

This tutorial will teach you how to use spot colors in Asanti. In classic printing techniques, such as offset or screen printing, spot colors are simple: load the custom ink on the print unit. In inkjet it's slightly different. The color needs to be reproduced with the ink set of the device.

By default Asanti is already equipped with commonly used spot color libraries such as Pantone. Other color books can be added by simply downloading them (e.g. HKS, RAL ...).

But sometime these color libraries are not sufficient. A sample may be provided of which the color needs to be reproduced as close as possible. A few things can then be done: visually compare with a printed swatch book or measure the color and add it to the Asanti databases, and with Asanti 3.0 it's also possible to print variations of these colors and select from that print a more visually pleasing color value. This tutorial will teach you how to measure spot colors ([ex 1](#)) and use the custom color book in the layout editor ([ex 4](#)). Additional exercises cover; spot color calculations ([ex 2](#)), swatch book printing ([ex 3](#)) and spot color mapping ([ex 5](#)).

This version (3.0) of the tutorial also contains exercises to print *variations* of the spot colors ([ex 6](#)) and to create and use *exception* color values for a job ([ex 7](#) and [ex 8](#)). Download the Asanti Sample Files via the Asanti Client (Help > Asanti Online > Download Sample Files).

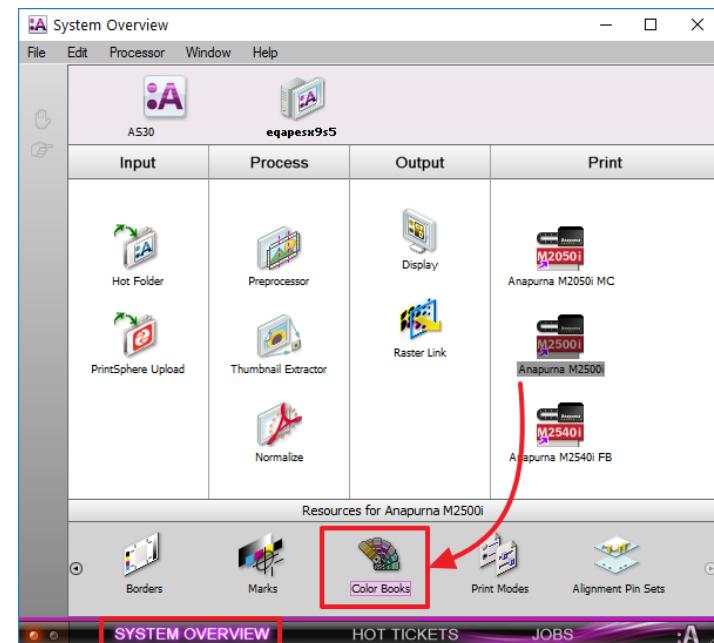
Part I: Creating and using custom spot color books

1. Creating a custom color books with spectral data.

Color books with spectral data allow a very accurate reproduction of these colors. It allows Asanti to compensate for certain variables such as a color mixing when one or more colors are covering each other.

Color books with spectral measurement data are truly device independant. The Pantone color books are by default installed as color books with spectral data.

1. Select a digital press like an Anapurna 2500i (or any other sign and display press) and double click the Color Books resource. This will give access to the color books overview.
Or from the Layout Editor windows menu - Resources - Color Books (Ctrl + Alt + 6)
2. The color books overview will be displayed. Notice the rainbow icon in front of the Pantone book name to indicate that this is a spectral color book.

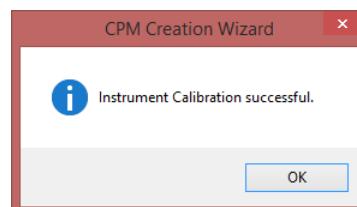


3. Click the + icon to add a new spot color book.
4. Select the Spectral Color Book and click OK.
5. The custom color book creation window will open.

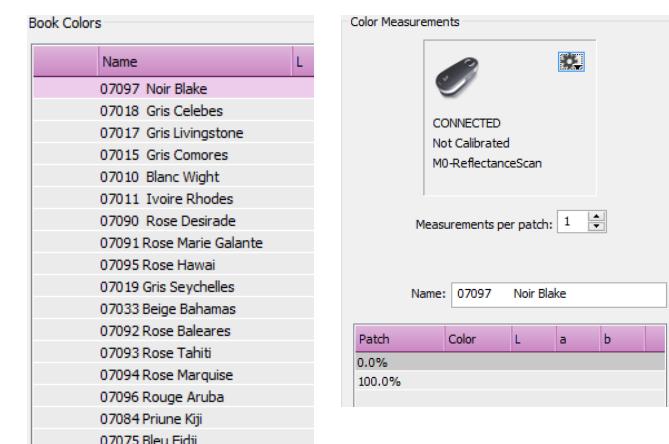
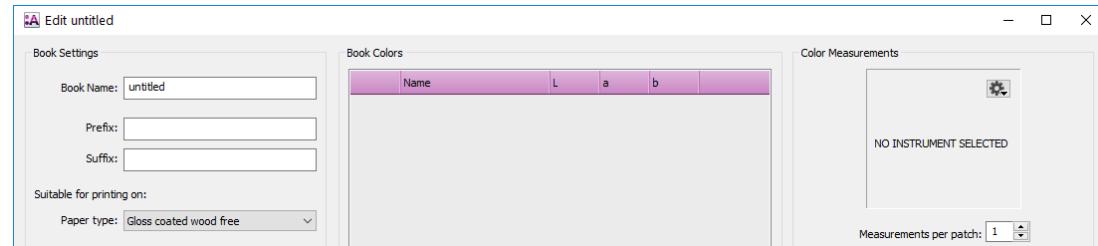
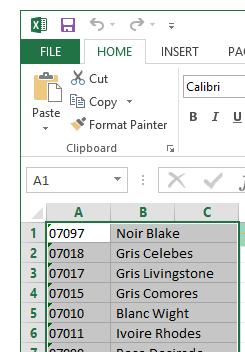
Name the color book "Tutorial".

Open the Spot Color Tutorial.xls file (from the Sample Files) with Microsoft Excel. This file contains a series of spot color names. Select the complete data range and copy them to the clipboard.

6. Go back to the custom color book. Use the Ctrl+V short cut to paste the list of spot colors in the color book. By default the first spot color will be selected.
7. Attach the EyeOne. The UI will recognize the measurement device. Click on the cogwheel to calibrate the device.



8. Select the first spot color and measure the paper white and the 100% tint.
TIP: use any Pantone Guide to measure a range of spot colors (they do not need to match the name exactly).



9. Proceed with the next colors. The 0% tint only needs to be measured only once.
 10. Click OK to add the color book. A new color book called "Tutorial" is now stored in the Asanti databases.

For the ease of use of this tutorial an example colorbook (.mime) can be loaded from the sample files folder.*

11. Click on the map icon and load the “Tutorial Color Book.mime” so that it can be used the next exercises.

2. Calculate the color difference of a series of spot colors.

The spot colors are reproduced with the inks available on the digital press. A conversion needs to be done. A conversion can change the colors when the colors can't be reproduced inside the color gamut of the digital press.

Asanti offers the possibility to calculate the ΔE of each color from any color book (including Lab books).

1. Select the new custom spot color book in the spot color overview.
 2. Activate the “Show color accuracy (ΔE)” option. This will open the Color Accuracy options which allow you to set a media, CPM and application.
 3. Select the parameters (in this case for Anapurna 2500i).

Media: Generic

CPM: Std – 3P Bi 540x1080 PMN IEG – 6C (or any other CPM)

Application: Color On Media

The Press profile selection is obsolete as Asanti calculates the ΔE value without respect to the white points (Absolute colorimetric).

The color accuracy is calculated. For each spot color the Lab value of the source (color book) and destination (CPM) is calculated together with the CMYK values from the CPM. All values above the Max will be notified in red.

Calculating the color accuracy can take some time (up to 30") for color books with a lot of colors.

Name: 07097 Noir Blake					Name			
Patch	Color	L	a	b	L	a	b	
0.0%		94.6	1.3	-3.9	61.9	2.2	3.6	
100.0%		23.1	-0.3	-1.4	51.9	2.2	2.6	
					83.0	-0.7	3.8	
					78.0	-5.8	2.5	
					86.3	-0.5	3.3	
					51.8	23.8	-20.1	
					86.0	9.1	60.1	
					58.5	4.9	-18.8	
					50.0	56.4	-26.5	
					68.7	-13.6	-32.8	
					81.0	27.1	9.0	
					83.9	27.2	6.0	
					44.1	0.3	8.5	
					58.9	55.0	-6.4	
					58.0	49.6	5.3	
					59.7	62.5	32.7	

The screenshot shows the 'Color Books' software interface. The top menu bar includes 'File', 'Edit', 'View', 'Print', 'Color', 'Help', and 'Special Colors...', 'International...'. The main window has a toolbar with icons for New, Open, Save, Print, and others. A left sidebar lists 'Color Book' and 'Paper Type' entries. The central area contains a grid of color swatches with their corresponding color names and values. A red arrow points from the 'Color Accuracy' section at the bottom left to the 'Show color accuracy (ΔE)' button in the bottom center.

Color Book	Paper Type
General	Gloss coated wood...
Pantone CV	Gloss coated wood...
Orafol	Gloss coated wood...
3M	Gloss coated wood...
Ral	Gloss coated wood...
Raudies	Gloss coated wood...
Pantone Plus coated 2010	Gloss coated wood...
Pantone Plus Coated 2014	Gloss coated wood...
Pantone coated 2000	Gloss coated wood...
Pantone coated 2005	Gloss coated wood...
Pantone matte 2000	Matt coated wood...
Pantone matte 2005	Matt coated wood...
Pantone Plus uncoated 2010	Uncoated white
Pantone Plus uncoated 2014	Uncoated white
Pantone uncoated 2000	Uncoated white
Pantone uncoated 2005	Uncoated white
China Red Tr	Gloss coated wood...
Pantone plus 2010 coated	Gloss coated wood...
Pantone Plus Coated 2014 - Open	Gloss coated wood...

Color	L	a	b	ΔE	L	a	b	C	M	Y	K
07010 BLANC WIGHT	95.5	-0.1	2.5	3.0	93.0	-1.1	1.1	0.0	1.3	6.0	0.0
07011IVOIRE RHODES	92.7	2.0	7.7	2.1	90.7	1.3	7.5	0.0	6.2	15.1	0.0
07015 GRIS COMORES	88.6	-2.1	3.1	0.0	88.6	-2.1	3.1	5.2	6.1	13.2	0.0
07017 GRIS LIVINGSTON	78.8	-1.6	-0.4	0.0	78.8	-1.6	-0.4	17.2	18.6	20.1	0.0
07018 GRIS CELEBES	40.8	-1.7	-3.2	0.0	40.8	-1.7	-3.2	55.8	59.2	60.5	30.8
07019 GRIS SEYCHELLES	73.5	4.3	6.1	0.0	73.5	4.3	6.1	19.0	31.0	35.0	0.0
07021 JAUNE CEYLAN	90.8	1.4	23.1	2.3	89.1	0.0	22.7	0.0	8.4	33.5	0.0
07022 ORANGE FLORES	89.0	3.1	17.9	0.7	88.3	3.0	17.8	0.0	10.9	25.0	0.0
07023 ORANGE JAVA	83.5	12.3	23.8	0.8	82.7	12.3	23.8	0.2	24.2	41.8	0.0
07025 ORANGE BALI	79.2	20.4	30.1	0.8	78.7	19.8	30.0	0.0	34.7	55.0	0.0
07033 BEIGE BAHAMAS	69.1	7.8	10.1	0.0	69.1	7.8	10.1	10.1	21.4	40.0	46.6
07061 BLEU PALMYRE	22.9	17.7	67.8	15.7	27.0	14.5	-51.9	1...	83.6	0.0	0.0
07062 VERT ACORES	84.0	-14.2	0.5	0.0	84.0	-14.2	0.5	18.2	23.3	17.0	0.0
07063 VERT ANTILLES	66.6	-13.6	20.8	0.0	66.6	-13.6	20.8	35.4	30.3	66.2	0.0
07064 VERT BERMUDIES	78.8	-39.8	73.4	14.6	74.8	-29.1	64.2	30.6	0.0	100.0	0.0
07067 VERT KOUROU	62.7	-49.8	80.9	5.9	63.6	-46.0	46.6	57.4	0.0	100.0	0.0
07071 VERT CANARIES	66.3	-13.5	20.8	0.0	66.3	-13.5	20.8	35.7	30.7	66.6	0.0
07072 BLEU MOJOTTE	76.0	-8.2	-12.5	0.0	76.0	-8.2	-12.5	27.2	16.5	10.5	0.0
07073 BLEU MIDWAY	67.1	-13.2	-23.5	0.0	67.1	-13.2	-23.5	44.4	23.4	8.7	0.0

Show color accuracy (ΔE)

Color Accuracy

Printer: Anapurna M2500i

Media: Generic

GPM: Std - 3P Bi 540x1080 PMN-IEG - 6C

Application: Color On Media

Press Profile: Agfa Fogra 39L Coatedv2

Viewing Conditions: D50, 2°

Rendering Intent: Absolute Colorimetric

Max ΔE: 3.0

Equation: ΔE^*ab

Print Selected Colors Variations... Exceptions...

3. Print a color swatch book

A printed color swatch book can be useful as a visual reference to indicate how spot colors will be reproduced with the selected CPM. The swatch book is automatically generated as an Asanti Job and takes into account the calibration and profile from the CPM.

1. Select the tutorial spot color book in the spot color overview.
2. Select a few or all spot colors from the color book (Ctrl+A).
3. Make sure that the “Show color accuracy” option is enabled with the required color accuracy parameters. For digital press that you want print on (eg Anapurna 2500i):

Media: Generic

CPM: Std – 3P Bi 540x1080 PMN IEG – 6C (or any other CPM)

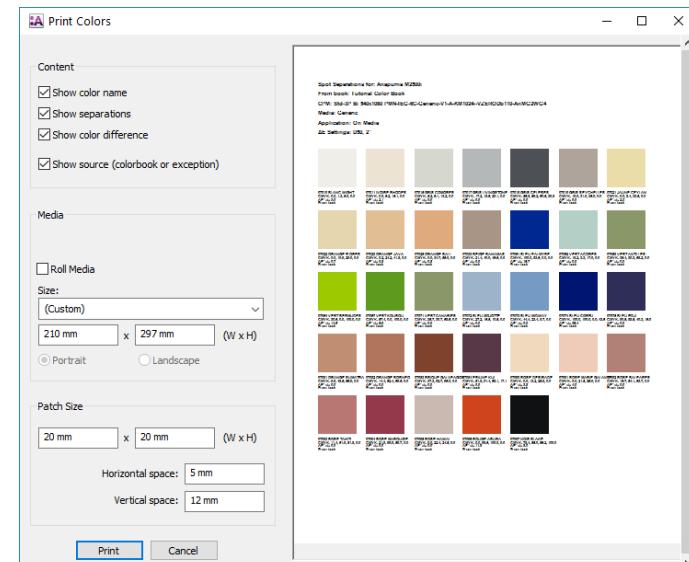
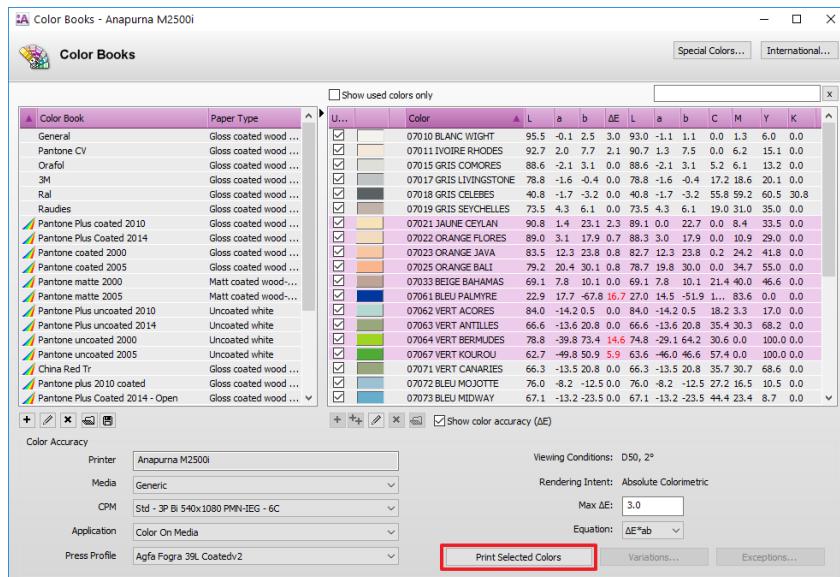
Application: Color On Media

The selection of the Press Profile: is obsolete.

4. Click “Print Selected Colors”.
5. A dialogue will appear. Change the output size to A4 (210x297) and the patch size to 20x20 mm.
6. Click the Print button.

The result is an automatically created test job which contains CMYK patches based on the converted spot colors that were selected, and will exactly represent the CMYK's of these spot colors when Asanti Jobs contain these spot colors.

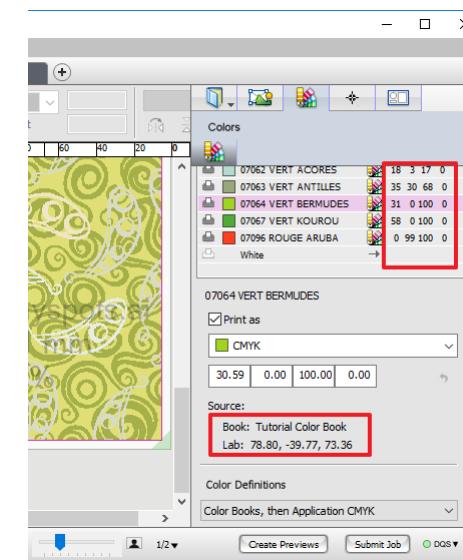
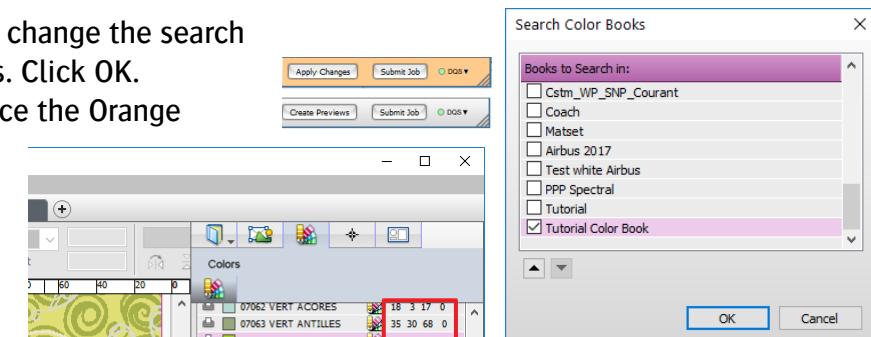
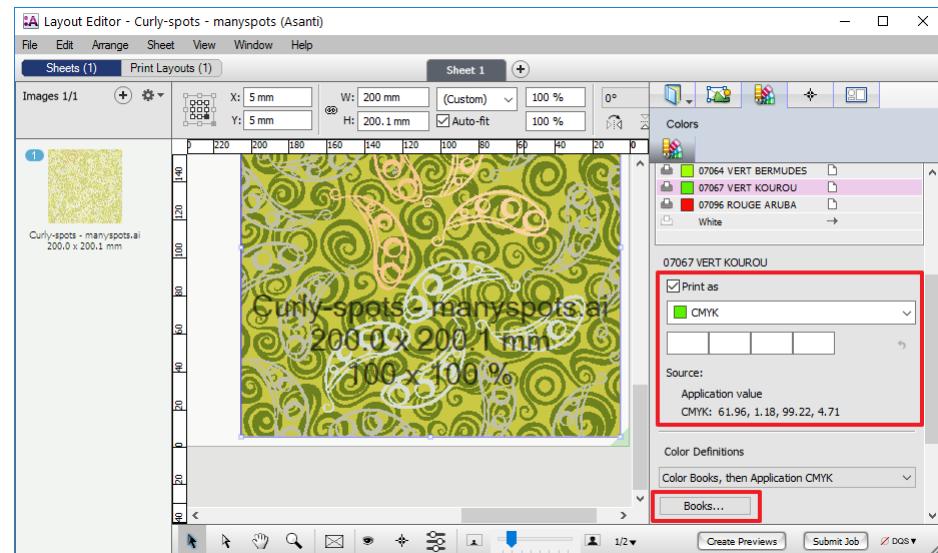
Next to the patches the CMYK, Lab and ΔE values can added to the swatch book print.



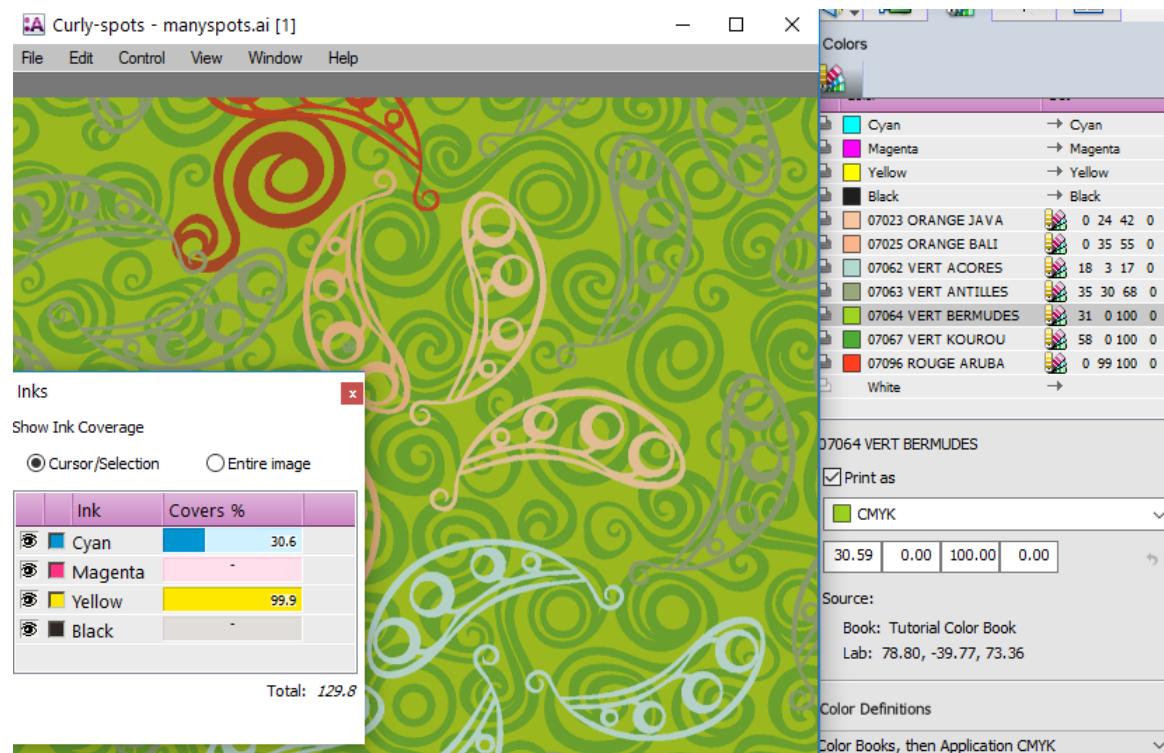
4. Use custom spot color books in the Layout Editor

This exercise will teach you how to use the (custom) color books in the Layout Editor.

1. Drag the *Curly-spots - manyspots.ai* file (from the Sample Files) on the digital press of your choice (eg Anapurna 2500i).
2. Drag the image on the sheet.
3. Open the Spot Colors inspector.
4. Select one of the spot colors: Notice that CMYK "Print as CMYK" values are not displayed yet. The CMYK values from the application (Illustrator converts the Lab spot color description to CMYK using the working space) are reported, and will be used unless if the custom spot color book is enabled. (Which is the goal of this exercise).
5. Click the Books button to add the Tutorial spot color book.
6. Scroll down to add the color book to the search list. You could also change the search priority list by using the small arrow buttons below the Color Books. Click OK.
7. The Layout Editor will recognize something has been changed (notice the Orange background). Click "Apply Changes" and "Create Previews".
8. The visual representation of the Layout Editor will change when the preview is completed. Notice that the color definitions of the Tutorial color book are now displayed in the Colors Inspector.
9. Select the "*Curly-spots - manyspots.ai*" in the image panel and right click "Edit in Preview" and open the ink palette. (Window – Palettes – Show Inks).
10. Select the Cursor/Selection tool from the Tools palette to measure the Ink Coverage.
11. Hover with the mouse over the background (07064 VERT BERMUDES spot color). Notice that the CMYK values are identical as shown in the Layout editor (same applies to the reddish 07096 ROUGE ARUBA spot color). Other spot color CMYK values do not match because these spot colors are set to overprint.



Minor differences (up to 1%) may be noticed between the actual measured (rendered) colors and the reported values in the color books panels. Also notice the red curl (Rouge Aruba) shows in 2 different result, this is due to the Overprint attribute which is applied on the lower of the 2 curls. Asanti accurately calculates the overprint effect of spot colors !



Spot color definitions are looked up based on their name. Asanti checks the color books sequentially. If a spot color with the same name is found in multiple books, the definition from the first book will be used. The priority of a color book can be changed by using the arrows.

12. Close the preview editor, click Submit and select make and hold to finish exercise-4.

5. Mapping a spot color to another spot color

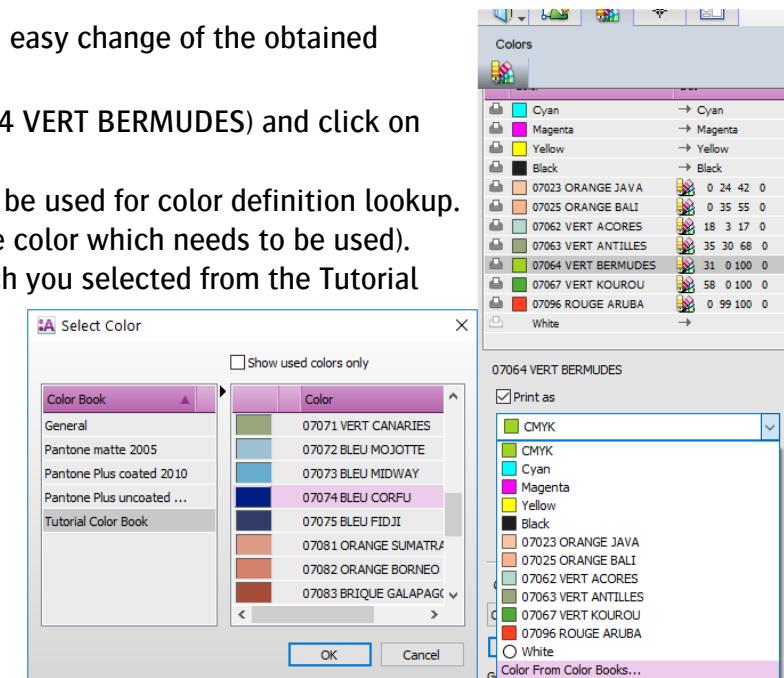
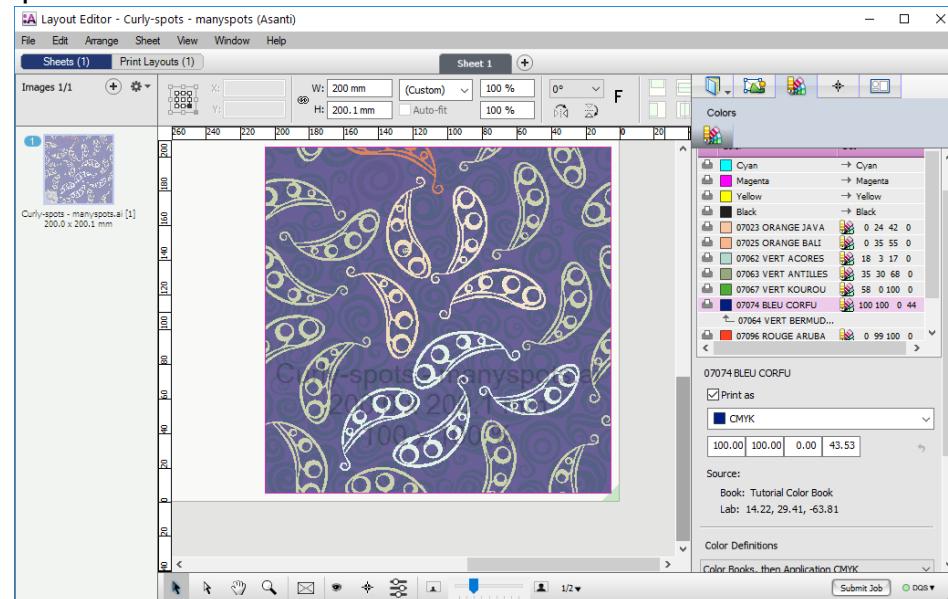
Asanti allows to map spot colors from one to another, which allows for a quick and easy change of the obtained color result.

1. Select any spot color from the colors list in the Colors inspector (eg. 07064 VERT BERMUDES) and click on the “Print as” drop down menu.
2. Select “Color From Color Books...” to display all spot color books that will be used for color definition lookup.
3. Select the Tutorial Color book and select one of the spot colors (this is the color which needs to be used).

The “07064 VERT BERMUDES” color is now mapped to the new color which you selected from the Tutorial color book.

4. Click “Apply Changes” and select “Update”, to update the preview result.

The mapped color will be converted using the color values of the select spot color.



5. Close the preview editor, click Submit and select make and hold to finish exercise-5.

Part II: Working with spot color exceptions – new in Asanti 3.0

Sometimes there is a need to reproduce spot colors as close as possible to original (e.g. Brand Colors) – which can become a challenge with digital printing, where you have to use an ink set with a smaller color gamut than what is required to cover the color a spot color. Or, in other words, with a specific CPM (refer to “Calibrated Printing Modes” tutorial). So when Asanti needs to print a spot color – it’s making a color conversion to the color gamut of CPM. As a result, printed spot color visually can be different from the original one – because the color gamut of current printer/printing mode may not reproduce it (because the gamut is too small).

By varying the way a spot color is converted it’s possible to find better visual match with the original color. To cope with this, Asanti can generate and print multiple sets of samples, with different conversion accuracy, which will help to determine the best visual match with original the spot color sample.

6. Printing the spot color Variations.

After evaluating the ΔE between the referenced spot color and a profile of a CPM you can print the variations of the spot color conversion accuracy – to find the best visual match.

Variation patterns can be printed, taking into account the calibration and color profile from the selected CPM.

1. Select the Tutorial Spot color book in the Color Books resource of your preferred printer (Anapurna 2500i in this samples).
2. Select the “07064 VERT BERMUDES” spot color.
3. Make sure that the “Show color accuracy” option is enabled and required color accuracy parameters are set:
 - Media: Generic
 - CPM: Std – 3P Bi 540x1080 PMN IEG – 6C (or any other CPM)
 - Application: Color On Media
 - The selection of the Press Profile: is obsolete.
4. Examine ΔE and CMYK values.
 - If the ΔE is less than 3 (or even 5) – than it’s a good chance that the default Asanti conversion with the chosen CPM will be close enough to the original spot color and there is no need apply an exception.

The screenshot shows the Asanti software's 'Color Accuracy' dialog box. At the top, there's a list of 'Color Book' entries: Coach, Matset, Airbus 2017, Test white Airbus, PPP Spectral, Tutorial, and Tutorial Color Book. Below this is a table with columns: U..., Color, L, a, b, ΔE , L, a, b, C, M, Y, K. Several rows are listed, each with a checked checkbox next to it. One row is highlighted in yellow. The bottom section of the dialog box contains settings for 'Printer' (Anapurna M2500i), 'Media' (Generic), 'CPM' (Std - 3P Bi 540x1080 PMN IEG - 6C), 'Application' (Color On Media), and 'Press Profile' (Agfa Fogra 39L Coatedv2). On the right, there are options for 'Viewing Conditions' (D50, 2°), 'Rendering Intent' (Absolute Colorimetric), 'Max ΔE ' (3.0), and 'Equation' (ΔE^*ab). At the bottom right, there are buttons for 'Print Selected Colors', 'Variations...', and 'Exceptions...'. The 'Variations...' button is highlighted with a red border.

- If the $3 < \Delta E < 11$, then varying the spot color conversion may possibly improve the visual match.
- If the ΔE is more than 11, the color mismatch will always be visible but finding a more pleasing color may be required. The color variations option enables the setup for the necessary tests

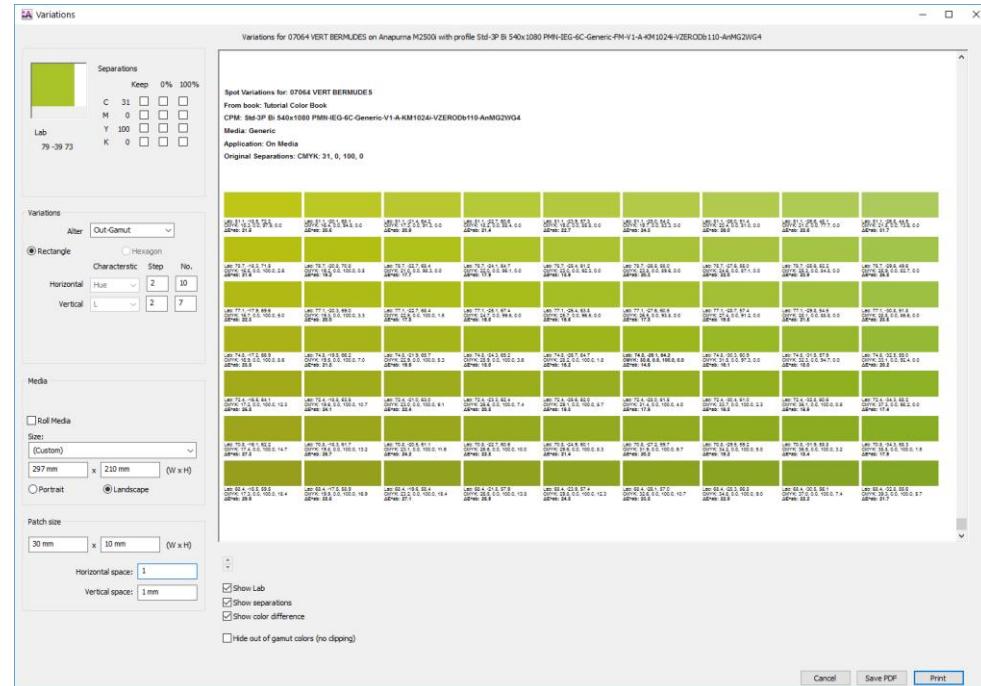
5. Click “Variations” – Variations printing window will

appear, where you can:

- Set color accuracy variation parameters;
- Set the media size used for printing the variation patterns.
- Set the patch size and gaps;
- Select information, added to a label of each patch;
- Print or export to PDF

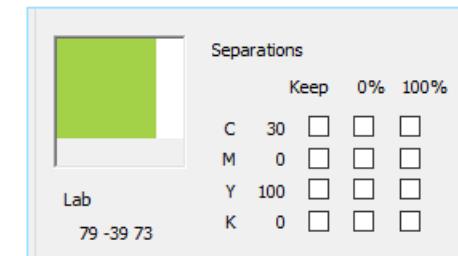
If you export Variation test patterns to PDF the patches will be created with CMYK for the selected CPM. They are not relevant for any other printing mode/media /printer combination.

When clicking print, Asanti automatically creates a job with the same content as the PDF and sets all process parameters correctly for the selected CPM.



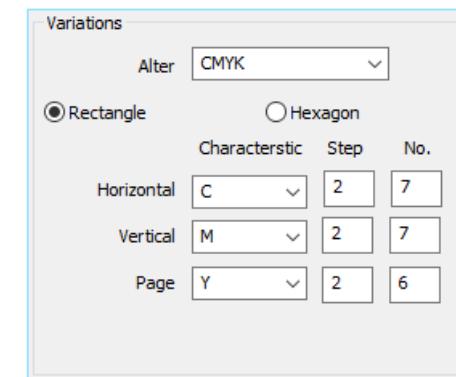
The **SEPARATIONS** parameters lets you freeze one of the colors value and block it from variating:

- **Keep** – will block the selected channel value within the CMYK variations
- **0%** – will set the selected channel to zero within the CMYK variations.
- **100%** – will set the selected channel to 100% within the CMYK variations.
- **LAB** text – just highlights the original Spot color LAB values, from Color Book.

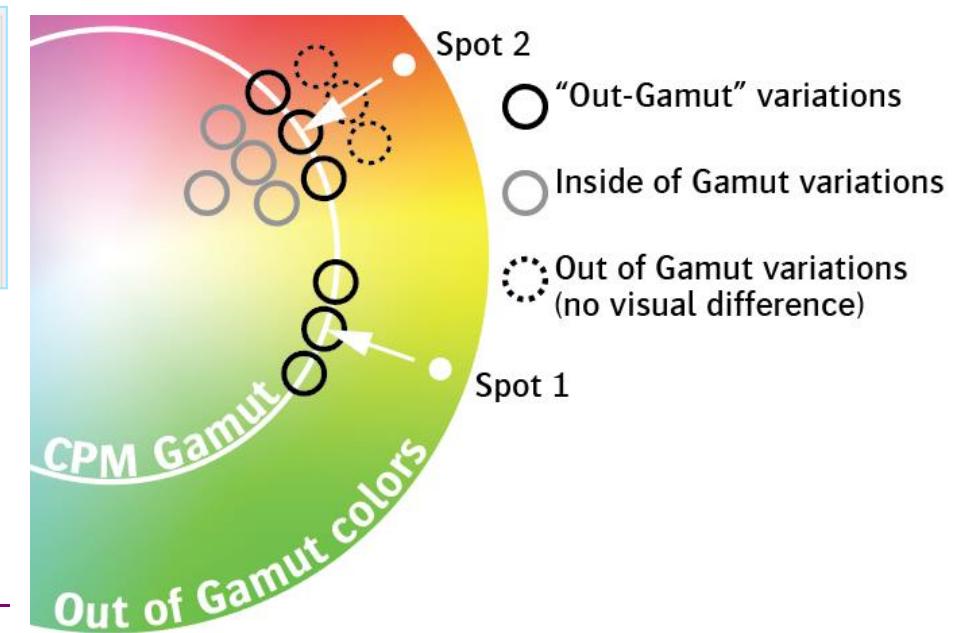
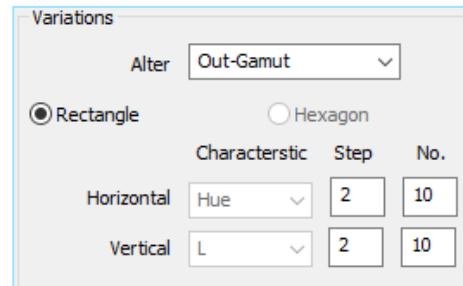


The **VARIATIONS** dialogue makes it possible to set multiple color variation parameters:

- **Alter** – lets you choose the color model to vary: CMYK, Lab, LCH or Out-Gamut.
- **Rectangle/Hexagon** – is for pattern representation when selecting CMYK as alter mode:
 - Rectangle may vary three directions of color steps – horizontally, vertically and by block (page)
 - Hexagon representation may vary four directions of color steps – vertically, by two diagonals (bottom-left to top right and top-right to bottom-right) and by block (page).
- **Characteristic** – choosing which color channel (CMYK or Lab, LCH) to vary into a direction.
- **Step** – the color difference between each patch.
- **No.** – Number of patches to generate.



Alter “Out-Gamut” – is a way to vary out of gamut colors on the edge of Color Gamut – when only the Hue and Lightness are varying, while Chroma stays the same (see the **Spot 1** on the picture). This is the advisable way to start finding the best visual match for colors with a high ΔE .



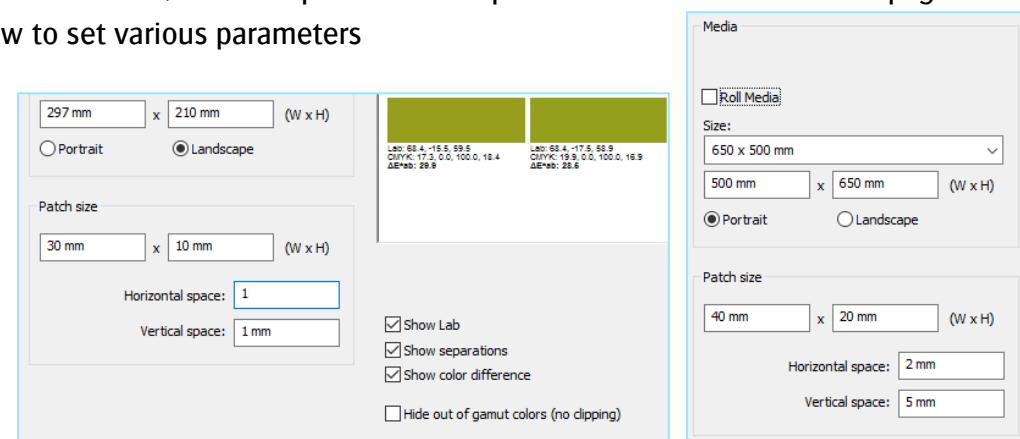
TIP: When looking for a match for colors with a High ΔE , it is useful to enable the “**Hide out of Gamut colors**” option, in order to hide color variations out of the printable Gamut on a pattern, as they would create doubles: patches with the same color.

MEDIA parameters makes it possible to adjust the media size of the variations print patterns: Size and Roll Media ON/OFF.

PATCH SIZE parameters makes it possible to set the patch size and horizontal/vertical space between patches on the variations test page.

The check box functions on the bottom of Variations window allow to set various parameters to include into a label, printer under each patch:

- **Show Lab** – is to add the Lab values;
- **Show separations** – is to add the CMYK values (should be always ON, as CMYK value is used for spot color exception);
- **Show color difference** – is to add the ΔE between the original Spot color value from Color Book, and the Color value of current patch.



Hide out of gamut colors (no clipping) – triggering ON this

parameter allows to hide variation patches, which are out of the Color Gamut of chosen printing color profile (CPM). The reason for that is that all the patches out of Gamut will have no visual difference and therefore will be doubles.

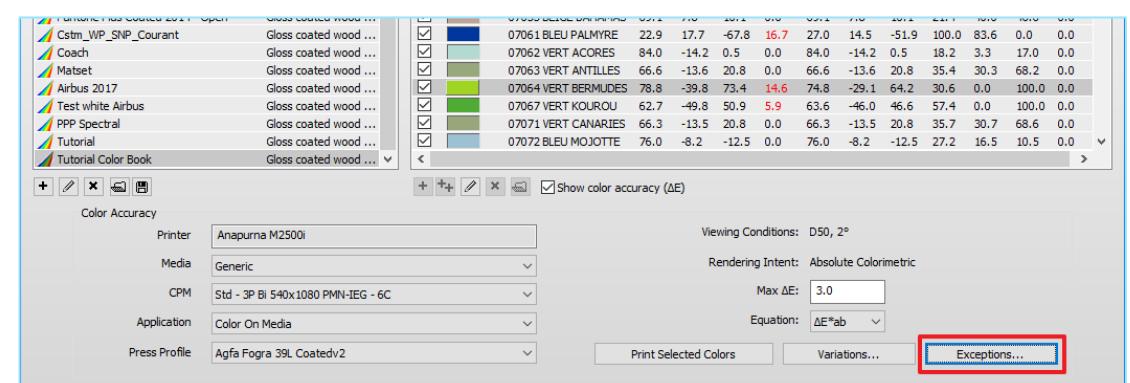
7. Setting the spot color exception.

When the best visual match is found – between one of the printed variations patches and the referenced spot color sample, the CMYK values of this sample can be used as the Spot color exception.

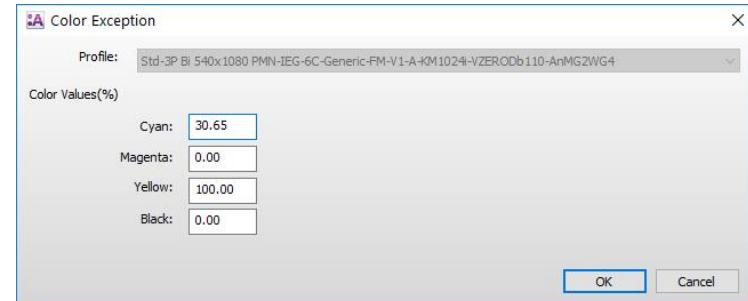
There are 2 ways to apply an exception for a spot color:

- **Global:** By editing the Spot color (context-click or “edit” button), or by using the “Exceptions” button. This allows automated triggering of the exception for every job that uses this spot color with the CPM, used to create exception.
- **Local:** by manually setting exception in the Asanti Layout Editor, for a given job only.

In this exercise we will add an exception to Spot color “07064 VERT BERMUDES” of the Tutorial Color Book:



1. Select the Tutorial Spot color book in the Color Books resource of the printer of your choice (Anapurna 2500i in this samples).
2. Select the "07064 VERT BERMUDES" spot color.
3. Make sure that the "Show color accuracy" option is enabled and the required color accuracy parameters are set:
 - Media: Generic
 - CPM: Std – 3P Bi 540x1080 PMN IEG – 6C (or any other CPM)
 - Application: Color On Media
 - The selection of the Press Profile: is obsolete.
4. Click "Exceptions" – it will open Spot color editor with Color Exception dialog.



The dialogue displays the actual ICC profile (which cannot be changed in this window) of the select CPM/application on which the exception will be set. This ICC profile is automatically selected when the CPM is used in a job (with the selected application: On media or On white)

5. Enter the following exception: to change the background from green to red Cyan=30, Magenta=100, Yellow=100, Black=0 and press OK. Note the Spot color editor window with the Color Exception for the ICC profile of the selected CPM/application.
6. Press OK.

The Spot color editor can contain multiple Color Exceptions for different ICC profiles.

The editor allows to manage Color Exceptions. Obsolete exceptions can be removed or edited.

The color exception is now added to the Spot color "07064 VERT BERMUDES":

When a spot color has at least one exception it gets a warning icon. Also, the CMYK values of an exception will be displayed, instead of the default.

Profile	Values
Std-3P Bi 540x1080 PMN-IEG-6C-Generic-FM-V1-A-K...	30.65 100.00 100.00 0.0

8. Using the spot color exception in job.

Spot color exception are automatically used, when the spot color is present in a job on which the CPM is active and for which the exception was entered.

Spot color exceptions are picked up in the Layout Editor only if you create the preview of a job, or when the job is rendered for printing.

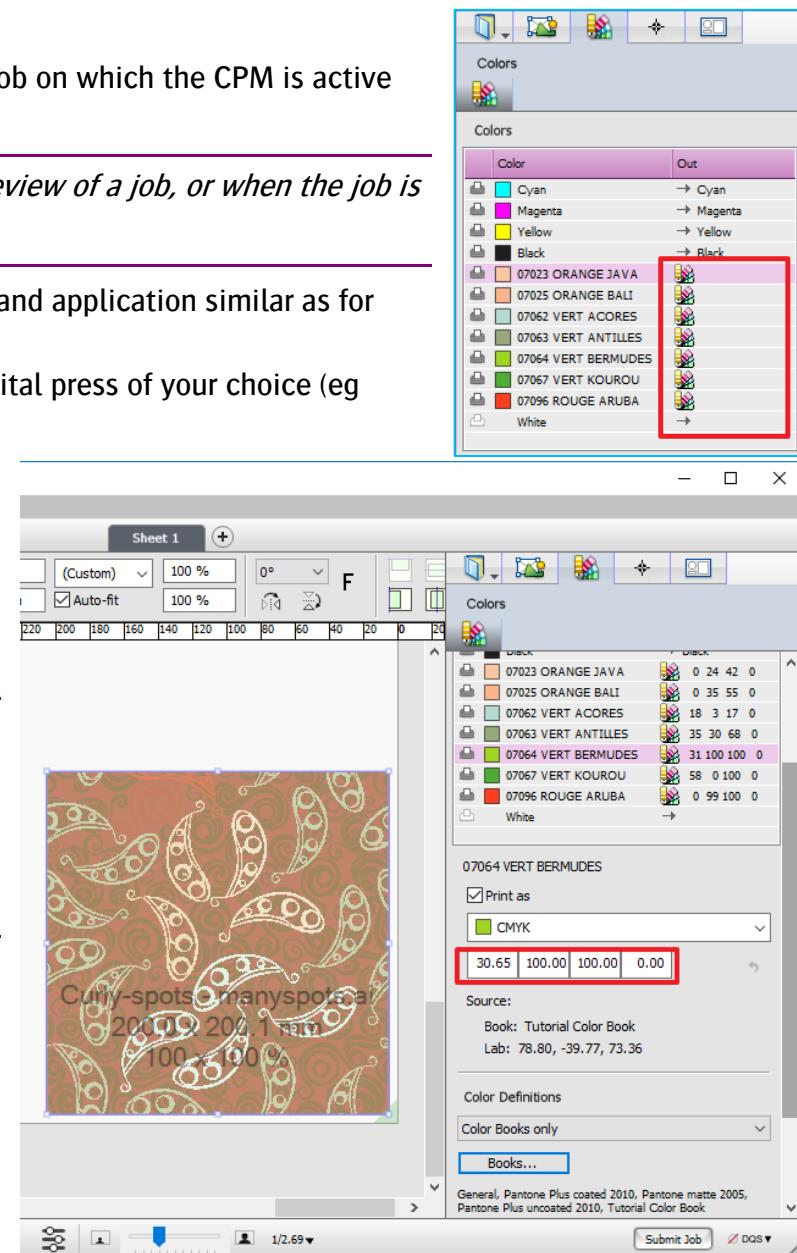
To use the **Global** Spot color exception, create a job with the printer, media CPM and application similar as for which you created the spot color exception.

1. Drag the *Curly-spots - manyspots.ai* file (from the Sample Files) on the digital press of your choice (eg Anapurna 2500i).
2. Drag the image on the sheet.
3. Open the Spot Colors inspector, and click on the “Books” button and enable the “Tutorial Color Book”. notice no CMYK values are present yet in the Out column.
4. Click the *Create Preview* button, and wait until the preview rendering has finished.

Notice that the CMYK (conversion colors) are now filled in the out column. The Color “07064 Vert Bermuda” gets the spot color exception values for the selected CPM: 30 100 100 0.

If the exception values are not displayed correctly, a reboot the PreviewGenerator and PDFRender TP's may be required. (76391)

5. In the image panel click on “Curly-spots – manyspots.ai” and select “Edit with preview” from the context menu.
6. Open the inks pallet (Ctrl+Alt+I) and measure the background color: the exception value is applied during rendering.
7. Close the preview window.



Alternatively to the **global** exception, Asanti also allows to set a **Local** Spot color exception

7. In the spot color inspector pallet select “07096 Rouge Aruba” Spot color and notice the CMYK values – as a result of the default Asanti conversion of this Spot color to CPM, selected for the job.
8. In the “print as CMYK” field, set CMYK values to Black: Cyan=0, Magenta=0, Yellow=0, Black=100 and click “07096 Rouge Aruba” in a Colors list.

When a custom CMYK values has been set the spot color is changed in the color list accordingly and gets a crayon icon to indicate that a local spot color exception has been added.

9. Press “Apply Changes” and answer “Update” to the “Create Preview” request.
10. In the image panel click on “Curly-spots – manyspots.ai” and select “Edit with preview” from the context menu.
11. Note that dark green curls now show black.
12. Close the preview window.
13. To reset the custom CMYK values to default ones – press the small curly arrow – right to values.
14. Place the “Curly-spots – manyspots.ai” on the press sheet and click the submit button.
15. Select “Make and Hold” to finish the exercise.

