Migrating your packaging prepress to native PDF 23.11

User documentation

ESKO✲

Contents

1. Introduction

This document describes how you can build or modify your Esko-based prepress system to become native PDF.

1.1. Products and versions

We assume that you have the latest Esko Software installed. That means the following versions:

Automation Engine	23.11
Imaging Engine	23.11
ArtPro+	23.11
DeskPack or **Data Exchange** (if applicable)	23.11

1.2. Why PDF Native?

Over the last 20 years, the native file format of Esko's pre-press solutions has evolved from proprietary (GRS and AP) toward open formats (PDF). The Esko **Normalized PDF** format was a very important milestone, but it had its limitations:

- The normalization can be too drastic for today's needs
- Some of the proprietary metadata got bypassed by ISO standards in the meantime
- The format was not designed for a 2-way integration with 3rd party tools (in other words: Normalized PDF files were not designed to be modified by non-Esko tools)
- There was no editor available for Mac

To overcome this, the time is right to step up to PDF native. This means that no conversions or changes are made to input PDF files, unless requested by the user. That also means that 3rd party metadata is preserved.

1.3. PDF Native vs. PDF+

Over the years, the PDF standard has acquired new capabilities to better support print production. Nevertheless, standard PDF is still limited in the area of editability and dynamic behavior.

So, the Esko native PDF components described in *Components of a native PDF prepress system* on page 8 not only make optimal use of the latest PDF standards, but also allow you to enrich your native PDF documents with extra information: Esko-proprietary "plus data". That is why we speak of **PDF+**: It's native PDF and more.

The plus-data puts no restrictions on the PDF content. It is also not mandatory. So, there is not really a clear boundary between native PDF and PDF+ and so we will use these terms in an interchangeable way.

Table: Extra Information in a PDF+ file

	Standard PDF	**"Plus" Data**
Document Structure	• Page and Page Boxes • Layers and Printing State	• Groups and named objects (for easier selection) • Crosshair position
Production	• Processing Steps (to identify the technical art). See *Processing Steps* on page 6 • Ink Order	• Printing method (eg. "Flexo" vs. "Offset")
Color	• Ink Color and Solidity (opaque or not) • Output Intent Profile (named Document Profile in ArtPro+)	• Color Engine Ink Book
Screening	• Screening Ruling and Angle	• Screening Dot shape • DGC/Correction Curves
Editability		• Metadata to update linked images, placed art and structural design objects • Metadata to regenerate the barcode(s) • Metadata to regenerate the trapping layer • Metadata to update dynamic marks • Metadata to improve text editing

1.4. Main Differences with Normalized PDF

In this section we describe the most important differences between **PDF+** and **Normalized PDF**.

Processing Steps & CAD

Processing Steps is the new ISO standard for identifying technical art in PDF files such as cut, crease, varnish or emboss. This standard requires you to organize the technical art in separate layers or

sublayers and set the corresponding **Processing Step Layer Type** on each layer or sublayer. See also *Processing Steps* on page 6

Compared to Normalized PDF, you no longer need to set inks as 'technical' or 'varnish'. You also don't have to rely on naming conventions for your separations. You can give them any name. For example: With processing steps you can use just one colorant (ink) for all your technical drawings, and still be able to distinguish Cut from Emboss.

Similar to a Normalized PDF, a PDF+ file can link to CAD files. Supported formats are ARD, ZAE (from Esko Studio) and CF2. The technical drawings from the CAD file are automatically put in the correct processing steps.

Screening

Screening (dot shape, ruling and angle) in native PDF is somewhat different from Normalized PDF. The main differences are:

- With PDF+, screening settings for all the separations are grouped into **Screening Sets**. You can apply a Screening Set to all or some objects. At any location in the design, the RIP will use one screening set.

- In Normalized PDF screening settings are obligatory. PDF+ allows you to set screening to 'none', thereby indicating that you wish to fall back on the *default* screening as configured in the RIP

- When using multiple Screening Sets, this does not show as duplicated separations ("similar inks"). Instead ArtPro+ offers a color-coded view mode to check where each screening set will be used (look for *Object Screening* in the ArtPro+ documentation).

Metadata and XMP

Normalized PDF relies heavily on Esko-specific fields in the XMP data. In a native PDF environment, it would not be possible to keep this in sync. Therefor PDF+ does not rely on such Esko-specific fields anymore (but you are free to use standard XMP for other purposes, though).

See *Metadata and Business Integration* on page 30 for more information.

Color Management

In a native PDF file objects (fills, strokes, images, ...) can be expressed in color spaces that are not necessarily your printing output space. You can for example have RGB images. These are only converted to the final printing space at the last minute: in the RIP. This is different from Normalized PDF or ArtPro files, where such objects were already converted during normalization / import. If you prefer this in a native workflow, then you can do so with preflight (See *Standardizing your input files* on page 26).
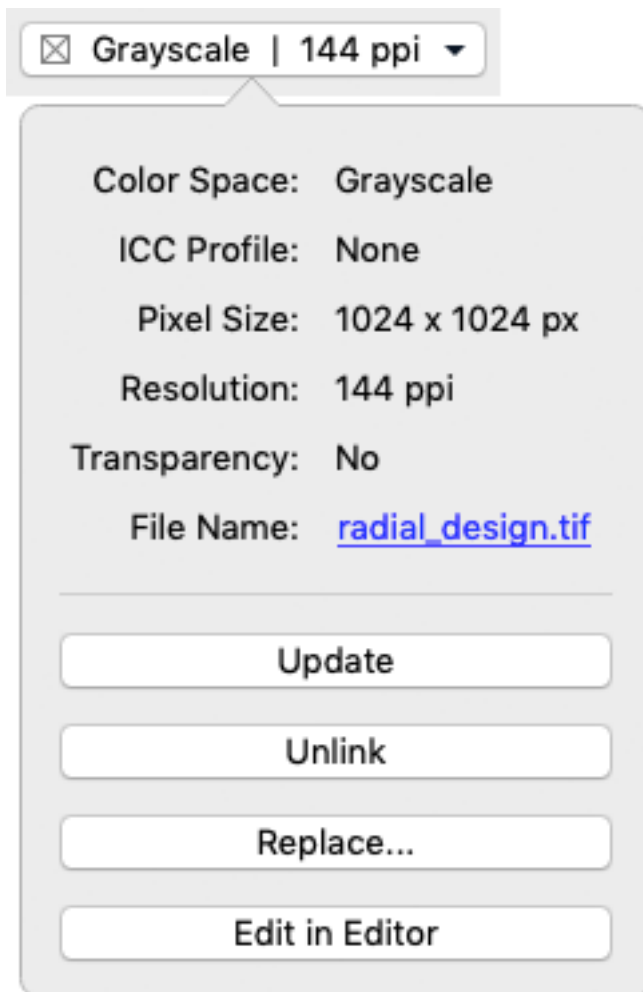
Another difference is that Normalized PDF files can have a Document Profile (added to the Esko XMP) but no output intent, while for PDF+ files the Document Profile is added as an output intent because no Esko XMP data is available.

Links and Placed Art

When placing images or other art in a PDF+ document, there are two important differences with Normalized PDF or ArtPro files:

- Our native PDF tools will always include a full resolution copy in the PDF+ file (with Normalized PDF this was optional). This ensures that the file can be viewed or RIP'ed without requiring extra files.
- Normalized PDF are automatically updated when changes are found in external files. With PDF+, you control if/when to synchronize the PDF+ file with possible changes in the external files. This way, you can ensure the job doesn't change between your last inspection and the RIP. To force a synchronization, you can click the **Update** button in ArtPro+ (see screenshot) or run the PDF Actions

Update Linked Image and Updated Linked Placed Art. Furthermore, you can configure the RIP ticket to issue an error or warning if one or more links are no longer up to date.

```
☒ Grayscale  |  144 ppi  ▼

    Color Space:    Grayscale
    ICC Profile:    None
    Pixel Size:     1024 x 1024 px
    Resolution:     144 ppi
  Transparency:     No
    File Name:      radial_design.tif

    ┌─────────────────────────────┐
    │            Update           │
    └─────────────────────────────┘
    ┌─────────────────────────────┐
    │            Unlink           │
    └─────────────────────────────┘
    ┌─────────────────────────────┐
    │           Replace...        │
    └─────────────────────────────┘
    ┌─────────────────────────────┐
    │         Edit in Editor      │
    └─────────────────────────────┘
```

1.4.1. Processing Steps

Processing Steps is the new ISO standard for identifying technical art in PDF files such as cut, crease, varnish or emboss.

Every Processing Step needs to follow some requirements:

- The Processing Step objects need to be in a **separate layer**
- The layer needs to have a **Processing Step Definition**
- All objects in the Processing Step need to be **overprinting**
- The Processing Step needs to be on top of the artwork layers.

Based on the specific Processing Step, additional requirements need to be followed, about what objects and object characteristics are allowed and how a processor (e.g. a finishing device) has to evaluate them:

1. **Processing Steps describing paths** can only contain **stroked paths**. For example: Cutting or Folding.
2. **Processing Steps describing surfaces** can only contain PDF path and text objects, no images etc .... A processor takes the objects as defining a surface (so any halftoning is ignored). For example: Embossing and Foil Stamping.
3. **Other Processing Steps**: All objects are allowed, a processor needs to take the rendered result. For example: White and Varnish
4. **Legend** is a special Processing Step and has no restrictions on content

These rules separate the colorants (separations) of a PDF file in two disjoint categories:

- Artwork Colorants (shown in AP+ and DeskPack as squares)
- Colorants used only in Processing Steps (shown in AP+ and DeskPack as circles)

▼	Separations		
👁	Name	#	Setup
👁 🟦	Cyan	1	☐
👁 🟪	Magenta	2	☐
👁 🟨	Yellow	3	☐
👁 ⬛	Black	4	☐
👁 🟦	PANTONE 280 C	5	☐
👁 ◯	White	6	☐
👁 🔴	die cut	7	☐
🔒		→ 🔳 + | − | ⚙ ▾	

1.5. Other Documentation on PDF+

You can also find relevant information on PDF+ in these places:

- The ArtPro+ user guide on PDF, PDF+ and Normalized PDF: see *here*

- A Knowledge Base Article "What is PDF+": see *here*

- Automation Engine documentation on PDF Formats and their metadata: see *here*

2. Components of a native PDF prepress system

2.1. PDF Editors

ArtPro+ is the only native PDF editor that can make full use of the plus data. Therefor it is the editor of choice. It runs on Mac and PC.

> **Note:**
>
> ArtPro+ can also open, edit and save Normalized PDF files, but that falls outside the scope of this document (*read more in the ArtPro+ manual*).

PackEdge and ArtPro are not suitable for native PDF workflows. These editors were built on previous generation graphic kernels and therefore not able to handle every variety of PDF file. In other words: they do a conversion/normalization at import.

Any native PDF editor can be used in a native PDF workflow. Neo is a native PDF editor, but it is agnostic of some recent standard PDF features and the plus data. So, it won't make use of all the available information. The same applies to 3rd party editors. Hence, we advise to use ArtPro+.

> **Note:** Adobe Illustrator is not a PDF editor, but using Esko Data Exchange, you can get more control over the Illustrator to PDF conversion, with full support for processing steps. For more information, see *Input files* on page 26

2.2. PDF Viewers

For viewing graphics and separations, any reliable PDF viewer should do the job:

- Automation Engine Viewer [1]
- ArtPro+
- Share & Approve Cloud Viewer [2]
- Adobe Acrobat (properly configured)[3]
- ...

[1] To make sure that the Automation Engine viewer is showing Layers, Processing Steps and Object Based Screening, set the configuration to view PDF files as in ArtPro+: **Configure** > **Viewer** > **View as**: **ArtPro+**.

[2]: The Share & Approve Cloud Viewer can correctly show overprints, visualize opaque inks, and a 3D preview where you can map separations to finishing operations (e.g. to see a real embossing effect instead of the preview color). If you don't have a Share & Approve account, you can use a Trial / Free Tier account. For more information, see the Share & Approve documentation *here*.

[3] Some viewing limitations apply:

1. The default Adobe Acrobat overprint viewing preference is set to "Only for PDF/X Files". Running a PitStop Preflight action list which changes the PDF/X version key of the PDF+ file to PDF/X-4, either interactively in ArtPro+ or via Automation Engine server tasks, you can make sure the overprints are by default correctly shown in any default Adobe Acrobat or Adobe Acrobat Reader.
2. Opaque ink definitions are not supported in Adobe Acrobat or Adobe Acrobat Reader. You can export your PDF to a "PDF for Viewing" in ArtPro+ 23.03, which will resolve overprints as well as opaque ink previewing in Acrobat. Note that this PDF for Viewing file is not suited for printing.

Obviously, Esko cannot be held accountable for the reliability of PDF viewers from other vendors.
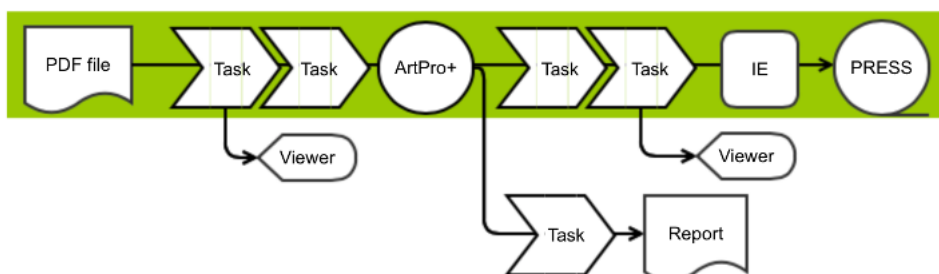
2.3. Automation

To build a native PDF packaging workflow, we apply the following guiding principles:

- If the input file is PDF and not an Esko Normalized PDF, then keep it native PDF all the way to the RIP.
- If the input file is an Esko Normalized PDF, Illustrator file, or ArtPro file, then choose the point in your flow where you want to convert to native PDF (preferably as early as possible). Beyond that point, you keep it native PDF all the way to the RIP (see *Input files* on page 26)

- A prepress workflow often has 'sidetracks', that do not directly contribute to the printed result. Sidetracks do not touch, change or adapt the production files of the main track. For these sidetracks, it is less critical to use PDF+ compatible tasks. However, it might be important that these tasks correctly honor the plus data.

In the following sections, we'll go in more detail.

Native PDF from input to RIP

If the input file is a regular PDF file (so not an Esko normalized PDF file), then the goal is to keep it as native PDF. That is especially important for all the steps that actually affect the print production. So in this section we focus on the main path in the workflow: the one that connects the input file with the press. Such a path can involve modifications in the editor (ArtPro+) and one or more Automation Engine workflows, ending with an imaging task producing LEN files that get imaged and printed.

To ensure a native PDF workflow, you need to be mindful of which Automation Engine tasks to use in the main path. Below is a list of graphics processing tasks that are safe to use in a native PDF workflow, because:

- They don't do unsolicited conversions or normalizations

- They honor all the information that can be present in PDF+ files.

> 📄 **Note:**
>
> As of version 22.03, the task label "(dynamic)" has been removed from the native PDF compatible tasks, and a new label "(classic)" was added to all non-native PDF tasks.

You can search ticket settings in workflows to easily identify all 'classic' tasks by setting the **Search** fields to **Task Type** > **contains** > **classic**

Table: Automation Engine Tasks that are compatible with PDF+

- Add Dynamic Marks
- Adjust PDF Screening
- Apply PDF Action List[1]

- Check Job and Product Parameters

- Convert Colors with Equinox
- Create PDF Report
- Create Flexo Plate Cutting Paths
- Export PDF Info
- Export to 3D
- Expand Dynamic VDP Data
- Export Picture List
- Export to Gravure using HELL Job Ticket
- Export to Unscreened Separations
- Import Picture List
- Merge PDF
- Optimize PDF[2]

- Preflight with PitStop[3]

- Prepare for Sharing

- Reverse Trap
- Split PDF File
- Step & Repeat Tabular
- Step & Repeat Template based
- Step & Repeat CAD based
- Trap
- Update Linked Files
- IE tasks[4]:

  - Image to Screened Separations
  - Image to Unscreened Separations
  - Image to Content Proof (RGB)
  - Image to Unscreened Proof
  - Proof for Content Approval
  - Proof for Contract Approval

[1] PDF Action lists offer a versatile and easy mechanism to build automations and execute them consistently in the ArtPro+ editor, or as part of an Automation Engine workflow.

[2] As of version 23.07, Optimize PDF contains a new **Color Management** category to remove or convert profile tags, or update spot color equivalents (CMYK only). This replaces the Optimize PDF Separations Color tab.

[3] For normal prefight use-cases. If you include drastic modifications in the Enfocus PDF action lists, then some plus-data might get lost.

[3] Make sure to read the chapter about the RIP below

Tasks that don't process graphics are obviously also safe to use in a native PDF workflow:

**Table: Automation Engine Tasks that don't process graphics**

Add to Products	Download WebCenter Document	Remove Product
Archive Job	Export ArtiosCAD Design Info	Resize Shape
Add to Pages View	Export Imposition to JDF Layout	Restore Job
Add Marks to Imposition	Export Imposition to PDF File	Run ArtiosCAD Standard
Apply Creep	Export Imposition to PostScript File	Run Script
Add Margins to LEN File		Select File
Assign PDF Pages to RunList	Export Kongsberg Cutting History	Send E-mail
Calculate Ink Key Settings (CIP3)	Export to VRML File	Send to AE
Change Imposition Layout	Fill Printing Lanes	Send to Nexus
Check Dynamic VDP Database	Import Die	Send to Odystar
Convert JSON to XML	Import JDF Stripping	Share Job
Convert Selection	Import Sheet Sizes from XML	Smart Task
Convert XML to JSON	Import Substrate Sizes from XML	Split XML File
Copy or Move File		Submit XML to Gang Run
Create ArtiosCAD Layouts	Inspect Artwork	Submit to CDI
Create ArtiosCAD Report from XML	Inspect Barcodes	Submit to Esko DFE
Create Job	Inspect Braille	Submit to Gang Run
Create Imposition	Inspect Spelling	Submit to HP SmartStream Production Pro Print Server
Create Imposition from JDF Layout	Inspect Text	Submit to Kongsberg Table
Create Imposition from Runlist	Integrate via External Hot Folder	Submit to Plate Merger
Create Imposition Sheet Report	Integrate with WebCenter	Synchronize ArtiosCAD Boards
Create Job Report	Interact using JDF	Synchronize ArtiosCAD Companies
Create Merged Plate	Interact using JMF	
Create RunList from PDF	Interact with Database	Unshare Job
Create Packshot from XML	Interact with SAP	Unzip
Create or Modify WebCenter Project	Interact with Web Service	Upload Files to Esko Cloud Job Folder
	Join XML Files	
	Link Product to Job	Upload Product to Esko Cloud

Create Runlist	Manage Milestone	Upload to Cloud Storage
Create or Modify WebCenter Project	Manage Product Status	Upload to SFTP
Create PDF from Runlist	Map Data	Upload via FTP
Create XML	Mark as Proof	Wait
Crop LEN File	Preflight Color for Digital Printing	Wait for Action (Checkpoint)
Delete File		Wait for Files
Download Files from Esko Cloud Job Folder	Publish Imposition on WebCenter Chain	Wait for Files (via JDF)
Download Products from Esko Cloud	Relocate Job	Wait for Product Status
	Remove Job	Zip

As Workflow Controls such as Data Collector, Data Splitter, Router, etc. are not processing files but rather controlling the behavior of a workflow, they are safe to use.

Workflow Sidetracks

In the previous section we focused on the tasks that directly affected the print production, but a workflow typically also has some 'side-tracks'. E.g. tasks that produce extra artifacts, such as reports, PDF for viewing, 3D pack shots, etc...
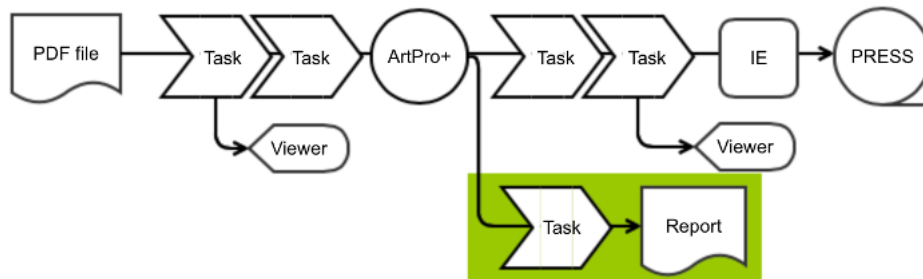
For these tasks it is less critical to be native PDF. So, next to all the tasks mentioned above, here are some more tasks that you can use in side-track workflows:

Task	Comment
Create Report (ReportMaker)	As of Automation Engine 20, a new **Create PDF Report** task is available, based on templates prepared in ArtPro+.
	As a fallback the legacy **Create Report (ReportMaker)** task can also still be used. This task will normalize the input file (and requires a Normalized PDF file as template), but that should not affect the appearance of the artwork or the separations.
Export to PDF File	A native PDF file is self-contained, so you can share your production PDF+ as a single file with others (without any of its references). It will view correctly and in full resolution in any PDF viewer.

Task	Comment
Extract Metadata	To export a smaller file size or avoid to share a file with all your production information, you can use **Export to PDF** in ArtPro+ interactively (see *the Export to PDF chapter*) or the **Prepare for Sharing** ticket in Automation Engine (see *the Prepare for Sharing chapter*
	To a standard (eg. PDF/X4): The task **Preflight with Pitstop** is recommended.
	Export for Illustrator: We recommend PDF Import plug-in for Adobe Illustrator instead.
	See also *Standardizing your input files* on page 26
	To integrate with MIS systems:
	The new **Export PDF Info** task to extract metadata of a PDF+ file can be used. The legacy task **Create PAF / JPG / XML (LinkEdge)** task can still be used to extract XMP information from a Normalized file. If the input file would be a PDF(+) file, the file will get Normalized on the fly (auto-normalization)

Font Management in Automation Engine for Dynamic Tasks

As of Automation Engine 22.07, the dynamic tasks look for fonts in the folders listed below according to the set priority:

Table: Tasks that use Dynamic Marks (Add Dynamic Marks, Apply PDF Action List, Optimize PDF, Step&Repeat tasks):

Priority	Location	Remark
1	\\<AE_server>\bg_data_fonts_v40	Available also via https://<AE_server>/ workspaces/#/admin?tab=managefonts
2	%SystemRoot%\Fonts	Fonts installed in Windows

Table: Expand Dynamic VDP Data Task:

| Priority	Location	Remark
1	URL in Fonts Path in VDP Expansion ticket	A font folder placed in a Job Container
2	\\<AE_server>\bg_data_fonts_v40	Available also via https://<AE_server>/ workspaces/#/admin?tab=managefonts
3	%SystemRoot%\Fonts	Fonts installed in Windows

2.4. Output and Export

2.4.1. Proofing

Esko PackProof can RIP native PDF files, and hence also PDF+ files. But make sure that the document's output intent (called **Document Profile** in ArtPro+) matches the input profile of the chosen Color Strategy. This to ensure that RGB images or other tagged objects are treated consistent with the RIP.

Use the **Task ends in error when the output intent is different from the source profile** option in the **Color Management** tab in the **proof for Contract Approval** ticket to avoid a mismatch between the output intent and the Color Strategy's input profile.
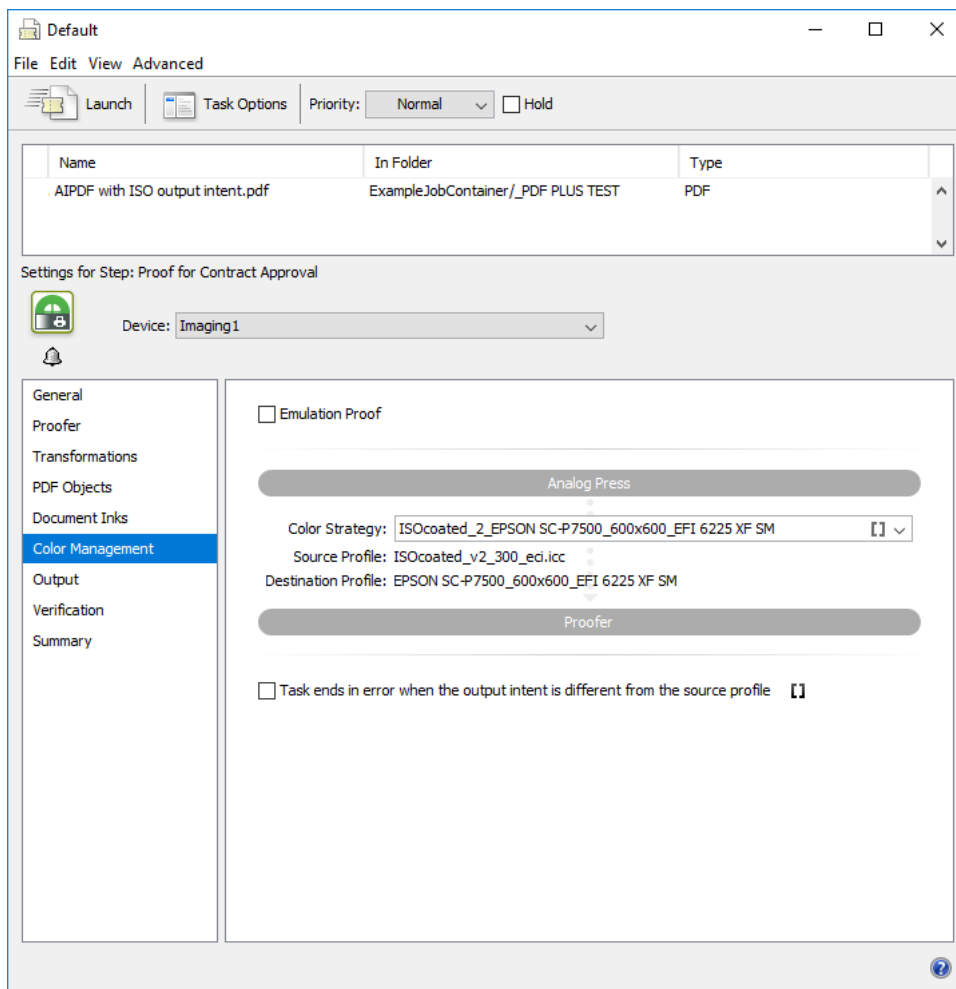
Also avoid an automatic Normalization in the background by using Dynamic Marks instead of SmartMarks! Dynamic Marks can be added in any earlier step of the workflow (for example in a PDF Action List).

See also *The RIP* on page 15 on how to filter on processing step layers to include/exclude the technical drawing.

See also *Ink Book info* on page 26 for the recommended way of adding ink book info.

2.4.2. The RIP

The Imagine Engine tasks (Image to ...) were mentioned above as safe to use in a native workflow. However, there are some limitations and constraints that you need to be aware of.

Avoid Normalization in your Imagine Engine Tasks

As of version 23.03, RIP tasks support **Dynamic Marks**, so you can apply Output Parameters via Dynamic Marks in the RIP tickets - Image to Screened and Unscreened Separations. The tasks offer a Type of Marks selector where you can choose Dynamic Marks for native PDF files, but also still SmartMarks if you process normalized PDF files.

For your workflow to remain native PDF, make sure not to choose a SmartMark set.

Correction Curves

Color correction curves (which can be set as of ArtPro+ 20) will be honored by the RIP (Imagine Engine 20), but only if you follow the guidelines in this document so that your entire workflow from editor to RIP is native PDF.

Exclude Technical Art from RIP output

Usually there are separations/part of the artwork that you wish to exclude from being RIP'ed. First you can filter on printing method (for example to exclude InkJet or Screenprinting separations). That works the same as in Normalized PDF. Secondly, you might want to filter on processing steps (for example to exclude the die cut).

As of Automation Engine 21.03, the RIP tasks support filtering on processing steps.
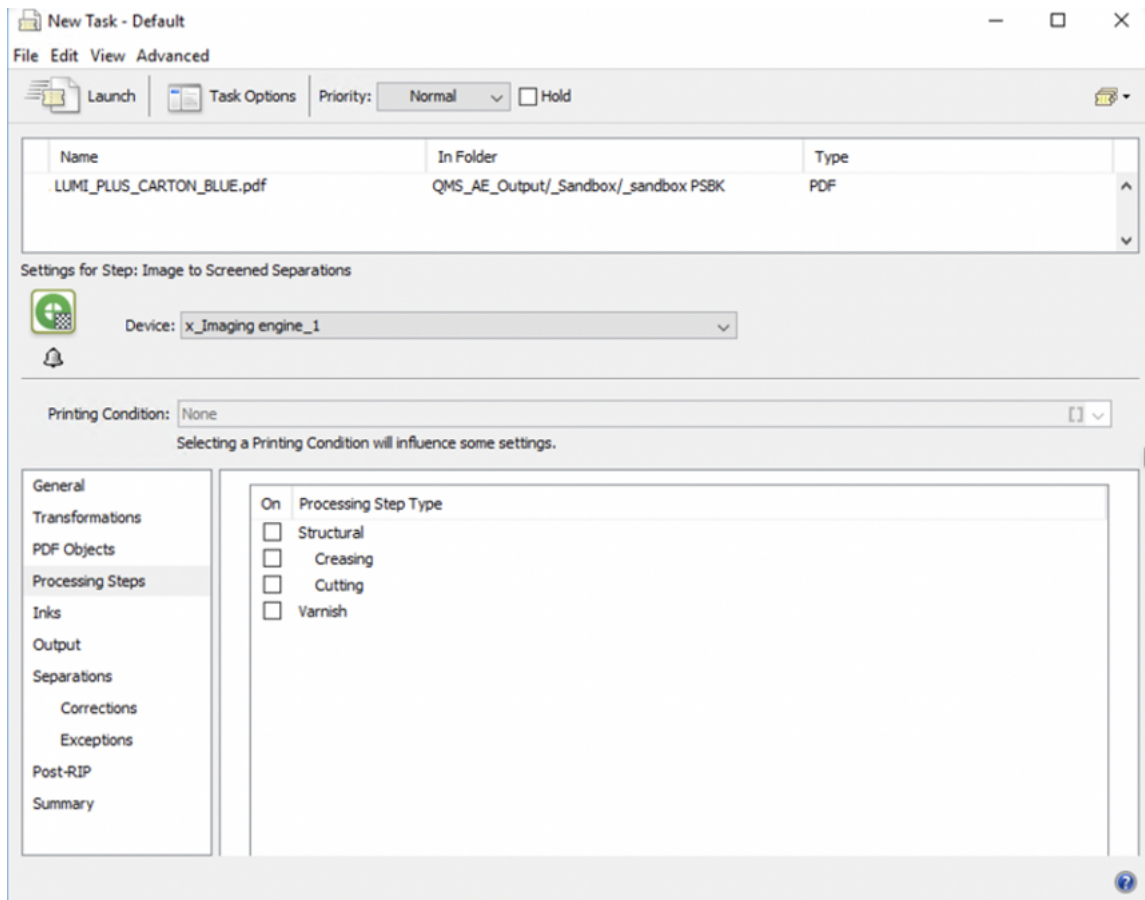
Esko DFE (output to a digital press)

The Esko DFE is designed to take any PDF as input, without performing a Normalization. So it is capable of processing PDF+ files.

2.4.3. Export to Gravure TIFF

If you require TIFF Export for HELL Gravure Tickets, you can use **Export to Gravure TIFF** in ArtPro+. See *the Export Gravure TIFF chapter*

There are three options in ArtPro+ to generate TIFF files:

- **Separated TIFF**. This outputs generic TIFF files
- **HELL-Compatible TIFF**. The generated TIFF names are compatible with the HELL workflow for HelioDisk users.
- **TIFF for HELL Jobticket**. HELL Jobtickets can be generated per separation by the HelioDisk software. By selecting the Jobticket, the settings (resolution, jobsize, ...) can be retrieved from the Jobticket. While exporting the TIFF files, the Jobtickets will be updated: Job information, Skip Areas, User History, Histogram and Proof Parameters will be written in the tickets.

In the settings, you can exclude certain separations that are not requred to make a gravure cylinder.

In Automation Engine 21.03 you can use the **Export to Gravure using HELL Job Ticket** ticket to export HELL compatible TIFF files using a Hell Jobticket.

2.4.4. Plate Cutting Paths

Plate Cutting paths in ArtPro+ are the alternative for Staggered Cutting in ArtPro & Plato. Plate Cutting paths or Staggered Cutting Paths are designed to facilitate seamless printing. Plate Cutting Paths define the shape of the flexo plates, which will typically be cut on a Kongsberg table.

A Plate Cutting Path can be used for all the separations, or a Plate Cutting Path per separation can be defined.

Plate Cutting Paths vs Staggered Cutting

ArtPro+ Plate Cutting Path	Plato Staggered Cutting Path
1. Create or open a grid-based Step & Repeat 2. Open the **Create Plate Cutting Paths** dialog 3. Define the Plate Cutting settings.	1. Create or open a grid-based PDFPla Step & Repeat file 2. Draw a path on your repetition with the **Draw Polygon** tool 3. Open the **Staggered Cutting** window 4. Define the Staggered Cutting settings.
As of ArtPro+ 21.03, a Plate Cutting Path can also be generated for files in which the grids were not created in ArtPro+.	A Staggered Cut Path can only be generated on a PDFPla based Step & Repeat.
You can choose to have an identical Plate Cutting path for all separations, or have one Plate Cutting Path per separation. From ArtPro+ 22.03 onwards, you can select separations to generate Plate Cutting Paths.	The Staggered Cut Path is the same for every separation in your document.
As of ArtPro+ 23.07, you can use **Plate Cutting tags** to ignore specific objects and marks during the plate cutting path creation.	
The ArtPro+ Plate Cut license has to be available on the customers system to be able to create the Plate Cutting Paths.	The Staggered Cutting license needs to be available on the customers system to be able to insert cutting lines for staggered jobs.
For more information, see *the Plate Cutting Path chapter*	For more information, see *the Staggered Cutting chapter*

Interacting with your Plate Cutting Path

The Plate Cutting Paths don't need any editing. You can only edit the Plate Cutting Path by expanding it, i.e. convert it to a regular object.

The Plate Cutting Path and modified labels are non-destructive, everything is stored in the Plate Cutting layer. When you remove the Plate Cutting Layer, your Step & Repeat file is back to normal.

Verifying your ArtPro+ Plate Cutting Path
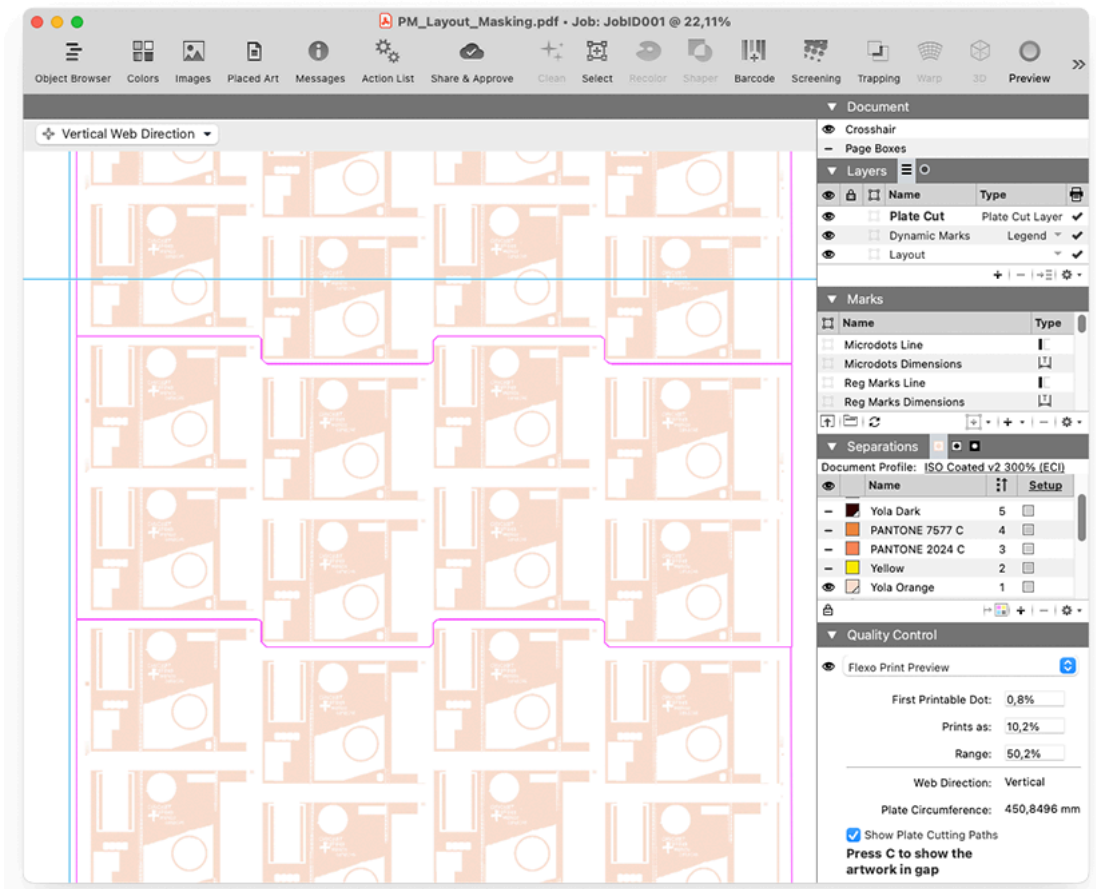
You can easily check your Plate Cutting Paths in ArtPro+ by using the **Flexo Print Preview** option in the Quality Control section. This will automatically display a continuous repetition of your layout. By enabling **Show Plate Cutting Paths** you will also see the Plate Cutting Path for the separation you are viewing.

As an alternative, a small workflow in Automation Engine has been created, that will create a multipage PDF with a single separation and the corresponding Plate Cutting Path per page. You can download the workflow *here*, import it in your Automation Engine and adjust it to your RIP device.

> **Note:**
>
> This workflow can only be used if you have Imaging Engine.

Below the multipage PDF with a separation on every page.
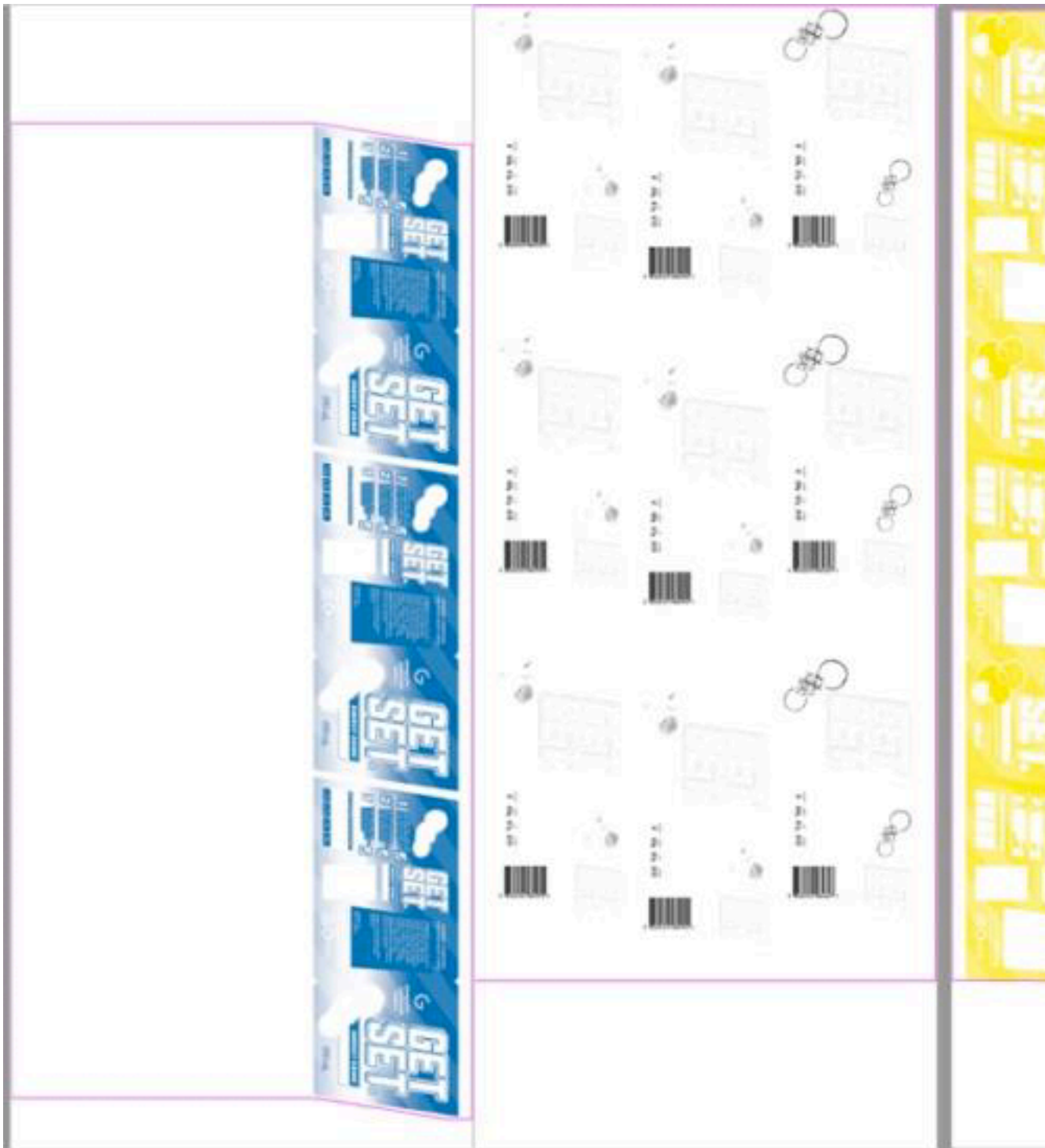
Plate Cutting Path in an Automation Engine workflow

The workflow for staggered Step & Repeat files is very similar between ArtPro+ and Plato.

You can use **Step & Repeat Tabular (Dynamic)** ticket in Automation Engine to create a staggered grid-based Step & Repeat file. Next, using the **Create Flexo Plate Cutting Path** task, you can add the Plate Cutting Paths.
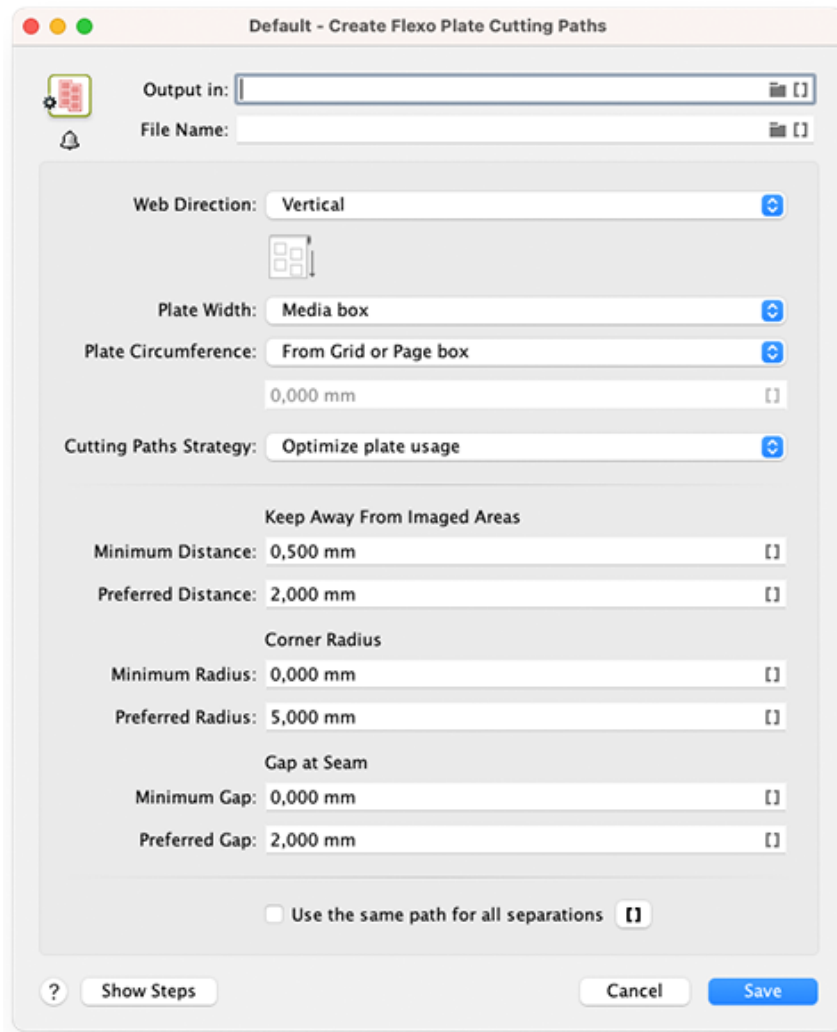
Alternatively, you can use the **Create Plate Cutting Paths PDF Action**. This allows additionally to Use Selected Paths (i.e. create a Plate Cutting Path based on an existing path). You can use the full power of PDF actions to select the path and select the separations you want to apply it to.

This PDF+ Step & Repeat file can be RIP'ed with Imaging Engine and send to the **Merge Queue**.

Every separation will keep its own Plate Cutting Path when send to the Plate Merger. When this plate is exposed, the cutting data can be sent automatically to the Kongsberg Cutting table.

Below a visualization of a Merged Plate ready to send to the CDI. The image shows a staggered Step & Repeat with a separate Plate Cutting Path per separation.
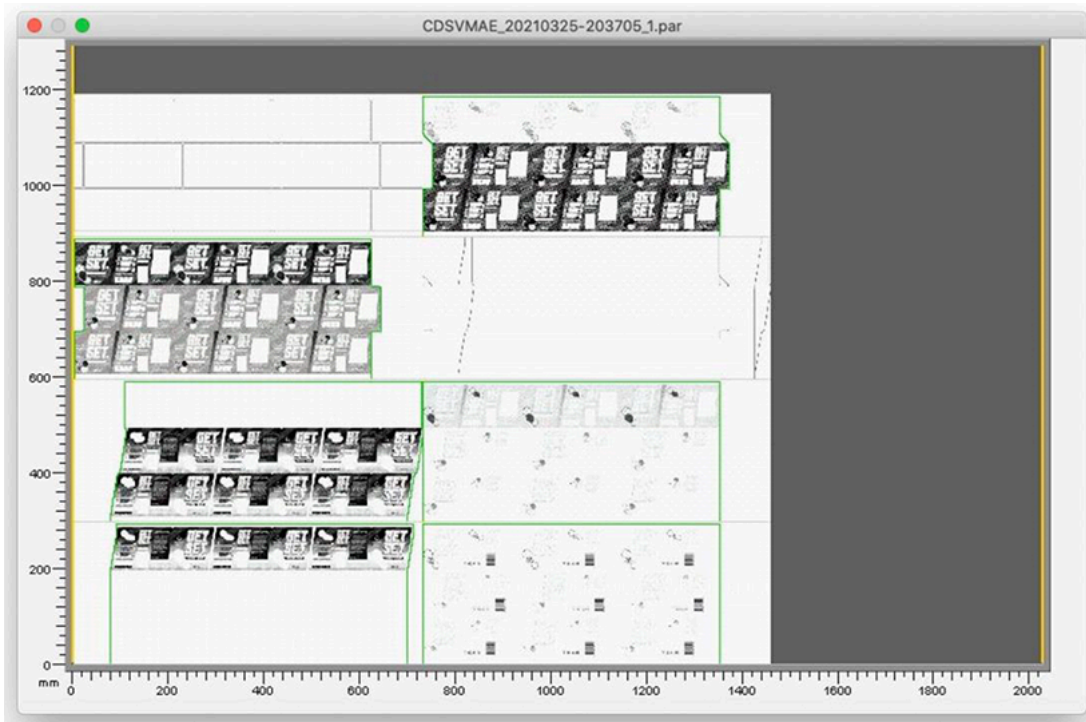
2.4.5. Printing Units

Why using Printing Units

Today, managing reverse print would require you to 'abuse' the native PDF Ink sequence to get a correct production file, compromising the viewing experience as if you would be looking at it from the backside.
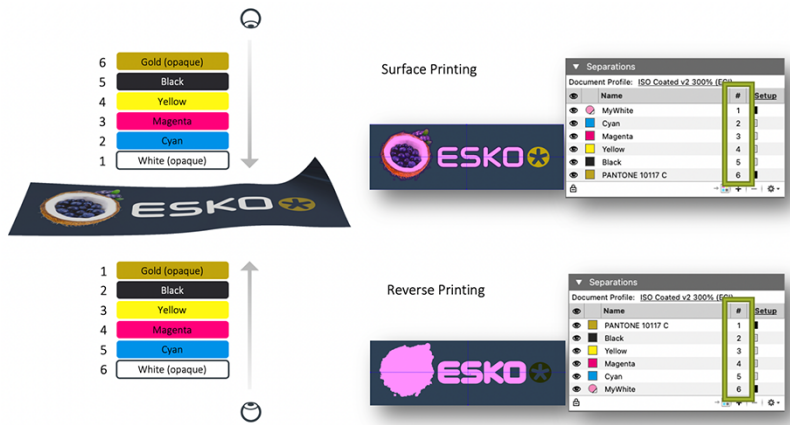

Today, all viewers are initially "wrong" because a consumer would also not be looking at a reverse printed job from the backside of the substrate.

Only PackEdge, ArtPro classic and AE Viewer can be **configured** to view correctly, but this would simply be a temporary viewing option which was not stored to the file.

With the release of version 22.07 of DeskPack, ArtPro+, Automation Engine and Imaging Engine, we introduce Printing Units, new (PDF+ only) metadata to separate the production order from the viewing order.

The native PDF ink sequence will remain as is to keep viewing experiences in PDF Viewers as expected, but we're adding Printing Units to make sure the production workflow takes the correct ink lay-down into account.
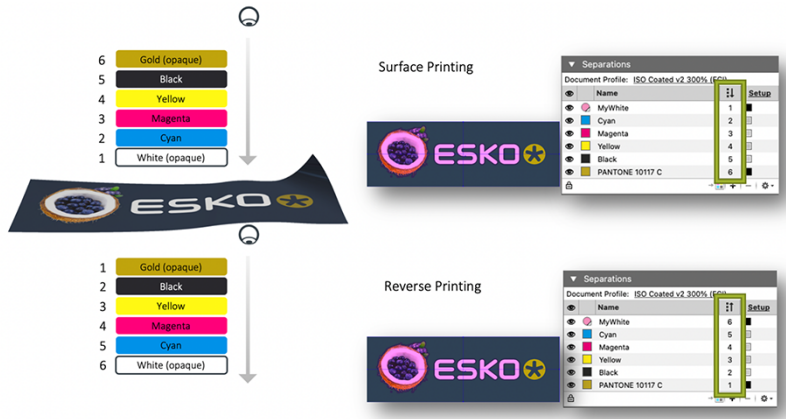
ArtPro+ and DeskPack offer options to set, edit or remove Printing Units.

There are 4 possible states:

- **undefined**, which is the default behaviour as we have today, taking the PDF Ink Sequence as printing and viewing order, perfect for surface printing,

- **normal** which means you have assigned the default printing units on top of the PDF Ink Sequence, i.e. allowing you to exclude processing steps or leaving print stations empty,

- **reverse** to indicate a reverse printed job and allowing a reverse numbering next to the native PDF Ink sequence therefore not compromising any viewing experience.

- **invalid** where the Printing Units sequence is not strictly a descending or ascending list.
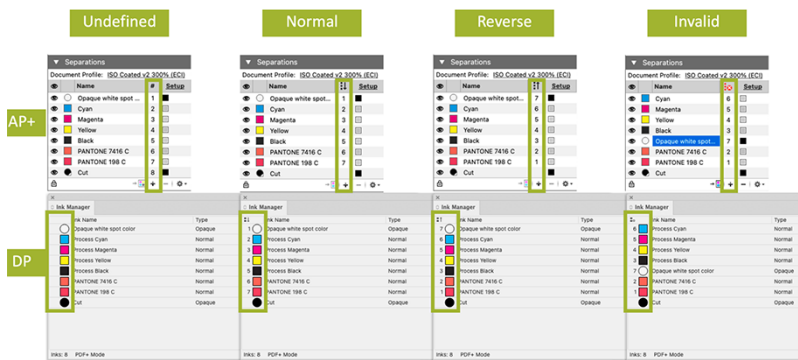
Printing Units can also be used to leave an empty patch in your mark sets, when i.e. JOB A needs to print with 7 inks, while JOB B would print with a subset of the same ink set. Using **Printing Units** you can assign the correct station number to a separation which can be reflected in marks, so I can print jobs with a (subset) of separations on the same press without setup or changeover time.

As for Automation, the **Printing Units** metadata can be used to drive workflow options such as mirroring of reverse printed jobs, naming of the output files and correctly evaluating marks.

A new system SmartName **Print Order** is available, which will query the file for Printing Units and will feedback one of 4 before-mentioned states, which can be used to route files to specific workflows.

The **File Info** dialog was extended with a **Printing Units** column.

For Imaging Engine, the **Printing Unit** SmartName is available under the **Imaging** SmartNames, allowing correct naming of output.
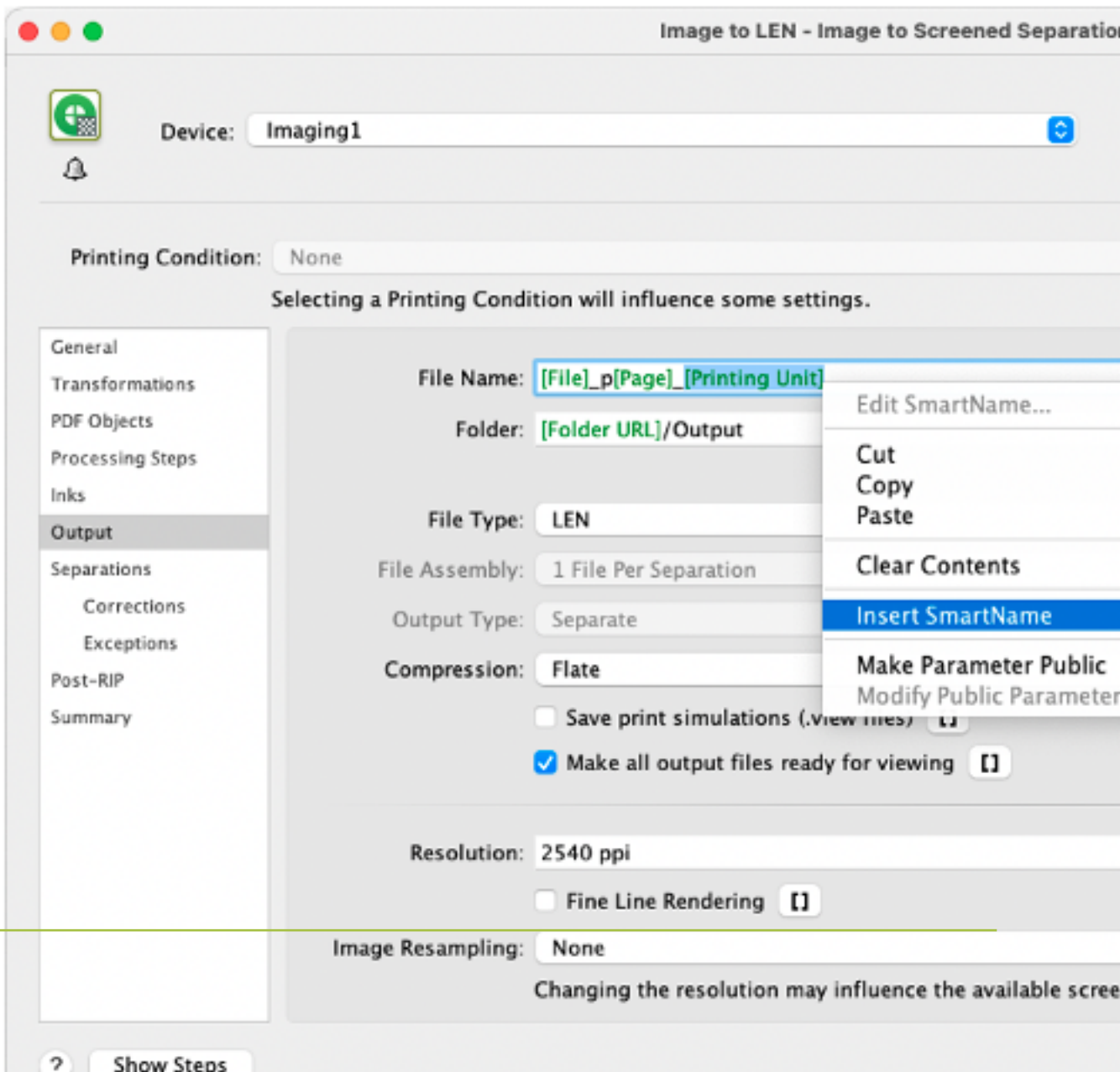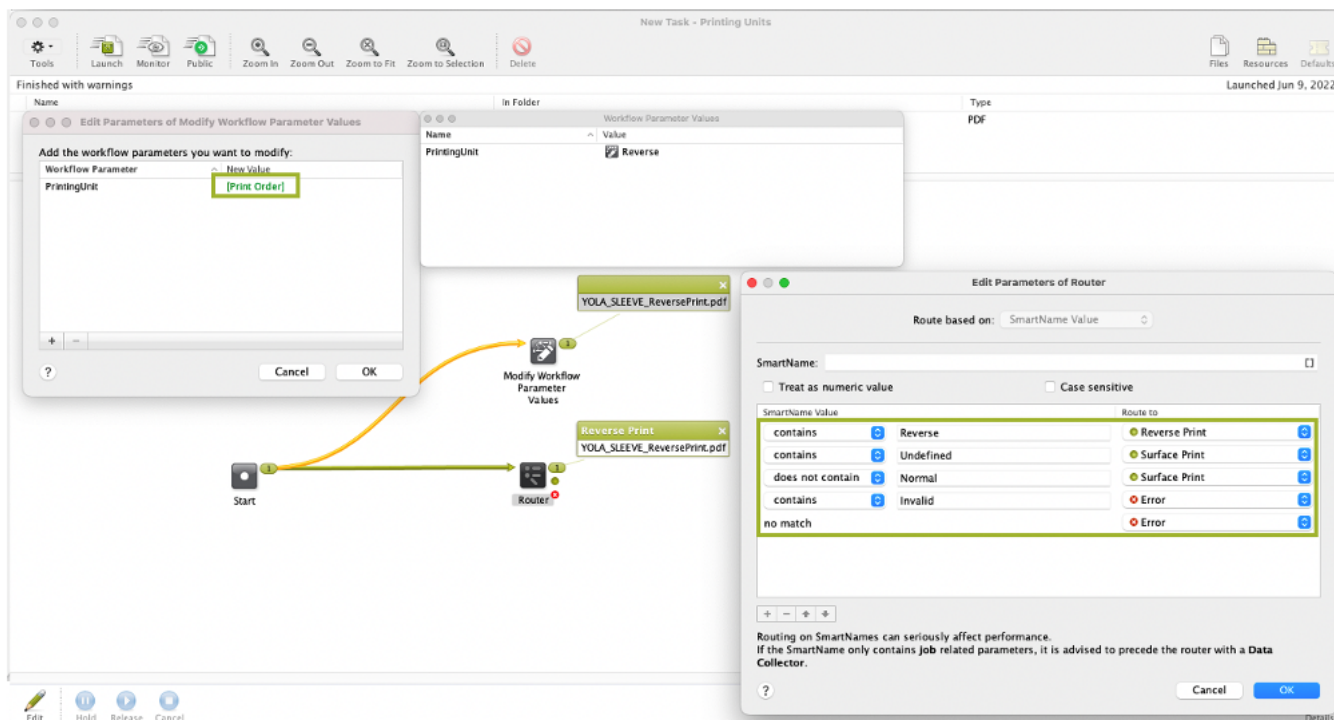
Marks

You can build or load **Marks** that filter on printing units:

The **Printing Units** option was added for specific Dynamic Marks with the Dynamic Color setting enabled. The new setting **Printing Units** does not follow the order of the separations but follows the assigned **Printing Order**.

You can also find a new variable in the **Separations** category of Smart Text variables. The **Separations Printing Units** variable can be used just like any other separation variable.

If the printing unit specified for a certain Mark is not available on the page, then the Dynamic Mark will be empty.

Export

In **ArtPro+**: When there are no printing units assigned, **Export to Gravure Tiff** will by default name TIFF files using the suffix as defined by the viewing order: [file name] # [separation index], e.g. Job#1.tif, Job#2.tif, etc.

When printing units are assigned, only the separations with printing units assigned can be enabled/disabled in the **Export to Gravure TIFF** in all 3 Export Formats.

When using **HELL-compatible TIFF** or **TIFF for HELL Job Ticket**, the suffix #1 etc. used in the file name of the exported TIFF will be based on the printing unit of that separation. Separations without printing unit cannot be enabled or disabled in the Gravure TIFF export menu.

When using **Separated TIFF**, only the separations with printing units can be enabled/disabled in the Gravure TIFF export menu.

In **Automation Engine**, the **Export to Gravure Tiff using Hell Job ticket** and the **Export to Unscreened Separations Hell Gravure Tiff** tasks were updated to automatically take the Printing Units into account when they are present.

In the **Export to Unscreened separations** task in **Automation Engine**, when printing units are defined in the input file, only those separations can be exported.

In the **Export PDF Info** task in **Automation Engine**, when printing units are defined in the input files, the separations in the PDF Info will be sorted by their printing units.

The **Export CIP3** task will also include the Printing Units.

DeskPack for Illustrator

In **DeskPack for Illustrator**, Printing Units functionality is part of Data Exchange's **Ink Manager** plugin. You will need to be in PDF+ mode to be able to apply Printing Units.

Similar to what you have in ArtPro+, you can find the action to assign default normal or reverse printing units in the Ink Manager flyout menu, and you can open the Ink Options dialog to set/edit or remove a printing unit for the selected separation.

DeskPack Dynamic Marks also offers a variable **Ink Printing Units** which you can use in a similar way as the **Separations Printing Unit** variable in ArtPro+.

3. Input files

3.1. Standardizing your input files

A Normalized PDF workflow had the advantage that undesirable variation in the input PDFs is automatically reduced to a common standard as part of the automatic Normalization. In a native PDF flow this no longer happens implicitly. Instead you can insert it in your workflow. And this time you have full control:

- **Pitstop Preflight**: Available in ArtPro+ and as an Automation Engine task. Will fix your PDF file based on a preflight profile, this can be an industry standard (e.g. PDF/X4) or your own profile.
- **Optimize PDF**: Is a collection of common tools to bring a PDF to your house standards. PDF files processed by this ticket will always get an output intent assigned. The default output intent is defined and can be changed in the **Automation Engine Configure** tool: **Automation Engine Pilot** > **Tools** > **Configure** > **Processing Preferences** > **PDF+ Processing**: **Default Document Profile**)
- Other, more advanced, modifications can be done with a PDF action list, either in ArtPro+ or using the **Apply PDF Action List** task in Automation Engine.

> **Note:** As of version 23.07, the **Apply PDF Action List** task supports Tilia Phoenix layout JDF files as input.

3.2. Ink Book info

If you rely on Color Engine for color accurate viewing or proofing, then it is important that the spot colors separations refer to the correct Color Engine inks.

To make sure that the correct ink book names are stored in the PDF+ file:

- You can set it manually in **ArtPro+**
- You can set it manually in **DeskPack Ink Manager** (and export to PDF+)
- You can use the **Optimize PDF** ticket to automatically assign the ink books. *More in this article*

> **Note:** If a PDF file has separations without an ink book name (also known as "unregistered inks"), then some Automation Engine tasks might search the ink books for matching names. This can lead to inconsistent results. Therefore it is advised to store the ink books names in the PDF+ file.

3.3. Legacy files

If the input file is an Esko Normalized PDF file or an ArtPro file (e.g. when you are processing a reprint order), then you could run them through your old workflows (We don't intend to deprecate these tasks

anytime soon). But for consistency, it is advised to convert them to native PDF as early as possible in the workflow, and then make sure to keep them native PDF (as described above).

To achieve this: Normalized PDF files and ArtPro files can be opened in ArtPro+ and converted to PDF+ there or converted with the PDF Action "Convert to PDF+".

You can see an example workflow in
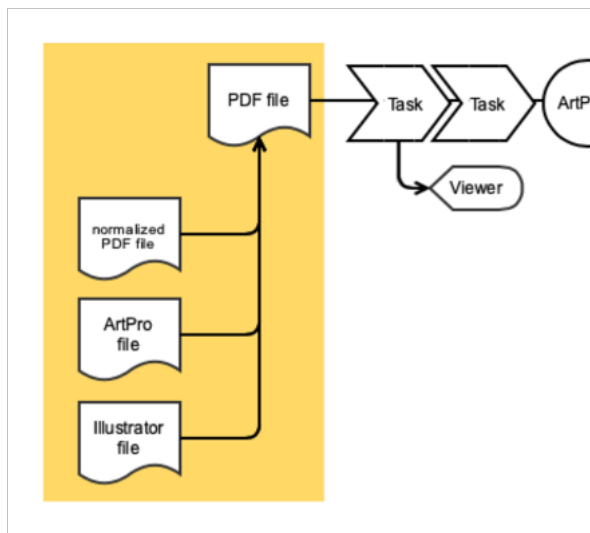
3.4. Illustrator files

An Adobe Illustrator documents needs to be converted to PDF* before it can be used in an output workflow. It is your choice at what point in the workflow you do this conversion:

Edit in Adobe Illustrator (and convert late)

If you prefer to prepare the one-up in Illustrator, using the Esko DeskPack and/or Data Exchange plug-ins, then you can export directly to PDF+: In the **Ink Manager**, set your document mode to **PDF+**, and then export to **Esko PDF**. (read more in the *DeskPack manual*).

When exporting to PDF+, the following metadata and high level objects are saved to their PDF+ counterpart:

- Layers, Groups and Named objects
- Text and type-setting
- Dynamic Barcodes
- Placed Structural Design files
- Linked images
- Trapping Tags and the Automatic Trapping Layer
- Ink information (eg. Printing Methods, Color Engine Ink Books)
- Document Color Profile (saved as the Output Intent Profile)
- Processing Steps
- Screening*
- Distortion info

- Ink information is stored

* DeskPack currently doesn't let you choose "None" for screening, so all objects in the exported PDF+ will have a screening defined.

> **Note:**
>
> The Dynamic Marks in DeskPack are designed to be exported to Normalized PDF only: when exported to PDF+ they will become static art.

> **Note:**
>
> Dynamic Content objects and Dynamic Art and Dynamic VDP artwork do not have an equivalent in PDF+ so they are exported as static art.

Edit in ArtPro+ (and convert soon)

If you prefer to use ArtPro+ for your editing needs, then you can just use Illustrator's built-in PDF save or export capability and process the file as a native PDF file. You can also directly use the Illustrator file (if it's PDF compatible) but note that as soon as that PDF file is modified, you will not be able to open it natively in Illustrator anymore.

> **Note:** As an Illustrator User providing Illustrator PDF files, you should enable the **Add top level layers** option to ensure you have a layered PDF file inside a PDF editor.

Illustrator can also write an "Illustrator PDF with Editing Capabilities", suggesting that you can go back and forth between Illustrator and PDF without a conversion. **This is not true**. Illustrator and PDF are very different formats, and a conversion is inevitable. An "Illustrator PDF file with Editing Capabilities" actually consists of 2 parts:

1. PDF data (equivalent to exporting to PDF)
2. The original AI-document

The PDF data can be used by any viewer, printer or RIP, while the AI data is used by Illustrator when reopening the file.

If you edit such a file in a PDF editor, you are breaking the consistency between the PDF and AI information. When reopening the file in Adobe Illustrator, you will have a choice:
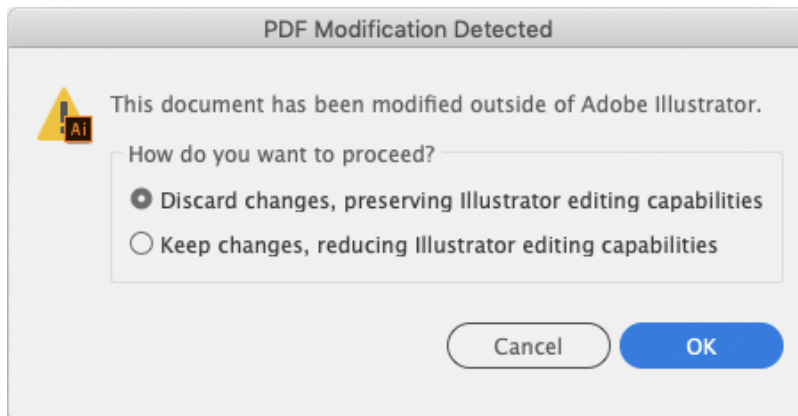
If you choose **Discard changes, preserving Illustrator editing capabilities** you discard all changes you made in the PDF editor, and open the original Adobe Illustrator file instead.

You can avoid this from the start by disabling the **Preserve Illustrator Editing Capabilities** option when saving the PDF in Adobe Illustrator, or you can remove the Adobe Illustrator portion of the file using a PDF Preflight profile. For more information, see *this article*

4. Metadata and Business Integration

PDF+ no longer relies on Esko proprietary tags in the XMP section. This has implications for your MIS integration and your Automation Engine workflows.

MIS Integration

In a standard MIS integration, Automation Engine will push XMP information to the business system. This XMP information includes the number of inks, the ink names, other ink attributes and ink coverage data.

For PDF+ files, we recommend that you use the **Export PDF Info** task instead of the **Create PAF / JPG / XML (LinkEdge)** task. If there was already an MIS integration then you can configure this task to export XML files that are backwards compatible. For new integrations, you can choose for an updated XML scheme. For detailed information, search for **XML specification of Metadata+** in the *Automation Engine* documentation.

Controlling the Workflows with Metadata

SmartNames are a powerful mechanism to control the Automation Engine workflow. When migrating to a PDF+ workflow, all SmartNames will still work in a similar way, except for XMP XPath SmartNames. They will not resolve, as there are no Esko tags in the XMP section of the file.

Instead you can now use these SmartNames (available in the File Info category

Ink Related	
Artwork Separation Names	Long Separation Names
Separation Names	Number of Separations
Long Artwork Separation Names	Number of Artwork Separations
Box Related	
Bottom Margin	Top Margin
Left Margin	Right Margin
Other	
Vertical Distortion	Horizontal Distortion
Layer Names	Output Intent

If you need other information that you previously would access from the XMP, then you can export the XMP to a separate and temporary file and perform an XPath query on that file, as shown in this example:
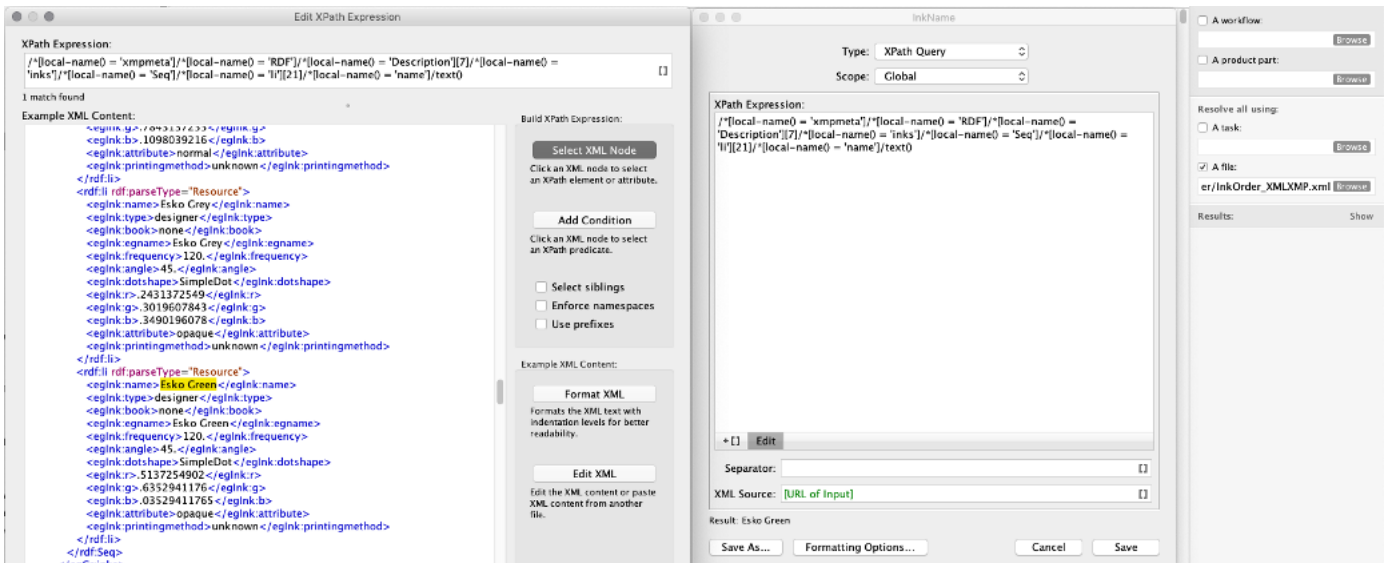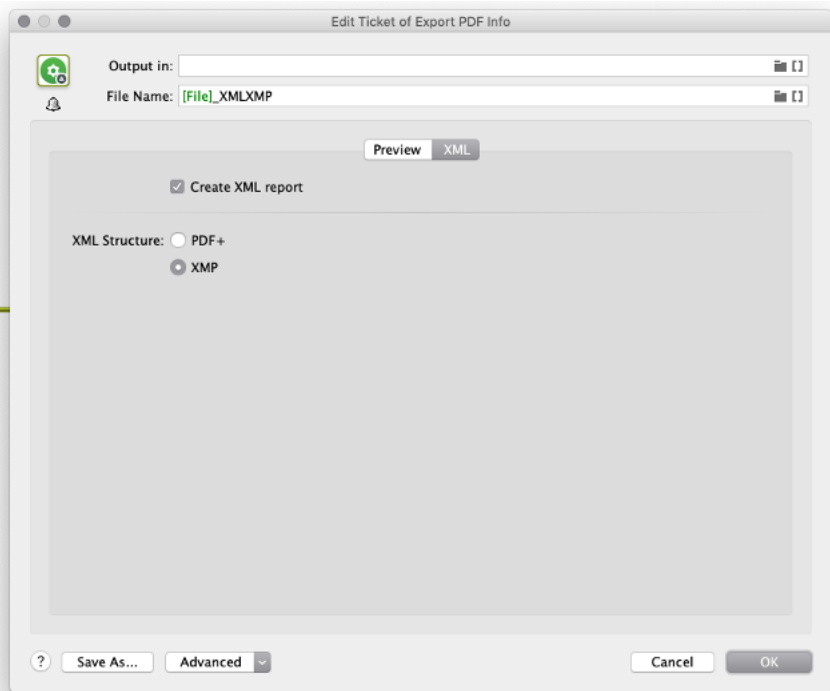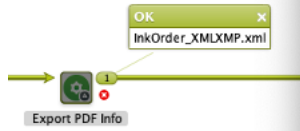
5. Planning your Migration

5.1. Am I ready to migrate?

Before diving into the migration, best to check if you and your tools are ready for it. You can start by reading this document from start to finish, as it lists some limitations in the current software versions. If these limitations and the presented workarounds do not fit your business requirements, then it might be better to wait for a future update of our software. You can let us know via the *Esko Ideas* platform.

5.2. Approach

Migrating to native PDF is a unique opportunity to review, standardize and update your system. In our experience you can end with a significantly simpler and easier to maintain system. We would not advice that you replace your current workflows one task at a time, as you will miss this opportunity to simplify.

You'll only get the full benefit from native PDF after you have migrated your entire system (software, workflows, marks, ...). It's unlikely (and risky) that you will switch overnight. So you will need a phased approach. Luckily you can use your old and new workflows and editors alongside

Get Help

If you feel that you don't have enough time or knowledge to do the migration yourself, you can now ask Esko for assistance. The Native PDF Migration Bundles include a range of services provided by Esko to assist you on the migration from classic formats to native PDF.

The Esko experts, after auditing the sistem in place, will recommend the right bundle of services according to your needs. For further information, please reach out to your sales account manager *or contact us.*

Rebuild Backwards

One way to phase the migration, is to start at the end of your workflow and then move upstream:

- First you reimplement your production workflow (**Step&Repeat** and **RIP**), using dynamic marks and the new S&R tickets. This workflow starts by a PDF Action that converts Normalized PDF or ArtPro one-ups to PDF+.
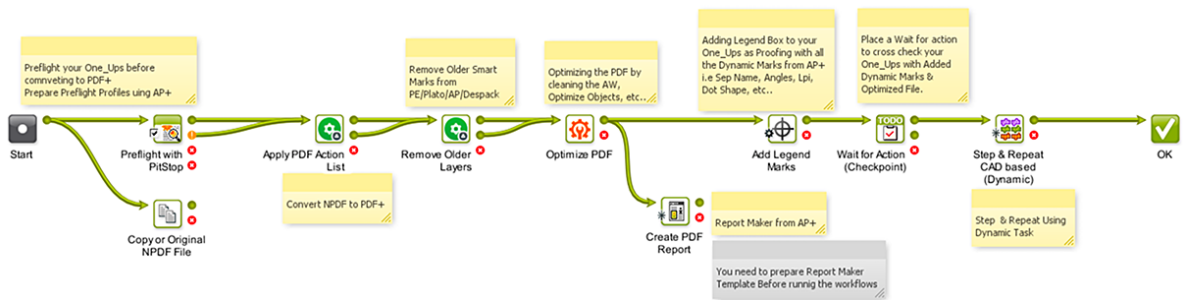
- In a next step, you can reimplement your technical reports, using dynamic marks and the new **Create PDF Report** ticket.

- In the meantime, you gradually roll out **ArtPro+** as prepress editor and QA viewer. Even for opening Normalized PDF files. If you're using Illustrator as editor, then this is the time to start exporting PDF + files.

- Lastly you reimplement your prepress (one-up) workflows

> ⚠️ **Important:**
>
> If you're using Normalized PDF files and want to replace SmartMarks with dynamic marks, we recommend to prepare a PDF action list to remove your SmartMarks layer and apply dynamic marks using the "Add Dynamic marks" task in AE, as depicted above *(Remove Older Layers)*
>
> Tip: You can recognize which layer to be removed from the PE/Plato/AP/Despack file through the action list and replace it with AP+ Dynamic Marks

💡 **Tip:**

Migrate by Job Category

Another successful approach is to choose one category of jobs, and build, test and deploy a completely new native PDF workflow for that. Then gradually add more categories, until you can handle the most complex job.

As you can probably imagine, you can also mix these two phasing strategies.

Marks

For your native PDF workflow, you will need to create new mark sets, based on **ArtPro+ dynamic marks**. If you were previously using **SmartMarks** or **ArtPro marks** then you will need to create new sets. Use this opportunity to review your requirements and simplify your mark sets. Before you get started, make sure to watch the e-learnings (see *https://www.esko.com/en/support/blendedlearning*). Also look at the example marks that are shipped with ArtPro+. You can immediate integrate them in your mark sets, modify them to your needs, or just inspect how they were built up to learn from it.

The traffic light, for example, is primarily a **Repeat for Separation Mark**, with as repeating content a square, a circle and **Point Text Mark** for the index number: