

QUALITY POLICY

Through continuous improvement, we educate and empower our coworkers to identify and prevent Non-Conformance, with a goal of zero defects. We promise to deliver effective solutions which are consistently accurate and on-time.

THE NEED FOR QUALITY CONTROL

Although quality assurance systems of the The BoxMaker, Inc. are becoming increasingly more efficient using innovative technologies, such as camera detection systems, there will always be room for improvement. Packaging and display equipment is largely engineered for speed and uptime, and combined with the nature of our materials, there is some level of variance in virtually every production batch. The goal is to create products that are within acceptable tolerances, with a low level of variance, and keep costs acceptable for clients.

ACCEPTABLE QUALITY LIMIT (AQL)

Acceptable Quality Limit (AQL) is a standardized quality control procedure used by buyers, suppliers, and 3PLs, to ensure products meet the agreed upon quality standards. The AQL procedure is defined by the International Organization for Standardization in [ISO 2959-1](#). This will provide a quick guide to run the process. By selecting, at random, a statistically significant subset of units within a larger lot, we can quickly determine the quality of the entire lot. Inspections levels are separated into two categories: General and Special.

General Inspections levels (GI-GII) and Special Inspection levels (S1-S4) indicate the size of the inspected sample batch. This determines the number of defects allowed based on product specific criteria and tolerances. Special inspection calls for smaller sample sizes, with S4 being the most rigorous. Level S4 is ideal for the quality control demands of packaging. It allows for enough samples to be inspected without delaying production.

SAMPLING PLAN

| ACCEPTABLE QUALITY LIMITS | | | | |
|---------------------------|--------------|-----------------------------|-----------------------------|----------|
| Total pieces in lot | Sample Batch | Max pieces w/ minor defects | Max pieces w/ major defects | Critical |
| 2-8 | 2 | 0 | 0 | 0 |
| 9-15 | 2 | 0 | 0 | 0 |
| 16-25 | 3 | 0 | 0 | 0 |
| 26-50 | 5 | 0 | 0 | 0 |
| 51-90 | 5 | 0 | 0 | 0 |
| 91-150 | 8 | 0 | 0 | 0 |
| 151-280 | 13 | 1 | 0 | 0 |
| 281-500 | 13 | 1 | 0 | 0 |
| 501-1200 | 20 | 1 | 0 | 0 |
| 1,200-3,200 | 32 | 2 | 1 | 0 |
| 3,201-10,000 | 32 | 2 | 1 | 0 |
| 10,001-35,000 | 50 | 3 | 2 | 0 |
| 35,001-150,000 | 80 | 5 | 4 | 0 |
| 150,001-500,000 | 80 | 5 | 4 | 0 |
| 500,001-1,000,000 | 125 | 7 | 6 | 0 |




The total number of pieces in a lot, or production run, will determine the number of samples needed for inspection. These samples should be chosen at random, preferably from the top, middle, and bottom of multiple pallets or bundles. Avoid picking from the top for all to get a true representation of the entire lot.

Based on the type of packaging being inspected, utilize the Quality Inspection Criteria outlined below for a list of defects and the tolerances permitted. Examine each of the items in the sample batch and take note of any imperfections, including the severity. Determine the number of defective pieces. If the number of pieces with minor, major, or critical defects is below the maximum of what is acceptable (per the preceding table) for the lot, it passes inspection. Report any quality issues promptly and include photos of the defective product so it can be reviewed by The BoxMaker, Inc. quality team and begin the root cause investigation process.

If the standardized tolerances for the items requiring inspection are not listed, please reach out to The BoxMaker, Inc. Quality Management or assigned Client Services Representative.

QUALITY INSPECTION CRITERIA

| CORRUGATED | | | | |
|--|---|--|--|---|
| MATERIAL | | | | |
| Item | Optimum | Minor | Major | Critical |
| Texture Consistency | Not visible at 18" in non-reflective light | Visible at 20" in non-reflective light | Visible at 22" in non-reflective light | Visible at 24" in non-reflective light |
| Paper Tear | 1/4" | 3/8" | 1/2" | >1" |
| Delamination | None | - | - | Present |
| Caliper Incoming (No more than +.010" of expected caliper off corrugator) | C-flute: <.005" crush of expected caliper off corrugator | - | - | C-flute: >.005" crush of expected caliper off corrugator |
| | B-flute: <.004" of crush expected caliper off corrugator | | | B-flute: >.004" crush of expected caliper off corrugator |
| | E-Flute: <.003" crush of expected caliper off corrugator | | | E-Flute: >.003" crush of expected caliper off corrugator |
| Caliper Outgoing | <.003" crush of incoming caliper | .005" crush of incoming caliper | >.005" crush of incoming caliper | C-flute: >.01" crush of nominal caliper |
| | | | | B-flute: >.009" crush of nominal caliper |
| | | | | E-Flute: >.008" crush of nominal caliper |
| Warp | Digital: <1/8" for every 12" | Digital: >1/8" for every 12" | Digital: >1/4" for every 12" | Digital: >1/2" for every 12" |
| | D/C: <1/4" for every 12" | D/C: >1/4" for every 12" | D/C: >3/8" for every 12" | D/C: >1/2" for every 12" |
| Sheet Dimensions (W x L) | Matches specification | ±1/16" of spec | ±1/8" of spec | >1/8" of spec |

| COATING | | | | |
|---|--|---|--|--|
| Item | Optimum | Minor | Major | Critical |
| Coating Distribution | Evenly Coated | - | - | Unevenly Coated |
| Cracking | None | - | - | Present |
| Blistering | None | - | - | Present |
| Speckling | None | - | - | Present |
| Dimpling | None | - | - | Present |
| CUTTING/SCORING | | | | |
| Item | Optimum | Minor | Major | Critical |
| Print-to-Cut Registration Single Operation | 1/16" | - | - | >1/16" |
| Print-to-Cut Registration Multiple Operations | 1/8" | - | - | >1/8" |
| Score Placement <i>Includes Slit-Score</i> | Matches Specifications | ±1/16" score-to-score | - | >±1/16" score-to-score |
| | | ±1/8" overall | | >±1/8" overall |
| Slit-Score Depth | Cuts through all liners and medium except the last liner | | | All liners and mediums cut through, including the last liner |
| | Folds 180° without resistance or tearing through | | | Resistance when folding 180° and tears present |
| Score Line Cracking | 1/4" | - | - | >1/4" |
| Rough Edges | None | - | - | Present |
| Burn/Staining <i>(Laser Cut Only)</i> | None |  Light yellowing which is <1/8" from the edge |  Darker yellow/orange >1/8" from the edge |  Dark brown or black >1/8" from the edge |
| | | No more than 25% of an individual cut line <1" | Between 25-50% of cut line. | >50% of individual cut line |
| SLOTTING | | | | |
| Item | Optimum | Minor | Major | Critical |
| Slot Depth | Flush with flap Score | 1/8" above or below flap score | >1/8" above or below flap score | >1/4" above or below flap score |
| Slot-to-Panel Score | Centered on Panel score | <1/16" left or right of center to panel score | 1/8" left or right of center to panel score | >1/8" left or right of center to panel score |
| Slot Width at MFG Joint | Matches Adjacent Slots | C-flute: ± 3/16" from target gap | - | C-flute: > ± 3/16" from target gap |

| | | | | |
|---------------------------------|--|--|---|---|
| | No gap <1/16" | B-flute: $\pm 1/8$ " from target gap E-Flute: $\pm 1/16$ " target gap | - | B-flute: $> \pm 1/8$ " from target gap E-Flute: $> \pm 1/16$ " from target gap |
| GLUING | | | | |
| Item | Optimum | Minor | Major | Critical |
| Glue Tab Coverage | Adhesive covers entire length of glue tab | -1/8" from top/btm ends of glue tab | >1/8" from top/btm ends of glue tab | >1/4" from top/btm ends of glue tab |
| | Adhesive centered on glue tab | $\pm 1/8$ " of center w/ no adhesive exposed | > $\pm 1/8$ " of center w/ adhesive exposed | > $\pm 1/4$ " of center w/ adhesive exposed |
| Excess Glue | None | - | - | Present |
| Fiber Tear | >90% fiber tear when pulled apart at mfg joint | | | <90% fiber tear when pulled apart at mfg joint |
| | Resistance when separating the outside panel from the glue tab | - | - | No resistance when separating the outside panel from the glue tab |
| DOUBLE SIDED TAPE | | | | |
| Item | Optimum | Minor | Major | Critical |
| Bonding | Firm bond w/ no lifting after application | - | - | Lifting present after application |
| Tape Placement | $\pm 1/16$ " from CAD drawing | $\pm 1/8$ " from CAD drawing | $\pm 3/16$ " from CAD drawing | $\pm 1/4$ " from CAD drawing |
| | 1/4" from edge if die cut | 3/8" from the edge if die cut | 3/16" from the edge if die cut | <3/16" from the edge if die cut |
| FOLDING | | | | |
| Item | Optimum | Minor | Major | Critical |
| Uniformity | Folds square | - | - | Does not fold square |
| Flap Closure | <1/4" spacing | | | >1/4" spacing |
| Skew (Fishtailing) | No overlap of flaps | Difference between top and bottom gap $\pm 1/8$ " | | Difference between top and bottom gap $> \pm 1/8$ " |
| | Flap edges even with opposite flaps | Misalignment of flap edges $\pm 1/8$ " | | Flaps overlap |
| PRINTING (FLEXOGRAPHY) | | | | |
| Item | Optimum | Minor | Major | Critical |
| Print Plate Registration | 1/16" | 1/8" | 1/4" | >1/4" |
| Ink Color Accuracy | 2.0 Delta E | 2.4 Delta E | 3.2 Delta E | >4.0 Delta E |
| Print Clarity | Clean | | | Dirty Edges |
| | Crisp | | | Spotty |
| | Legible from a distance of 18" | - | - | Illegible from a distance of 18" |

| | | | | |
|--|---|---|---------------------------------------|---|
| Print Coverage | No paper show through | - | - | Paper shows through |
| Text Size | Matches Proof | - | - | Does not match proof |
| Trapping | ±1/8" | ±3/16" | ±1/4" | >1/4" |
| Ghosting | Not Present | - | - | Present |
| Color Consistency | Matches Proof | - | - | Does not match proof |
| Stray marks within 1" of logo | 1/16" diameter | 1/8" diameter | ¼" diameter | >1/4" diameter |
| Stray marks outside of logo | 1/16" diameter | 1/8" diameter | ¼" diameter | >1/4" diameter |
| Ink Rubbing | ½" length | - | - | >1/2" length |
| Ink pH @ Press | 9.0-9.5 | - | - | <8.8 >9.8 |
| Ink Viscosity @ Press | 21-23 seconds | 19-20 seconds 24-25 seconds | - | <19 seconds >26 seconds |
| PRINTING (DIGITAL) | | | | |
| Item | Optimum | Minor | Major | Critical |
| Color Accuracy | 2.0 Delta E | 2.2 Delta E | 2.4 Delta E | >2.5 Delta E |
| Graphic Element Bleed | ¼" on dust & glue flaps; 1/8" min elsewhere | - | - | >1/4" on dust & glue flaps; >1/8" elsewhere |
| Ghosting | Not Present | - | - | Present |
| Streaking outside of logo | None | <1/32"x1/4" <8 on entire box | - | >1/32"x1/4" >8 on entire box |
| Streaking within 1" of logo | None | <1/32"x3/16" | - | >1/32"x3/16" |
| Burnish | None | Visible at 18" | Visible at 22" | Visible at 24" |
| Spots within 1" of logo | None | <1/32"x3/16" | - | >1/32"x3/16" |
| Spots outside of logo | None | <1/16" diameter <8 on entire box | - | >1/6" diameter >8 on entire box |
| QR & Barcodes (Standard RF Scanner) | Scannable | - | - | Not Scannable |
| Rub/Abrasion Test | No ink transfer | - | - | Ink transfer present |
| Rub Marks | None | <1/2" in length <4 on entire box | - | >1/2" in length >4 on entire box |
| Scuff Marks | None | <1/8"x1/8" <1/32" white edge on flap | 1/8"x1/8" 1/16" white edge on flap | >1/8"x1/8" >1/8" white edge on flap |

Note: It should be clearly understood that the method of producing non-production samples and first articles is very gentle and has no relationship to what will happen in production.

| PRESSURE SENSITIVE LABELS | | | | |
|---------------------------|----------------|-------------|-------------|----------------------|
| MATERIAL | | | | |
| Item | Optimum | Minor | Major | Critical |
| Material Grade | Matches Spec | - | - | Does not match spec |
| Laminate | Matches Spec | - | - | Does not match spec |
| | No air bubbles | | | Air bubbles present |
| CUTTING | | | | |
| Item | Optimum | Minor | Major | Critical |
| Print-to-Cut Registration | ±1/64" | ±1/32" | ±1/16" | >±1/16" |
| PRINTING | | | | |
| Item | Optimum | Minor | Major | Critical |
| Graphic Content | Matches Proof | - | - | Does not match proof |
| Color Accuracy | 2.0 Delta E | 2.2 Delta E | 2.4 Delta E | >2.5 Delta E |

Note: It should be clearly understood that The BoxMaker, Inc. is a label converter, not a label manufacturer. Issues encountered with adhesive should be communicated so they can be addressed with the vendor.

| FOAM PACKAGING | | | | |
|-------------------------------|-----------------------------|-------|--------|--------------------------|
| MATERIAL | | | | |
| Item | Optimum | Minor | Major | Critical |
| Foam Type | Matches spec | - | - | Does not match spec |
| CUTTING & ASSEMBLY | | | | |
| Item | Optimum | Minor | Major | Critical |
| Length | <±1/8" | ±1/8" | >±1/8" | >±1/4" |
| Width | <±1/8" | ±1/8" | >±1/8" | >±1/4" |
| Thickness | <±1/8" | ±1/8" | >±1/8" | >±1/4" |
| Assembled Parts | Matches spec | - | - | Does not match spec |
| | <±1/8" per layer | | | >±1/8" per layer |
| CONVERTED TAPES AND ADHESIVES | | | | |
| MATERIAL | | | | |
| Item | Optimum | Minor | Major | Critical |
| Slitting | <±1/16" | ±1/8" | >±1/8" | >±3/16" |
| Cut Quality | No frays or strings present | - | - | Frays or strings present |

PALLETIZING

The BoxMaker Inc. makes every effort to ship all product in a way that will prevent damage before, during, and after transit. The type of product, in addition to the manufacturing location, will determine how items are palletized for shipment to ensure these efforts are upheld. Unless special requirements are requested, the below standards will be followed. Special palletizing requirements should be requested at the quoting stage of the ordering process.

Approved Pallets:

- ✓ 48 x 40" GMA Grade A or B style four-way hardwood
- ✓ 48 x 40" Block Platform Pallet (Kent, WA-High Graphics Packaging Specific)
- ✓ No Broken Pallets

Standard Corrugated-Kent, WA

- ✓ Clean, undamaged, unprinted Kraft dunnage/slip sheet on top and bottom
- ✓ Dunnage should cover all four sides (2-6" minimum) for multiple stack bundles and utilize a 2x2 (4-way) strapping pattern (Figure 1 & 2)
- ✓ Dunnage should cover two side sides (2-6" minimum) for single stack bundles and utilize a minimum 2x0 strapping pattern (Figure 3)
- ✓ Strapping with proper tension tight enough to hold bundle together, yet not cut into product
- ✓ May ship without a pallet unless otherwise specified
- ✓ May ship without stretch wrap unless otherwise specified



High Graphics Packaging

OPL-156-TBM-Palletizing Digitally Printed Product (Figure 4)

OPL-175-TBM-Additional Approved Palletizing (Figure 5)

- ✓ Protective sheet or tray under product
- ✓ Protection on all four corners
- ✓ Stretch-wrapped and/or banded to the pallet

