



COLORSOURCE

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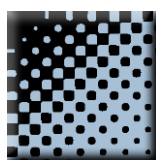
SPOT_Color_Manager User's Guide

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CMYK_Print_&_Proof



PLATE



CMYK_100%



CMYK_Gravure



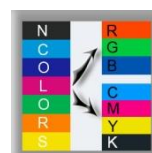
SPOT_Color_Manager



SPOT_Gravure



ICC PROFILE CONVERTOR...



SPOT_Color_Manager allows you controlling all your inks formulation quality, and computing their ideal print densities, for any special ink such as PANTONE or SUN or any CUSTOM ink of your Customers. The target reference color can be a physical sample you have measured, or a reference spectral reflectance in a tint's library, or a mere Lab D50 2° apparent color specified by Lab or XYZ reference values.

In order to save a lot of time and money, you should control any ink AT RECEPTION by measuring it on a piece of stock paper, BEFORE you install this ink on your press.

You can easily test **SPOT_Color_Manager** by measuring a few tints on a classical PANTONE Coated swatch book. **SPOT_Color_Manager** allows you comparing each measured sample with its reference "ideal" spectral reflectance held in memory:

Thanks to **SPOT_Color_Manager**, you will find that:

1. Some PANTONE references on your swatch book are well formulated (Low metamerism) **and** printed with the appropriate density (Low ΔE visual distance): OK! ;-)
2. Some PANTONE references on your swatch book are well formulated (Low metamerism) **but** printed with wrong density (High ΔE) ;-(
3. Some PANTONE references on your swatch book are poorly formulated (High metamerism), so that even if printed at optimal density, they will only match their reference color with required tolerance under D50 light ;-((
4. Some PANTONE references on your swatch book are so poorly formulated (High metamerism) that even if printed at optimal density, they will not match their reference color under D50 light with required tolerance ;-(((

This information is crucial when you are using special inks such as PANTONE, SUN or else. **You should detect that your ink has a problem and it will not match your target color at any density BEFORE the press-setting step.**

In any circumstance, **SPOT_Color_Manager** will compute your ideal print densities, and the corrections you should make in terms of **ink thickness** or **pigment concentration**. Or show that you should send back your ink to its Vendor!

Installation and general using rules:

Please read carefully the "Software installation and brief description Guide".

Using SPOT_Color_Manager application:

Computing spot colors optimal print density:

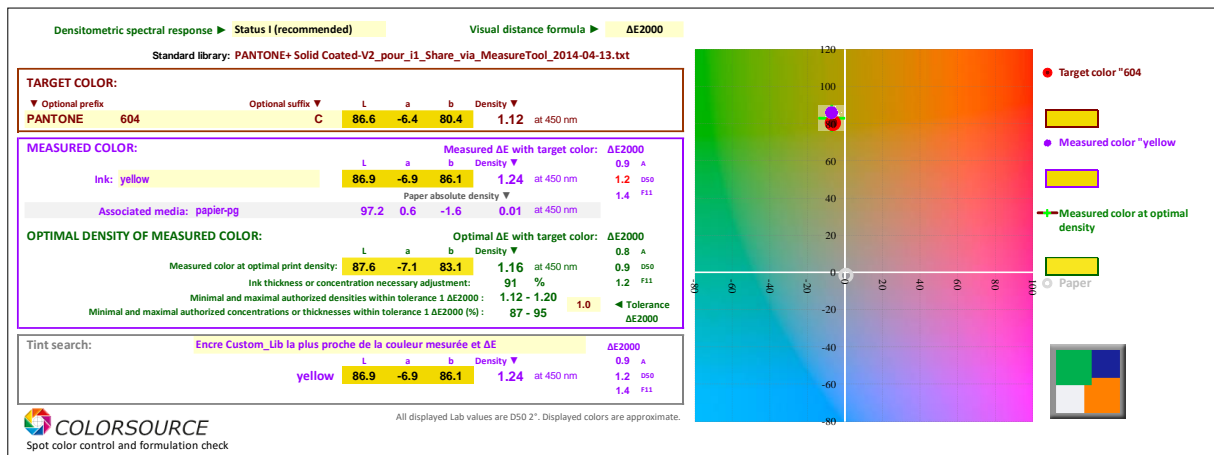
The **Medias** tab allows you pasting the spectral measurements of the paper(s) on which you are going to measure your special inks. You can memorize up to 50 spectral réflectances of 50 print medias:

Each measured paper should be named to allow being associated to each ink measured on this substrate in "Measures" tab
 With your present Excel preferences the decimal separator of your data should be a dot.
 ▼ Your spectral measurements of papers should be present between lines 2 and 51

MEASURED MEDIAS 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 IDEAL WHITE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
2 papier 0123	0.3291	0.3806	0.4574	0.6197	0.7892	0.8496	0.8678	0.8648	0.8538	0.8447	0.8336	0.8305	0.8255	0.8192	0.8123	0.8025	0.7953	0.7904	0.7854	0.7806	0.7772	0.7777	0.7886	0.7989	0.8104	0.8202	0.8226	0.8299	0.8298	0.8292	0.8277	0.8281	0.8293	0.8285	0.8327		
3																																					
4																																					
5																																					
6 papier SC	0.40241	0.50376	0.55332	0.61632	0.69585	0.70086	0.72383	0.74124	0.75867	0.77321	0.78	0.79535	0.80333	0.81046	0.81422	0.81727	0.82056	0.82382	0.82681	0.82958	0.83236	0.83509	0.83784	0.84054	0.84319	0.84579	0.84834	0.85084	0.85329	0.85569	0.85804	0.86034	0.86259	0.86479	0.86694	0.86904	0.87109
7																																					
8																																					
9																																					
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12																																					
13 papier-pg	0.41529	0.46389	0.54011	0.70988	0.88193	0.96164	0.97978	0.97772	0.96289	0.9555	0.94868	0.94443	0.9411	0.93882	0.93601	0.93377	0.93201	0.93042	0.92828	0.92658	0.92528	0.92433	0.92369	0.92328	0.92308	0.92308	0.92328	0.92369	0.92417	0.92477	0.92537	0.92602	0.92678	0.92754	0.92843	0.92943	
14																																					
15																																					
16																																					
17																																					

Line 1 is write-protected: it stores the ideally white paper spectral reflectance that is used by default if you work on an ink with known spectral reflectance but unknown substrate spectral reflectance.

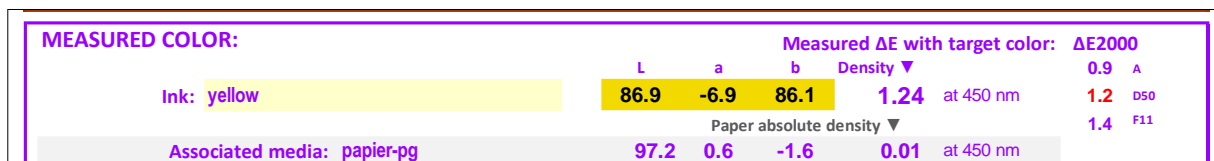
The **Optimal** tab provides all useful practical information for controlling metamerism of a measured tint compared with the target color and for determining its optimal print density and its visual distance at optimal density under several different illuminants, in order to assess the quality of its formulation:



You have to specify the **name of your Measured ink** to be controlled, and the **name of your target color**.

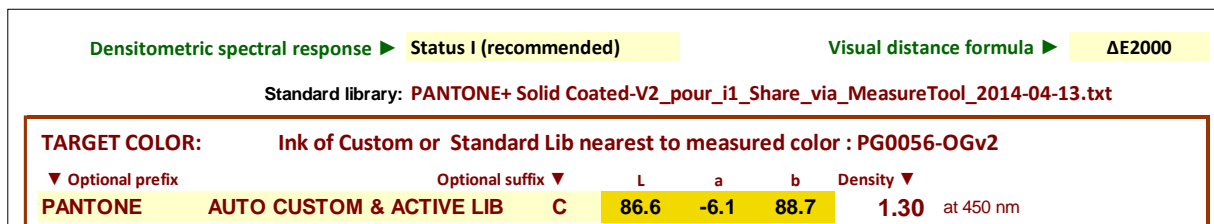
The **name of the Measured ink** is searched into **Measures** tab.

The **Measured ink** can be chosen by the **pull-down menu** or by typing-in its **full name**:



The application displays the name of the paper associated to your ink in the **Measures** tab, and the C.I.E. Lab D50 2° colors of your inks and media.

The name of **your target color** can be searched into the **Custom_Lib** and **Standard_Lib** tabs:



For easy use, you can specify your target color by several different ways:

A) By its name:

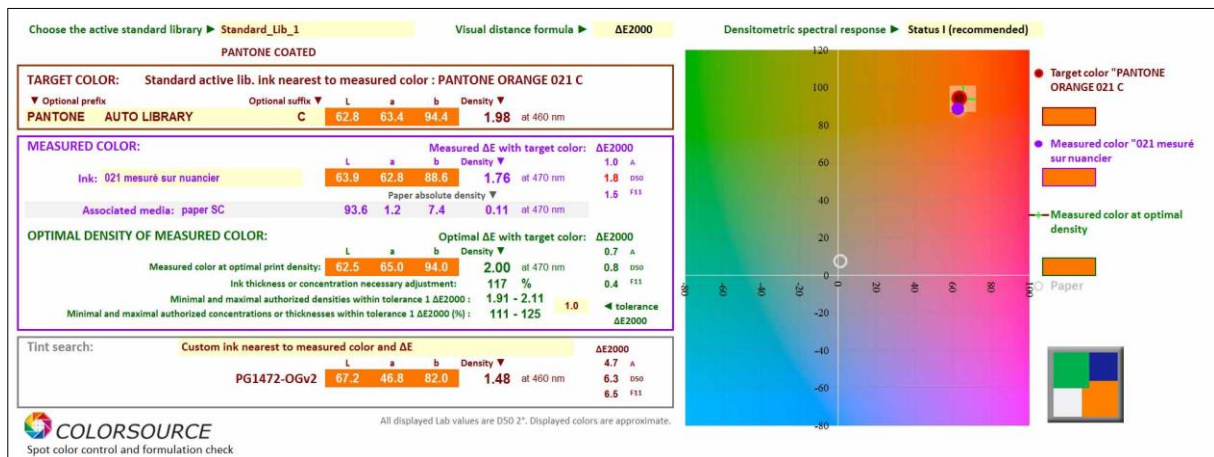
- 1) By the **pull-down menu** that list first all your **Custom_Lib** tints and then all your **Standard_Lib** tints,
 - 2) By **typing its name directly**: You can type-in your target color **full name**, whichever prefix and suffix are present,
 - 3) By **typing a swatch book tint number only**, if you have entered a prefix and suffix in order to type shorter names for selecting you target colors. On above example, the prefix is "PANTONE" and the suffix is "C".
- So that if you are looking for "PANTONE 1795 C", you can still type "PANTONE 1795 C" full name, or type only "1795", provided this tint is present somewhere in the **Custom_Lib** or **Standard_Lib** tabs.

B) By automatic target selection depending on each Measured tint you select:

For example, if you work for 7 colors press job, you can store in the **Custom_Lib** tab your 7 target primary inks and chose "AUTO CUSTOM" as target color. Each time you will select as **MEASURED COLOR** one of your seven press inks, **SPOT_Color_Manager** will use as target color the nearest target ink present in your **Custom_Lib** tab:

- 1) In "AUTO CUSTOM" mode: Chosen Target color is the nearest to Measured color in **Custom_Lib** tab,
- 2) In "AUTO LIBRARY" mode: Chosen Target is the nearest to Measured color in the **Standard_Lib** tab,
- 3) In "AUTO CUSTOM & ACTIVE LIB." mode: Chosen Target is the nearest to measured color in the **Custom_Lib** and **Standard_Lib** tabs.

Once you have specified your **MEASURED** and **TARGET COLORS**, the **Optimal** tab displays:



1. Your measured ink apparent color **C.I.E. Lab D50 2°** and its paper relative print density (1.76 above),
2. The ΔE_{76} or $\Delta E_{CMC2:1}^*$ or ΔE_{2000} visual distances between your measured and target colors, under three reference **D50**, **A** and **F11** illuminants (i.e. 1.0, 1.8 and 1.5 ΔE_{2000} on above example), for checking your measured ink formulation quality by control of metamerism. Of course, visual distances of the measured color under **A** and **F11** illuminants are only displayed if target color spectral data are available,
3. Your measured ink **optimal print density** (i.e. 2.00 on above example) that ensures getting minimal **D50 2°** ΔE_{76} or $\Delta E_{CMC2:1}^*$ or ΔE_{2000} visual distance from your target color, and the minimal and maximal allowed print densities for within your chosen ΔE tolerance (i.e. 1.91 to 2.11 on above example for 1 ΔE_{2000} tolerance),
4. The **pigment concentration correction** you should make if you do not want or cannot play on your measured ink thickness for correcting you print density (e.g. 117% i.e. x 1.17 on above example),
5. **The minimal and maximal allowed pigment concentration** if you do not want or cannot play on your measured ink thickness for correcting you print density (i.e. 111% to 125% on above example for 1 ΔE_{2000} tolerance),
6. Your measured ink minimal ΔE_{76} or $\Delta E_{CMC2:1}^*$ or ΔE_{2000} visual distances under **D50**, **A** and **F11** illuminants when this inks at the recommended optimal print density (i.e. 0.7, 0.8 and 0.4 ΔE_{2000} on above example). Of course, ΔE values of your ink at optimal density under **A** and **F11** illuminants are only displayed if you specify your target color by spectral data.

The **Optimal** tab also allows you typing your ΔE_{76} or $\Delta E_{CMC2:1}^*$ or ΔE_{2000} tolerance and displays the minimal and maximal authorized print densities for matching your target color within this tolerance.

If **SPOT_Color_Manager** application foresees a too large visual distance under one or more of the **D50**, **A** or **F11 illuminants**, this may mean that your ink was badly formulated, or was formulated on some substrate significantly different from your stock paper, or that may be your press ink pot is polluted and a press wash is required. Do not waste time and paper to try to set properly your density!

(* Please note that as for all other Colorsource software $\Delta E_{CMC2:1}$ visual distance is computed with a symmetrized formula, because otherwise the visual distance between two A and B colors could be different from the visual distance between same B and A colors!

Please note that depending on the visual distance formula you are using, the computed optimal print density (and concentration correction) will change. For example, if we consider above example:

With $\Delta E76$:

Choose the active standard library ▶		Standard_Lib_2		Visual distance formula ▶		$\Delta E76$	
PANTONE UNCOATED							
TARGET COLOR: PANTONE 123 U : Standard active lib. ink nearest to measured color							
▼ Optional prefix		Optional suffix ▼	L	a	b	Density:	
PANTONE	AUTO LIBRARY	C	80.1	28.4	73.9	0.95	at 430 nm
MEASURED COLOR:							
		C.I.E. L*a*b* 2°	L	a	b	Density:	ΔE with target color: $\Delta E76$
Ink:	ORANGE 1472		72.6	46.8	90.0	1.47	at 450 nm 24.7 A
							D50 25.6
							F11 24.8
	Associated media:	paper SC	93.6	1.2	7.4	0.13	at 450 nm
OPTIMAL DENSITY OF MEASURED COLOR:							
			L	a	b	Density:	
	Measured color at optimal print density:		77.3	35.9	69.2	0.94	at 450 nm 5.1 A
		Ink thickness or concentration necessary adjustment:				57	% 10.2 F11
		Minimal authorized density and ΔE within tolerance: ($\Delta E76$):				0.93	9.3 3.0 ◀ tolerance $\Delta E76$
		Maximal authorized density and ΔE within tolerance: ($\Delta E76$):				0.94	9.3

With $\Delta E_{CMC2:1}$:

Choose the active standard library ▶		Standard_Lib_2		Visual distance formula ▶		$\Delta E_{CMC2:1}$	
PANTONE UNCOATED							
TARGET COLOR: PANTONE 137 U : Standard active lib. ink nearest to measured color							
▼ Optional prefix		Optional suffix ▼	L	a	b	Density:	
PANTONE	AUTO LIBRARY	C	76.5	36.7	65.5	0.91	at 440 nm
MEASURED COLOR:							
		C.I.E. L*a*b* 2°	L	a	b	Density:	ΔE with target color: $\Delta E_{CMC2:1}$
Ink:	ORANGE 1472		72.6	46.8	90.0	1.47	at 450 nm 9.3 A
							D50 9.1
							F11 7.8
	Associated media:	paper SC	93.6	1.2	7.4	0.13	at 450 nm
OPTIMAL DENSITY OF MEASURED COLOR:							
			L	a	b	Density:	
	Measured color at optimal print density:		77.7	34.8	67.3	0.90	at 450 nm 3.3 A
		Ink thickness or concentration necessary adjustment:				54	% 2.7 F11
		Minimal authorized density and ΔE within tolerance: ($\Delta E_{CMC2:1}$):				0.78	3.2 3.0 ◀ tolerance $\Delta E_{CMC2:1}$
		Maximal authorized density and ΔE within tolerance: ($\Delta E_{CMC2:1}$):				1.02	3.0

You should generally use the most recent and reliable ΔE_{2000} visual distance. The other color distance formulae are only offered for compatibility with existing habits and old standards such as **ISO12647-x** or **IDEAlliance** that specify using $\Delta E76$.

On the same subject, we recommend using the universal Status I densitometry spectral response because it works with all inks, and not only for CMYK. The DIN (Status E) and ANSI T (Status T) are only offered for compatibility with pressroom CMYK densitometers when you print CMYK inks.

For density setting of your presses with CMYK inks, you should rather use **Colorsource CMYK_100%** application that is more convenient for CMYK, and do not need displaying metamerism because **ISO12647-x** and **IDEAlliance CMYK** print standards do not specify their target colors by spectral data but by colorimetric data only.

Nevertheless, the advanced CMYK Print House should use SPOT_Color_Manager for checking their CMYK inks formulation quality and frequent formulation changes that can create undesirable metamerism effects.

Using SPOT_Color_Manager with D50 2° Lab or XYZ only specified target:

You can use **SPOT_Color_Manager** for controlling any existing special ink on a print versus its target **C.I.E. Lab D50 2° apparent color**. In this case, the application **Optimal** tab only displays the results which are physically possible to know, because your target color is known **ONLY** under **D50** light, i.e.:

Choose the active standard library ▶		Standard_Lib_1		Visual distance formula ▶		ΔE2000	
PANTONE COATED PARTIAL							
TARGET COLOR:							
▼ Optional prefix		Optional suffix ▼	L	a	b	Density:	No spectral data
PANTONE	032C	C	53.6	73.7	45.5	? ?	
MEASURED COLOR:							
		C.I.E. L*a*b* 2°	L	a	b	Density:	ΔE with target color: ΔE2000
Ink:	Red 032 C_1_try		54.3	74.4	44.5	1.54 at 520 nm	? A 0.9 D50 ? F11
Associated media:	paper AB		91.5	0.5	-3.5	0.09 at 520 nm	
OPTIMAL DENSITY OF MEASURED COLOR:							
			L	a	b	Density:	? A
Measured color at optimal print density:			53.9	75.1	46.4	1.60 at 520 nm	0.4 D50 ? F11
Ink thickness or concentration necessary adjustment:						105 %	
Minimal authorized density and ΔE within tolerance: (ΔE2000):			1.40	2.7			
Maximal authorized density and ΔE within tolerance: (ΔE2000):			1.85	2.9		3.0	← tolerance ΔE2000

1. C.I.E. Lab D50 2° apparent color of your measured ink, and its paper relative density,
2. Its **ΔE76** or **ΔE CMC 2:1*** or **ΔE2000** visual distance from the **specified target color** at current print density, under **D50 illuminant only**,
3. Its optimal print density that ensures getting minimal **D50 ΔE** visual distance from the specified target color, and minimal and maximal allowed densities within your specified **ΔE** tolerance.
4. The minimal **ΔE76** or **ΔE CMC 2:1*** or **ΔE2000** visual distances under **D50 illuminant only** that you will get when printing your measured ink at recommended optimal print density.

If SPOT_Color_Manager application foresees a too large D50 visual distance, this may mean that your ink was badly formulated, or was formulated on some substrate significantly different from your stock paper, or that may be your press inkpot is polluted and a press wash is required.

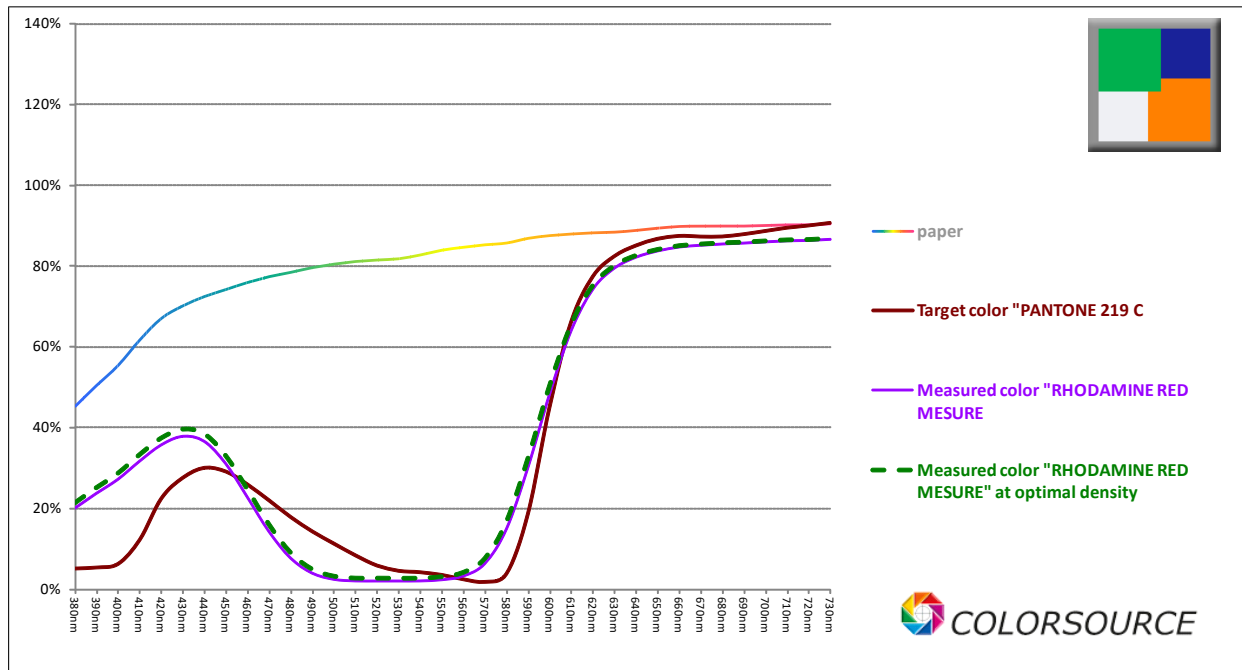
(*) Please note that as for all other Colorsource software ΔECMC2:1 visual distance is computed with a symmetrized formula, because otherwise the visual distance between two A and B colors could be different from the visual distance between same B and A colors!

SPOT_Color_Manager Optimal tab also offers powerful **Tint Search** functions. When you have specified your measured ink and target color, **Tint search** pull-down menu allows you finding:

1. **The measured ink nearest to your target**, and its **D50**, **A** and **F11 ΔE** to this target.
2. **The active standard library ink nearest to your measured ink**, and its **D50**, **A** and **F11 ΔE** to your measured ink.
3. **The Custom ink nearest to your measured ink**, and its **D50**, **A** and **F11 ΔE** to your measured ink.
4. **The Custom or active standard library ink nearest to your measured ink**, and its **D50**, **A** and **F11 ΔE** to your measured ink.
5. **If your target is a Custom color, you can also look for the ink in your active standard ink's library nearest to your Custom target**, and its **D50**, **A** and **F11 ΔE** to your Custom target.

This is quite useful when you are working on finalizing specific ink formulations for a specific job, because it allows you best possible use of all existing **Measured**, **Custom**, and **Standard** inks you have stored in your application when doing other jobs.

The **Spectra** tab displays all useful spectral data of your attempt to match your measured ink to its target color:



Using Colorsource programs for multicolor printing with or without a CMYK base:

SPOT_Color_Manager and **SPOT_Gravure** coupled with **CMYK_100%** and **CMYK_Gravure** applications, allow excellent 7 colors prints with CMYK + Orange + Green + Blue, with offset, gravure or flexographic print technologies, and CMYK press settings with spot colors matching **ISO 12647-2-3-4-6** or **IDEAlliance** or your own **CUSTOM** standards.

One last advice for avoiding wasting time and money:

When a Customer gives you a sample printed spot color, saying "This is Pantone n°3012 and I want the same", you **always should** measure this Customer's sample tint and check it with **SPOT_Color_Manager**: You will very often find that your Customer's required color is NOT a Pantone N°3012!

This is quite true as well when the sample color is printed on a "Pantone swatch book", the latter having too often contained in the past some involuntary - or maybe sometimes deliberate - print errors!

A very good exercise: Check your own **PANTONE** swatch book:

1. Which inks are well formulated and printed at appropriate thickness?
2. Which inks are well formulated but not printed at appropriate thickness?
3. Which inks are badly formulated and cannot match their reference color at any density and/or show bad metamerism even if printed at optimal ink thickness?

Only the digital spectral reflectance of a tint can be a reliable and complete data.

Only trust spectral MEASURES and you will save a lot of time and money!

Colorsource.

support@color-source.net

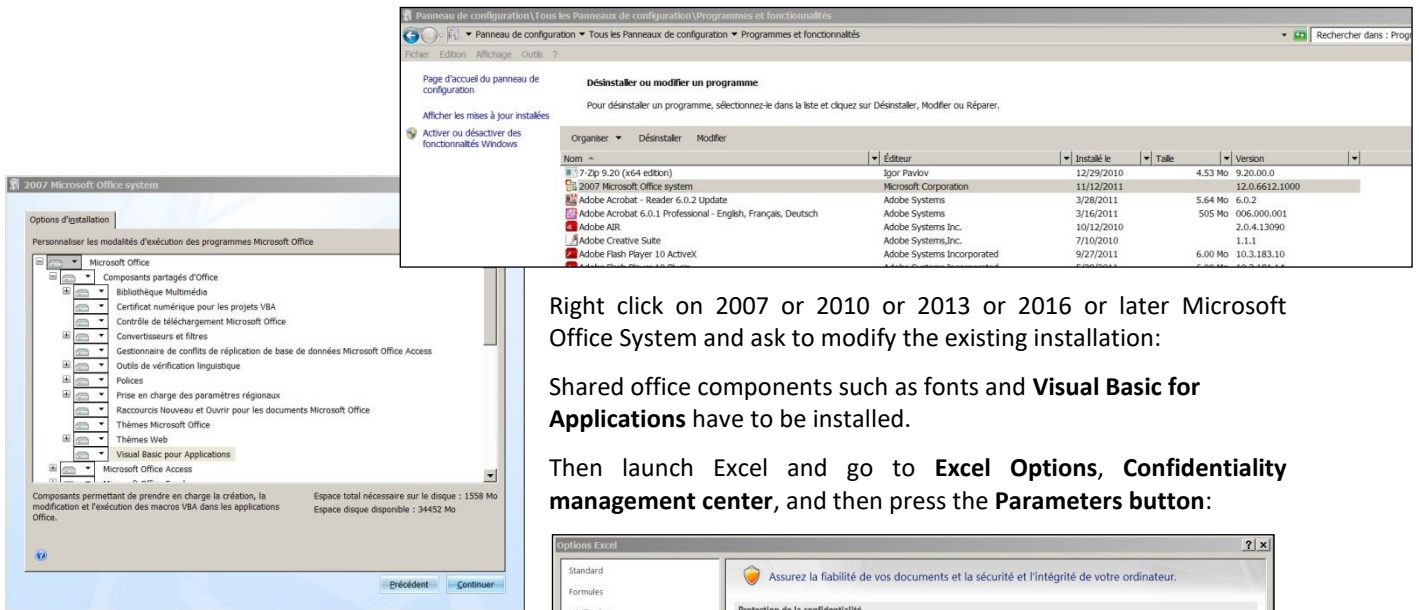
Troubleshooting and FAQs:

The application does not launch:

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

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

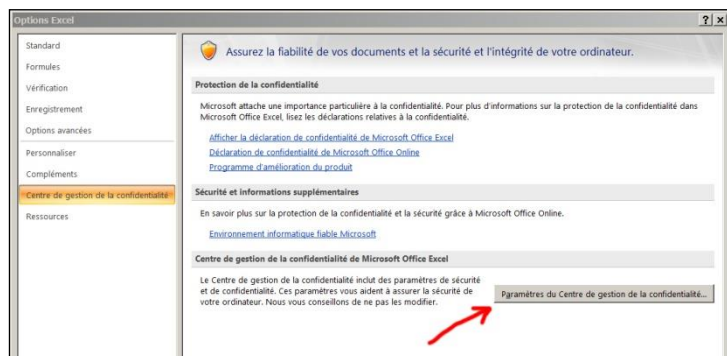
Sometimes optional components of Microsoft Excel (depending on your Excel version and installation kit) MUST be installed. If needed go to Windows Control Panel, in the program's installation menu:



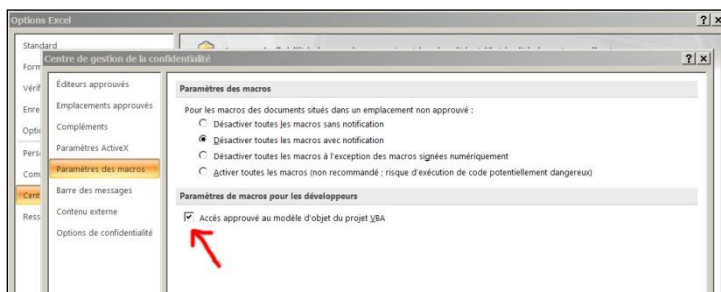
Right click on 2007 or 2010 or 2013 or 2016 or later Microsoft Office System and ask to modify the existing installation:

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.

I cannot paste or import my measurement data in application tabs:

The program says it is “The cell is write protected”.

Please note before pasting your spectral measurement text file to **Measure** tab, you need first select cell **"Paste here!"** with your mouse, or select a cell in the relevant "Tint names" column when using **SPOT_Color_Manager**, in order to paste your data at the right location.

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 blank (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.

The application shows error messages such as “#####” or strange curves in the result display tabs once I have pasted my data:

Check your measurement data decimal separator is a dot. If needed see the details in the **Software installation and brief description Guide** on page 11.

Check you have pasted your measurement data at the right location(s) in your **Colorsource** application.

i1Profiler refuses to measure my SPOT_Gravure or PLATE chart in scan mode, telling measured colors do not match the reference file:

See the “**Software installation and brief description Guide**” on page 9.

Eye-One Share application does not see my Eye-one Pro:

Please see **Eye-One Share** installation procedure for Windows 64 bits versions on page 11 of the “**Software installation and brief description Guide**”.

I cannot find all Pantone 2004 tints in my Eye-One Share Pantone libraries:



You need to use X-Rite installation CD-ROM as on aside monitor copy: Press Color Guides.

But in order to use **i1Share** with the latest **PANTONE digital libraries**, you can use **Colorsource FREE CxF3_to_CGATS** application that allows you extracting all modern **PANTONE digital libraries** from **Pantone Color Manager** and **InkFormulation** applications, and convert them into **CGATS** format for use with **ColorPicker**, **MeasureTool**, **SPOT_Color_Manager** and **Eye-One Share**.

Results 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”).

You can mask Excel ribbon (Point the ribbon with your mouse and use the mouse right button menu).

You can as well use **Excel FULL SCREEN display** (menu display ... Full screen) because you do not need Excel menus for making full use of **Colorsource** software. The Escape key allows switching back to normal Excel display mode.

Colorsource software search for the language at each start:

Each **Colorsource** application detects your keyboard language and configures the appropriate language **at first launch**. You have to save your application ("Ctrl s" or File/Save) for avoiding the application searching the language at each following launch.

Colorsource software cannot run on my Macintosh:

Yes, it can under Windows XP or Windows 7 or Windows 8.x. or Windows 10.

OK but it cannot run them under MacOS X:

OK when we can find 300 US\$ mobiles Mac as for mobile PCs! Because **Colorsource** applications work very well on low cost PCs and on 10 years-old Win XP PC if needed, so that using expensive Macs would be as uselessly expensive at the time as using the latest iPhone!

Moreover, many excellent and free color management and applications now only run under Windows operating systems, including some of them that are 20 years old, so that the widest variety of color management applications and utilities experts need are only supported by Windows today. You can always use the results of these apps on your Macs.

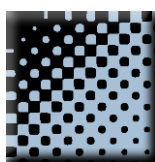
Any other question or suggestions?

support@color-source.net

CMYK_Print_&_Proof



PLATE



CMYK_100%



CMYK_Gravure



SPOT_Color_Manager



SPOT_Gravure

