Graphic Packaging INTERNATIONAL | GSS GRAPHIC SUPPORT SERVICES

# Prepress Specifications

## Perfecting Print Production

Rev: 4/01/2023 2.3.0

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# Our Centralized Approach



Please contact your Salesperson or Customer Advocate so that a Graphic Specialist can be assigned to your account. The Graphic Specialist will be your primary contact to obtain prepress/print specifications and proof profiles, as well as participate in the graphic pre-production meeting.

The GPI Graphic Services team will support our customers with their submission of new artwork. Our Graphic Specialist professionals will work with our customers' graphic separators/suppliers to perform a single pre-production review of new proposed artwork to ensure printability within GPI's print environment.

It is the responsibility of the graphic separators/suppliers to ensure that artwork submitted to GPI is accurate and has the proper specifications required for print production. Graphic Services reserves the right to request corrections to any defects found in materials provided by the graphic separators/suppliers at the expense of the graphic separators/suppliers.

Any excessive requests, made by graphic separators/suppliers to GPI, beyond a single pre-production review, is subject to a chargeable fee schedule administered by the GPI Graphic Services team.

Artwork should be prepared in accordance with the current GPI PREPRESS SPECIFICATIONS document and fit the approved GPI die drawing. It is the responsibility of the graphic separators/suppliers and customer to include these specifications within graphic files and approve all copy and content.


# Prepress Specifications



## Design and File Prep

### Color Separations

- **Profiles:** A GPI-supplied profile must be used to color correct all graphics to match the brand color intent for GPI print conditions. The use of "industry standard" profiles is not supported. If the customer or separator is unable to comply with this workflow, GPI does offer conversion and proofing services for a reasonable fee. See page 7, Appendix C, and Appendix D for more information.
- **DMAX:** Unless otherwise noted, please use total Ink Coverage or DMAX of ≤ 280%. Heat Set Offset ≤ 200%. Maravac board ≤ 250%. Plastic cups ≤ 100% (no overprints).
- **GCR:** Gray Component Replacement must be applied to all files supplied to GPI. Due to the variability of technology used across suppliers, GPI profiles do not contain a set amount of GCR. It is up to the separator to ensure this is properly applied per the "specifications by process" table below. GPI expects MAX GCR settings to be used. The use of UCR is not supported.
- **Rich Black:** Enhancing 1C Black with K, C, M, or Y is a common practice with many approaches. Common builds GPI utilizes are: (4C neutral gray) 100K/40C/20M/20Y, (2C w/cyan bump) 100K/40C, and (2C w/black bump) 100K/50K. Each approach must be put into context of print process capability, color variability, registration (trapping/holdback), dmax, and other factors. Due to the complexity of these variables, GPI strongly suggests the use of 2C builds, as 4C builds may have unfavorable results even when printed within tolerances to our specifications. If you choose to use the 4C neutral gray option, you must accept these risks and the build noted above must be used. Please see the "specifications by process" for more details as all options are not available across all print processes.

### Min/Max Dot Specifications

- **Flexo Minimum Dot:** Specifications should reference the "specifications by process" section. All graphics supplied to GPI should be checked and all image data removed below that specification. In the case of 1% minimum dot, image data < .79% should be removed. These values or any value below will result in poor image reproduction of any design. Additionally, special consideration should also be taken to reduce number of colors in a separation (no more than 2) with tone values < 5-10 percent.
- **Flexo Scum Dots:** Scum dots are stray pixels created through unintentional editing in photoshop, layering of gradients, glows, and or other vector effects with the combination of transparency elements. GPI uses a combination of high-resolution plates and hybrid screening, resulting in these unintentional pixels creating unwanted dots that will print, especially in the flexo printing process. GPI suggests the use of flexo centric QC software such as Esko AE Viewer to highlight these areas of concern and remove them from the separations.
- **Maximum Dot:** Reference the "specifications by process" section for print condition specific information. These specifications provide a warning to not have any critical design elements above this percentage. If a design element critical to the design is near or above this specification, the separations should be corrected.

### Layout, Structure, Bleeds, and Coatings

**Layout:**

- Please pay special attention to panel orientations, panel crossovers, end panel/flap matches, outside print code areas, inside print code locations, and ensure all graphics and marks are outside of glue areas.
- **Standard Structures:** Please use the "Specifications by Process" specs as outlined.
- **Complex or Large Structures:** When the carton design flows across end flaps or complex folds are joined to match/align or create a single image, type or detailed graphics should be held back from knives and scores by 1/4". Please note that these specifications have been provided to ensure the best visual representation of your designs once erected. Normal print-to-cut process variation, while minimal, will have exponential impacts in these complex panel/end flap match points. It should be noted that small type or intricate design elements should not be used on cross match to avoid double or missing letters/image. The customer and separator are responsible for checking and verifying that match points are accurate and that they will align when fully formed.
- **Small Structures:** When designing on small structures, it may be challenging to utilize the "Vital Copy from Knife/Score/Crease" specifications outlined in the "specifications by process" section. In some cases we will allow 3/32" to be utilized. Please check with your Graphic Specialist for confirmation this is appropriate for your situation.
- **Color Bars:** The use of customer supplied color bars, tone blocks, or tint patches are not allowed and should never be placed in the 1-up file. When space allows, GPI will place post production quality control patches in the stepped layout.

## Design and File Prep (cont.)

### Layout, Structure, Bleeds, and Coatings (cont.)

**Structure:**

- GPI-supplied structure must be applied to graphics. Do not alter the GPI structure in any manner, including removal of die elements. Please note that any die dimensions, notes, or callouts should be removed or moved outside the printed image area.

**Bleeds:**

- Follow GPI 1-up drawing for bleeds.
- Unless otherwise requested or approved, all graphics should be built for single knife. Anticipate that bleeds will cross the diecut line where they are common. When the colors are not common, they will butt on the diecut line and may transfer to the adjacent graphic on the stepped layout. If the graphics are not conducive to this treatment, please notify the Graphic Specialist immediately for approval and input.

**Coatings:**

- Modification of the coating pattern cannot be done in the graphics file. A formal request must be made through the GPI structural design department for approval. Once your request has been processed, you will receive a new drawing to place in your graphic layout. You can contact the Customer Advocate or Technical Sales Rep to communicate all required modifications.
- Upon finalizing placement, the separator must supply a layered .ai/pdf file with the die and only the patterned coatings, emboss/deboss or various other enhancements, depicted as a single stroke path, to be imported into the GPI CAD drawing.
- **Coating Separations By Print Process:**
  - **Offset:** GPI follows the approved die for coating pattern/plate. Do not include a separate coating layer/separation in the file unless there are multiple coatings that must register or a single coating that must register to a printed color.
  - **Flexo:** All flexo items must contain a coating layer/separation. The coating must follow the approved GPI drawing with no modifications made for any reason.
  - **Special Coating Treatments:** Notify your Graphic Specialist if you have multiple coatings or coatings that have tight spot register with a graphical element. They will work with you and the producing plant on the proper treatments required for successful reproduction.

### Trapping, Hold Backs, and General Comments

- **Trapping:** Please refer to “Trapping” in “specifications by process” section. Please ensure both vector and raster images are trapped accordingly.
- **Hold Backs:** Please refer to “Hold Back Specs” in “specifications by process” section. The dominant single color should make the shape, all other colors are held back.
- **General Comments:**
  - The use of small multicolor type, lines, or images (positive or reverse) should be kept to the absolute minimum number of colors to achieve the design intent. Trapping and hold backs should be applied in all cases. If the effect of trapping or hold backs are unappealing, discuss options with your Graphic Specialist.
  - Due to the vast difference in type styles, GPI does not have a minimum type specification. Please refer to the “specifications by process” table below for positive and reverse “Thinnest line min” specification. This specification should be applied by measuring the thinnest line within a given font.

### UPC Handling

- **Quiet Zone:** The minimum quiet zone width should equal 10 times the width of the narrowest bar in the barcode.
- **Orientation:** The bars must run vertically through Web Offset and Flexo printing presses. This is indicated in our 1-up CAD drawings as Grain or Web Direction.
- **Separations:** When two separations, such as line and screen associated with the UPC color, the UPC should always be associated with the screen separation.

## Design and File Prep (cont.)

### Other Scannable Codes

- **Other Linear Bar Codes:** As a general rule GPI complies with ISO 22742:2010, however, please check with your Graphic Specialist for details on your specific needs. Special consideration on how the code will be scanned (hand vs. automated/unattended) should be taken under advisement as the magnification (or x bar width) requirements may differ.
- **QR Codes:** See "specifications by process" section.
- **2D Codes:** See "specifications by process" section.

### Special Enhancements

- **Please note:** Not all printing processes, structures, and print locations allow for special enhancements. Work closely with the Graphic Specialist on each project to ensure success.
- **Special enhancements include:** White or Opaque Inks, Metallic Inks, Spot UV Inks, Metallic/Holographic Board, Specialty and Effect Coatings, Spot Coatings, Multiple Coatings, Foil Stamping, Embossing/Debossing.
- **Print Testing & Fingerprints:** Depending on the use of enhancements and the complexity of your design, print testing, or fingerprinting may be required. Please work closely with Sales, Customer Service, and Graphic Specialist to properly factor this into your overall timeline and project budget. The Graphic Technical Services team also should be consulted on all special projects to ensure proper test procedures are followed. Please note that any data derived from fingerprints or the resulting profiles must originate from GPI.

### Separation Names

- **Process Colors:** Cyan, Magenta, Yellow, Black, Orange, Green, Blue, or Violet
- **Spot Colors:** PMS color or named brand spot color.
- **Die Line:** Separation must be named "Die" and set to overprint.

### Final Files

**PDF Specifications:**

- **PDF Types:** PDF/X-1a 1.3 or PDF/X-4 1.6 format unless otherwise agreed upon with your Graphic Specialist.
  - See Appendix A and B for recommended Esko export settings.
  - The PDF file must not contain RGB elements, videos, web links, transfer curves, or encryption that are unnecessary for the printing process.
  - Final image resolution must be 300dpi after scaling is applied to the image in the layout.
  - PDF/X-1a 1.3 files must have all fonts embedded, and transparency and layers must be flattened.
- **Separations:** All unused process and spot color channels must be removed from the file.
- **Legend:** Must include client name, prepress supplier and contact, file name, file date, customer code, GPI die number, color separation names with GPI ink numbers (when supplied), and GPI proofing profile used. The legend must not contain any color channels not used within the graphics that may unintentionally add additional separations to the final file.
- **Trim Box:** Must be set to the center of the of the outermost knife/cut line, not bleed line.

**File Uploads:**

- **Graphic File:** Do not upload anything other than the required production pdf, unzipped (no zip files, fonts, images, low-res pdfs, etc.). If additional files are required to be sent such as low resolution PDF's or additional instructions, please email these directly to your Graphic Specialist.
- **Coating File:** The coating separation should not be included with your final file unless requested or approved. If an exception is needed, acknowledgement and agreement from the Graphic Specialist is required. See also above "coatings" section.
- **File Name:** Must be named with Customer Code Number and/or last 5 digits of UPC with brief description of item.

### Unsupported Workflows

- Pre-screened files are not supported.
- Image carriers or plates from outside vendors (flexo, offset, or gravure) are not supported.

# Prepress Specifications

## Proofing Requirements

- In order to leverage one set of separations across all locations, GPI uses common ICC color profiles for all our Primary Printing Processes, Substrates, and Ink Systems. As such, GPI does not allow proofs using "industry standard" profiles such as GRACoL, SWOP, or CRPC-X to enter the GPI network. Your Graphic Specialist will be able to correctly identify and provide the necessary profile for your given project. If the customer or separator is unable to comply with this workflow, GPI does offer conversion and proofing services for a reasonable fee.
- If this is your first-time providing proofs to GPI, please see Appendix D for specifics on the validation process.

**Proofs Should Contain The Following**

- All CMYK and CMYKOGV color contract proofs, including graphics with only spot colors, must utilize a GPI profile with substrate simulation applied. All spot colors should target Linear SCTV (ISO 20654) for dot gain.
- Proofs must have a Graphics Legend (format as requested above) and Idealliance ISO 12647-7 Control Wedge.
- If the proof is for flexo, it must have a highlight bump as indicated in Appendix D.
- Proofs should be 100% actual size, include the imposed die line with all dimensions, notation, and coating layers turned off.
- If die dimensions are required, they must be moved outside the trim line.
- All proofs must specify what the approval is to be used for (i.e., "color and copy," "copy only," or "color only").
- It is acceptable to send copy proofs on non-contract proofing bond/uncoated papers.
- Inside print proofs must indicate which front side copy they are assigned to. Inside and front side proofs must be shipped together.
- All proofs for color are required to have a verification sticker or printed verification on the proof that states that it has passed the tolerances noted in Appendix D.

## Contact and File and Proof Transfer

**Packaging proofs should ship to:**
Graphic Packaging International, LLC
80 Commercial Street
Concord, NH 03301
Attn: Graphic Services
603.230.5100

**Files should be uploaded to:**

- http://insite.graphicpkg.com.

If this is your first time sending files to us, please contact your Graphic Specialist for initial account set up.

**Cup proofs should ship to:**
Graphic Packaging International, LLC
155 Old Greenville Hwy., Suite 103
Clemson, SC 29631
Attn: Graphic Communications Hub
864.633.6000
gchub.clemson@graphicpkg.com

**Files should be upload to:**

- http://exchange.graphicpkg.com/
- User: quickdrop  Password: gWLgf8@4

Send email to gchub.clemson@graphicpkg.com when files are uploaded. FTP is only checked when we are notified.

# Prepress Specifications



## Specifications by Process

| OUTSIDE FILE PREPARATION: | FOLDING CARTON SHEETFED OFFSET | FOLDING CARTON WEB OFFSET | FLUTED OFFSET | FILTER FRAME OFFSET & FLEXO | COMPLEX GRAPHICS GRAVURE | COMPLEX GRAPHICS FLEXO | SIMPLE GRAPHICS FLEXO & GRAVURE | PLASTIC CUP |
|---|---|---|---|---|---|---|---|---|
| VITAL COPY FROM KNIFE/SCORE/ CREASE*** | 1/8” | 1/8” | 1/4” | 1/8” | 1/4” | 1/8” | 1/8” | 1/32” |
| FACE PANEL IMAGE ROLLOVER | 1/32” | 1/32” | 3/16” | 1/8” | 1/32” | 1/32” | 1/32” | 1/32” |
| REVERSE COPY 1/C THINNEST LINE MIN | .007” | .009” | .007” | .02” | .010” | .013” | .02” | .02” |
| REVERSE COPY MULTI-COLOR THINNEST LINE MIN | .010” | .010” | .010” | NOT recommended | .012” | .015” | NOT recommended | N/A |
| POSITIVE COPY THINNEST LINE MIN | .006” | .006” | .006” | .015” | .008” | .008” | .015” | .015” |
| TRAPS | .005” | .008” | .008” | .032” | .015” | .015” | .032” | N/A |
| HOLD BACK | .003” | .006” | .003” | .032” | .003” | .006” and .015” for Cup | .032” | .002” |
| MAX GCR APPLIED | Required | Required | Required | 4C process not supported | Required | Required | 4C process not supported | 4C process not supported |
| RICH BLACK | 2C Recommend | 2C Recommend | 2C Recommend | 100% K Only | 100% K Only | 2C Recommend | 100% K Only | 100% K Only |
| AM SCREENING CAPABILITIES** | 150 LPI | UV/EB 150 LPI Heat Set - 133 | 150 LPI | 45 LPI | Per location requirement | 120 to 150 LPI | 50 to 85 LPI | Screens should not be used |
| FM SCREENING | 35 micron | 35 micron | 35 micron | N/A | N/A | N/A | N/A | N/A |
| MIN DOT IN FILE | 1% | 1% | 1% | 8% | 3% | >1% for 150 LPI >3% for 120 LPI | 8% | N/A |
| MAX DOT HELD | 90% | 80% | 90% | 80% | 90% | 90% and 80% for Cup | 80% | N/A |
| SOLID TINTS MIN DOT TO BE HELD IF POSSIBLE | 4% | 4% | 4% | 8% | NOT recommended | 4% | 8% | NOT recommended |
| UPC MIN % / BWR | 85% / .003” | 85% / .003” Heat Set: 100% / .003” | 85% / .003” | N/A | 100% / .000” | 100% / .003” and .005” for Cup | 100% / .005” | 100% / .003” |
| QR CODE ERROR CORRECTION (.075” MIN SIZE) | Level 15 1 Module quiet space surrounding code | Level 15 1 Module quiet space surrounding code | Level 15 1 Module quiet space surrounding code | N/A | Level 15 1 Module quiet space surrounding code | Level 15 1 Module quiet space surrounding code | Level 15 1 Module quiet space surrounding code | Level 15 1 Module quiet space surrounding code |
| 2D CODE DATA MATRIX | 0.5” Min Size | 0.5” Min Size | 0.5” Min Size | N/A | 0.5” Min Size | 0.5” Min Size | 1” Min Size | 1” Min Size |
| **INSIDE FILE PREPARATION*:** | **FOLDING CARTON SHEETFED OFFSET** | **FOLDING CARTON WEB OFFSET** | **FLUTED OFFSET** | **FILTER FRAME OFFSET & FLEXO** | **COMPLEX GRAPHICS GRAVURE** | **COMPLEX GRAPHICS FLEXO** | **SIMPLE GRAPHICS FLEXO & GRAVURE** | **PLASTIC CUP** |
| VITAL COPY FROM KNIFE/SCORE/ CREASE | 1/4” | 1/4” | N/A | N/A | N/A | 1/4” | N/A | N/A |
| REVERSE COPY THINNEST LINE MIN | .015” | .015” | N/A | .015” | .015” N/A for Cup | .018” FS N/A for Cup | N/A | N/A |
| POSITIVE COPY THINNEST LINE MIN | .010” | .010” | N/A | N/A | .010” | .010” N/A for Cup | .015” FS N/A for Cup | N/A |
| SCREENING CAPABILITIES** | 85 LPI | 85 LPI | N/A | N/A | 70% | 85 to 120 LPI N/A for Cup | 50-85 LPI N/A for Cup | N/A |
| BARCODE BWR | .003” | .003” | N/A | N/A | N/A | .005” N/A for Cup | N/A | N/A |

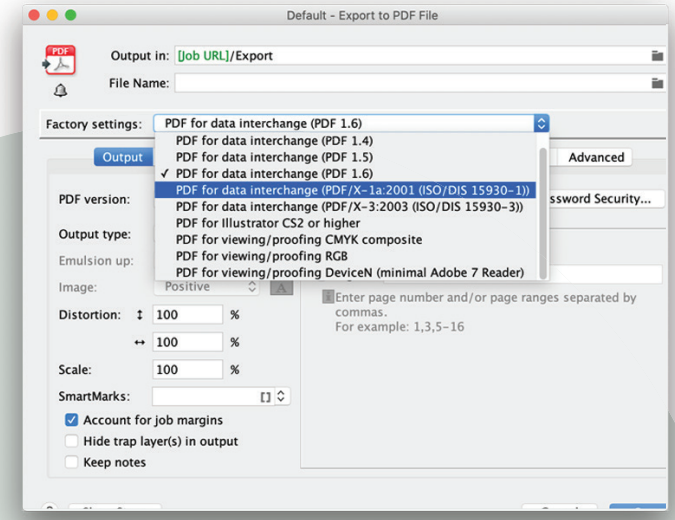
* No tone-critical work on inside prints. ** Screening applied by GPI facilities. *** Please see the “Layouts” section on page 4 for more information

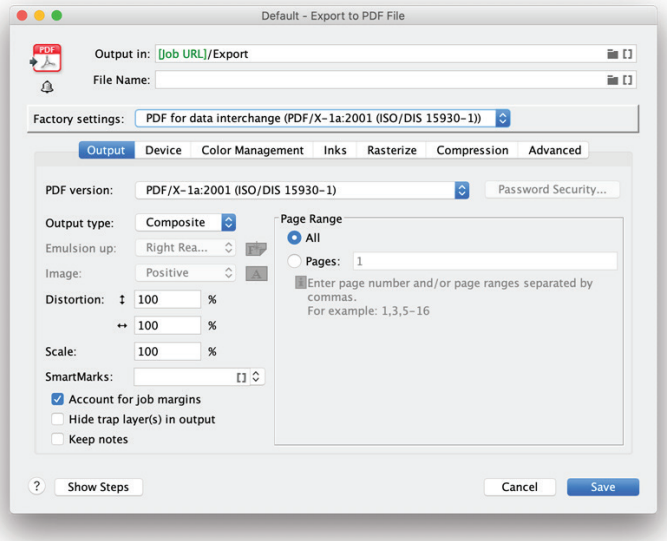
# Appendix A

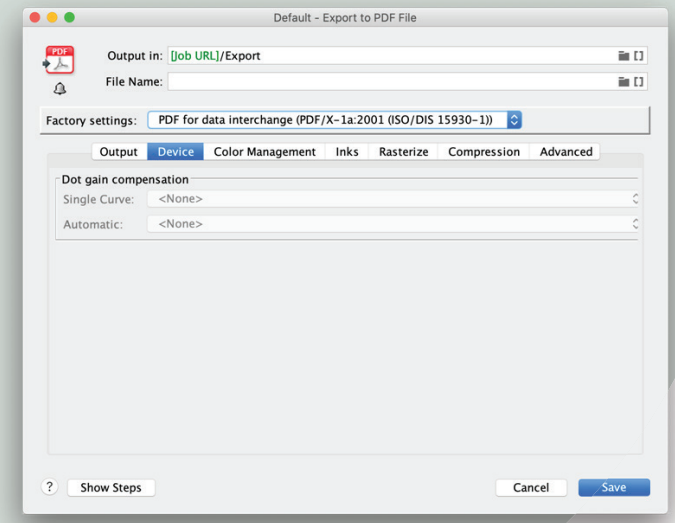


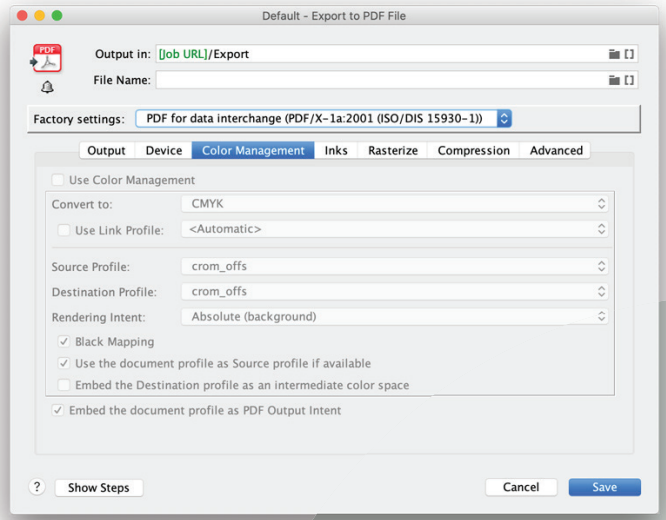
## PDF/X-1A 1.3 File Settings

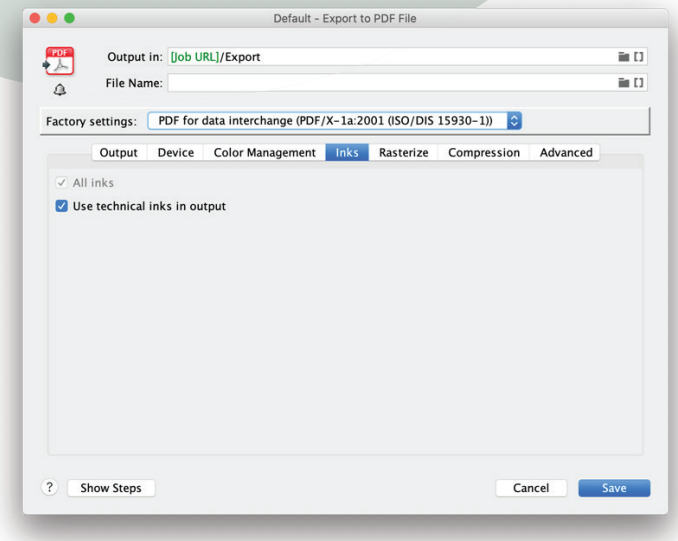
These settings are correct as of Esko Automation Engine v18.1 and should be used for guidance as to acceptable settings for GPI.

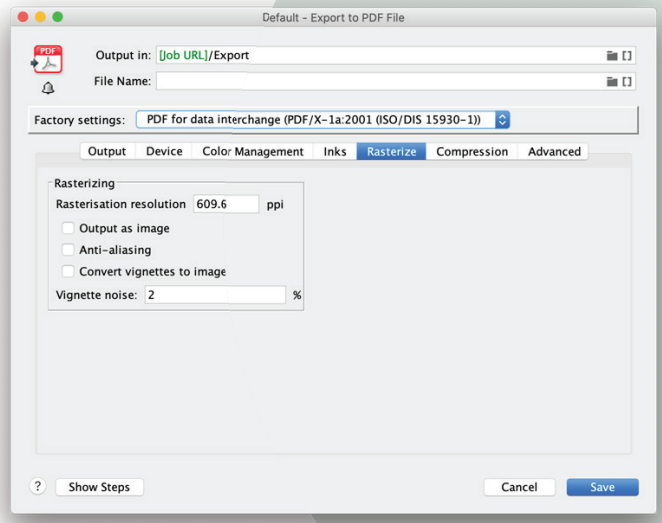


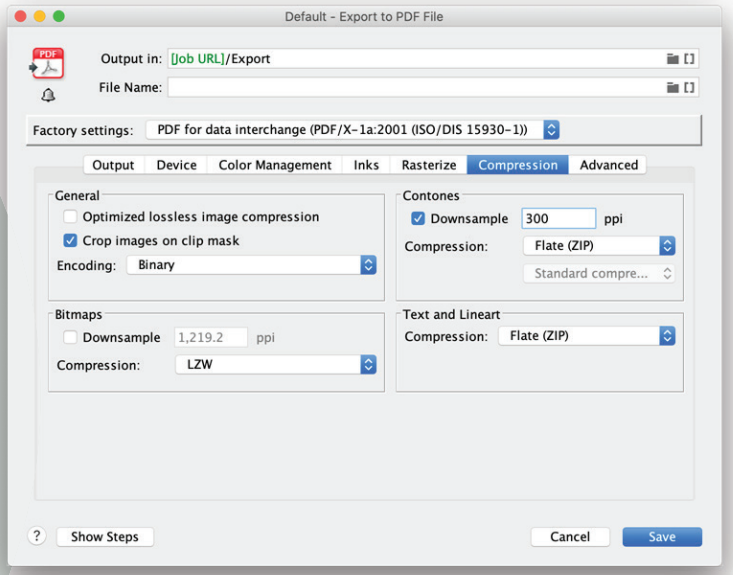



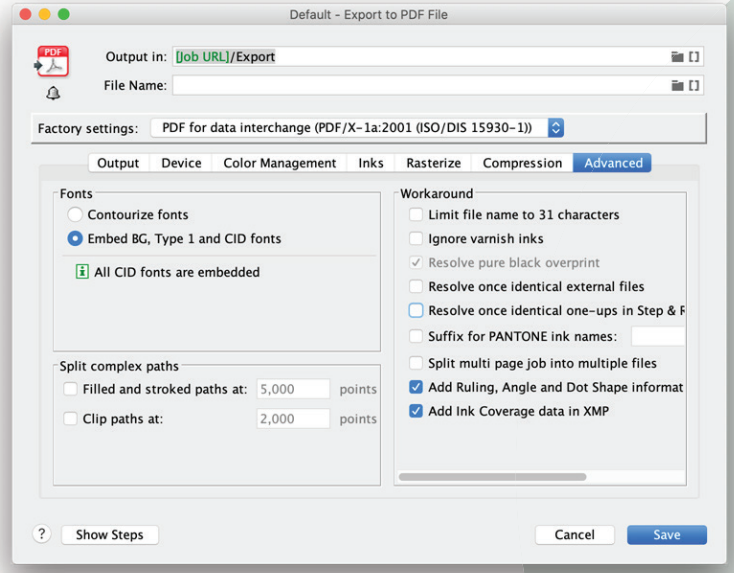
# Appendix A



## PDF/X-1A 1.3 File Settings (cont.)

Please use the following settings when creating the pdf file of your graphics.



# Appendix B



## PDF/X-4 Files

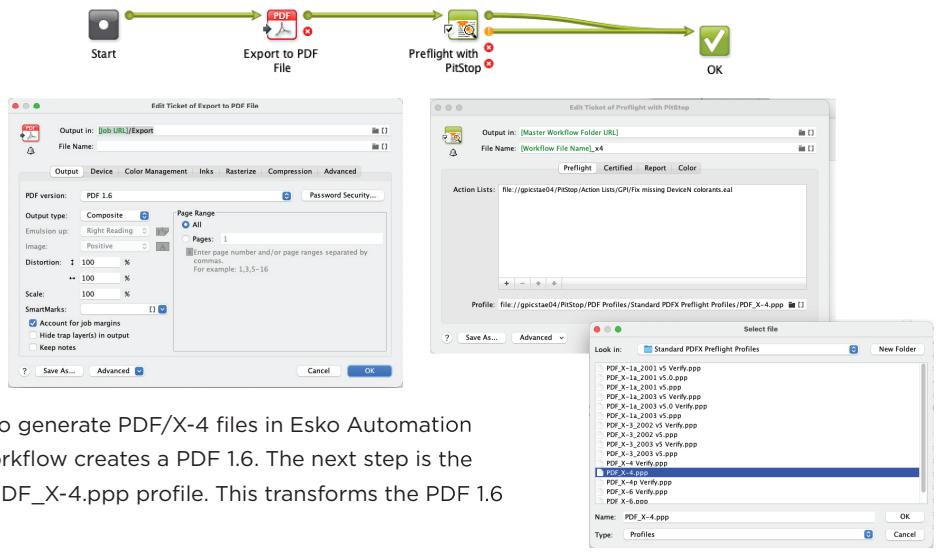
### What Are the Differences Between PDF/X-1a and PDF/X-4?

Both are ISO standards that deliberately restrict some aspects of what you can put into a PDF file in order to make them more reliable for the purposes of print production. But the two standards address different needs/desires:

- PDF/X-1a files must be converted into CMYK + spot colors, so it puts all of the responsibility for correct separations and transparency handling / validation within the prepress workflow. All the plating RIP must do is assign the correct overprint settings and screen a plating file. Therefore, PDF/X-1a was and still is popular with many printers including GPI.
- On the other hand, PDF/X-4 supports quite a few things that PDF/X-1a does not, including (but not limited to): Device-independent color spaces, Transparency, and Layers. This moves a lot more of the responsibility downstream into the plating RIP, because PDF/X-4 can include unseparated colors (RGB) and the RIP must properly render complex transparencies created by today's various design and prepress softwares.

Due to these additional complexities, both separator and printer must put in safeguards to ensure PDF/X-4 1.6 aligns with a common workflow to reduce the potential for unintended results:

- Because of the potential pitfalls related to color management in PDF/X-4, the Ghent PDF Workgroup (www.gwg.org) developed preflight profiles for different industry segments. These preflight profiles prohibit usage of objects requiring color management and the usage of transparency blending spaces other than CMYK.
- Below are a few examples of unsupported PDF/X-4 elements:
  - Color Spaces: LAB & RGB.
  - Transparency & Blend Modes: Difference, Exclusion, Hue, Saturation, Color & Luminosity.




### Recommended PDF X-4 File Settings for Esko Automation Engine

- The workflow shown here allows you to generate PDF/X-4 files in Esko Automation Engine. The first task in the sample workflow creates a PDF 1.6. The next step is the "Preflight with Pitstop" task with the PDF_X-4.ppp profile. This transforms the PDF 1.6 into a PDF/X-4 document.
- PDF/X-4 compatibility depends on the settings for color management and other parameters you define in the "Export to PDF File" ticket. These settings may be unique to your worfklow but validated by the "Preflight with PitStop" ticket.

### Additional Resources

- Below are some helpful links related to unsupported Transparency & Blend Modes:
  - https://helpx.adobe.com/illustrator/using/transparency-blending-modes.html
  - https://docs.esko.com/docs/en-us/artpro/22.03/userguide/home.html#en-us/common/ap/concept/c_an1624581.html
- The Ghent Working Group (GWG) website is a great resource for additional information regarding PDF/X-4. As the GWG and software suppliers continue to evolve their methods of complying to this specification, GPI will rely on GWG preflighting profiles and PDF Output Suite to validate our workflows and the PDF's we receive from prepress suppliers.
- Below are a few useful links for more information on GWG:
  - https://gwg.org/packaging/
  - https://gwg.org/gos5/compliancy_and_instructions/
  - https://gwg.org/gos5/

# Appendix C



## Color Management Specifications

### Color Profiles and Print Specifications

- GPI utilizes common profiles specific to a print process, substrate, and ink combination. These profiles were developed utilizing G7 and FTA best practices but tailored to GPI's printing conditions. The profiles are meant to be used by all GPI facilities for a given print condition.
- In our flexo workflow, due to the varied business mix, press capabilities, and specialized ink vehicles having end use product requirements, there are cases where location-specific profiles are used. Your Graphic Specialist will help guide you to the correct profile.
- Our workflow is designed to leverage the same data both upstream and downstream from the production process. GPI profiles should be used for color correcting graphics, proofing, on press process control, and post-production sample analysis by customers and third party PQM's.
- GPI freely shares these profiles in a variety of formats in order to support your Proofing, QC, and PQM workflows. Please contact the Graphic Specialist for details.

### Print Production Tolerances and Metrics

| CATEGORY | MEASUREMENT METHOD | TOLERANCE | CMYK + SPOT | CMYK + SPOT WITH TINTS | WITHOUT C, M, OR Y SPOT ONLY |
|---|---|---|---|---|---|
| PROCESS INK COLOR SOLIDS (CMYKOGV) | Profile (ΔE00 1:1:1) | ≤ 3.0 | ✓ | ✓ | ✓ |
| CMYK DOT AREA 25/50/75 | Profile (Murray Davies) | ± 5% | | | ✓ |
| PROCESS INK OVERPRINTS (RGB) | Profile (ΔE00 1:1:1) | ≤ 6.0 | ✓ | ✓ | |
| CMY GRAY BALANCE (HC/HR/SC) | Profile (w/ΔL & w/ΔCH) | Average ≤ 1.5 Max ≤ 3.0 | ✓ | ✓ | |
| CMY OVERPRINT | Profile (w/ΔL & w/ΔCH) | | ✓ | ✓ | |
| K TONE VALUE 25/50/75 | Profile (w/ΔL) | | ✓ | ✓ | ✓ |
| OTHER INKS COLOR SOLIDS | (ΔE00 1:1:1) | ≤ 2.0 | ✓ | ✓ | ✓ |
| OTHER INKS TONE VALUE 25/50/75 | Linear (SCTV) | ± 5% | | ✓ | ✓ |

Please note that the above indicate the average expectation not the upper spec limit.
The above are also varied based on run length, product type, and print process.

# Appendix C



## Spot Color Standards and Drawdown Specifications

### Spot Colors

- Regardless of their origin (Pantone, sample, proprietary brand color, etc.), spot colors are validated for achievability for a given print process, substrate, and ink system during the graphic approval process.
- GPI leverages the ink approval/drawdown workflow to validate that these colors are achievable for the given ink film thickness, pigmentation, print process, and substrate. These standards are utilized across all facilities where the same printing conditions are utilized.
- Unless otherwise stated, Spot Color Inks are developed on the intended substrate with an aqueous coating.
- As a standard practice, GPI REQUIRES our customer to reset the standard to our drawdown for any color >1 DE00 from the original target. This allows GPI to have an operating range in production to maintain tight tolerances and achieve consistency of the brand intent.
- CXF files of these standards are available upon request from the Graphic Specialist to ensure streamlined color communication. GPI requires the use of these standards for any post-production evaluation and third party PQM.

### Non White Substrates

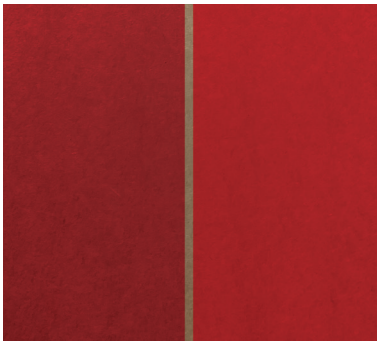
- Spot Colors developed for non white substrates (e.g. kraft or backside substrates) must be properly developed to manage the brand expectations, operational efficiency, and run to run consistency. All inks developed for this printing condition maintain a minimum amount of opaque additives in order to achieve your color expectations and maintain printability requirements.
- Inks developed utilizing the above method often result in the substrate affecting the color intent. If opacity requirements are greater than the above specification to achieve the desired color, the customer must consider printing white under the spot color.
- Please note that printing white ink requires different approaches depending on flexo and offset. Sheet fed offset requires UV curing, Web offset UV/EB curing, and Flexo is wet trapped. These approaches are location dependent and have varying print capability requirements.
- Regardless of the color match approach, noted above, the GPI internal color match standard for ink and process control will be set from the single ink on substrate without overprinting the white ink. The portion of the drawdown with the white ink applied will remain a visual standard.

### Specialty Coatings

The below applies to non standard coatings/varnishes:

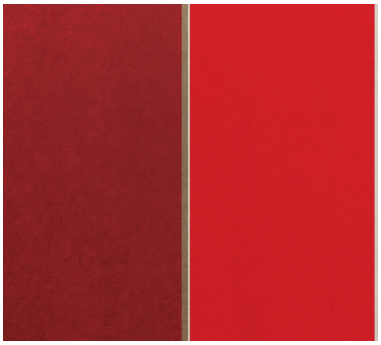
- GPI's standard practice is to match the intended color standard with an aqueous coating (not with the specialty coating). Once the initial color match is completed, the speciality coating is applied and the color is allowed to naturally shift depending on the properties of the coating.
- If you wish to maintain the target after the specialty coating is applied, please notify your Graphic Specialist. While we will do our best to comply with this request, the coating may impact our ability to achieve your expectations.
- The drawdown will be created showing 2 different coating conditions: standard aqueous coating and with the specialty coating.
- Regardless of the color match approach, noted above, the GPI internal color match standard for ink and process control will be set from the aqueous coated portion of the drawdown. The portion of the drawdown with the specialty coating applied will remain a visual standard.

Kraft Substrate



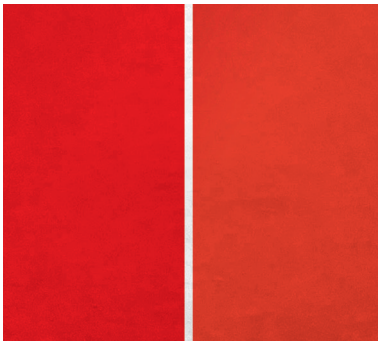
Transparent Ink | Semi-Transparent Ink

Kraft Substrate



Transparent Ink | Transparent Ink + White Underprint

White Substrate



Aqueous Coating | Matte Coating

# Appendix D



## Proof Validation and Certification Process

If this is your first time providing proofs for GPI, you must request a validation form from your Graphic Specialist so you can be pre-approved to make proofs for us. This process ensures that your software and workflow settings properly replicate GPI's profiles and your proofs represent an achievable and repeatable proof-to-press match. This must be done for each of the profiles that you are provided and should be done in each proofing location where proofs are made.

### Proofing Expectations

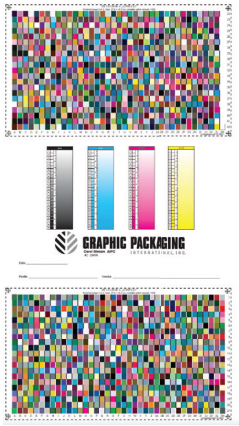
Proofs provided to GPI for color must adhere to the below conditions:

- **Process Colors (CMYKOGV/B):** Must leverage the GPI profiles, and proof must match the specifications and practices noted in the below validation and certification process.
- **Spot Colors:** GPI strongly suggests that you use a proofing RIP that leverages a spectral proofing engine and has a track record of providing visual color match for spot colors overprinting or interacting with other spot or process colors.
- **Spot Color Dot Area:** GPI requires all dot gains associated with spot colors to be measured and adhere to linear SCTV (spot color tone value). Please refer to ISO 20654 and/or proofing vendor for details on how to achieve this specification.
- **Validation:** Each Proof must contain an Idealliance ISO 12647-7 Control Wedge 2013 or 2009 and conform to the tolerance noted below "Proof Tolerance Specification" in the table below.

### Process Steps

1. Contact the Graphic Specialist for the proofing profile you require. You will need to know the Printing Process, Substrate, and Ink System. If you do not know these pieces of information, your Graphic Specialist can assist you.
2. Please notify your Graphic Specialist if your proofing workflow can support Multi-Color Profiles or 4C process only. Most of GPI's profiles are Extended Gamut, meaning they contain 7 Colors (CMYKOGV/B). We will email you the ICC or CGATS profile that will best support your workflow.
3. We will also provide a standard proofing form based off 4C Process or 7C Extended Gamut. We prefer to validate the extended gamut profiles wherever possible, as most of our customers, and yours, end up needing this at some point.
4. Before you load the profile or proof the form, we recommend that you first perform general maintenance on your proofing system and check/recalibrate your proofer's output profile. The reasons a supplier will not pass the validation process are primarily due to these two issues.
5. Once you have loaded the profile and configured your software, output your validation form. Please ensure that your settings include the paperwhite from our profile. Please pay close attention to the visual representation of the white point to ensure it is neutral in appearance and has a low DE.
6. Before sending the form back to GPI, please measure the IT8.7-4 Targets with your preferred measurement device and compare them back to the provided profile. This can be accomplished in many software programs, such as Chromix Curve Verify, SpotOn! Verify, and many others including your proofing RIP.
7. Once you have validated internally against the tolerances noted below for "Proof Certification", please send the proof back to GPI for our review. If possible, please share your internal validation with us, along with the proof.


6 Color Validation Chart




4 Color Validation Chart

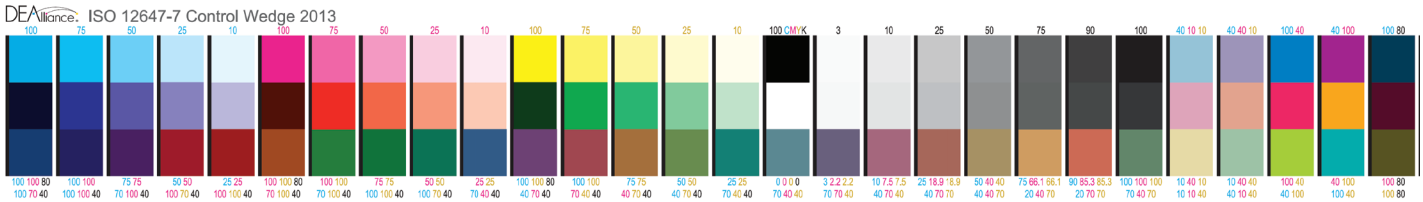
# Appendix D



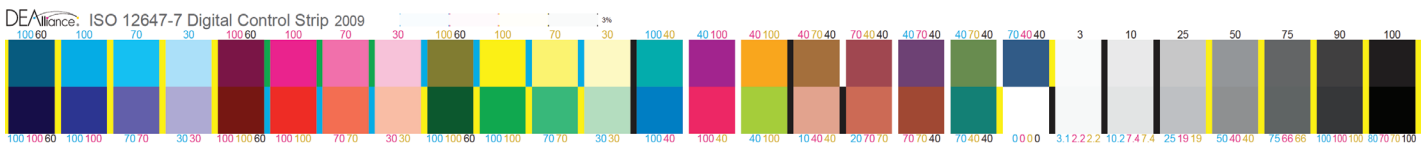
## Proof Validation and Certification Process (cont.)

| PROOF TOLERANCE SPECIFICATION | PRODUCTION PROOF | PROOF CERTIFICATION |
|---|---|---|
| **PATCH TYPES** | **ISO 12647-7:2016** | **GPI Tolerance Set** |
| **SUBSTRATE** | ΔE00 ≤ 3.0 | ΔE00 ≤ 1.5 |
| **CMY SOLIDS** | ΔE00 ≤ 2.5 | ΔE00 ≤ 2.0 |
| **K SOLIDS** | ΔE00 ≤ 5.0 | ΔE00 ≤ 2.0 |
| **GRAY BALANCE** | Avg. ΔCh ≤ 2.0<br>Max ΔCh ≤ 3.5 | Avg. ΔCh ≤ 2.0<br>Max ΔCh ≤ 3.5 |
| **RGB SOLIDS** | N/A | ΔE00 ≤ 3.0 |
| **AVERAGE** | ΔE00 ≤ 2.5 | ΔE00 ≤ 1.5 |
| **MAX - ALL PATCHES** | ΔE00 ≤ 5.0 | ΔE00 ≤ 5.0 |
| **SPOT COLOR TVI** | Linear (SCTV) ± 5% | |

| FLEXO PROOF HIGHLIGHT BUMP | ANILOX SELECTION | MIN DOT INPUT | MEASURED ON PROOF |
|---|---|---|---|
| **120 LPI** | 900 LPI Anilox | 3% Min Dot | 10% Measured Dot |
| | 800 LPI Anilox | 3% Min Dot | 13% Measured Dot |
| | 600 LPI Anilox | 3% Min Dot | 15% Measured Dot |
| **150 LPI** | 1000 LPI Anilox | 1% Min Dot | 5% Measured Dot |
| | 900 LPI Anilox | 1% Min Dot | 8% Measured Dot |
| | 800 LPI Anilox | 1% Min Dot | 12% Measured Dot |




**IDEAlliance ISO 12647-7 Control Wedge 2013**




**IDEAlliance ISO 12647-7 Control Wedge 2009**

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| VERSION | DATE | CHANGE |
|---|---|---|
| v2.0.0 | 9/2020 | Created. |
| v2.2.0 | 4/2022 | General grammar and spelling updates. |
| v2.3.0 | 4/2023 | Major updates across the entire document |
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