, in areas of solid printed ink coverage.

glitches — Spots or imperfections in printing.

gloss — The degree to which the quality of the reflectance of a surface approaches that of a perfect mirror. Opposed to dull or matte finish.

glue joint — The part of a fabricated product which comprises the adhesive and the adhered parts in contact therewith.

grain — The arrangement or direction of fibres in a fibrous material, such as paper or wood, or the direction or molecular orientation in a non-fibrous material.

grain direction — The direction parallel to the grain in paper. When pulp is started through a paper machine, the fibres tend to settle in a direction parallel to the motion of the machine. This grain

	direction or machine direction of paper or paperboard is an important strength factor in container design. There is greater tearing strength across the grain than with it. There is greater tensile strength in the grain direction
graphics	Art or other visual elements used to make messages more clear.
H	
hickey	Donut-shaped spot or imperfection in printing, most visible in jobs with heavy solid ink coverage.
Humidity Indicator Card	A card containing chemically impregnated, humidity sensitive, color changing spots used to detect the approximate relative humidity of air.
I	
impression	One pressing of paper against type, plate, blanket, or die to transfer an image.
imprint	To add additional copy on a previously printed sheet.
J	(None)
K	
kraft	A chemical wood pulp made by the sulphate process, or paper or paperboard made from such pulp. It is brown in color and is the strongest pulp product made from wood. (*Kraft* is the German wood for *strong*.) Kraft paper and paperboard are used extensively for wrapping paper, gummed tape, fibreboard boxes, and bags.
L	
logo	Assembly of type and art into a distinctive symbol unique to an organization, business, or product.
M	
material assembly instructions (MAI)	Product specific instructions utilized at the manufacturing site to: 1. Outline the process steps necessary to assemble packaging materials.

2. Outline the process steps necessary to package product into the finished goods packaging solution and prepare it for transportation.

make-ready Activities required to set up a press before production begins. Also refers to the paper used in the process. This is where a press check occurs to correct any printing errors or colors.

mechanical drawing Detailed CAD drawing for the design and physical from factor of a box or carton, designed by a packaging engineer. This is the drawing that is used to create the dies that will score and cut the finished box and is used by the graphic artist as a master to create artwork for printing.

Moisture Barrier Bag A bag or pouch used to provide a dry environment for moisture sensitive items during shipping and storage.

N

nonconformity A departure of a quality characteristic from its intended level or state that occurs with a severity sufficient to cause an associated product or service not to meet a specification requirement.

O

offset printing Printing technique that transfers ink from a plate to a blanket to paper instead of directly from a plate to paper.

overpack An outer container usually made of steel, wood, or fibreboard designed to enclose and protect one or more less durable inner containers.

P

package engineering The activity whereby scientific and engineering principles are applied to solving the problem of functional design, formation, filling, closing, and/or preparation for shipment of containers regardless of type or kind, or the product enclosed therein.

packaging Packaging is the enclosure of products, items or packages in a wrap, pouch, bag, box, cup, tray, can, bottle or other container form to perform one or more of the following major functions:

1. Containment for handling, transportation and use.
2. Preservation and protection of the contents from hazards in the external environment.

3. Identification of contents, quantity, quality, and manufacturer - usually by means of printing, decoration, labeling, package shape or transparency.
4. Facilitate dispensing and use, including ease of opening, re-closure (if required), portioning, application, unit-of-use, multi-packs, safety, second use or re-use and working features such as are found in aerosol sprays, cook-in-bag, “memory packs”, and especially provision for instructions or directions.

If the device or container performs one or more of these functions, it is considered a package.

Packaging is also the development and production of packages (filling, closing, labeling), by trained professionals or operators employing methods and equipment designed for specific product lines and types of packages.

packaging, distribution

Refers to integrated package and product handling from factory to point of sale. Although consumer or shelf packaging is part of the product distribution cycle, it is usually understood that distribution packaging means the outer and/or intermediate container which is required for efficient transportation and storage.

Pantone Matching System (PMS)

A series of standard colors commonly used by package designers, printers, and manufacturers. A check standard trademark for color reproduction and color reproduction materials owned by Pantone, Inc. Alternative color standards are used in different geographies (e.g., Toyo* is used popularly in Japan).

perforations

1. Holes or slots made by boring, piercing or stamping.
2. Holes resulting from action of acid or other deteriorating factor on metal or other material.

performance specification

A specification incorporating certain mechanical tests or measurable criteria performed either in a laboratory or in field trials, which may be used to determine the suitability of a container for shipping certain materials under ordinary anticipated hazards and conditions of use.

phytosanitary

Practices to prevent importation of pests and diseases harmful to plants; especially from pests requiring quarantine.

picking

Undesirable phenomenon of bits of fibre or coating coming loose from paper during printing.

pin holes Tiny holes in the emulsion of negatives or printing plates.

press check Event in which test press sheets are examined as part of make-ready before product run is authorized to begin. Sheets are examined for correct color, registration, hickeys, picking, glitches, dirt, smudges, ghosting, streaks, correct paperboard, etc., and a final sheet is signed as an authorization or approval to complete the print run as well as be used as a master for subsequent printing acceptance.

primary packaging The material that first envelops the product and holds it. This usually is the smallest unit of distribution or use and is the package which is in direct contact with the contents.

printing, flexographic A method of rotary letterpress printing that employs flexible rubber or plastic plates and rapid drying inks. Extensively used in the printing of corrugated packaging materials and distribution boxes.

process colors The colors needed for 4-color process printing: cyan, magenta, yellow, and black.

process inks Translucent inks in the four process colors.

process printing Alternative term for *4-color process printing*.

proof Test sheet made to reveal errors or flaws, predict results, and record how a printing job is intended to appear.

Q

quality assurance (QA) Planned or systematic actions necessary to provide adequate confidence that a product or service will satisfy given needs.

quality control (QC) The operational techniques and the activities which sustain a quality of product or service that will satisfy given needs; also the use of such techniques and activities.

R

registration

1. To have one part positioned accurately with respect to another. In multicolor printing, to have each impression in the correct position to ensure that, in each successive pass through the press, the ink deposits in the correct position on the material being printed. In package printing, refers to accuracy of imposition to secure correct alignment of color-to-color areas, or of design-to-scores shown on the die-sheet,

	or the correct placement of the design on the printed areas or items. 2. In overwrapping operations, the placing of the design in proper relation to the package faces.
reject	A material or part which has been rejected for its intended purpose because of defects or imperfections.
roll end tuck front (RETF)	A style of die-cut carton that does not require tape or glue for assembly and closure but can be taped for security.
roll end tuck top (RETT)	A style of die-cut carton that does not require tape or glue for assembly and closure but can be taped for security.
rights	Conditions and terms of licensing agreement between copyright owner and client. Usually refers to artwork or photographic usage rights when designed into packaging.
roll label	Label supplied in roll form.
S	
secondary packaging	Packaging used outside of the primary packaging, usually used to group primary packages together.
separation	Alternate term for color separation. (See COLOR SEPARATION)
score	1. (verb) To make an impression or a partial cut in a flat material for the purpose of facilitating bending, creasing, folding, or tearing. 2. (noun) In a folding carton, two types of scores are used: (a) folding score in which the fibres are compressed but not cut, to insure that a fold or bend takes place on the score line; (b) tearing score in which the fibres are cut approximately halfway through the board to permit tearing along the score line. 3. In set-up paper boxes, scores are cut half through the board but corners are usually reinforced by gummed paper stays.
score crack	A break in the outer board surface of a folding carton over a folded or unfolded score.
single unit package	Single unit packaging is designated as any product or kit that ships individually. A single unit could be either a trade or consumer unit item.

sleeve, box	A folded and glued boxboard blank having only four panels and open ends. A tray or inner box may be inserted from either end to form a box.
specifications, printing	Complete and precise descriptions of paper or board, ink, binding quantity, and other features of a printing job.
standard tuck end (STE)	A style of die-cut carton that has a glue seam and two tuck style ends that does not require tape or glue for assembly but can be taped for security.
stock, paper	Unconverted paper, board, or other substrate.

T

tensile Strength	The maximum load that a material can support without fracture when being stretched, divided by the original cross-sectional area of the material.
tertiary packaging	Packaging used for bulk handling, warehouse storage and transport shipping. The most common form is a palletized unit load.
test, drop	A rough-handling test consisting of dropping a filled container in certain standard ways (i.e., on corners, edges, faces, etc.) on a solid surface. The drop test measures how well a container and its inner packaging (if any) will protect the contents against the handling encountered in shipping.
test, vibration	A test for resonant responses of a packaged item or a packaging material or for determining the ability of a container to protect its contents against vibration.
thermoforming	A process of forming thermoplastic sheet which consists of heating the sheet and forcing it into or over a mold by vacuum or mechanical or air pressure. Used to produce blisters, skin packs and thin wall cups, trays, platforms, and other sheet formed containers or components. The term is an overall designation for vacuum forming, pressure forming and combinations of these.
thermoplastic	A plastic that will repeatedly soften when heated and harden when cooled. Typical packaging thermoplastics are polystyrene, polyethylene, acrylic, vinyl, and nylon.
top liner	The surface of the paperboard which forms the exterior of a paperboard box, i.e., the outside liner.

trade item	A container used to consolidate and transport a predefined number of consumer units. The label on the outside of the trade item should indicate the product inside is labeled for individual resale.
trapping	To print one ink over another or to print a coating, such as varnish, over an ink. The first liquid traps the second liquid.
Triboelectric effect	A type of contact electrification in which certain materials become electrically charged after they come into contact with another different material and are then separated (such as through rubbing).
tuck	The end portions of the top, bottom, or side flaps of a folding paper box (carton) which are inserted inside the container to hold the end (top, bottom, or side) flaps in place. Various types of cuts and shapes of tuck ends have been developed to hold flaps, the most common being a pair of notches at the fold which engage the side flaps and hold the end flaps in place.
U	
	(None)
V	
varnish	Clear liquid applied like ink on press for beauty and protection. Varnish is usually applied during the same press run as the 4-color process, but may be applied dry after printing (dry trap) to achieve higher gloss.
W	
water-based coatings	Coating materials which contain polymeric components suspended, emulsified, or dissolved, in an aqueous carrier. Volatile portion contains a minimum of 80% by weight water. Environmentally friendly.
Water Vapor Transmission	The rate at which water vapor passes through a given material. This material property is usually measured in grams of water vapor passed per 100 square inches of surface area in 24 hours.

COMMON ACRONYMS USED IN THIS DOCUMENT

ANSI	American National Standards Institute - www.ansi.org
ASTM	American Society for Testing and Materials - www.astm.org
BMC	Box Makers Certificate
BOM	Bill Of Material
CD	Compact Disk
CEN	Comite' Europe'en de Normalisation (European Committee for Standardization) - www.cen.eu
ECT	Edge Crush Test
ePDM	Electronic Product Data Management
ESD	Electro-Static Discharge
FAI	First Article Inspection
FG	Finished Goods
ISPM	International Phytosanitary Measure
MBB	Moisture Barrier Bag
PPM	Parts Per Million
REACH	European Unions Registration, Evaluation and Authorization of Chemicals – www.reach-compliance.eu
RSC	Regular Slotted Container