



CMYK_Backgrounds User's Guide

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CMYK_Backgrounds



About CMYK_Backgrounds:

CMYK_Backgrounds allows you computing how the colors of a CMYK chart will change depending on each printed media color, even in case of important media color changes.

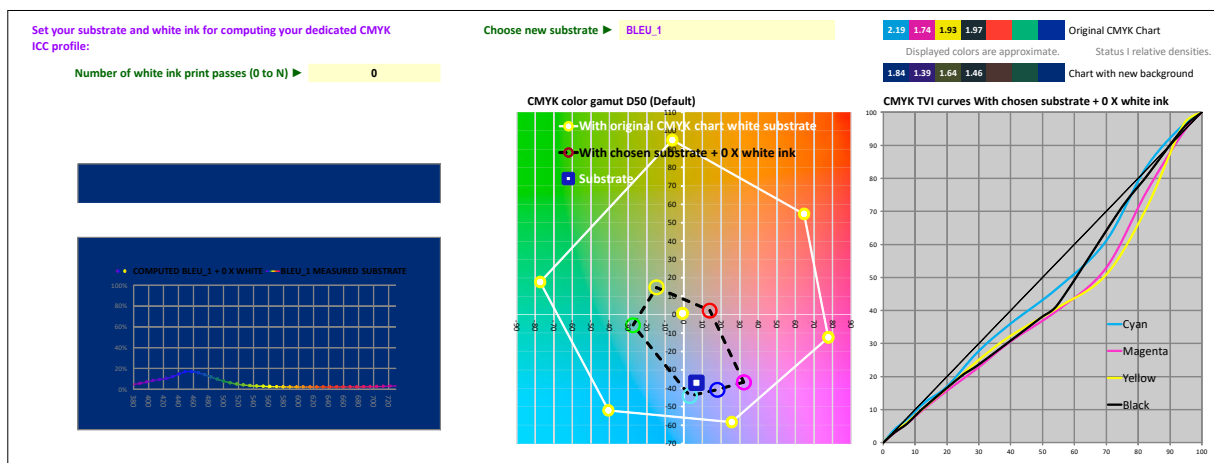
If the substrate to be printed has a color very different from white, you may find that printing one or more white ink layers prior to printing your CMYK file may be necessary, in order to get a decent CMYK color gamut:



Above image has been computed using **CMYK_Backgrounds** application: **CMYK_Backgrounds** allows you computing how the colors of your CMYK chart will change, depending on each printed media AND on the number of white ink layers you print before your CMYK inks. So that making accurate ICC profiles characterizing your CMYK press or digital printer on hundreds of different print substrates, becomes quite fast and easy.

All you need to do is:

1. Print your CMYK characterization test chart on a good white media (**preferably non-fluorescent print media using no optical brighteners**),
2. Measure this CMYK chart spectral data (These data can allow you computing the ICC profile for printing on this white media),
3. Paste these spectral data to **CMYK_Backgrounds Original_CMYK_Chart** tab,
4. Select **CMYK_Backgrounds Configure** tab and choose your new print substrate:





Installing new print substrates in the application SUBSTRATES library:

The **SUBSTRATES** tab allows you pasting, saving, and managing all your different print substrates. You should always specify your substrates by 380-730 nm 45/0° spectral reflectance data:

| Print substrates library | | COLORSOURCE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
| You should name each measured substrate to allow you selecting it in the Configure tab. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| The decimal separator of your measures should be a dot. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ▼ Please store your print substrates spectral measurements between lines 1 and 1500 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUBSTRATES NAMES | | 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 | | |
| 1 | PANTONE 200 C | 0.023 | 0.024 | 0.021 | 0.014 | 0.043 | 0.040 | 0.041 | 0.043 | 0.043 | 0.040 | 0.037 | 0.040 | 0.045 | 0.042 | 0.037 | 0.041 | 0.024 | 0.019 | 0.012 | 0.024 | 0.117 | 0.309 | 0.451 | 0.549 | 0.583 | 0.613 | 0.630 | 0.645 | 0.659 | 0.671 | 0.682 | 0.691 | 0.698 | 0.704 | 0.709 | 0.713 | 0.717 | |
| 2 | GOLD | 0.046 | 0.029 | 0.088 | 0.11 | 0.138 | 0.143 | 0.198 | 0.176 | 0.195 | 0.202 | 0.182 | 0.221 | 0.241 | 0.264 | 0.289 | 0.319 | 0.338 | 0.369 | 0.389 | 0.402 | 0.408 | 0.418 | 0.429 | 0.438 | 0.445 | 0.451 | 0.456 | 0.461 | 0.465 | 0.469 | 0.473 | 0.477 | 0.481 | 0.484 | 0.487 | 0.490 | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | VIOLET | 0.196 | 0.176 | 0.237 | 0.276 | 0.281 | 0.278 | 0.287 | 0.283 | 0.225 | 0.202 | 0.172 | 0.148 | 0.126 | 0.104 | 0.073 | 0.071 | 0.062 | 0.057 | 0.056 | 0.057 | 0.059 | 0.086 | 0.097 | 0.104 | 0.108 | 0.114 | 0.127 | 0.136 | 0.151 | 0.161 | 0.204 | 0.268 | 0.308 | 0.365 | 0.401 | 0.409 | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | LIGHT BLUE | 0.115 | 0.198 | 0.376 | 0.603 | 0.806 | 0.714 | 0.725 | 0.728 | 0.735 | 0.737 | 0.728 | 0.746 | 0.747 | 0.704 | 0.654 | 0.674 | 0.649 | 0.63 | 0.658 | 0.682 | 0.566 | 0.523 | 0.532 | 0.529 | 0.524 | 0.526 | 0.523 | 0.527 | 0.513 | 0.516 | 0.521 | 0.547 | 0.574 | 0.536 | 0.543 | 0.539 | | |
| 9 | BLACK | 0.054 | 0.024 | 0.024 | 0.031 | 0.029 | 0.021 | 0.018 | 0.021 | 0.021 | 0.023 | 0.021 | 0.021 | 0.023 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | |
| 10 | BLEU_1 | 0.063 | 0.091 | 0.276 | 0.608 | 0.807 | 0.717 | 0.725 | 0.728 | 0.735 | 0.737 | 0.728 | 0.746 | 0.747 | 0.704 | 0.654 | 0.674 | 0.649 | 0.63 | 0.658 | 0.682 | 0.566 | 0.523 | 0.532 | 0.529 | 0.524 | 0.526 | 0.523 | 0.527 | 0.513 | 0.516 | 0.521 | 0.547 | 0.574 | 0.536 | 0.543 | 0.539 | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | PAPER | 0.908 | 0.273 | 0.297 | 0.021 | 0.035 | 1.062 | 1.130 | 1.103 | 1.049 | 1.029 | 0.977 | 0.942 | 0.941 | 0.881 | 0.877 | 0.833 | 0.828 | 0.816 | 0.825 | 0.794 | 0.802 | 0.819 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | 0.821 | | |
| 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

With Eye-One Pro or Eye-One Pro 2 models, free **Eye-One Share** software is the more convenient: It allows measuring, naming and saving one or more substrates in the very convenient form of CxF v1 format colors palette, and then exporting these color palettes to Excel format (Menu File/Export, and then choose "Excel Palette" in the pull-down menu).

You could use as well free **MeasureTool** or **i1Profiler** applications: For example, if you want to measure 12 different substrates, declare you want to measure 1 line x 12 columns chart. For more details, please refer to the general "Software installation and brief description Guide".

Characterizing the white ink you are using:

If you do not characterize your white ink, you should declare in the **CMYK_Backgrounds Configure** tab that your Number of white ink passes is **0 (zero)**. In these conditions, for computing your CMYK chart new colors on a new substrate with white ink, you have to measure the spectral reflectance of your new substrate WITH white ink, and paste it to the **SUBSTRATES** tab: You can consider your substrate measured with white ink is a new substrate by itself, which you will print using no white ink.

Of course, it is much more convenient characterizing your white ink, and memorizing in your **SUBSTRATES** library bare substrates reflectance data measured with no white ink. Because characterizing your white ink allows **CMYK_Backgrounds** software displaying the color gamut you will get according to the number of white ink print passes you print before CMYK. This allows choosing the appropriate number of white ink passes, depending on each substrate and each application.

The **White_Ink** tab allows you characterizing easily the white ink you are using:

White ink characterization process page COLORSOURCE

Paste spectral data only: This program cannot work using Lab data.

Measure AT LEAST ONE patch of white ink at high thickness on a white substrate, PLUS AT LEAST ONE patch of white ink printed on perfectly black substrate (D > 2.3).

For maximal accuracy, we recommend measuring a few patch of above each kind: This program averages your measures in any order.

The decimal separator of your measures should be a dot. ▼ Specify the number of print passes, for the white ink you have measured printed over black substrate.

Measurement_mode patch

CREATED 5/16/2013 # Time: 17:51

INSTRUMENTATION Eye-One Pro

MEASUREMENT_SOURCE WhiteInk-Absolute Filter=No

ILLUMINATION_NAME D50

OBSERVER_ANGLE 2

KEYWORD SampleID

KEYWORD SAMPLE_NAME

NUMBER_OF_FIELDS 38

BEGIN_DATA_FORMAT

SampleID SAMPL nm380 nm390 nm400 nm410 nm420 nm430 nm440 nm450 nm460 nm470 nm480 nm490 nm500 nm510 nm520 nm530 nm540 nm550 nm560 nm570 nm580 nm590 nm600 nm610 nm620 nm630 nm640 nm650 nm660 nm670 nm680 nm690 nm700 nm710 nm720 nm730

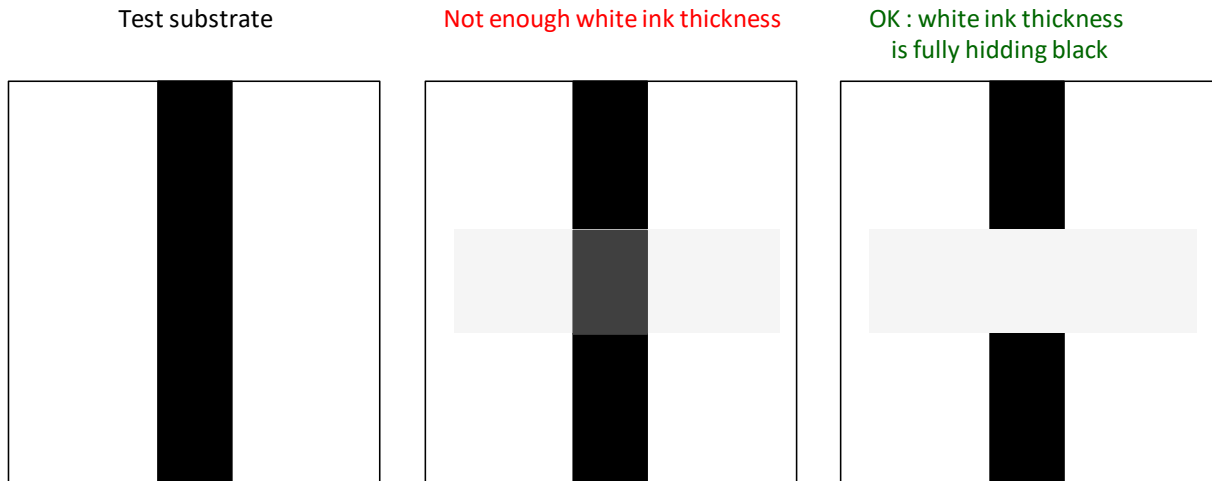
END_DATA_FORMAT

NUMBER_OF_SETS 20

BEGIN_DATA

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|----|-------|-------|-------|-------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 1 | A1 | 0.098 | 0.187 | 0.342 | 0.468 | 0.51 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.5 | 0.49 | 0.48 | 0.48 | 0.47 | 0.46 | 0.46 | 0.45 | 0.44 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.35 | 0.35 | 0.34 | 0.33 | 0.33 |
| 2 | B1 | 0.1 | 0.191 | 0.35 | 0.48 | 0.52 | 0.53 | 0.53 | 0.53 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 3 | C1 | 0.102 | 0.193 | 0.355 | 0.486 | 0.53 | 0.54 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.35 |
| 4 | D1 | 0.103 | 0.193 | 0.354 | 0.485 | 0.53 | 0.54 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.35 |
| 5 | E1 | 0.102 | 0.192 | 0.352 | 0.484 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.35 | |
| 6 | F1 | 0.102 | 0.194 | 0.357 | 0.485 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | |
| 7 | G1 | 0.102 | 0.192 | 0.351 | 0.48 | 0.52 | 0.53 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.49 | 0.48 | 0.47 | 0.46 | 0.46 | 0.45 | 0.44 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 |
| 8 | H1 | 0.1 | 0.19 | 0.348 | 0.476 | 0.52 | 0.53 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.44 | 0.43 | 0.42 | 0.42 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 9 | I1 | 0.1 | 0.19 | 0.348 | 0.479 | 0.52 | 0.53 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.44 | 0.43 | 0.42 | 0.42 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 |
| 10 | J1 | 0.103 | 0.194 | 0.354 | 0.486 | 0.53 | 0.54 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.35 |
| 11 | K1 | 0.099 | 0.183 | 0.352 | 0.486 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 12 | L1 | 0.1 | 0.182 | 0.351 | 0.485 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 13 | M1 | 0.097 | 0.183 | 0.351 | 0.486 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 14 | N1 | 0.098 | 0.183 | 0.351 | 0.487 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 15 | O1 | 0.099 | 0.186 | 0.354 | 0.484 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 16 | P1 | 0.098 | 0.184 | 0.351 | 0.484 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 17 | Q1 | 0.099 | 0.186 | 0.354 | 0.486 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 18 | R1 | 0.1 | 0.184 | 0.352 | 0.484 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 19 | S1 | 0.101 | 0.187 | 0.355 | 0.485 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.4 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 | 0.36 | 0.35 | 0.34 | 0.34 |
| 20 | T1 | 0.1 | 0.186 | 0.355 | 0.486 | 0.53 | 0.54 | 0.54 | 0.53 | 0.53 | 0.52 | 0.52 | 0.51 | 0.51 | 0.5 | 0.49 | 0.48 | 0.47 | 0.47 | 0.46 | 0.45 | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0. | | | | | | | | | | |

1. You need to measure the spectral reflectance of your white ink at very high ink thickness: For printing the appropriate white ink sample, you should print many passes of white ink on a substrate: Enough passes for masking completely your substrate colors. You can print your white ink on a white substrate with black strips, such as Leneta cards, and the black strips should disappear completely:



2. You need to measure the spectral reflectance of your white ink printed with a known number of passes on a very dense black substrate: e.g., print one pass of white ink on a very dense black substrate. Ideally, the black density should be over 2.3 D (i.e., < 0.5% spectral reflectance):



1 X White Ink on Black

Once you have produced above two sample prints, all you need to do is:

1. Measure **at least** one patch of the white ink printed at very high thickness on the white substrate,
2. Measure **at least** one patch of the white ink printed with one (or two) pass on the black substrate.

For doing so, you can use **MeasureTool** or **i1Profiler** applications:

- If using **MeasureTool**, choose **Measuring/Chart** in the toolbar, and then **Custom...** in the pull-down menu: Say you want to measure a chart having 20 columns x 1 Row, which will allow you measuring between 0 to 20 white ink patches, in patch measurement mode.

- If using **i1Profiler**, choose **Measure Chart** in the Workflow Selector, and say you want to measure a chart having 1 Row x 20 Columns, which will allow you measuring 20 patches, in patch measurement mode.

This allows you, for example:

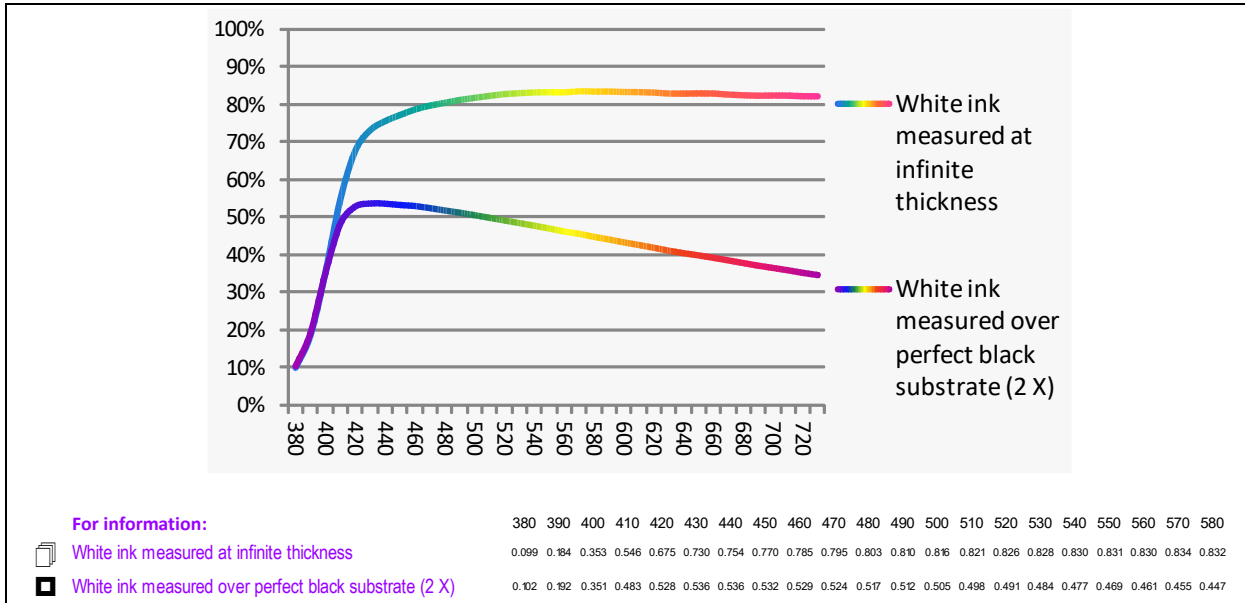
1. Measuring 5 patches of the white ink printed at very high thickness on the white substrate,
2. Measuring 15 patches of the white ink printed with one (or two) pass on the black substrate.

Then save your measures as a CGATS spectral measurement file. Then copy and paste this text measurement file to the **White_Ink** tab. For more details, please refer to the general "**Software installation and brief description Guide**".

CMYK_Backgrounds software automatically detects, sorts, and averages both kind of white ink measurements (White over white and white over black). Averaging many white ink patches measurement is helping the accuracy of your white ink characterization process.

Do not forget to specify in the **White_Ink** tab the number of white inks layers you have printed for your measures of white ink over black.

For your information, the application **Preferences** tab displays the average results of your white ink characterization:



Computing your CMYK ICC profiles for printing on new substrates, with or without using white ink:

CMYK_Backgrounds **Configure** tab allows you:


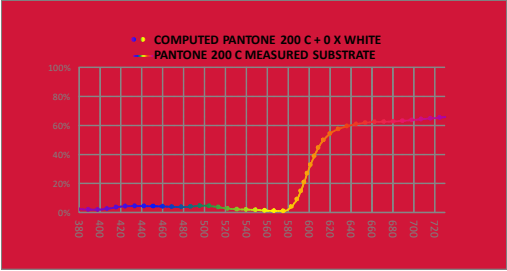
1. Choosing any of your substrates in your **SUBSTRATES** library (Use the pull-down menu or type-in your substrate name),
2. Declaring the number of white ink passes, you want to use (Use the pull-down menu or type-in the number of white ink passes).

For example: **Red + no White Ink (0 X White Ink):**

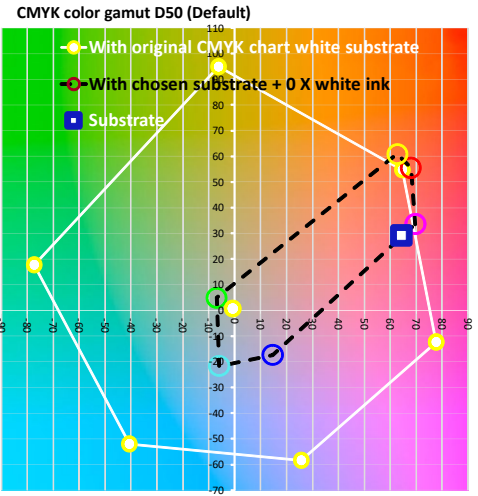
Set your substrate and white ink for computing your dedicated CMYK ICC profile:

Choose new substrate ► **PANTONE 200 C**

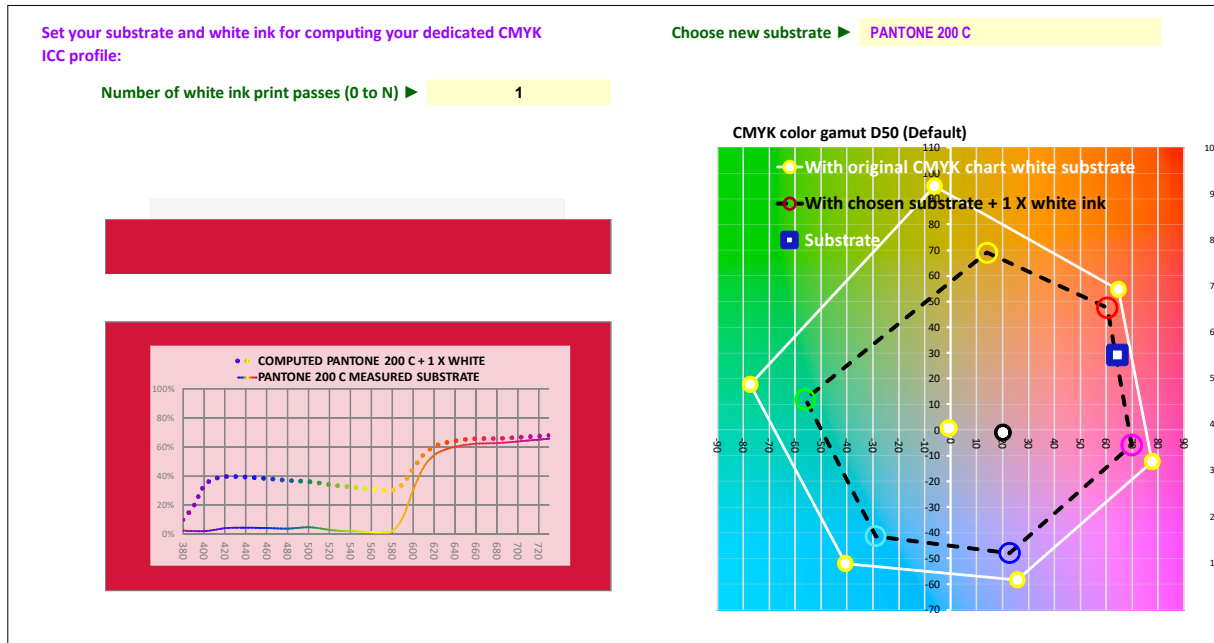
Number of white ink print passes (0 to N) ► **0**

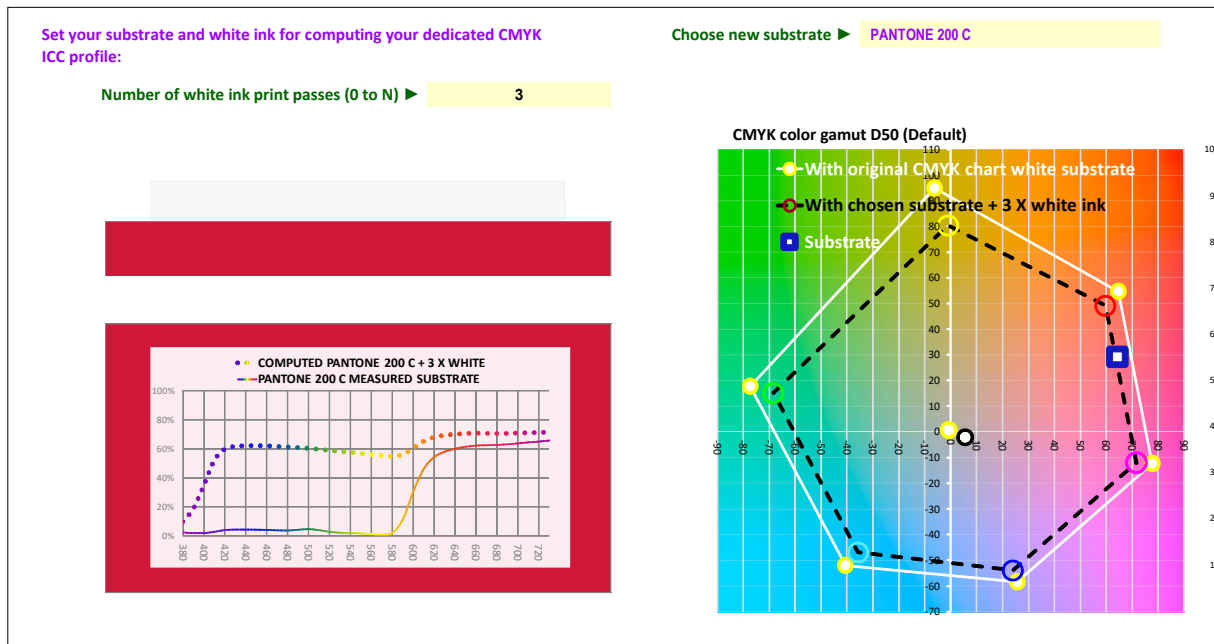
CMYK color gamut D50 (Default)



Red + 1 X White Ink:

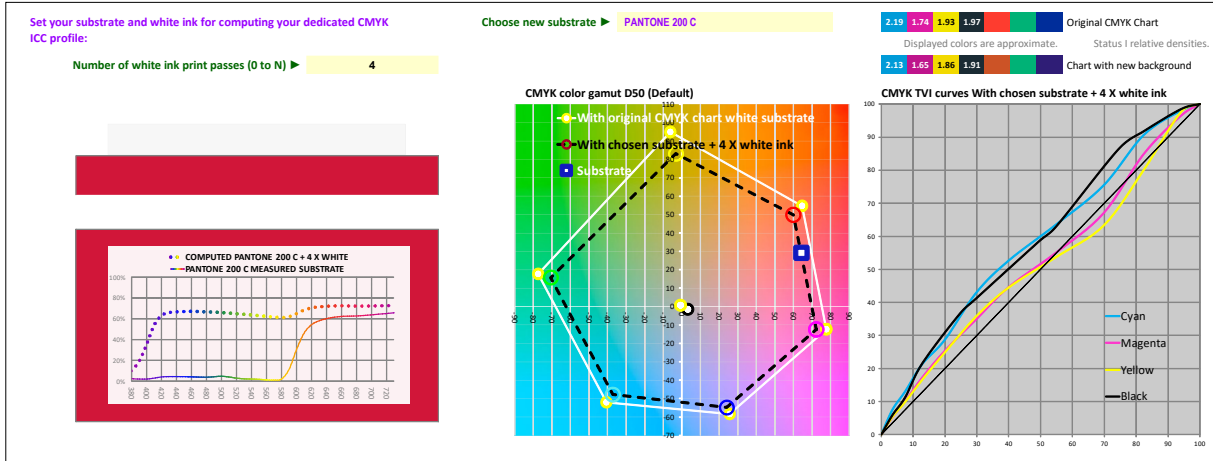


Red + 3 X White Ink:



CMYK_Backgrounds **Configure** tab displays:

1. The CMYK color gamut of the CMYK characterization chart you have printed on a white substrate, measured and pasted to the **Original_CMYK_Chart** tab,
2. The CMYK color gamut you will get depending on chosen substrate and number of white ink print passes,
3. The status I CMYK densities of the Original CMYK measured chart on good white substrate,
4. The status I CMYK densities you will get on new substrate + N X White Ink,
5. The CMYK gradation (TVI) curves you will get on new substrate + N X White Ink,

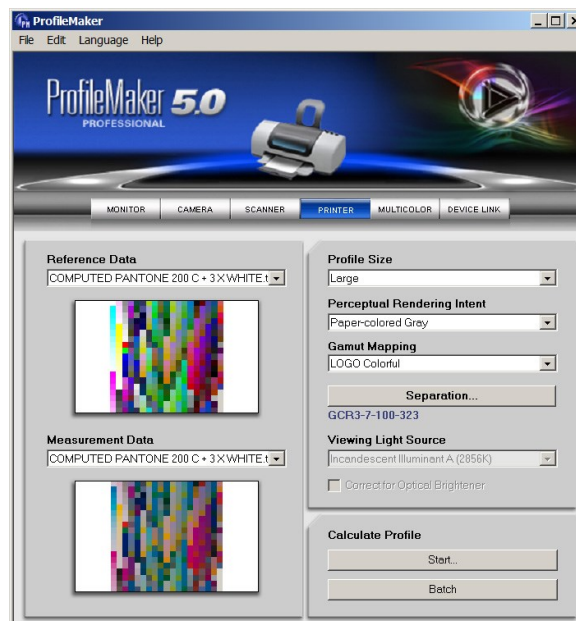


When you are happy with displayed data, you can copy (Ctrl A then Ctrl C) the **New_CMYK_Chart** tab, and then paste it (Ctrl V) to a text file, and use this CGATS text measurement file for computing the ICC profile of your printer, for your new substrate + N X White Ink:

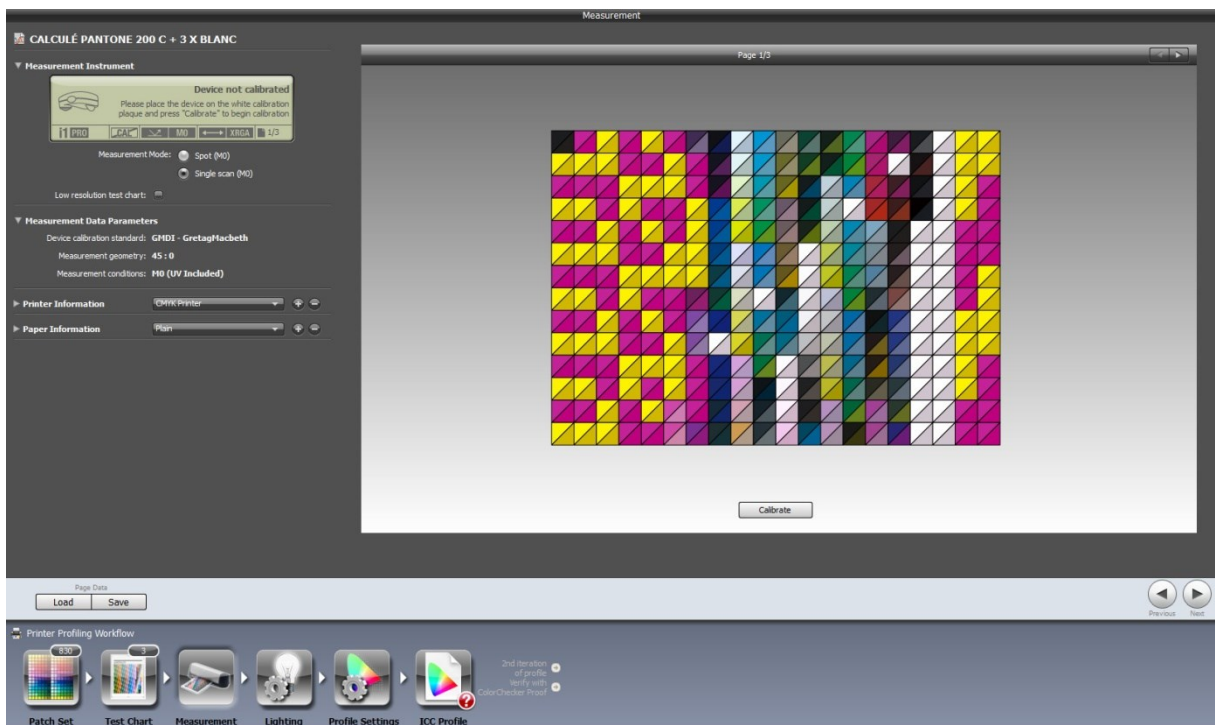
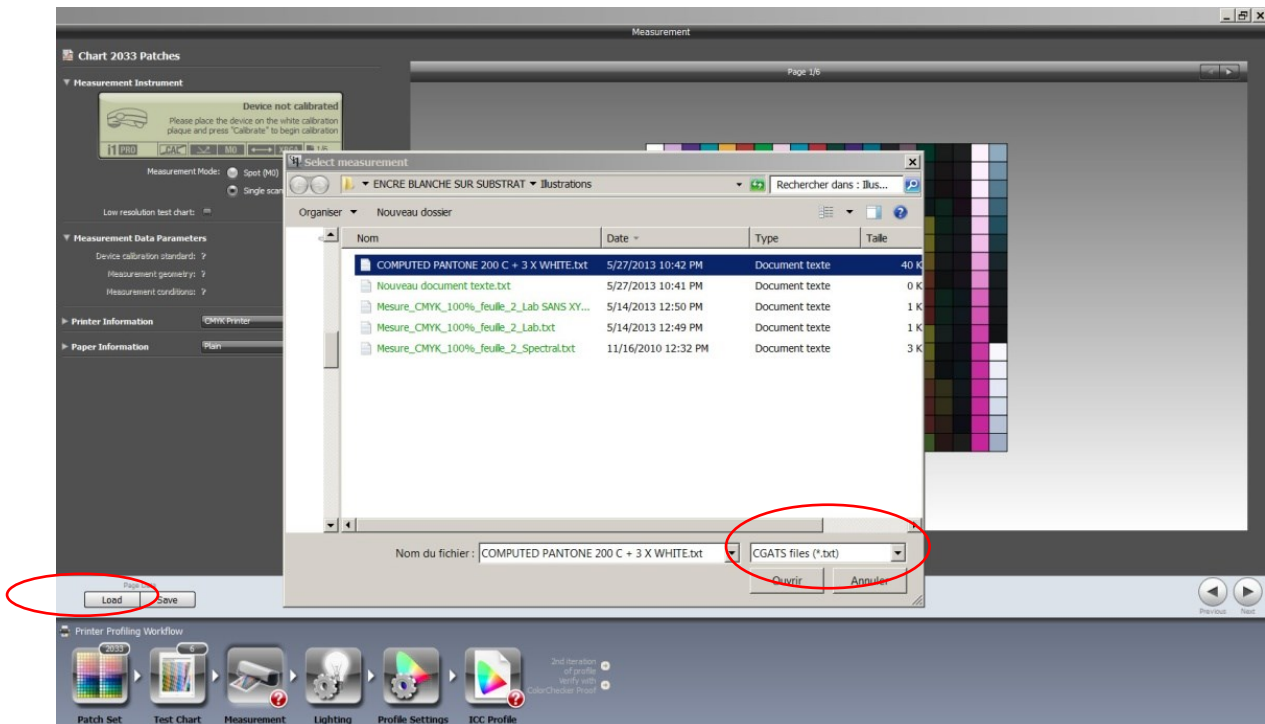
```

LGOROWLENGTH      28
INSTRUMENTATION    Colorsource
MEASUREMENT_SOURCE WhiteBase=Absolute Filter=No
ILLUMINATION_NAME  "D50"
OBSERVER_ANGLE     2°
CREATED            16/6/13 0:04
KEYWORD            SampleID
KEYWORD            SAMPLE_NAME
NUMBER_OF_FIELDS   12
BEGIN_DATA_FORMAT  SampleID
END_DATA_FORMAT    SAMPLE_NAME CMYK_C CMYK_M CMYK_Y CMYK_K XYZ_X XYZ_Y XYZ_Z LAB_L LAB_A LAB_B
NUMBER_OF_SETS     830
BEGIN_DATA
1 1 0.00 0.00 0.00 100.00 0.01124 0.01108 0.00685 9.86 1.91 4.08
2 2 0.00 0.00 100.00 0.00 0.51379 0.54592 0.05431 78.79 -3.28 82.69
3 3 0.00 100.00 0.00 0.00 0.29277 0.14717 0.17191 45.24 72.07 -12.97
4 4 0.00 0.00 100.00 0.00 0.51656 0.54835 0.05374 78.93 -3.16 83.22
5 5 0.00 100.00 0.00 0.00 0.29356 0.14689 0.17204 45.20 72.54 -13.06
6 6 0.00 0.00 100.00 0.00 0.51692 0.54922 0.05393 78.98 -3.28 83.21
7 7 0.00 100.00 0.00 0.00 0.29585 0.14837 0.17440 45.40 72.53 -13.25
8 8 0.00 0.00 100.00 0.00 0.52009 0.55311 0.05426 79.21 -3.42 83.43
    
```

For using this CGATS printer characterization text file with **ProfileMaker**, you just need to drag and drop it to ProfileMaker **PRINTER** tab (ProfileMaker is **Colorsource** preferred ICC profiling application, because we consider it is the simplest, most complete, and most flexible profiling package):



For using this CGATS printer characterization text file with **i1Profiler**, you need choosing **CMYK Printer** and then **Profiling** in the **Workflow Selector** (main menu on the left). Then skip first two steps "Patch set" and "Test chart" that you do not need. Then only, when at "Measurement" step, **Load** your CGATS characterization text file:



At following step, **always choose D50 illuminant**, because **CMYK_Backgrounds application always delivers D50 adapted measurement files**, whichever illuminant you choose in the **Preferences** tab. (Moreover, **i1Profiler** illuminant choice is bugged when working from non-D50 non-spectral data!).

In the end, compute your ICC profile with your appropriate ink settings.



COLORSOURCE

Working with non-D50 illuminants:

The default **D50** illuminant of **CMYK_Backgrounds Preferences** tab should be OK for most of applications, because **D50** is the standard for ISO viewing conditions. However, we know that ISO or any else standards cannot be optimal for all applications, so that we allow you choosing in **CMYK_Backgrounds Preferences** tab any other **C.I.E. D, F, or Custom** illuminant:

COLORSOURCE Language ► English
 Illuminant ► D50 (Default)
 Licensed to: ...
 Buy this software: info@color-source.net
 A question? support@color-source.net
 Check the Web for updates: http://www.color-source.net/CMYK_Background_v1.1_MAJ.htm

D50 (Default)

For information:
 White ink measured at infinite thickness
 White ink measured over perfect black substrate (2 X)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 |
| 0.099 | 0.184 | 0.353 | 0.546 | 0.675 | 0.730 | 0.754 | 0.770 | 0.785 | 0.795 | 0.803 | 0.810 | 0.816 | 0.821 | 0.826 | 0.828 | 0.830 | 0.831 | 0.830 | 0.834 | 0.832 | 0.833 | 0.831 | 0.831 | 0.830 | 0.827 | 0.828 | 0.827 | 0.826 | 0.825 | 0.823 | 0.822 | 0.822 | 0.822 | 0.820 | 0.820 |
| 0.102 | 0.162 | 0.351 | 0.483 | 0.528 | 0.536 | 0.536 | 0.532 | 0.529 | 0.524 | 0.517 | 0.512 | 0.505 | 0.498 | 0.491 | 0.484 | 0.477 | 0.469 | 0.461 | 0.455 | 0.447 | 0.440 | 0.433 | 0.426 | 0.418 | 0.410 | 0.404 | 0.398 | 0.392 | 0.385 | 0.378 | 0.371 | 0.364 | 0.358 | 0.352 | 0.345 |

COLORSOURCE Language ► English
 Illuminant ► F11 (TL84)
 Chromatic adaptation ► SHARP (Default)
 Licensed to: ...
 Buy this software: info@color-source.net
 A question? support@color-source.net
 Check the Web for updates: http://www.color-source.net/CMYK_Background_v1.1_MAJ.htm

F11 (TL84)

For information:
 White ink measured at infinite thickness
 White ink measured over perfect black substrate (2 X)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 |
| 0.099 | 0.184 | 0.353 | 0.546 | 0.675 | 0.730 | 0.754 | 0.770 | 0.785 | 0.795 | 0.803 | 0.810 | 0.816 | 0.821 | 0.826 | 0.828 | 0.830 | 0.831 | 0.830 | 0.834 | 0.832 | 0.833 | 0.831 | 0.831 | 0.830 | 0.827 | 0.828 | 0.827 | 0.826 | 0.825 | 0.823 | 0.822 | 0.822 | 0.822 | 0.820 | 0.820 |
| 0.102 | 0.162 | 0.351 | 0.483 | 0.528 | 0.536 | 0.536 | 0.532 | 0.529 | 0.524 | 0.517 | 0.512 | 0.505 | 0.498 | 0.491 | 0.484 | 0.477 | 0.469 | 0.461 | 0.455 | 0.447 | 0.440 | 0.433 | 0.426 | 0.418 | 0.410 | 0.404 | 0.398 | 0.392 | 0.385 | 0.378 | 0.371 | 0.364 | 0.358 | 0.352 | 0.345 |

COLORSOURCE Language ► English
 Illuminant ► Custom 3000 K
 Chromatic adaptation ► SHARP (Default)
 Licensed to: ...
 Buy this software: info@color-source.net
 A question? support@color-source.net
 Check the Web for updates: http://www.color-source.net/CMYK_Background_v1.1_MAJ.htm

3000 K (Planck)

For information:
 White ink measured at infinite thickness
 White ink measured over perfect black substrate (2 X)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 |
| 0.099 | 0.184 | 0.353 | 0.546 | 0.675 | 0.730 | 0.754 | 0.770 | 0.785 | 0.795 | 0.803 | 0.810 | 0.816 | 0.821 | 0.826 | 0.828 | 0.830 | 0.831 | 0.830 | 0.834 | 0.832 | 0.833 | 0.831 | 0.831 | 0.830 | 0.827 | 0.828 | 0.827 | 0.826 | 0.825 | 0.823 | 0.822 | 0.822 | 0.822 | 0.820 | 0.820 |
| 0.102 | 0.162 | 0.351 | 0.483 | 0.528 | 0.536 | 0.536 | 0.532 | 0.529 | 0.524 | 0.517 | 0.512 | 0.505 | 0.498 | 0.491 | 0.484 | 0.477 | 0.469 | 0.461 | 0.455 | 0.447 | 0.440 | 0.433 | 0.426 | 0.418 | 0.410 | 0.404 | 0.398 | 0.392 | 0.385 | 0.378 | 0.371 | 0.364 | 0.358 | 0.352 | 0.345 |

COLORSOURCE Language ► English
 Illuminant ► Custom 9300 K
 Chromatic adaptation ► SHARP (Default)
 Licensed to: ...
 Buy this software: info@color-source.net
 A question? support@color-source.net
 Check the Web for updates: http://www.color-source.net/CMYK_Background_v1.1_MAJ.htm

9300 K (Daylight)

For information:
 White ink measured at infinite thickness
 White ink measured over perfect black substrate (2 X)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 380 | 390 | 400 | 410 | 420 | 430 | 440 | 450 | 460 | 470 | 480 | 490 | 500 | 510 | 520 | 530 | 540 | 550 | 560 | 570 | 580 | 590 | 600 | 610 | 620 | 630 | 640 | 650 | 660 | 670 | 680 | 690 | 700 | 710 | 720 | 730 |
| 0.099 | 0.184 | 0.353 | 0.546 | 0.675 | 0.730 | 0.754 | 0.770 | 0.785 | 0.795 | 0.803 | 0.810 | 0.816 | 0.821 | 0.826 | 0.828 | 0.830 | 0.831 | 0.830 | 0.834 | 0.832 | 0.833 | 0.831 | 0.831 | 0.830 | 0.827 | 0.828 | 0.827 | 0.826 | 0.825 | 0.823 | 0.822 | 0.822 | 0.822 | 0.820 | 0.820 |
| 0.102 | 0.162 | 0.351 | 0.483 | 0.528 | 0.536 | 0.536 | 0.532 | 0.529 | 0.524 | 0.517 | 0.512 | 0.505 | 0.498 | 0.491 | 0.484 | 0.477 | 0.469 | 0.461 | 0.455 | 0.447 | 0.440 | 0.433 | 0.426 | 0.418 | 0.410 | 0.404 | 0.398 | 0.392 | 0.385 | 0.378 | 0.371 | 0.364 | 0.358 | 0.352 | 0.345 |


Please note that when you specify a **Custom** color temperature **T**, a Planckian blackbody spectrum is generated if $T < 4000$ K, a C.I.E. D (Daylight) spectrum is generated if $4000 \text{ K} \leq T \leq 25000 \text{ K}$, and a Planckian blackbody spectrum is generated again if $T > 25000 \text{ K}$.

As soon as you choose an illuminant other than D50 (i.e., other than C.I.E. D 5003 K), you should declare the adaptation matrix the application will use to for computing the **D50** values required by **ProfileMaker**, **i1Profiler**, or other ICC profiling applications.

SHARP adaptation is proposed by default: Gives quite good results with wide color gamut UV printing. Popular and robust **Bradford** is offered too. **CAT02** is offered as well, for potential compatibility with **ProfileMaker** software modules, including ProfileMaker and MeasureTool that are using CAT02 for adapting non-D50 colors to D50 (Which is not a good choice).

Because **CMYK_Backgrounds** always computes **D50** CGATS measurement files, your ICC profile generation applications will not use any adaptation to D50, whichever the adaptation you select in these applications. This allows you enhancing ProfileMaker chromatic adaptation when working with non-D50 light sources.

The header block of **CMYK_Backgrounds** **New_CMYK_Chart** tab reminds you all useful information regarding the chosen illuminant, adaptation, and print substrate and number of White Ink passes:

| | | | | | | | | | | | | |
|--------------------|--|--------|--------|--------|--------|---------|---------|---------|-------|-------|--------|--|
| LGOROWLENGTH | 28 | | | | | | | | | | | |
| INSTRUMENTATION | Colorsource  | | | | | | | | | | | |
| MEASUREMENT_SOURCE | WhiteBase=Absolute Filter=No | | | | | | | | | | | |
| ILLUMINATION_NAME | "D50 adapted from F11 (TL84) via SHARP (Default)" | | | | | | | | | | | |
| OBSERVER_ANGLE | 2° | | | | | | | | | | | |
| CREATED | 16/6/13 0:09 NEW BACKGROUND: COMPUTED PANTONE 200 C + 3 X WHITE | | | | | | | | | | | |
| KEYWORD | SampleID | | | | | | | | | | | |
| KEYWORD | SAMPLE_NAME | | | | | | | | | | | |
| NUMBER_OF_FIELDS | 12 | | | | | | | | | | | |
| BEGIN_DATA_FORMAT | SampleID | | | | | | | | | | | |
| END_DATA_FORMAT | SAMPLE_NAME | CMYK_C | CMYK_M | CMYK_Y | CMYK_K | XYZ_X | XYZ_Y | XYZ_Z | LAB_L | LAB_A | LAB_B | |
| NUMBER_OF_SETS | 830 | | | | | | | | | | | |
| BEGIN_DATA | | | | | | | | | | | | |
| 1 | 1 | 0.00 | 0.00 | 0.00 | 100.00 | 0.01074 | 0.01063 | 0.00643 | 9.50 | 1.73 | 4.26 | |
| 2 | 2 | 0.00 | 0.00 | 100.00 | 0.00 | 0.48060 | 0.51443 | 0.04095 | 76.93 | -4.19 | 86.74 | |
| 3 | 3 | 0.00 | 100.00 | 0.00 | 0.00 | 0.29182 | 0.14747 | 0.18173 | 45.28 | 71.52 | -15.11 | |
| 4 | 4 | 0.00 | 0.00 | 100.00 | 0.00 | 0.48318 | 0.51676 | 0.04043 | 77.07 | -4.09 | 87.29 | |
| 5 | 5 | 0.00 | 100.00 | 0.00 | 0.00 | 0.29252 | 0.14725 | 0.18210 | 45.25 | 71.92 | -15.24 | |
| 6 | 6 | 0.00 | 0.00 | 100.00 | 0.00 | 0.48347 | 0.51747 | 0.04054 | 77.12 | -4.19 | 87.30 | |
| 7 | 7 | 0.00 | 100.00 | 0.00 | 0.00 | 0.29479 | 0.14866 | 0.18446 | 45.44 | 71.95 | -15.43 | |

The displayed CMYK color gamut's in the **Configure** tab of course strongly depend on your chosen illuminant.

CMYK_Backgrounds valid conditions of use:

CMYK_Backgrounds is excellent software allowing you computing quite accurately the ICC profile of any CMYK print process when your print media color is changing. You need using a spectrophotometer with 45/0° geometry and CMYK transparent inks.

About print substrates:

When you have established an offset press CMYK ICC profile on a white coated paper having a given whiteness, **CMYK_Backgrounds** allows you computing the ICC profile you will need for a white coated paper having a different whiteness, or a colored coated paper.

From your measurements on white coated paper, **CMYK_Backgrounds** will not allow you computing the ICC profile you get when printing on thin-coated or non-coated papers such as newsprint or uncoated papers; because you will not be able using the same CMYK ink thicknesses and colors on these papers, and your dot gains will be quite different from coated paper.

CMYK_Backgrounds does allow you computing a very accurate ICC profile, when going from a white newsprint paper to a yellow or pink dyed newsprint paper.

Your substrates rheological properties should be approximately the same as the substrate of your **Original CMYK Chart**. When you use UV inks, that instantly polymerize on the print substrates, the influence of the print substrate is quite reduced, which helps **CMYK_Backgrounds** delivering very accurate results. **In order to minimize the potential influence of the print substrate on the CMYK inks behavior, you can print your Original CMYK Chart on a white substrate with white ink, rather than on the white substrate itself.**

About White Inks:

Titanium dioxide based white inks have an excellent whiteness. Some print technologies such as flexography or silk printing allow printing thick layers giving excellent opacity. Print technologies such as Gravure or Inkjet do not allow printing thick layers with high pigment concentrations and may require multiple white ink passes.

Because White inks have an excellent whiteness, they should not contain optical brighteners. So that **CMYK_Backgrounds** is assuming your white ink is not containing optical brighteners, and gives you an alert if it detects the presence of optical brighteners in white ink.

If **CMYK_Backgrounds** detects optical brighteners in your white ink and you really want to use this strange white ink, you should declare your Number of white ink print passes is **0 (zero)**. Then measure this fluorescent white ink printed on your substrate, and write your spectral measure in your **Substrates** library: **You can consider the fluorescent white ink measured on your substrate is your new substrate** to be printed in CMYK with no white ink.

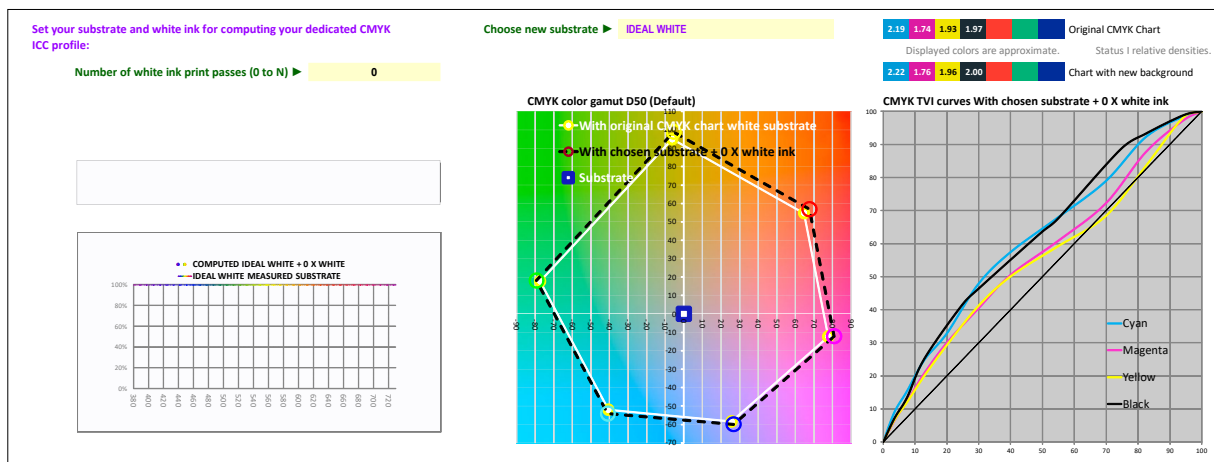
This will optimize your computing process accuracy, but please note that your CMYK screened tones will act as a variable UV filter that will influence the results in real world.

We could enhance **CMYK_Backgrounds** for using white inks with optical brighteners, but now we do not think this would be useful for anybody. Please contact us if this would be of importance for you.

Advanced considerations:

Ideally White print substrate:

You can declare in **Configure** tab that your new substrate is an ideally white substrate and you are using no white ink: In these conditions, you will display the color gamut your CMYK print process would reach on a perfectly white substrate, which is larger than your Original Chart CMYK color gamut:



This shows, once again, that normalizing the papers tints for ISO12647-x standards have no interest for Graphic Industries, except for a few paper Vendors!

Because **Colorsource** technology allows computing the ICC profile of a given print process with different paper tints, from the virtual spectral characterization file of this print process on a virtual ideally white paper.

Optimal color reproduction of cameos and logos:

CMYK_Backgrounds application allows you printing, for example, the same $L^*a^*b^*$ colors on a white substrate and on a black substrate with N x White Ink, by deducing the ICC profile on the black substrate with N x White Ink from your CMYK characterization file on the white substrate.

HOWEVER, this does not ALWAYS mean that you will perceive the same colors ;-). Because C.I.E. $L^*a^*b^*$ (1976) is not a very sophisticated color appearance model: The colors you perceive may depend as well on the substrate color itself, when it is not fully covered by the white ink.

This is the case, for example, when you print only small color cameos or logos on a larger colored substrate:



Colors on white substrate

Same Lab colors on black substrate

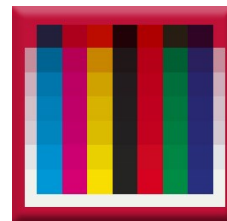
As proven by the two images above, printing same Lab colors on light and dark substrate **does not ensure seeing the same colors.**

So that, if you are more attached to **perceiving** the same colors than to **measuring** the same L*a*b* colors (Unlike Graphic Industries ISO12647 expert committee for color proofing applications...), we will enhance **CMYK_Backgrounds** application in order it delivers you the best possible color reproduction ...in all cases.

We can also enhance this program for processing as well all your N-Colors printing applications.

Please let us know your interest...

CMYK_Backgrounds



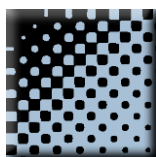
Colorsource - May 2013

support@color-source.net

CMYK_Print_&_Proof



PLATE



MagicPress



MagicPrepress



SPOT_Color_Manager



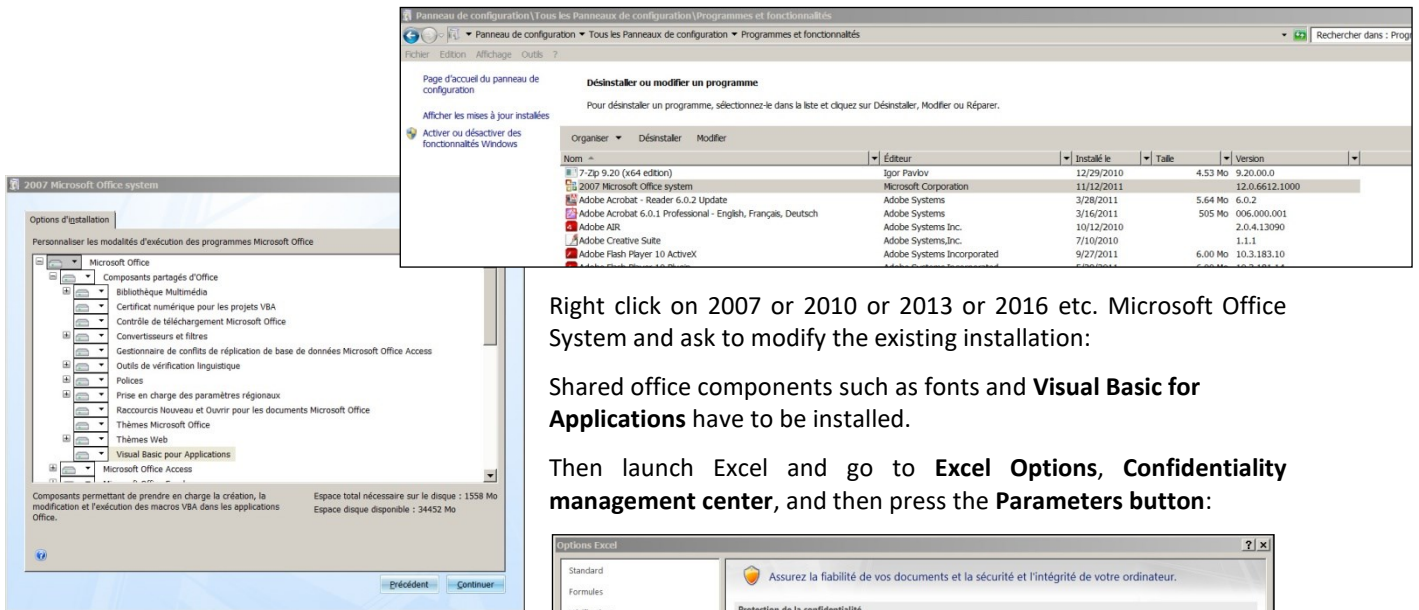
Troubleshooting and FAQs:

1) The application does not launch:

Colorsource applications are using Microsoft Excel for computing engine. Use **Microsoft Excel 2007, Excel 2010 or Excel 2013, 2016, 365 etc.**

Please note that Excel (or Microsoft Office) should be installed with appropriate Microsoft Office components including Visual Basic, otherwise the application will not launch.

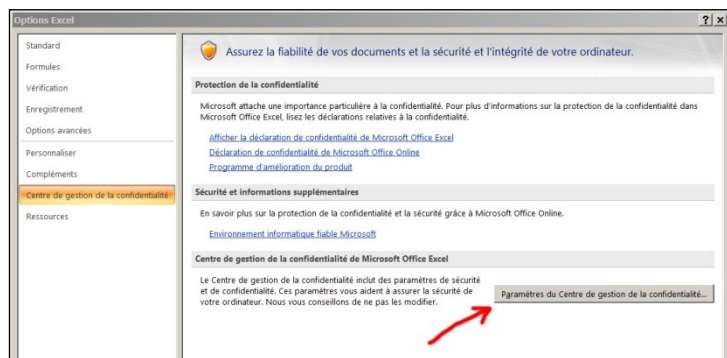
Sometimes optional components of Microsoft Excel (depending on your Excel version and installation kit) **MUST** be installed. If needed go to Windows Control Panel, in the program's installation menu:



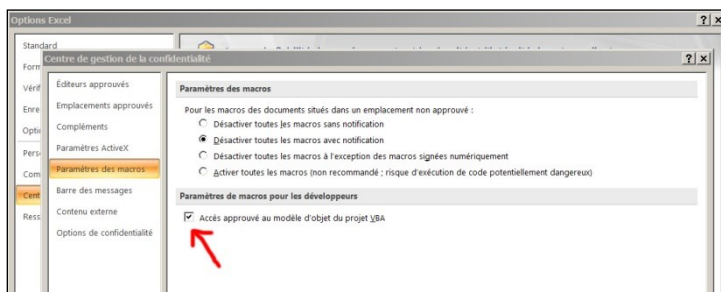
Right click on 2007 or 2010 or 2013 or 2016 etc. Microsoft Office System and ask to modify the existing installation:

Shared office components such as fonts and **Visual Basic for Applications** have to be installed.

Then launch Excel and go to **Excel Options, Confidentiality management center**, and then press the **Parameters** button:



You HAVE TO approve the access to object model of VBA project:



Check your Excel version is installed with all most recent Microsoft updates.

For checking Excel is up to date, go to **Excel/Options/Resources** (Excel 2007), or go to **Excel/File/Help** or to **Excel/File/Account** and then press the « **Search for updates** » button.

Finally, if the application does not launch, disable your antivirus: There are no problems with most of the serious antivirus applications (including Windows native protection systems, free antivirus like Avira, AVG etc.) but some rare antivirus applications may prevent the application launching.

Make a test by disabling your antivirus and if necessary, change of antivirus program if your present application is the problem.



2) I cannot paste my CMYK spectral data in the **Original_CMYK_Chart** tab:

The program says it is "The cell is write protected".

Please note before pasting your spectral measurement text file, **you need first select cell Paste here!** with your mouse. If you don't select the right cell, you may get a "write protected message": This does not mean the useful cells are write protected: This means that your text measurement file tries to write not only the allowed cells but also one or more write protected cell(s) around.

This can happen for example if you add many blanks (and invisible!) lines at the end of the text measurement file after the last data line "END_DATA", or if blank data are present at the end of each line.

Your CMYK test chart should have less than approx. 1675 patches (depends on the length of your text file header block). This is more than enough for computing quite accurate ICC profiles. It is often better averaging a few smaller CMYK charts measurement files.

If you use spectral measurement files from some application other than **MeasureTool, i1Profiler, or ColorPort**, mind to format your measurement data in CGATS formats the appropriate way.

3) I cannot paste my Substrates spectral data in the **SUBSTRATES** tab:

The program says it is "The cell is write protected".

When measuring your substrates with free **Eye-One Share** application, export to Excel and then copy and paste your substrates names and spectral data to the **SUBSTRATES** tab. For doing so, select a cell in the "SUBSTRATE NAMES" column and your names and spectral data will paste from this cell.

4) I cannot paste my White Ink characterization data in the **White_Ink** tab:

The program says it is "The cell is write protected".

Before pasting your spectral measurement text file, **you need first select cell Paste here!** with your mouse. If you don't select the right cell, you may get a "write protected message": This does not mean the useful cells are write protected: This means that your text measurement file tries to write not only the allowed cells but also one or more write protected cell(s) around.

This can happen for example if you add many blanks (and invisible!) lines at the end of the text measurement file after the last data line "END_DATA", or if blank data are present at the end of each line.

Your text file should have less than approx. 35 patches (depends on the length of your text file header block). This is more than enough for averaging many "white ink over white" and many "white ink over black" patches for quite accurate white ink characterization.

If you import spectral measurement files from some application other than **MeasureTool** or **i1Profiler** CGATS text file formats, mind to format your measurement data the appropriate way.

5) The application shows error messages such as "#####" or strange curves in the displayed tabs once I have pasted my data:

Check your measurement data decimal separator is a dot. If needed, see details in the "Software installation and brief description Guide"

Also, check you have pasted your measurement data at the right location(s) in your application.

6) Eye-One Share application does not see my Eye-one Pro 1 or 2:

Please see **Eye-One Share** installation procedure for Windows 64 bits versions on page 10 of the "Software installation and brief description Guide".

7) Tabs display too small or too large on my monitor:

Press "Ctrl" key and use the mouse wheel for zooming in or out, and then save your application ("Ctrl s").

Use Excel Full screen display mode, and then save your application ("Ctrl s"). You can switch back from full screen display mode by pressing Escape key.

Any other question or suggestions?

support@color-source.net

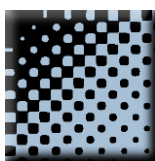
CMYK_Backgrounds



CMYK_Print_&_Proof



PLATE



MagicPress



MagicPrepress



SPOT_Color_Manager

