PaperWorks
Packaging Group

Folding Carton
Graphic Specification
Guide – Lithographic

File Development • Transfer Instructions • Contact Information

Revised June 2026

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Introduction

Paperworks has five full-service folding carton facility across North America supported by a centralized Digital Services (Prepress) group that offers a comprehensive range of graphic and structural services delivered through a state-of-the-art technology platform.

This document outlines the specifications to which we print: including mechanical, structural, and color specifications.

With these specifications in mind, our customers can better understand our capabilities, allowing them to design artwork that will have maximum impact on shelf and flow seamlessly through the PaperWorks production chain.

We strongly encourage our graphics suppliers to involve our prepress personnel in the graphic design process as early as possible. Our personnel can provide insight to achieve possible manufacturing cost-savings and improved product consistency.

As a standards-run shop, accuracy and consistency on press are directly related to the prepress activities and materials provided to us, and in turn, to press. That is why it is extremely important to understand and follow the prepress specifications outlined in this document.

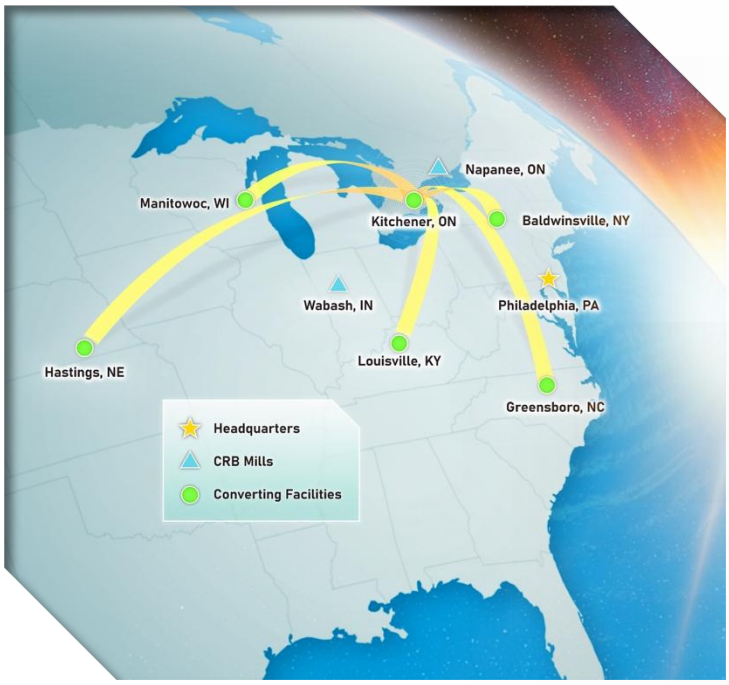
PaperWorks reserves the right to reject any files or proofs that do not match specifications.

If rework is required, additional charges may apply.

Locations

The specifications published in the document apply to all of our Lithographic facilities.

PaperWorks DIGITAL SERVICES advanced COLOR + PREPRESS



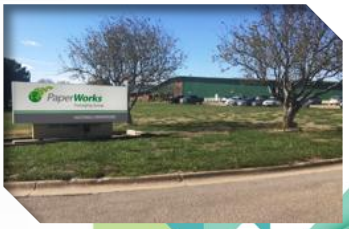
Louisville, KY

Kitchener, ON

Greensboro, NC

Baldwinsville, NY

Manitowoc, WI



Hastings, NE

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PaperWorks FAST FACTS Summary

Mechanical Specifications

Trapping	Metric	Imperial
Regular trap:	0.13 mm	0.005"
Trap for metallic inks:	0.065 mm	0.002"

Minimum Line Widths	Points	Imperial
Positive lines:	0.36	0.005"
Negative (reverse) lines:	0.36	0.005"

Minimum Font Sizes	Points/Metric	Imperial
Minimum thickness (positive):	4.875 pts. / 1.719mm	0.0677"
Minimum thickness (negative):	6.85 pts. / 2.417mm	0.095"

Total Area Coverage (TAC)

Total dot percentages in any spot of four color file 280%

UPC/EAN Specifications	Details
Minimum size:	80% (no maximum size)
Truncation:	to be used at the discretion of the art providers
Color:	use darkest single spot ink or black (preferred)
Bar width reduction:	1.667 mil (0.042 mm / 0.002")
Orientation:	UPC can be printed using any orientation for litho
Quiet zone:	6.35 mm / 0.25"
Standard:	Refer to GS1 Guidelines https://www.gs1.org

Black Support	Details
Large black areas:	***Ultra Rich Black*** (40% C, 35% M, 20% Y, 100% K)
Smaller black areas:	***Rich Black*** (30% C, 100% K)

Structural Specifications

Bleed	Metric	Imperial
Follow bleed path of PaperWorks dieline	3.2 mm	0.125984"

Type Safety	Metric	Imperial
Minimum distance from crease and trim:	2 mm	0.079"

Crease Rollover	Metric	Imperial
600um caliper paperboard or less:	0.6 mm	0.03125"
over 600um caliper paperboard:	0.8 mm	0.03125"

Proofing • File Formats • Contact Information

Color & Proofing

Acceptable Proofs:

- Calibrated inkjet proof profiled to PaperWorks ICC profile
- Calibrated inkjet proof profiled to G7 GRACol standard

Please contact us if you have any questions about whether your proofing setup falls within our specificaitons

Ink Drawdowns

Upon request, PaperWorks will provide digital verification of ink drawdowns created on the substrate for approval.
If physical swatches are required, please communicate with your customer service representative.

Maximum Colors

We offer a wide range of ink + coating options; since these are often site-specific, please contact Customer Service for more details

Screening

See screening details on page 8

File Formats

*Preferred	Adobe Illustrator native with all supporting elements (high resolution images, layered PSD files and fonts)
Press ready PDF	
Other formats:	Esko Normalized PDF, PackEdge, Art Pro

FTP (File Transfer Protocol)

https://kitftp.paperwrks.com/dropbox/incoming

(Limit of 1.5 GB per upload)

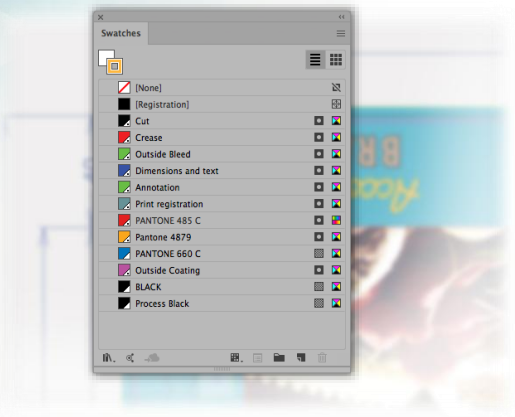
Contact Information

Attn.:
Digital Services Manager

PaperWorks Kitchener
120 Trillium Drive
Kitchener, Ontario, Canada
N2E 2C4

pacdevss@paperwrks.com

Mechanical Specifications

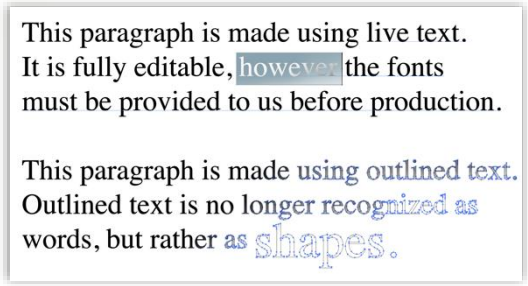


Spot + Special Colors

Name each spot color according to Illustrator's or Esko's "Ink Book" names. For example, "PANTONE Red 032 C".

Every spot color will print as a different separation, so make sure that there are no colors unnecessarily specified as spots, to avoid confusion and extra charges. If you have custom colors, make sure they're set to Color Type: Process Color.

PaperWorks has PantoneLive capabilities. If you wish to explore the use of this system, please contact us.



Fonts

All vector screen fonts & PostScript fonts need to be supplied compressed unless converted to outline.

Linked Files

Supply all supporting files and links used in your graphic files.
The preferred file format is linked,
layered .psd files with no embedded links. Please ensure that they are CMYK and of an appropriate (300dpi or greater) resolution in relation to their final printed size (scale).

Raster
(ie. jpeg)

Vector
(ie. ai, .eps)

Trapping

Traps should be 0.13 mm / 0.005". Traps for metallic inks should be 0.065 mm / 0.002" due to their unique printing characteristics. If you do not have the ability to trap files, they will be trapped by PaperWorks Digital Services before output.

Type Thickness

Font Selection: Small type and fine serifs should not be used for reverse type whenever possible. Minimum Thickness: 0.102 mm / 0.004" at the thinnest part of a character or rule.

- Positive Type: 4.875 pts.
- Negative Type: 6.85 pts.

Universal Product Code (UPC) and other Bar Codes

- Preferred Size: 100%
- Color: Must be printed in the darkest solid color
- Bar Width Reduction: 1.667 mil (0.042 mm / 0.002")
- "Quiet Zones" measuring 6.35 mm / 0.25" on both sides of the barcode are required
- Barcode Standard: Refer to: **GS1 Guidelines** https://www.gs1.org for additional technical specifications

Paperworks has the ability to generate and print a wide variety of bar codes, including EAN and QR codes.

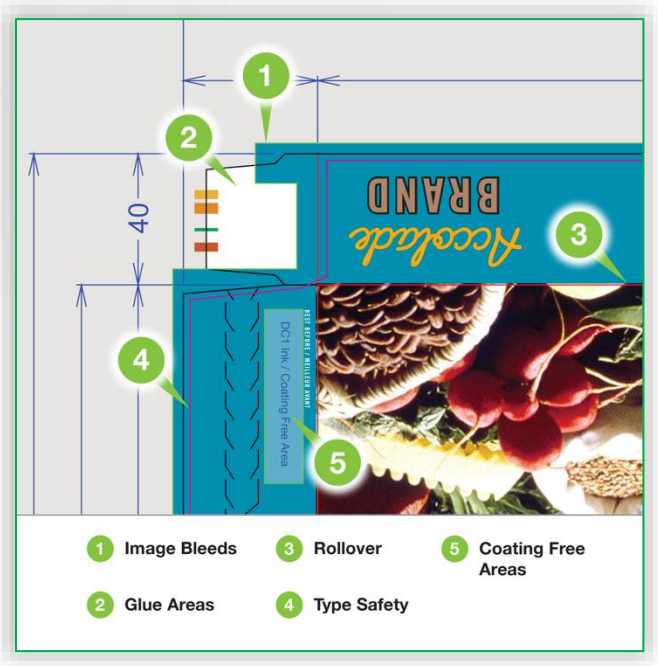
Consult with the Paperwork's Digital Services team on any specialty bar code requirements.

Structural Specifications

Graphics Composition to Cutting Die

Graphics must be composed to an approved PaperWorks Kitchener cutting-die CAD drawing. This is required in order to ensure proper panel registration and bleeds for the graphics. CAD files will be sent by PaperWorks Kitchener upon request.

The die file must be an approved version sent from PaperWorks Kitchener CAD system to ensure that the graphics will form + layout (i.e., step and repeat) properly. All descriptor text on original dieline must remain on file, and the artwork must adhere to bleed pattern, and utilize a separate (overprinting) spot dieline color. This should be placed on a separate layer.



Dieline Geometry

Image Bleeds must follow the bleed path indicated on the BBX supplied dieline file, which is 3.2 mm / 0.125984" past the knife cut around the outside edges of carton, and 6.35mm / 0.25" over the score on glue flaps.

Glue Areas must be free of any ink or coating.

Wax or Varnish Free Area must be free of any coating and must be identified on digital dieline as such.

Rollover Allowance: Make sure that the dominant panels (principle display panels) on the carton have a rollover allowance to compensate for the width of the fold, and any minor dieline shift, especially on multi-up runs.
The rollover allowance should be 0.6 mm / 0.03125” for any cartons that use up to 600um caliper paperboard, and 0.8 mm / 0.03125”
for any carton using over 600um cal. paperboard.

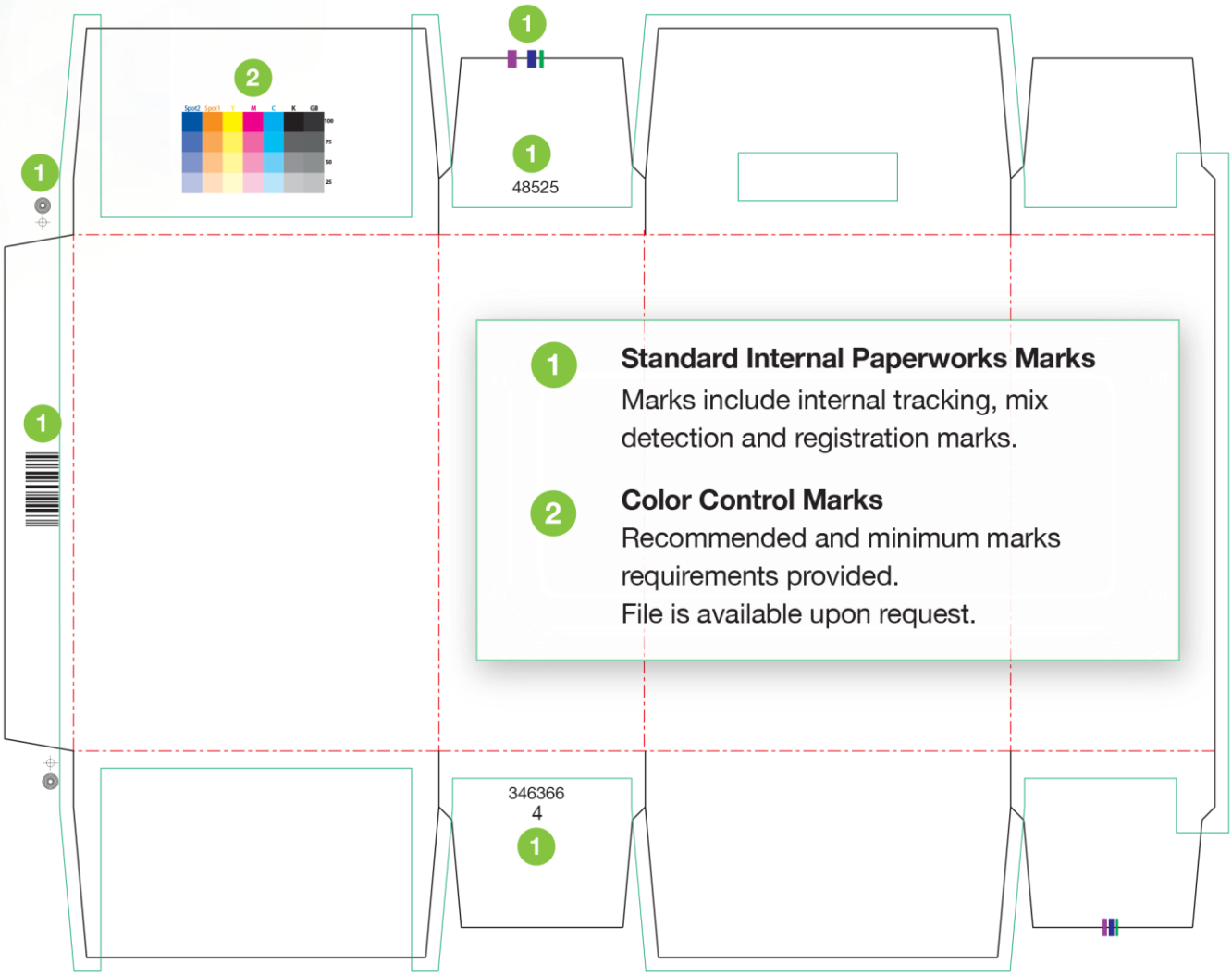
Type Safety needs to have a clearance of 2 mm from the edge of the dieline must be adhered to.

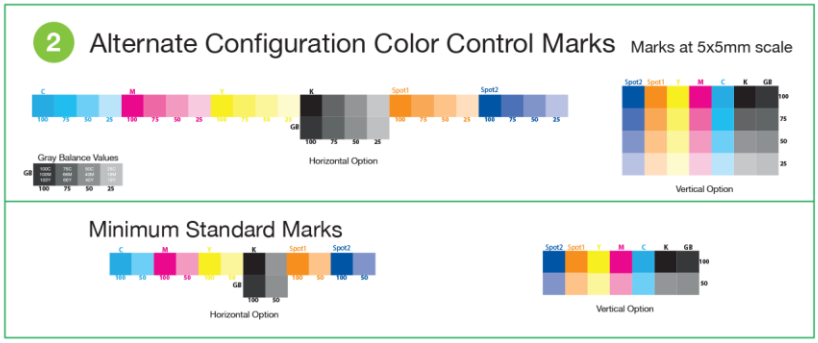
Applied Process Control Marks

The carton diagram below shows the location of the standard internal and color control marks we place onto the artwork.

Paperworks will comply to special requirements for any PQP (print quality programs).

NOTE: Additional material may be required to accommodate for color and process control marks requested by 3rd party PQP. if any additional custom marks are required, please contact Paperwork Digital Services.





Color Specifications

Standard Marks + Process Control Targets

- Process control targets will be added by Paperwork's if not provided for every color in the file. Ideal position of control targets will be located on inside tuck flap of a carton.
- Type of control patches: Inclusion of these control targets is imperative. However, the position and order of the targets is at the discretion of the art house/graphic designer.
- **Preferred** Dot Gain Targets: 5 mm square using 25%, 50% and 75% and 100% of all colors in the job.
- **Preferred** CMY Gray Balance Targets:
- Block 1: 25 Cyan, 19 Magenta, 19 Yellow
- Block 2: 50 Cyan, 40 Magenta, 40 Yellow
- Block 3: 75 Cyan, 66 Magenta, 66 Yellow
- Block 4: 100 Cyan, 100 Magenta, 100 Yellow

These will be used to verify the accuracy of data transfer and/or interpretation. **Minimum** requirements 100%, 50% of each ink and Gray Balance targets.

Color Specifications - Overview

Screening

We offer a wide range of standard to high definition screening options to meet your design intent across multiple substrates and production processes. Please speak to our team to explore the use of all screening options.

We manage screening and press compensation curves in-house, and therefore we do not accept 1-Bit Tiffs.

In the absence of a customized selection, we will default to standard definition (150 am dot) screening.

Types of Proofs

We can provide an ICC profile (and/or CGATS data) of our printing condition to help achieve predictable and consistent color to ensure industry-standard proof to press match.

Below are the types of proofs we accept in order of preference.

A calibrated inkjet proof profiled and verified to a PaperWorks ICC profile (supplied by us). See Proof Verification Procedure below.

- A calibrated inkjet proof profiled and verified to a PaperWorks ICC profile (supplied by us). See Proof Verification Procedure below.
- A calibrated inkjet proof profiled to G7 GRACoL 2006 or 2013
- Proofs from other Proofing systems such as Kodak Approval and Fuji FinalProof laminated to the proper substrate or paperboard using G7 GRACoL guidelines for CMYK solids (Lab values) and neutral density aimpoints for CMY (25, 19, 19) (50,40,40) and (75,66,66)
- All other types of proofing systems must be approved by the PaperWorks Digital Services Department.

Verification Procedure

Below are the steps to verify your proofing process.

1. Install the PaperWorks ICC Profile provided to you into your calibrated proofing system. How to do this depends on your proofing system
2. Output the proof verification pdf using the PaperWorks ICC Profile. If your proofing system has the capability, measure and verify the proof against the profile.
3. Input relevant information into the allotted space on the proof, including the proofing profile used.
4. Send the proof to:

   PaperWorks Kitchener
   120 Trillium Drive
   Kitchener, Ontario, Canada
   N2E 2C4
   Attention: Prepress
   Department Color Manager

5. We will measure and visually compare your digital proof and inform you of how it compares to our printing system.
   (Note that spot and Pantone colors are only simulations on the proof. Digital color files are used at the press for final color)

Color Specifications - Proofing

Specifications for Supplied Proofs + Digital Color

This section explains our proofing and digital color specifications and how adherence to the specification will ensure that the customer receives an accurate representation of how PaperWorks will reproduce the supplied graphics.

Proofs that do not follow these specifications will not yield an accurate color target. Many proofing devices provide outputs that are not easily obtainable using the lithographic process, so bear in mind that the proof we supply to you shows a reasonable expectation of the results that will be obtained on press, rather than just average color.

CMYK Proofing

We use the G7 Methodology to calibrate our presses, and Esko color management to align our proofing and presswork. G7 is the basis for the GRACoL ICC profiles, as well as our profiles. In almost all cases, we prefer a proof to our ICC profile rather than a GRACoL profile. A GRACoL proof simulates a press condition printing with Grade 1 Coated paper. Many of our customers prefer to print on recycled paperboard (CCNB). The color gamut on CCNB does not match that of a Grade 1 Coated paper, so a GRACoL proof will overpromise the color that is achievable. Tonal areas and the general look of a GRACoL proof will align well with our print condition because both are based on the G7 methodology.

Pantone and Special Color Proofing

Because Special and Pantone colors are not accurately simulated by most proofing solutions, we will attempt to align to the approved digital color value and/or ink drawdown rather than the proof's simulated color. If a special color is screened or overprinted with other inks, it further complicates the ability for a proof to simulate the print result. In such a case, performing a press characterization using the special or Pantone colors will allow for a more accurate proof. This process is only recommended when specific special inks are going to be used regularly as screens and overprints with other inks.

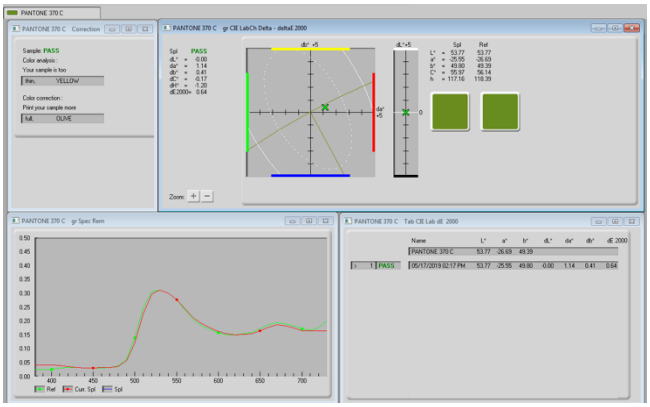
PantoneLive® Support

PantoneLive is an X-Rite solution for managing customer colors. It is a cloud-based application that houses digital color targets in the form of CXF files (Color Exchange Format). When a customer specifies a Pantone color, any print supplier subscribing to PantoneLive will have the same color file to target on press/in their ink room, thereby eliminating the need for custom colors and drawdowns, as well as keeping color consistent across print suppliers. Drawdowns can still be requested to obtain a visual of what the ink would look like on a specific substrate, but the color value from PantoneLive will ultimately be the target. PaperWorks Industries fully supports PantoneLive in our prepress workflow and across all of our print facilities.

PaperWorks has PantoneLive capabilities. If you wish to explore the use of this system, please contact us.

Spot Color Approval • Ink Drawdowns

PaperWorks makes every effort to match color digitally to the most recent Pantone Library, however upon request we can provide digital verification of ink drawdowns for spot and Pantone colors, produced by our ink manufacturer on the specified substrate with the coating to be used on the final production work. Please communicate your approval for the drawdowns via email.



If requested, we can provide four physical swatches instead. As part of our business practice, customers are asked to approve the drawdowns by signing the back of the swatches and return two signed ink drawdowns back to PaperWorks for our records.

It is important to keep in mind that our in-house ink manufacturer uses the latest instrumentation and measuring technology to achieve the best possible match but generally there is a slight visual difference between the color on a recycled paperboard versus a bright white glossy Pantone guide.

For custom ink colors such as a previously printed carton or sample swatch, we can take a LAB reading and create an ink drawdown from it. These would then follow the same procedure as mentioned above.

High Definition Extended Color Gamut System (ECG)

PaperWorks offers a range of Extended Color Gamut (ECG) services. Utilizing up to 3 inks in addition to the standard process inks (CMYK), ECG printing provides many benefits. This technology and its benefits are made possible by using specialty screening modulations and frequencies, advanced color matching technology, and strict process control on press.

Benefits of ECG Printing

1. Increased Color Gamut. Achieve vibrant reds/oranges, greens, and/or blues/purples that are unattainable with just CMYK.
2. Reduce costs by simulating many Pantone colors using the ECG inks rather than using a speciality ink for each Pantone color
3. Reduce costs associated with short run lengths over multiple jobs as jobs can be run on the same sheet (gang run)

Reach out to the Digital Services team or your Account Manager to find out if ECG printing is right for you.

Specialty Coatings / Embellishments

PaperWorks offers a wide range of embellishment capabilities aimed at increasing the first and second “moment of truth” effectiveness of your packaging.

Our PacDev Design + Innovation team can assist you in selecting the most suitable combination of substrate, inks, coatings, and specialty embellishments to meet your objectives.

We leverage state-of-the-art virtual and physical prototyping technology to streamline this process while our packaging professionals ensure that all technical requirements are considered.

Please contact our PacDev Design + Innovation team for more information.

PaperWorks

PACDEV

DESIGN + INNOVATION

File Formats

Preferred file formats

1. Adobe Illustrator
2. Esko Normalized PDF or PDF (press ready)

Acceptable file formats

3. Art Pro
4. PackEdge

All graphics files must comply with the PaperWorks Specification Guide (see previous page) and be submitted as outlined in this section.

Files should be submitted as Adobe Illustrator native with all supporting material i.e. hi-res images and fonts. PaperWorks constantly upgrades to use the newest versions of software. Please ensure that images are CMYK (rather than RGB), and will output at 300dpi or above based on the scale they're imported at.

Note: Adobe Illustrator® has a 'package' function which can be used to automatically collect and relink all imports and fonts.

Please ensure that if any transparency effects are used, the "Document Raster Effects Settings" are set to High – 300 ppi for best results.

Other forms of press-ready files may be acceptable – please contact PaperWorks for confirmation prior to sending files.

File Submission

Upload compressed files via this link: https://kitftp.paperwrks.com/dropbox/incoming

Note: There is a limit of 1000 MB per upload; if the file you need to send us exceeds this, please contact us.

For any file transfer outside of the recommended link above use the following email:

Digitalservices_FTP@paperwrks.com

This will notify the Digital Services team that the artwork is available to download.

In addition to sending an email to that address, the CSR should also be notified, and a description of the file should be included, along with contact information.

Contact Information

For most artwork-related communication, please contact:

pacdevss@paperwrks.com

Otherwise, please contact your Customer Service or Sales Representative who will relay your question to the appropriate individuals in order to have the most comprehensive information.

Quality + Certification

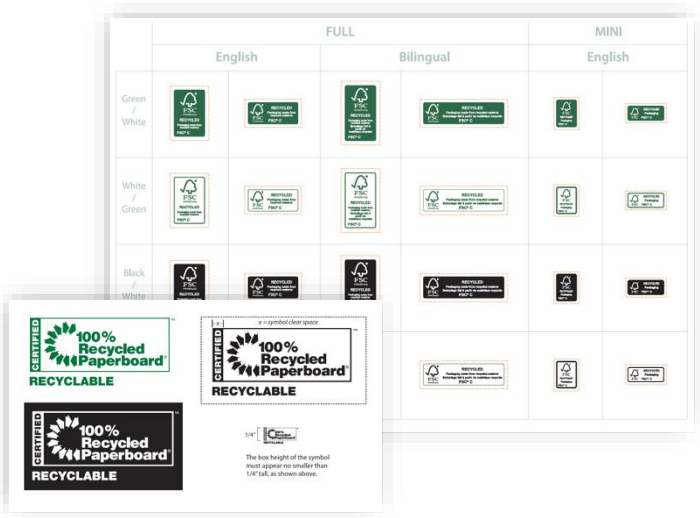
Paperworks has committed to our environmental and social responsibilities by registering all facilities in a common certification programs for Forest Stewardship Council® (FSC®) and Sustainable Forestry Initiative® (SFI®)*

For ease of use, a common standard code has been supplied for all Paperworks print locations for FSC and SFI.

As the graphics requirements change regularly, please contact us for the latest logo requirements to apply to the artwork.

Standard recycle logo specifications and graphics are also available upon request, along with certification claims.

*SFI marks are registered marks owned by Sustainable Forestry Initiative Inc..



FSC C107031
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PaperWorks

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