

ColorConvert section of the Refine process template

The **ColorConvert** section of the refine process template defines how Prinergy handles overprints and uses ICC profiles and ColorFlow device conditions to transform color data from the input color space to the output color space.

About ICC profiles and color management

An ICC device profile is a standard color space description, defined by the International Color Consortium (ICC), that facilitates conversion of color data among color capture and reproduction devices. For example, an ICC device profile that describes a specific RGB device, such as a digital camera, provides a mapping of the camera's red, green, and blue color coordinates to device-independent L*a*b* coordinates, called the CIELAB color space.

Color conversion using ICC profiles typically uses two device profiles. The source profile represents the origin of the color data, or its initially intended reproduction device. The destination profile represents an (alternate) reproduction device selected for output. Color data is converted using both profiles, and a rendering intent that defines how source color coordinates are mapped to destination color coordinates.

An alternative is to use an ICC DeviceLink profile for conversion from source to destination color space. A DeviceLink encapsulates relevant portions of the source and destination profiles, and the rendering intent. DeviceLinks offer some benefits in processing speed and preservation of black ink usage in CMYK-to-CMYK conversions.

Prinergy stores ICC profiles in C:\Prinergy\CreoAraxi\data\ICCProfiles. These profiles are typically used for Refine color conversion without ColorFlow. ColorFlow also stores ICC profiles and maintains their relationship to color response measurement data and other color control objects.

For new Refine process templates, the default behavior is to convert RGB images and graphics to CMYK. The default source profile is Monitor\Adobe RGB 1998.icm, the default destination profile is GRACoL2013_CRPC6.icc, which is a current ISO standard for sheetfed offset printing on coated stock, and the default rendering intent is **Perceptual**.

You should change the Primary Color Output profile to a profile which most closely represents your target print condition. Prinergy supplies a variety of standard profiles for a range of print conditions, but you should consider using ColorFlow Pro Workflow Edition to characterize your specific print condition and create an ICC profile which exactly represents your print condition, and will result in the most accurate conversion of spot colors, images and graphics for reproduction on your print device.

For more information, see the [Using ColorFlow software](#) topic in the *Color* chapter.

JTP

Select the JTP (job ticket processor) to use for color conversion. For converting colors, use the Color Matcher JTP.

Note: You set up JTPs in Prinergy Administrator.

Overprint Conversion

Select to perform automatic conversion of overprints.

Set CMYK Colors to Knockout

Select this check box to override the overprint setting in the input file and force CMYK process colors to knockout. As a result, color printing order affects which separations are knocked out, including spot colors.

Set Spot Colors to

Select this check box to override the overprint settings in the input file and force spot colors to either overprint or knockout. Then, select one of the following two options:

- **Overprint**—All spot colors in a document are set to overprint. Spot colors will not knock out other colors.
- **Knockout**— All spot colors in a document are set to knockout. As a result, color printing order affects which separation is knocked out.

Set Black to Overprint when Black is ____ % or higher

Select this check box to overprint pure black objects (that is, K=1–100% and CMY=0%) when the black tint equals or is greater than the value that you specify in the adjacent box. For example, if an input file contains a black object with 75% black and you type 70% in the adjacent box, Prinergy overprints the object.

Set Rich Black to Overprint

Note: The **Set Rich Black to Overprint** check box is available only when the Color Matcher JTP is used.

Select this check box to overprint all rich black objects (that is, K=100%, and at least one of C, M, and Y has more than 0% tint). When the **Set Rich Black to Overprint** check box is selected, the **Set Black to Overprint** check box is automatically selected.

Note: Overprinting rich black may result in high ink coverage in some areas, depending on the percentage of tint in the C, M, and Y channels.

Set Overprint CMYK White to Knock Out

Select this check box to knock out all white objects.

White is considered white when black (K) is less than 0.9%—that is, C=0%, M=0%, Y=0%, and K<0.9%.

Sometimes a graphic designer inadvertently defines white (which is really the absence of ink) to be overprinted, which makes white objects invisible when the file is RIPed. For white to be visible, it must be knocked out.

If you want all white objects to be overprinted, clear the **Set Overprint CMYK White to Knock Out** check box.

Enable Gray Overprint

Note: The **Enable Gray Overprint** check box is available only when the Color Matcher JTP is used.

The **Enable Gray Overprint** check box affects grayscale objects that are set to be overprinted. The Color Matcher JTP represents the overprint mode of grayscale objects in a way that the RIP can process. By default, this check box is selected.

When the **Enable Gray Overprint** check box is cleared, the Color Matcher JTP doesn't affect the overprinting of grayscale objects. This results in knockout behavior for CMYK objects below the grayscale object and may be the preferred behavior in some situations.

Note: You can view the overprint mode in the Enfocus PitStop software and view the results in the Virtual Proofing System software or in the Acrobat software.

Change Overprint Mode

Select this check box to convert the overprint mode from OPM 0 to OPM 1.

When an object is overprinted with OPM 0, channels with no data are painted with a tint of zero. For example, the zero channels in a 100,0,0,0 CMYK object knock out the channels of a 0,100,100,100 CMYK object. The channels of the 0,100,100,100 CMYK object overprint only a spot object.

When an object is overprinted with OPM 1, channels with no data are not painted at all, causing background objects that are painted in that channel to show through the channel. For example, the zero channels in a 100,0,0,0 CMYK object overprint the channels of a 0,100,100,100 CMYK object.

For more information on OPM, see a PostScript or PDF reference guide.

Treat pure gray RGB as gray

Select this check box to convert pure gray RGB to a black-only process color. Pure gray RGB is defined as any gray that is created by equal values of red, green, and blue—for example, R=23, G=23, B=23.

Treat shading as

Use this option for color-matching shadings. By default, this option is set to **Image**, because Prinergy typically treats shading objects as images. When an input file doesn't define a source profile for shading, Prinergy uses the source profile from the image.

Select **Graphic** for PDF pages with shading and gradients that look similar, when you want shading and gradients to appear the same after color matching.

Process CEPS Data

Select this check box to specify spot color mapping and color matching of CEPS data.

For more information, see the [CEPS Conversion section of the Refine process template](#) and [Normalize section of the refine process template](#) topics.

Color match 1-bit images

Select this check box to color match 1-bit images. 1-bit images are images that represent two tones, typically black and white. The pixel is either a 0 or 1 value. Examples are copydot images.

Note: When selected, this check box converts 1-bit images to 8-bit images. The conversion causes pages to become larger and to render more slowly. Clear this check box if you do not require color matching of 1-bit images or if the feature causes unacceptable performance degradation. (For example, copydot files take a very long time to refine and render.)

This check box is available when **Match Colors in Page Content** is selected.

Overprint Handling

Overprint Handling (CPU Intensive)

Select this check box to use vector overprint handling, which prevents overprinted objects from generating unintended knockouts, including on objects printed on a transparency stock. Apply vector overprint handling if you are converting spot colors to process colors or if you are color matching from one CMYK color space to another CMYK color space. Kodak Spotless color management involves the conversion of most spot colors to process colors.

Note: Applying vector overprint handling is very CPU intensive. Your computer may slow down considerably.

Note: This feature does not eliminate all overprints. For example, in objects where overprinting does not have an effect on output, these objects are still considered overprints. For example, if you set black to overprint other objects, but one black object is not placed on top of another object, the black object is still considered an overprinted object after overprint handling.

Final Output Resolution

Type the resolution that is suitable for the intended output device.

The default setting is **2400 dpi**.

Preserve Traps

Select this check box to preserve existing Kodak traps when vector overprint handling is used.

Note: When existing traps are preserved, you cannot remove them in later processing. You must remove the traps in the original file. Traps are color-managed as regular objects.

Extended Blend Mode Handling (use with caution)

This option is only available when the **Overprint Handling (CPU Intensive)** check box is selected. If you select this option, additional Transparency Blend Modes (ColorDodge, ColorBurn, Difference, Exclusion, Lighten, Darken and Screen) will be processed through the Overprint handler (if necessary). This option is to be used with caution (check output carefully) since colormatching transparency can cause unexpected results (for more information, see the Color Convert section of the *Release Notes*).

Note: In Prinergy 6.0, 6.1 and 7.0, this functionality was enabled whenever **Overprint Handling (CPU Intensive)** was selected. In Prinergy 7.5, you can decide whether to enable it or not.

Match Colors

The Color Matcher JTP handles color management in Prinergy. It performs the following functions:

- RGB image and graphic conversion
- CMYK-to-CMYK color matching

Prinergy is shipped with standard RGB and CMYK ICC profiles for conversion of RGB images and graphics to CMYK when other profiles are not provided.

For CMYKtoCMYK color matching, the Color Matcher JTP uses ICC profiles to transform the color space of CMYK objects in the PDF file to a color space that is appropriate for the intended output print condition.

When color matching is selected during the refine process, color data is matched to a Primary Color Output, which serves as the destination of color conversions. The Primary Color Output generally represents an established print condition on a specific output device, or a industry print specification.

You should change the Primary Color Output profile to a profile which most closely represents your target print condition. Prinergy supplies a variety of standard profiles for a range of print conditions, but you should consider using ColorFlow Pro Workflow to characterize your specific print condition and create an ICC profile which exactly represents your print condition, and will result in the most accurate conversion of spot colors, images and graphics for reproduction on your print device.

Enable ColorFlow

Select this check box to use the ColorFlow software, which provides color relationship management that unifies all color elements (such as ICC profiles and curves) and manages the relationship between them and the device print conditions. When you select **Enable ColorFlow**, the adjacent **Snapshot** and **Color Setup** lists become available.

Snapshot

A ColorFlow snapshot captures the state of the entire color database, making its elements available to the workflow and providing a convenient backup. The snapshot feature enables you to isolate experimentation, adjustments and testing in ColorFlow from Prinergy production Refine processing. At any time, you can roll back (revert) to the state of a previous snapshot in the ColorFlow software. If you revert to a previous snapshot, ColorFlow deletes all color database changes that were made after that snapshot was captured.

When you have completed your work in ColorFlow to a certain level and you are satisfied with the elements in color setups, you will mark a snapshot as *approved*. Refine using the **Approved** snapshot is recommended for production jobs. The default **Snapshot** selection for new process templates is **Approved**. Only one snapshot can be in the approved state at any time.

This list is available only if **Enable ColorFlow** is selected.

Color Setup

A color setup is a collection of device conditions and the color control elements (curves, device profiles, and DeviceLink profiles) that are required to process color data with consistency among color capture and reproduction devices.

This list displays the names of all color setups in the selected snapshot for which **Show in Prinergy** is selected in ColorFlow. At the top of the list are **Job color setup** and **Select by PDF/X Output Intent**.

If you select a specific color setup, that color setup provides ICC profiles for converting color data. If you select **Job color setup**, the color setup selected in the **Job Color Setup** list in the Edit Job Attributes dialog box provides ICC profiles.

If you select the **Select by PDF/X Output Intent** option, the color setup, whose PCO profile matches the PDF/X Output Intent profile of the PDF file, provides ICC profiles.

Note: If you refine multiple PDF/X files with different output intents, a different color setup will be selected for each file.

WARNING: If you select **Job color setup**, and the **Job Color Setup** selection is **None**, the Refine process will fail.

WARNING: If you select **Select by PDF/X Output Intent**, the Refine process will fail in the following cases:

- One or more files being refined is not a PDF/X file with an embedded output intent ICC profile
- None of the color setups in ColorFlow, with **Show in Prinergy** selected, have a PCO Profile that matches the PDF/X Output Intent embedded profile

This list is available only if **Enable ColorFlow** is selected.

Show only PDF/X Output Intent color setups

When this check box is selected, the **Color Setup** list displays only the names of color setups whose PCO is a PDF/X Output intent.

Preserve White and Black Colors for Graphics

When this option is selected, the Color Matcher JTP bypasses pure white and pure black. For example, if an input file has a build of 0,0,0,100, Color Matcher does not touch the input build of pure black, for graphics only. Similarly, for pure white, if an input file has a CMYK build of 0,0,0,0, Color Matcher does not touch the input build of pure white. The following builds are also preserved:

- 255,255,255 RGB
- 0,0,0 RGB
- 255 Gray
- 0 Gray

Preserve Any CMYK Pure Black for Graphics

When this option is selected, Color Matcher bypasses all CMYK (0, 0, 0, 0...100) colors. The options are available regardless of whether ColorFlow is used. The options are also unrelated to the use of a DeviceLink profile.

Tagged Content

This section controls how the Color Matcher JTP processes content that is tagged with an embedded ICC profile. You can choose from two processing modes for each of four element types: **CMYK Images**, **CMYK Graphics**, **RGB Images**, and **RGB Graphics**. Images refers to raster image data, and Graphics refers to vector data.

- **Convert using embedded profiles and Primary Color Output profile**—uses embedded profiles, working in conjunction with the Primary Color Output profile, to convert color data. The rendering intent used for conversion is the Rendering Intent selection for Images in CMYK or RGB Calibrated Colors.
- **Convert using ColorFlow Input Conversions matching embedded profiles**-- searches the color setup for a color input whose ICC device profile matches the embedded profile. If a match is found, content will be processed using the DeviceLink or profile pair conversion defined in ColorFlow. Otherwise, content will be processed using the embedded profile and Primary Color Output profile, same as in the above selection.
- **Strip embedded profiles and process as Untagged Content** —removes embedded profiles for the content type, enabling you to assign different profiles or leave the color data unconverted. Content will be processed according to **Untagged Content** settings for the same content type.

These selections have no effect on PDF pages that do not have embedded ICC profiles.

Untagged Content

This section controls how the Color Matcher JTP processes content that is not tagged with an embedded ICC profile. You can control processing for each of four element types: **CMYK Images**, **CMYK Graphics**, **RGB Images**, and **RGB Graphics**. Images refers to raster image data, and Graphics refers to vector data.

This section also controls processing of tagged content, if **Strip embedded profiles and process as Untagged Content** is selected for the same content type.

- **Convert**—when this option is selected, color data is converted using the selected **Input Device Condition** ICC profile. When this option is cleared, color data is left unconverted.
- **Input Device Condition**—if **Enable ColorFlow** is selected, this control for **CMYK Images** and **CMYK Graphics** provides a selection list of all CMYK color input device conditions in the selected snapshot and color setup. For **RGB Images** and **RGB Graphics**, it provides a selection list of all RGB color input device conditions in the selected snapshot and color setup.

If the **Color Setup** selection is **Job color setup**, the selection lists contain all CMYK and RGB color input device conditions appearing in any color setup of the selected snapshot. Note this may cause the Refine process to fail, if a selected device condition does not appear as a color input of the job color setup.

If the selected device condition is a color input of the job color setup, or if a specific color setup is selected, the Color Matcher JTP converts color data using ICC profiles and rendering intent provided by ColorFlow. The provision of those color conversion objects is also controlled by the **Input Version** selection.

If **Enable ColorFlow** is cleared, this control allows selection of an ICC profile for each content type from the file system.

If the selected ICC profile is an ICC device profile, the Color Matcher JTP uses the selected ICC device profile, working in conjunction with the **Primary Color Output profile**, to convert color data. The rendering intent used for conversion is the **Rendering Intent** selection for **Images in CMYK** or **RGB Calibrated Colors**.

If the selected ICC profile is an ICC DeviceLink profile, the Color Matcher JTP uses the selected ICC DeviceLink profile to convert color data. The **Primary Color Output** and **Rendering Intent** settings have no effect on the conversion.

This control is unavailable if **Convert** is cleared for the same content type.

- **Input Version**—an input version is an instance of a ColorFlow ICC DeviceLink profile, or a pair of ICC device profiles and a rendering intent, used to convert color data.

ColorFlow can provide various input versions for a given **Input Device Condition** selection to achieve different color conversion goals. Each input version has a name. When a specific color setup is selected, the **Input Version** list contains all input versions for the selected device condition in the selected snapshot and color setup, plus **Default** at the top of the list. The default input version is determined in ColorFlow and indicated in its name displayed in the list. When **Job color setup** is selected, only the **Default** input version is available for Refine color conversion.

This control is unavailable if **Convert** is cleared for the same content type or if **Enable ColorFlow** is cleared.

Primary Color Output

Specify the ICC profile that objects to be color-matched will use for final output.

You must specify an ICC profile in this box, regardless of whether you are performing color conversion of Image or Graphic objects.

Notes:

- This box is located in the **ColorConvert** section and the **Spot Color Handling** section of the refine process template. Changing the entry in one section changes the entry in the other section.

- In the **ColorConvert** section, the **Primary Color Output** box is unavailable when the **Enable ColorFlow** check box is selected. The ICC profile is automatically delivered by ColorFlow in this case.

Prefer embedded Output Intents for Primary Color Output

If your input file contains an Output Intent, and you want to use the color profile specified in the output intent, select the **Prefer embedded Output Intents for Primary Color Output** check box.

If you want to retain the Output Intent in the PDF Subpage, be sure to select **ColorConvert and Spot Color Mapping Destination** profile in the Normalize section of the Refine Process Template

[More about Output Intent...](#)

Retain CMYK Black In

Select this check box to preserve black in images and graphics that are defined in the CMYK color space.

For ICC-based color-matching engines, CMYK images and graphics are transformed from CMYK to L*a*b* and back to CMYK, so that Prinergy can perform color matching. During the transformation from CMYK (four components) to CIE L*a*b* (three components) and back again, the black (K channel separation information—UCR/GCR) has in the past been destroyed. When selected, this check box instructs the Color Matcher JTP to preserve the black channel information as much as possible. As a result, the amount of black relative to CMY in the images and graphics remains about the same. This practice helps reduce ink consumption.

Notes:

- When you select this check box, the Color Matcher JTP requires additional processing time because of the extra calculations involved.
- When ColorFlow has been specified, the **Retain CMYK Black In** options are unavailable, because all black generation parameters are specified when DeviceLink profiles are created.

CMYK Images

Select this check box to preserve the black channel information when CMYK images are transformed from CMYK to L*a*b* and back to CMYK.

CMYK Graphics

Select this check box to preserve the black channel information when CMYK graphics are transformed from CMYK to L*a*b* and back to CMYK.

Rendering Intent

Select a colorimetric rendering intent for the selected object types:

- In the **Images in:** section, select **CMYK**, **RGB**, or **Calibrated Colors**

- In the **Graphics in:** section, select **CMYK**, **RGB**, or **Calibrated Colors**

Select **Relative** to turn off gamut compression and retain color saturation for the selected object types.

Select **Perceptual** to use gamut compression and produce fewer saturated colors for the selected object types.

Select **From PDF** to use the rendering intent that is specified in the file when output by the creative software for the selected object types.

Select **Absolute** to represent the colors solely with the light source for the selected object types. No correction is made for the output media's white point. For example, an output media's white point might be the color of paper with no print marks on it.

Select **Saturation** to represent the colors in a way that preserves or emphasizes saturation for the selected object types.

Note: Calibrated colors are described in a device-independent color space, such as an ICC-based color space, CalGray, or CalRGB. For colorimetric rendering of calibrated colors, do not select the **Override Embedded Profiles** check box.

Reset to Defaults

Select to return all options to the default (factory-set) values.