(800) 443-5431
BoxMaker.com

ACCEPTABLE QUALITY LIMITS & INSPECTION CRITERIA

VERSION 3-DEC 27,2023

CORPORATE OFFICE
6230 S 190th St, Kent, WA 98032

SEATTLE OFFICE
6412 S 190th St, Kent, WA 98032

TABLE OF CONTENTS

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
1,201-3,200	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 Criteria is an internal recommendation only & is not recognized by our sheet vendors]*	**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 ***Includes Slit-Score***	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 ***(Laser Cut Only)***	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: ± 1/8” from target gap	-	B-flute: > ± 1/8” from target gap

		E-Flute: ± 1/16" target gap		E-Flute: > ± 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	±1/8" of center w/ no adhesive exposed	>±1/8" of center w/ adhesive exposed	>±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	±1/16" from CAD drawing	±1/8" from CAD drawing	±3/16" from CAD drawing	±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 ±1/8"		Difference between top and bottom gap >±1/8"
	Flap edges even with opposite flaps	Misalignment of flap edges ±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	-	<19 seconds
		24-25 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"	-	>1/32"x1/4"
		<8 on entire box		>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	-	>1/6" diameter
		<8 on entire box		>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	-	>1/2" in length
		<4 on entire box		>4 on entire box
Scuff Marks	None	<1/8"x1/8"	1/8"x1/8"	>1/8"x1/8"
		<1/32" white edge on flap	1/16" white edge on flap	>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

EXPIRATIONS

The BoxMaker Inc. converts many packaging materials that are comprised of a combination of substances. Some of these have a recommended shelf life, which can affect the quality of the product. Below are the recommended use periods and expirations for the packaging materials we supply.

Corrugated

There is no standard that requires the inclusion of an expiration date on corrugated packaging. When stored away from the elements, kept dry and away from extreme heat and cold, they can last for up to two years with no issues.

Things that can diminish the timeframe of use are:

- ✓ Stacking too much weight on the product
- ✓ Fluctuations in humidity
- ✓ Storing in direct sunlight
- ✓ Allowing the product to get wet

Labels

The paper used within the labels themselves does not have a standard expiration, however, the adhesive and varnish used on the labels has a recommended use period for optimal performance. The BoxMaker Inc. uses label stock on average within 90 days of receiving from the vendor as it is ordered in bulk. Custom material is converted immediately after receiving from the vendor.

- ✓ **Removable Adhesive**—Recommended use within 8 months of manufacturing
- ✓ **Permanent Adhesive**—Recommended use within 1 year of manufacturing
- ✓ **Printable Varnish**—Recommended use within 1 year of manufacturing

If a converted label from stock is not used within a few months of receiving from The BoxMaker Inc. there is a chance it may exceed its recommended shelf life.

Foam

- ✓ **Polyurethane:** Foam will oxidize when exposed to open air and turn a yellowish tint after an estimated period of six months. While this affects the appearance, it does not affect the integrity or performance of the product.
- ✓ **Polyethylene:** Over time the foam will start to lose thickness, however, the overall performance is not affected. Storing in adequate conditions and avoiding additional weight on the foam will help prolong it.

Tape

Tape products do not typically include an expiration date. When stored properly, tape can be used for up to two years with no issues. Below are the recommended storage requirements for maximum use and performance.

- ✓ Store in original cartons
- ✓ Keep away from extreme cold; recommended temp of 70 degrees Fahrenheit
- ✓ Recommended 50% relative humidity

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


Figure 1


Figure 2


Figure 3

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


Figure 4


Figure 5

RETURN POLICY

We strive to get everything about your order correct the first time around. In the unlikely event you receive a damaged or defective product, we will promptly send you a replacement or issue you a full refund upon return of the damaged or defective product. We do not charge any additional shipping or handling fees for replacement shipments.

Stock merchandise must be returned to our warehouse in 100% saleable condition to qualify for a refund and is subject to a 20% re-stocking fee. Custom products are not returnable. We accept returns within 30 days of receipt of goods. Anything outside of that timeframe is subject to review.

If product does not meet Acceptable Quality Limits, The BoxMaker will request the product be returned for credit as a standard practice. Product shipped to a non-local client will be evaluated for cost to return.

Credit Limits

The BoxMaker reserves the right to deny credit should defects meet one of the following criteria:

- ✓ Defect is <5% of the qty shipped—Standard Brown Box
- ✓ Defect is <3% of the qty shipped—High Graphics Print
- ✓ Defect is less than $50 in credit value

Return Requirements

For a return and/or credit to be processed, the following must be provided:

- ✓ Order/PO number and item description
- ✓ Estimated qty affected
- ✓ Detailed pictures of the issue
  - Dimension issues should have pictures with tape measurements included
- ✓ **Picture of the core label (Labels Only)**

Lost or Missing Product & Damage Discrepancies

- ✓ ***Lost or Missing*** product must be communicated at time of delivery and noted on the Delivery Receipt. We reserve the right to deny credit for missing product claims in the event we have a signed DR and the claims are not noted.
- ✓ ***Damage*** to units/pallets should be communicated at time of delivery and noted on the Delivery Receipt. There is a two-week grace period to communicate any damage that is not immediately noticed. Damage noted after opening a unit will be reviewed for return and/or credit.

Document History		
Document Creation	4/21/2023	Version 1
Additional notes and typo fixes	5/03/2023	Version 2
Addition of Return Policy & Expirations Sections	12/11/2023	Version 3