

(800) 443-5431 BoxMaker.com

ACCEPTABLE QUALITY LIMITS & INSPECTION CRITERIA

VERSION 4-AUG 21, 2024

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

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



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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 <u>ISO 2959-1</u>. 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.

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		

SAMPLING PLAN



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.

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	
	Outside: <1/4"	-	-	Outside: >1/4" (Requires internal Quality Rep. Approval)	
Paper Tear / Score Cracking	Inside: <1/4"	-	-	Inside: >1/4" & >3% of production order (Requires internal Quality Rep. Approval)	
Delamination	None	-	-	Present	
Caliper Incoming (No more than +.010" of expected caliper off corrugator)	C-flute: <.005" crush of expected caliper off corrugator B-flute: <.004" of crush expected caliper off corrugator E-Flute: <.003" crush of expected	-	-	C-flute: >.005" crush of expected caliper off corrugator B-flute: >.004" crush of expected caliper off corrugator E-Flute: >.003" crush of expected caliper off	
	caliper off corrugator			corrugator	
Caliper Outgoing	<.003" crush of	.005" crush of	>.005" crush of	C-flute: >.01" crush of nominal caliper	
	incoming caliper	incoming caliper	incoming caliper	B-flute: >.009" crush of nominal caliper	

QUALITY INSPECTION CRITERIA



				E-Flute: >.008" crush of nominal caliper
	Digital: <1/8" for	Digital: >1/8" for	Digital: >1/4" for	Digital: >1/2" for every
Warn	every 12"	every 12″	every 12″	12″
[Digital Criteria is an		D/C: 1/4" for every 12"		D/C: >1/4" for every 12"
internal		>100 sheets -or-	-	>100 sheets -or- entire
recommendation only &	D/C: <1/4" for	entire order qty		order qty
is not recognized by our	every 12	<90 days old		<90 days old
sheet vehaorsj		ALL THREE CRITER	IA MUST BE MET BEFO	RE REQUESTING CREDIT
			FROM VENDOR	
Sheet Dimensions (W x	Matches	+1/16" of spec	+1/8" of spec	>1/8" of spec
L)	specification	11/10 01 5000	170 01 spec	× 170 01 3pee
Material rejects that do n	ot meet optimum cri	teria may require addit	tional review and/or so	rting. Receiving should
perform visual checks up	on unloading and veri	ify to the above criteria	a in the event somethin	g looks off. Sheet orders
should be evaluated on a	case by case basis for	r usable quantities befo	ore contacting the vend	lor.
-		COATING		
Item	Optimum	Minor	Major	Critical
Coating Distribution	Evenly Coated	-	-	Unevenly Coated
Cracking (In Coating)	None	-	-	Present
Burnish	None	No criteria for Burnis	h. Not recognized by ve Requires approval if pre	ndors as a creditable issue. esent.
Blistering	None	-	-	Present
Speckling	None	-	-	Present
Dimpling	None	-	-	Present
		CUTTING/SCORING		
Item	Optimum	Minor	Major	Critical
Print-to-Cut				
Registration Single				
	1/16"	-	-	>1/16"
Operation	1/16"	-	-	>1/16"
Operation Print-to-Cut	1/16″	-	-	>1/16"
Operation Print-to-Cut Registration Multiple	1/16"	-	-	>1/16"
Operation Print-to-Cut Registration Multiple Operations	1/16"	-	-	>1/16"
Operation Print-to-Cut Registration Multiple Operations	1/16"	- - ±1/16″ score-to-	-	>1/16"
Operation Print-to-Cut Registration Multiple Operations Score Placement	1/16" 1/8" Matches	- - ±1/16" score-to- score	-	>1/16" >1/8" >±1/16" score-to-score
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score	1/16" 1/8" Matches Specifications	- - ±1/16" score-to- score ±1/8" overall	-	>1/16" >1/8" >1/8" >±1/16" score-to-score >±1/8" overall
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score	1/16" 1/8" Matches Specifications Cuts through all	- - ±1/16" score-to- score ±1/8" overall	- - -	>1/16" >1/8" >1/8" >±1/16" score-to-score >±1/8" overall
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score	1/16" 1/8" Matches Specifications Cuts through all liners and medium	- - ±1/16" score-to- score ±1/8" overall	- - -	>1/16" >1/8" >1/8" >±1/16" score-to-score >±1/8" overall All liners and mediums out through including
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score	1/16" 1/8" Matches Specifications Cuts through all liners and medium except the last	- - ±1/16" score-to- score ±1/8" overall	- -	>1/16" >1/8" >±1/8" >±1/16" score-to-score >±1/8" overall All liners and mediums cut through, including the last liner
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score	1/16" 1/8" Matches Specifications Cuts through all liners and medium except the last liner	- - ±1/16" score-to- score ±1/8" overall	- -	>1/16" >1/8" >±1/16" score-to-score >±1/8" overall All liners and mediums cut through, including the last liner
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score	1/16" 1/8" Matches Specifications Cuts through all liners and medium except the last liner Folds 180°	- - ±1/16" score-to- score ±1/8" overall	- - -	>1/16" >1/8" >1/8" >±1/16" score-to-score >±1/8" overall All liners and mediums cut through, including the last liner
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score	1/16" 1/8" Matches Specifications Cuts through all liners and medium except the last liner Folds 180° without resistance	- - ±1/16" score-to- score ±1/8" overall	- - -	>1/16" >1/8" >±1/16" score-to-score >±1/8" overall All liners and mediums cut through, including the last liner Resistance when folding 180° and term present
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score	1/16" 1/8" Matches Specifications Cuts through all liners and medium except the last liner Folds 180° without resistance or tearing through	- - ±1/16" score-to- score ±1/8" overall		>1/16" >1/8" >±1/16" score-to-score >±1/8" overall All liners and mediums cut through, including the last liner Resistance when folding 180° and tears present
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score Slit-Score Depth Rough Edges	1/16" 1/8" Matches Specifications Cuts through all liners and medium except the last liner Folds 180° without resistance or tearing through None	- ±1/16" score-to- score ±1/8" overall	- - -	 >1/16" >1/8" >±1/16" score-to-score >±1/8" overall All liners and mediums cut through, including the last liner Resistance when folding 180° and tears present Present
Operation Print-to-Cut Registration Multiple Operations Score Placement Includes Slit-Score Slit-Score Depth Rough Edges Burn/Staining	1/16" 1/8" Matches Specifications Cuts through all liners and medium except the last liner Folds 180° without resistance or tearing through None None	- ±1/16" score-to- score ±1/8" overall		>1/16" >1/8" >±1/16" score-to-score >±1/8" overall All liners and mediums cut through, including the last liner Resistance when folding 180° and tears present Present

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		Light yellowing	Darker	Dark brown or black	
		which is <1/8" from	yellow/orange >1/8"	>1/8" from the edge	
	the edge		from the edge		
		No more than 25%	Between 25-50% of	>50% of individual cut	
		of an individual cut	cut line.	line	
ltom	Ontimum	Minor	Major	Critical	
item					
Slot Depth	Score	flap score	>1/8" above or below flap score	<pre>>1/4" above or below flap score</pre>	
Slot-to-Panel Score	Centered on Panel score	<1/16" left or right of center to panel	1/8" left or right of center to panel	>1/8" left or right of center to panel score	
		score	score		
	Matches Adjacent	C-flute: ± 3/16" from	-	C-flute: > \pm 3/16" from	
	Slots	target gap		target gap	
Slot Width at MFG Joint		b-nule: ± 1/8 nom		b-Hule: > ± 1/8 Hom	
	No gap <1/16"	$F_{-}F_{+}$	-	$E_Flute: > + 1/16'' from$	
		target gap		target gap	
Item	Optimum	Minor	Maior	Critical	
	Adhesive covers				
Glue Tab Coverage	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	±1/8" of center w/	>±1/8" of center w/	>±1/4" of center w/	
	on glue tab	no adhesive exposed	adhesive exposed	adhesive exposed	
Excess Glue	None	-	-	Present	
	>90% fiber tear			<90% fiber tear when	
	at mfg joint			pulled apart at mfg joint	
Fiber Tear	Resistance when	-	-		
	separating the			No resistance when	
	outside panel			separating the outside	
	from the glue tab			parler nom the give tab	
		DOUBLE SIDED TAPE			
Item	Optimum	Minor	Major	Critical	
Bonding	Firm bond w/ no lifting after	-	-	Lifting present after	
	application			application	
	±1/16" from CAD	±1/8" from CAD	±3/16" from CAD	±1/4" from CAD drawing	
Tape Placement	drawing	drawing	drawing		
rape riacement	1/4" from edge if	3/8" from the edge	3/16" from the edge	<3/16" from the edge if	
	die cut	IT die cut	if die cut	die cut	
litere	Ontin	FOLDING	Nac!=	C-4411	
Uniformity	Eolds coupro	iviinor	iviajor	Critical Doos not fold coupro	
	rolus square	-	-	>1/4" chaosing	
riap ciosure	<1/4 spacing			>1/4 spacing	

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		Difference between		
	No overlap of	ton and bottom gan		Difference between top
	flaps	+1 /0"		and bottom gap >±1/8"
Skew (Fishtailing)		-1/0		
	Fiap edges even	Misalignment of flap		
	flanc	edges ±1/8"		Flaps Overlap
	liaps		n <i>4</i> 1	
ltere	Outinuum	PRINTING (FLEXOGRAPH	1Y) Maiar	Cuitical
Item	Optimum			
Print Plate Registration	1/10	1/8 2.4 Dalta 5	1/4 2.2 Dalta F	>1/4
	2.0 Delta E	2.4 Delta E	3.2 Delta E	>4.0 Delta E
	Clean			Dirty Edges
Print Clarity	Crisp	-	-	Spotty
	Legible from a			Illegible from a distance
	distance of 18"			of 18"
Brint Coverage	No paper show			Bapar shows through
Print Coverage	through	-	-	Paper snows 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"		4 /0// diamatan	1///	
of logo	1/16° diameter	1/8 diameter	⁷ 4 diameter	>1/4 diameter
Stray marks outside of		4 /0% diamatan	1///	
logo	1/16" diameter	1/8" diameter	¼" diameter	>1/4" diameter
Ink Rubbing	½" length	-	-	>1/2" length
	0.0.0.5			<8.8
Ink pH @ Press	9.0-9.5	-	-	>9.8
	24.22	19-20 seconds		<19 seconds
Ink viscosity @ Press	21-23 seconds	24-25 seconds	-	>26 seconds
		PRINTING (DIGITAL)		
Item	Optimum	Minor	Major	Critical
Inside/Outside		4 /0//	2/467	
Registration	1/16″	1/8″	3/16″	>3/16″
Color Accuracy	2.0 Delta E	2.2 Delta E	2.4 Delta E	>2.5 Delta E
	¼" on dust & glue			
Graphic Element Bleed	flaps; 1/8" min	-	-	>1/4" on dust & glue
-	elsewhere			flaps; >1/8" elsewhere
Ghosting	Not Present	-	-	Present
Streaking outside of		<1/32″x1/4″		>1/32"x1/4"
logo	None	<8 on entire box	-	>8 on entire box
Streaking within 1" of	NI	41 /22// -2 /4 C//		> 1 / 22// - 2 / 4 C//
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"
Smoto outside of lease	Name	<1/16" diameter		>1/6" diameter
spots outside of logo	None	<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
Dub Marka	None	<1/2" in length		>1/2" in length
KUD WIARKS		<4 on entire box	_	>4 on entire box
		<1/8″x1/8″	1/8"x1/8"	>1/8"x1/8"
Scuff Marks	None	<1/32" white edge	1/16" white edge on	>1/9" white edge on flan
		on flap	flap	>1/8 white edge on hap

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	Optimum Minor Major Critical					
Material Grade	Matches Spec	-	-	Does not match spec			
Lominato	Matches Spec			Does not match spec			
Laminate	No air bubbles	-	-	Air bubbles present			
	CUTTING						
ltem	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						
ltem	Optimum		Minor		Major	Critical
Foam Type	Matches spec		-		-	Does not match spec
		CU	TTING & ASSEME	BLY		
ltem	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"
	Matches spec			-		Does not match spec
Assembled Parts	<±1/8" per layer					>±1/8" per layer
	(TED TAPES AND A	DHESIVE	ES	
MATERIAL						
ltem	Optimur	Optimum			Major	Critical
Slitting	<±1/16"	,	±1/8"		>±1/8"	>±3/16"
Cut Quality	No frays or s	trings				Frays or strings
	present		-		-	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

<u>Labels</u>

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.

<u>Tape</u>

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



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





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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 &	12/11/2023	Version 3			
Expirations Sections					
Fixed an issue with table of	8/21/2024	Version 4			
contents; added clarification for					
material criteria; added criteria for					
inside/outside registration for					
digital					