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Technical bulletin

Using Color Management in the Prinergy and Powerpack Workflows

This document assumes the following:

- You have a basic understanding of color management
- Advanced Color Management is licensed on your Prinergy system
- You have the capability of making ICC compliant profiles, device and DeviceLink profiles, or have been supplied with these types of profiles.

Note: Prinergy will only use profiles that comply with the ICC standards. More information on the ICC specification can be found at www.color.org.

Prinergy uses color management in refine process plans and proofing process plans.

Color Management in the Refine Process Plan

Use the **ColorConvert** tab of the Refine process plan to apply color management and specify spot color handling.

Map Spot Colors

The **Map Spot Colors** area of the ColorConvert tab deals with spot color handling, whether you want to convert to process or retain the spot color separation. See Prinergy online help for details.

Match Colors

The **Match Colors** area enables you to strip out or override embedded profiles or convert from one color space to another using profiles. Prinergy has the ability to accept source, destination, and DeviceLink profiles.

Source profiles	Are from an RGB color space like your scanner, digital camera or monitor
Destination profiles	Are from a CMYK color space like your press or proofing device
DeviceLink profiles	Enable you to go from one space to another without the conversion to L*A*B*, and produce very good results with more shadow detail. The most common types of DeviceLink profiles are RGB->CMYK and CMYK->CMYK. The RGB to CMYK is a conversion from one color space to another. The CMYK to CMYK is from the device you are simulating (source), a press or proofer, to the device you are outputting to, a different press or proofer (destination). A DeviceLink profile can be used to replace a source profile in Prinergy.

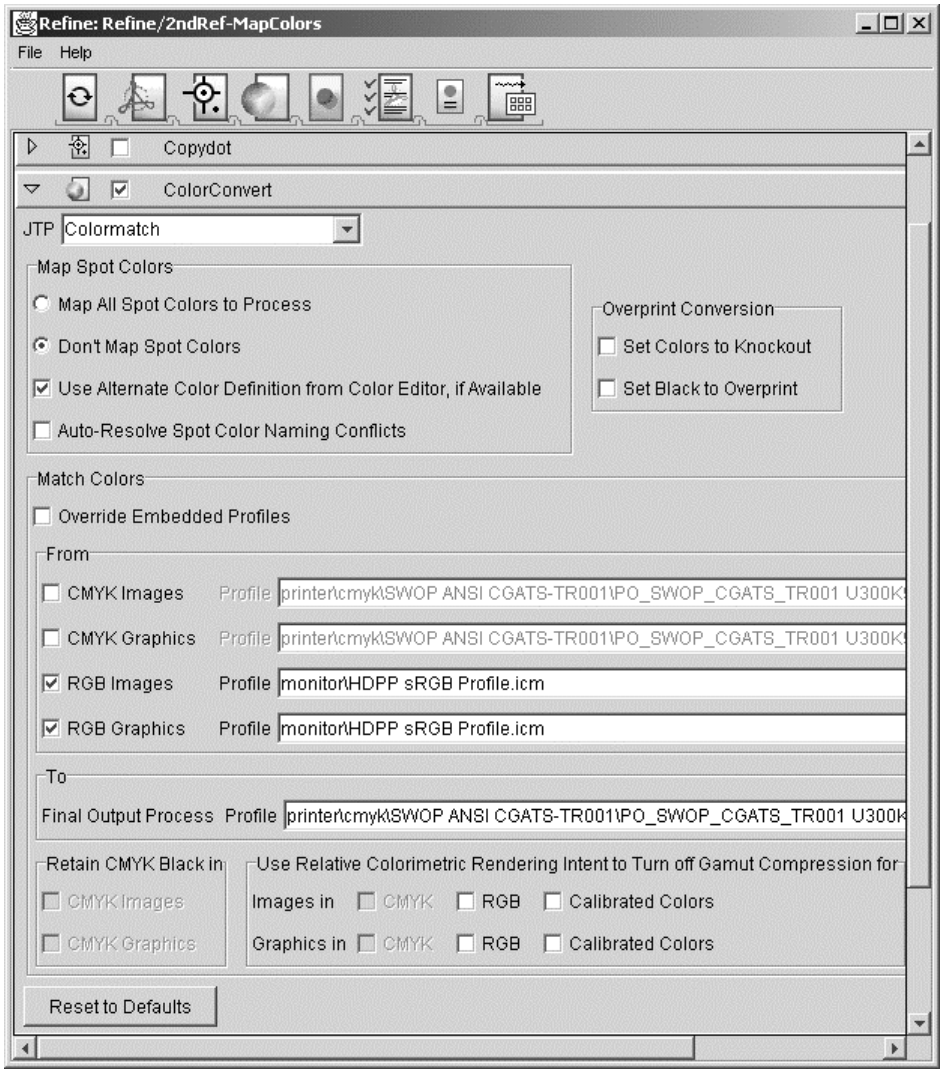


Figure 1: Color Management in the Refine process plan

Override Embedded Profiles

If the **Override Embedded Profiles** check box is **unchecked,** the embedded profile in the page will be your source profile and it will work in conjunction with the **Final Output Process** profile. There will be a conversion to the L*A*B* space before converting to the final output space.

Note: In Prinergy 2.0.7, the choice of application that lets embedded profiles through the workflow is limited; PDF out of Adobe InDesign works well. But for PostScript generated from QuarkXpress and Adobe Photoshop, Distiller does not recognize the Postscript Color management option—and unless the file is coming into Prinergy as PDF, the profile gets removed. Prinergy 2.1, however, is able to recognize the Postscript Color Management option.

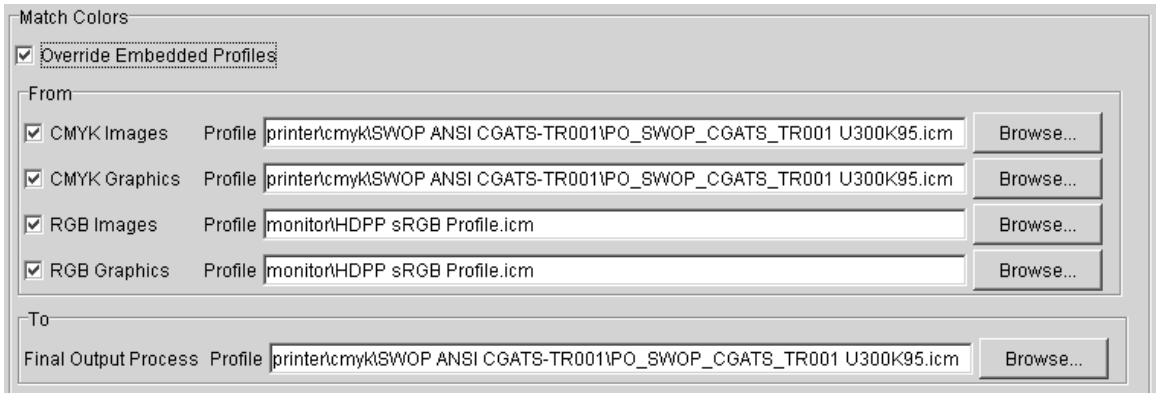


Figure 2:Match Colors section

If the **Override Embedded Profiles** check box is **checked,** there are two options:

1. **The Profile is removed**. The embedded profile will be removed and nothing will replace it, **providing** the CMYK Images and CMYK Graphics check boxes are **unchecked**. Also uncheck the RGB Images and Graphics if you do not want these to be converted to CMYK at this time. Often these are left checked because some applications embed an RGB thumbnail, which can cause issues upstream. If you see an RGB warning in the process window that is unexpected, this is a likely cause. Re-refine with Override embedded profiles and the RGB boxes checked, and the thumbnails will be converted to CMYK.

2. **The Embedded profile is removed and replaced**. The embedded profile will be removed and a different profile will be used to make a conversion.

   You can select the profile based on the type of conversion you want to make:

   From CMYK Images and CMYK Graphics to CMYK

   If both the CMYK images and CMYK Graphics boxes are checked, you want to color manage your CMYK images and graphics within the file. You can browse to a Source Profile, using the browse button to the right of these check boxes, and the CMM will use this profile in conjunction with the destination profile entered in the Final Output Process Profile window. Using this option of a Source and Destination means the CMM will convert any CMYK images and Graphics to L*A*B* before converting to your Press Space. (See section **Final Output Process Profile**.)

   In place of the Source profile a DeviceLink profile can be selected. This is a much better workflow, as you will get more accurate results. The Black channel will not become a rich black as it is not going through the L*A*B* conversion. This is also dependant on the ability of the profile creator to retain pure black.

   From RGB Images and RGB Graphics to CMYK

   sRGB is the default profile but with the Advanced Color management license in Prinergy you can replace this with your preferred RGB space. This can be a monitor, scanner or digital camera profile

as your **source**. The destination profile is selected at the **Final output process** profile window. (Press).

A DeviceLink profile or RGB->CMYK can be used instead of the source profile.

Final Output Process Profile

This is the destination profile for your final destination, usually the press.

A default SWOP TR001, defined as the midpoint in the SWOP specifications, is provided with Prinergy. To use custom profiles you need the Advanced Color Management license.

A source profile combined with the destination profile makes for a complete color transform. Keep in mind when using this combination, a conversion to L*A*B* will occur between the source and destination profiles.

When a **DeviceLink** profile is used in the CMYK, and/or RGB windows above, the **final output process profile** is ignored and no L*A*B* conversion occurs.

Grayscale Conversion

RGB to grayscale is available with the Basic Color Management license but since this is a source and destination configuration, the CMM will convert RGB to L*A*B* before going on to grayscale. A generic gray profile is supplied with Prinergy.

CMYK to Grayscale is part of the Advanced Color Management license.

For CMYK to Grayscale, if there are any single color black halftone areas in the page, these will not retain the same value if a source and a final destination profile are used. A conversion from CMYK to L*A*B* takes place before converting to grayscale.

Retain Black

The **Retain CMYK Black** check boxes maintain the black channel information during CMYK color matching; otherwise the information tends to get lost in the transformation. A **DeviceLink** profile is even better, especially created by Profile Wizard, as you have more controls to keep the black almost unchanged.

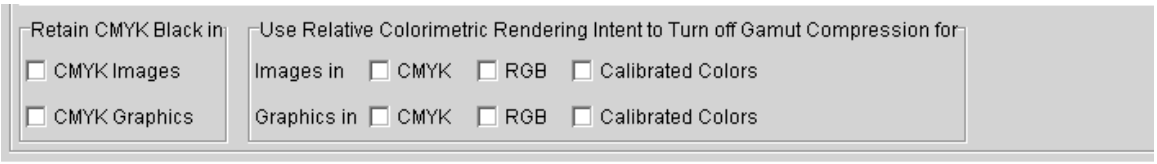


Figure 3: Relative Colorimetric Rendering Intent

For example, text placed within an image will convert to a 4-color black if this check box is not selected. If you wish the text to remain close to 100% black, then this option must be selected. It affects blacks from 92% to 100% only.

Use Relative Colorimetric Rendering Intent to Turn Off Gamut Compression

The color manager defaults to perceptual rendering intent. Perceptual rendering intent means there is no clipping from RGB to CMYK, but a systematic smooth compression. This is ideal for Adobe RGB 1998 (a large RGB gamut), when converted to CMYK, which is a much smaller gamut.

Now you have the ability to change the rendering intent to Relative Colorimetric. You would use this when two gamuts do not have a big difference in size—for example, sRGB to SWOP CMYK. When using perceptual there is an over-compression and compensation between the gamuts, and as a result the images are washed out.

Color Management on Proofing Output

In a proofing process plan, the **ColorConvert** option is turned on by default. The reason for this is a default check mark for **Support for Non-CMYK spot color recipes and proofing devices** in the **Extra Colors** area. When the recipe for the spot color is in L*A*B*, the color matcher uses the **Proof Process Profile** for the conversion to CMYK, to simulate the spot colors with the use of Color Combiner on a CMYK proofing device. It is important to use a profile from the device you are proofing with for a more accurate simulation of the spot color. A custom profile of the device cannot be used here unless the Advanced Color Management license has been purchased.

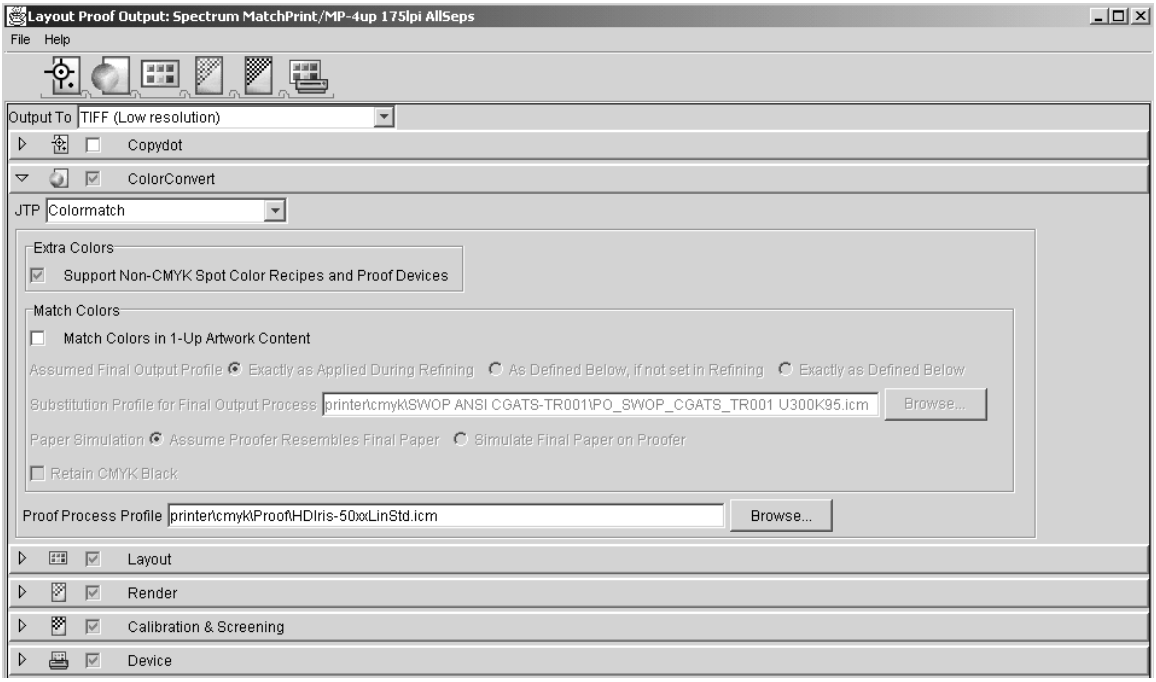


Figure 4: Default Color Matcher

Spot colors converted to CMYK on output to a 4-color proofing device with a DeviceLink profile in place, will use the DeviceLink for the conversion if the recipe is CMYK or if you use the CMYK Pantone Library. If the

spot color has a L*A*B* recipe, or you are using the L*A*B* Pantone Library, then the CMYK conversion will take place using the Proof Process Profile instead of the DeviceLink profile.

Match Colors

When **Match Colors in Page (1-Up Arwork) Content** is selected, Color Management is active and allows you to add ICC profiles, either source or DeviceLink to the process plan. If you are using a **Source** profile, the **Destination** profile is the **Proof Process Profile**. Keep in mind when using this combination that a conversion to L*A*B* will occur between the source and destination profiles. If you are using a DeviceLink profile the **Proof Process Profile** is ignored and no L*A*B* conversion will occur.

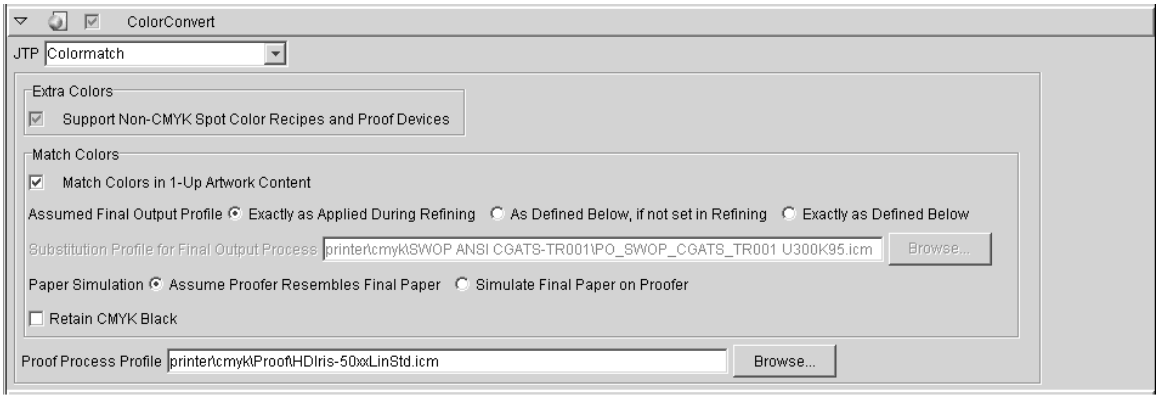


Figure 5: Color Management Active

The Match Color options are described in the following table:

Option	Description
Exactly as applied during refining	Picks up source profile from PDF that was embedded at the refining stage.
As defined below, if not set in refining	If you didn't set a source profile at the refining stage, or you want to use a different profile instead of the one set in the Refine Process Plan.
Exactly as defined below	With this option Checked, you will override any profiles embedded or set at the refine stage. Use this setting when using a DeviceLink profile.
Assume proofer resembles final paper	This is the equivalent to using a Relative Colorimetric rendering intent.
Simulate final paper on proofer	This is the equivalent to using Absolute Colorimetric Rendering Intent.
Retain CMYK Black	This has the same function as in the Refine Process.

About Creo

Creo is a world leader in solutions for the graphic arts industry. Core product lines include image capture systems; inkjet proofers; thermal imaging devices for films, plates and proofs; professional color and copydot scanning systems; and workflow management software. Creo is also an Original Equipment Manufacture supplier of on-press imaging technology, components for digital presses, and color servers for high-speed, print-on-demand digital printers.

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