# Advanced Tutorial

# Color Management
# Sample

In this Advanced Tutorial you will learn how to deal with the Color Management settings. Color Management enables you to define the color behavior of PostScript, EPS or PDF images and objects, which can have a CSA (Color Space Array) or profile embedded or not. You can use Color Management in both the PDFRender and the Normalizer Task Processors.

**Duration:** You will need approximately 5 hours to complete the lessons in this Advanced Tutorial.

**This tutorial is only a preview of the full basic tutorial.**

If you would like to obtain the full version of this tutorial or a training on this subject, please contact your local Agfa sales or service representative.
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# Advanced Tutorial Objectives

In this Advanced Tutorial you will learn how to use Color Management in both the PDFRender and the Normalizer. You will learn what CSAs and profiles are and how you can import them in PDFRender. You will also learn how to ignore or overrule embedded CSAs or profiles. You will also learn about Device Link Profiles, and how to use them for Input-Press Color Management.

In the Press Repurposing lesson you will learn how a file can be repurposed for a different output device.

# Before You Begin

## Prerequisites

Check whether the following Task Processors are installed and running in :APOGEE Prepress:

- ☐ TIFF PlateSetter

- ☐ PDFRender

- ☐ Display (Output Task Processor)

Check whether Adobe Acrobat 5.05 (or later) is installed, together with the Enfocus PitStop Professional 5.04 (or later) plug-in.

**NOTE:** To check whether you have the plug-ins installed, open Acrobat and choose **Help > About Third-Party Plug-Ins**. For more information, refer to the :APOGEE Prepress Installation Guide.

## Log on as Administrator

Before you start the lessons in this Advanced Tutorial, make sure that you are logged on to the :APOGEE Prepress System with Administrator access level.

## Files and Tickets

You will also need the following sample files and tickets which are bundled together with this Advanced Tutorial PDF file:

- ■ Sample files:

  - ☐ PDF_colormanagement_v2.pdf

- ☐ ps_colormanagement_v2.ps

- ☐ Transparancy_repurposing.pdf

- Color profiles:

  - ☐ ArcII-AgfaB_10b_Pb2.icm

  - ☐ ISOcoated_v2_eci.icc

  - ☐ ISOwebcoated.icc

  - ☐ SWOP_CyanCurve_401.icm

  - ☐ SwopCyan-StandEuro-Rel.icc

- Tickets:

  - ☐ studentname-colormgmt-0001.aht

  - ☐ studentname-colormgmt-0002.aht

  - ☐ studentname-colormgmt-0003.aht

  - ☐ studentname-colormgmt-0004.aht

These files are provided in a single ZIP file, which is available for downloading from the Graphics Portal - Services Library website.

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**NOTE:** While working through the lessons in this Advanced Tutorial, do not forget to replace **studentname** with your own name in the Administration tab.

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# Contact Us

Agfa welcomes your suggestions, questions or comments about this documentation. You can send e-mail feedback to: *Apogee@agfa.com*

# About Color Profiles and Conversion

Before we start the tutorial lessons, you need to understand the basics about color profiles.

## What are Color Profiles?

Color profiles contain the necessary information for CMM to convert color data between native-device color spaces and device-independent color spaces. The color spaces of two devices are connected via the device-independent color space, i.e. the so-called Profile Connection Space or PCS.

The International Color Consortium (ICC) specifies 3 device profiles and 4 "other" profile types:

- Input profiles: for input devices, such as scanners and digital cameras

- Display profiles: for display devices such as monitors, but also generic display color spaces such as sRGB, AdobeRGB

- Output profiles: for output devices such as printers and presses.

- Device Link profiles: to convert with a single (fixed) link 2 device color spaces with each other. (e.g. Press CMYK to Proofer CMYK)

- Abstract Profiles: the opposite of Device link profiles; they convert PCS to PCS and can be used to apply color edits in for example the Lab space (saturation boost, gamma changes,...). Currently, :APOGEE Prepress does not use or support these profiles.

- Named Color profiles: for spot color libraries like Pantone. :Apogee Color-Tune Spot can be used to generate named color profiles. These profiles contain a list of color names with their corresponding color values.

- Space profiles: to convert between non-device color spaces, e.g. from Lab to Luv (rather theoretical and used rarely).

Each profile type contains a series of algorithmic models. These models perform the transformation between color spaces.

## Profile Structure

ICC profiles have a standard structure that allows you to use the profiles within CMMs that are in conformance with the ICC standard.

Every profile starts with a header, followed by a tag table and a number of tagged elements. The tag table is a 'table of contents' for the tagged elements in the profile.

The tagged elements contain the necessary information for color transformation. The profile may also contain additional information for advanced color management. These optional items include Closed Loop Optimized profiles.

A device color profile always contains two look-up tables for every rendering intent. A press profile, for example, has the following:
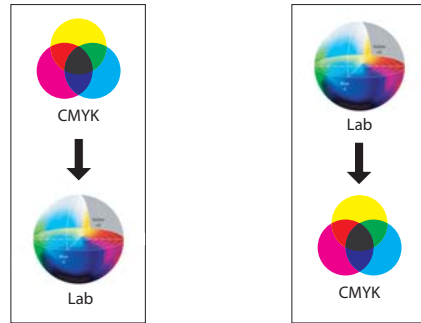


A lookup table to convert
CMYK to Lab

A lookup table to convert
Lab to CMYK

## How Does Color Conversion Happen?

To be able to do a color conversion, you need two profiles: a source profile and a destination profile. The device-dependent CMYK color data of the source space needs to be linked to the device-dependent color data of the destination space via the device-independent Lab color space (PCS. The first lookup table of the first profile will be linked to the second lookup table of the second profile:
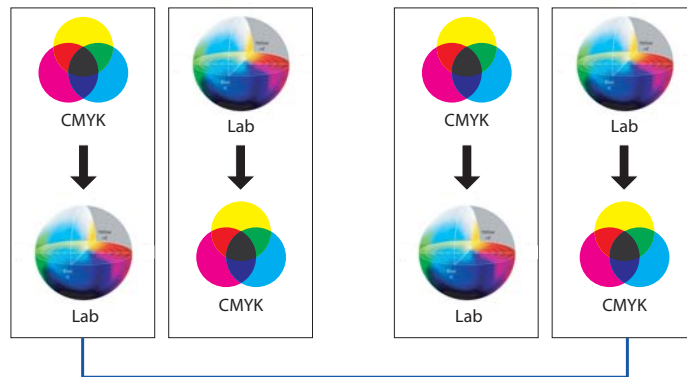


Thus, colors are converted over the device-independent Lab color space (PCS. The above example is a typical press-to-proofer conversion, in which the press is the source space and the proofer is the destination space. The press needs to be simulated on the proofer. For this application, the proofer color space needs to be larger than the press colors space so that every single color on press can be simulated.

An example of an input-to-press conversion is the following:
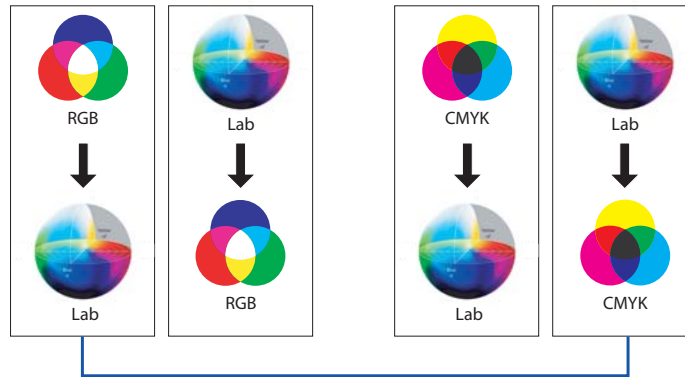


Here, you see that an RGB profile is linked to a CMYK profile using device-independent Lab as an intermediate color space.

## Color Management Module (CMM)

:APOGEE Prepress includes a built-in Color Management Module (CMM) that handles all color conversions and that is compliant with ICC specifications (ISO 15076-1-2005). The CMM is also used across the various :APOGEE product families for commercial and newspaper prepress.

Within :APOGEE Prepress, the CMM is used by the different Task Processors and it automatically combines the conversions of the different Task Processors.

The following task processors make use of the CMM:

- PDFRender: for input color management and converted spot colors

- Press: for :Apogee Inksave

- Proofer TPs: for proofer color management

- Digital Print Link TPs: for press retargeting towards digital presses

- Preview service: for color managed softproofing

- Export: for exporting color managed (not rendered) PDFs

- Apogee Preflight: when placed after the Run List, or in Hot Ticket mode

- PDFReady: when combined with a CPSI Renderer

The Normalizer does not apply color conversions, however, it can be used to tag or un-tag color profiles from incoming PS files.

At the moment, there is no OS-based version of the :APOGEE Prepress CMM and it can not be used inside third-party software products that make use of OS-based CMMs (e.g. Adobe Photoshop).

This advanced tutorial only covers color management within the PDFRender task processor and only focusses on the color management settings within the Render operation of the PDFRender task processor.

*Example:* Color Management Settings



These parameters manage the source side of incoming colors, and are therefore referred to as input color management. The destination side of the input color management is controlled on the (Digital) Press TP.

In the following lessons, we do not focus on the Press profile and the default press profile (StandardEURO) will be used.

# LESSON 1: **Using Color Management in PDFRender** (Fully included)

In this lesson, you will learn how to set up the PDFRender to use Color Management on images in PDF files, both with and without embedded profiles. All profiles embedded in images and objects will be used.

▷ **To create a Hot Ticket**

1  In the **Hot Tickets** window, choose **File > Open**.

2  Locate the **studentname-colormgmt-0001.aht** sample ticket template, and click **Open**.

3  In the **Administration** tab, replace "studentname" with your name.

4  Click the **Plan** tab, and click the **Render** operation of PDFRender.

5  In the **Color Management Settings** area, ensure that the **Honor application settings** option is selected.

6  Choose **File > Submit Hot Ticket**.

The studentname-colormgmt-0001 Hot Ticket is added to the Hot Ticket list.

▷ **To process a document**

1  First, let's take a look at our sample file: locate and open the **PDF_colormanagement_v2.pdf** sample file in Adobe Acrobat.

2  Notice that the PDF file contains four Photoshop TIFF files, each containing a picture and eight color patches with four different profile combinations:
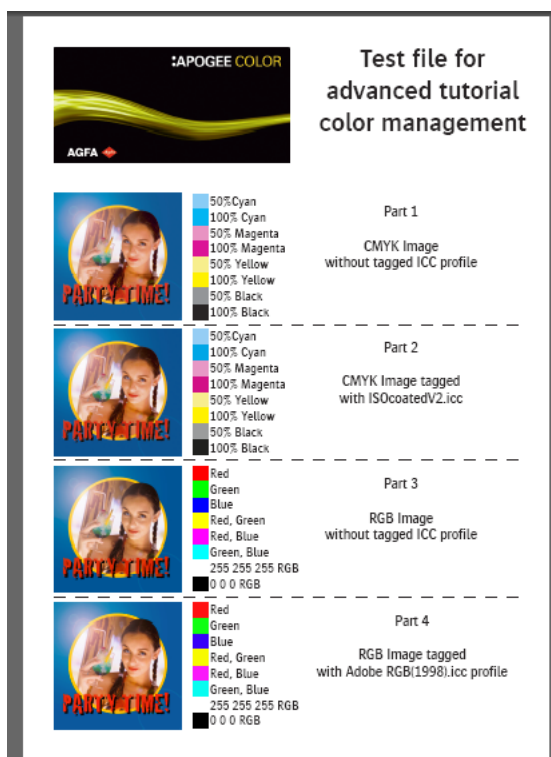
**1** CMYK file without embedded profile
**2** CMYK file with the `ISOcoated_v2_eci.icc` profile embedded
**3** RGB file without embedded profile
**4** RGB file with the `Adobe RGB (1998)` profile embedded

**3** Do one of the following:

☐ Locate the **PDF_colormanagement_v2.pdf** sample file, and drag it to the studentname-colormgmt-0001 Hot Ticket in the **Hot Tickets** list.

☐ Context-click the studentname-colormgmt-0001 Hot Ticket in the **Hot Tickets** list and choose **Upload Document**. Open the **PDF_colormanagement_v2.pdf** sample file.

**4** Monitor the processing of the job in the **Results** tab.

**5** When the job has been rendered, double-click the **thumbnail**.

The job is opened in Raster Preview.

▷ **To measure the separation values of the patches**

**1** In Raster Preview, choose **Window > Palettes > Show Tools**. and **Window > Palettes > Show Navigator**.

**2** Use the Zoom Tool to zoom in to **1x** on the **50% cyan patch of part 1**. The Navigator will help you locate this part.
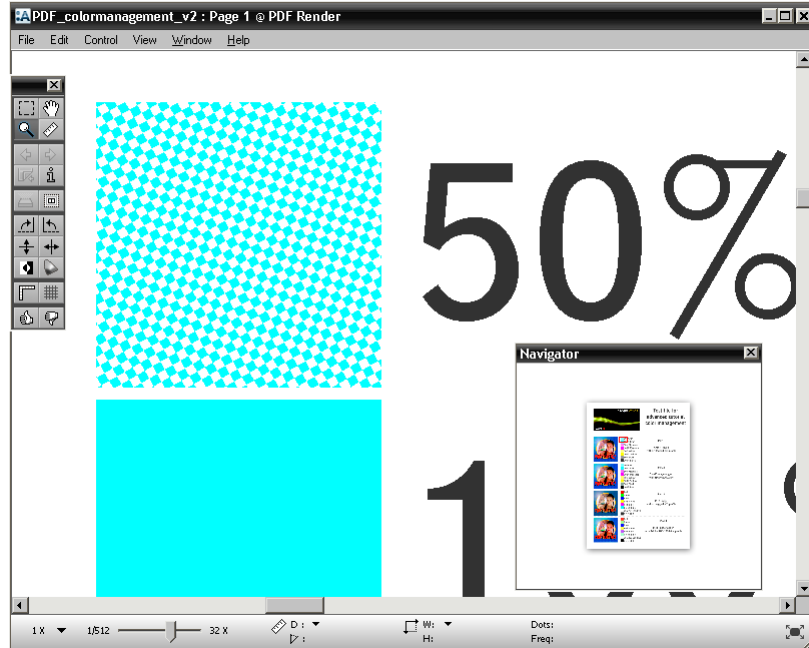


**3** Using the **Marquee Tool,** select the complete patch.

**4** Choose **Window > Palettes > Show Inks** to view the separation value of the selected patch.

**5** In the **Inks** palette, select **Show ink coverage of selection**.

You will see that the measured result is approximately 50% cyan. This means that no profile is used and consequently no color conversion occurred.

**NOTE:** Raster Preview now displays values with decimals so the values you see in your sample may vary slightly. The measured values also depend on the position and zoom factor.
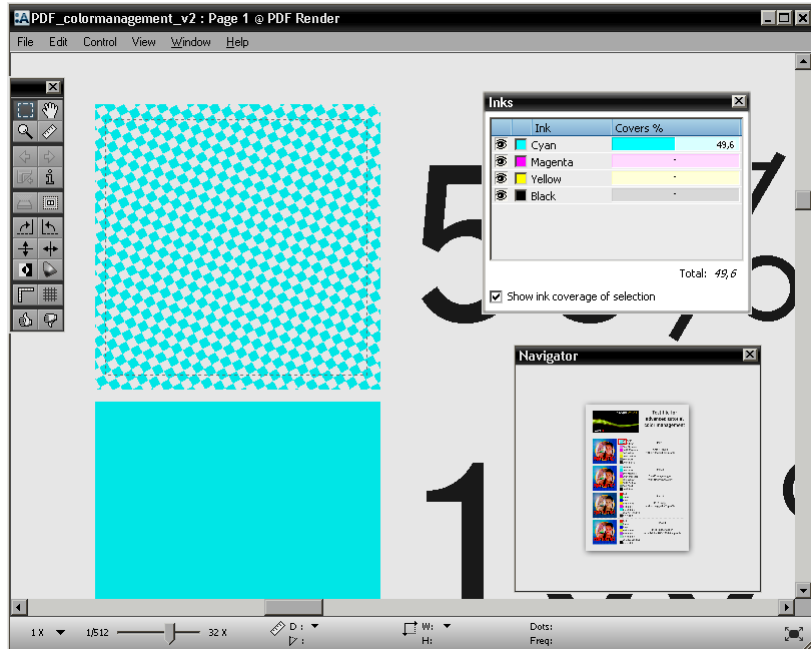
**6**   Select the **50% cyan patch of Part 2**.

You will see that the measured result is 52% cyan, 0% magenta and 0% yellow. This means that a color conversion was done, and the embedded ISOcoatedv2_eci profile was used to convert the colors to the **standardEURO** press profile.

**7**   Select the **red patch of Part 3**.

You will see that the measured result is 100% magenta and 100% yellow. This means that a **simple conversion** was used to convert the colors to the standardEURO press profile.

**8**   Select the **red patch of Part 4**.

You will see that the measured result is 0% cyan, 81% magenta, 87% yellow, 0% black. This means that a color conversion was done, and the embedded Adobe RGB (1998) profile was used to convert the colors to the **standardEURO** press profile.

**9**   Close Raster Preview.

# LESSON 2: Ignoring Embedded Profiles

In this lesson, you will learn how to edit a job in order to ignore embedded profiles.

▷ **To edit the studentname-colormgt-0001 job**

1   In the **Job** list, context-click the **studentname-colormgmt-0001** job and choose **Edit Job**.

2   In the **Plan** tab, click the **Render** operation of PDFRender.

3   Unlock the Parameter Settings and click to clear the **Honor application settings** check box in the **Color Management Settings** area.

4   Select the following options for images and line art:

| Tab | Object type | Tagging | Setting |
|-----|-------------|---------|---------|
| RGB | Images | Untagged | Simple Conversion |
| | | Tagged | Treat as Untagged |
| | Line Art | Untagged | Simple Conversion |
| | | Tagged | Treat as Untagged |
| CMYK | Images | Untagged | Don't Convert |
| | | Tagged | Treat as Untagged |
| | Line Art | Untagged | Don't Convert |
| | | Tagged | Treat as Untagged |

The settings you have selected mean the following:

☐ **Simple Conversion**: A basic -1 conversion happens, which is never satisfactory.

☐ **Treat as Untagged**: The tagged images will follow whatever is selected in

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worldwide/index.jsp