COLORSOURCE

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MagicPrepress user's guide for managing all Print House public and private print standards and associated correction curve's sets for each press

MagicPrepress operating principles:

MagicPrepress makes it easy computing and programming optimal correction curves in any prepress workflow, with any type of printing press (Offset, heliogravure, flexography...), and for any configuration of the press.

MagicPrepress also makes it easy updating the workflow correction curves, by measuring a press control bar on any production print run. By using your production runs, **MagicPrepress** can therefore often avoid you making specific calibration test print runs.

For classic CMYK printing applications, **MagicPrepress** allows quick and easy matching of any ISO 12647-2-3-4-6 standard.

MagicPrepress also does the job for all printing configurations using one to ten process inks. For example:

- Classic four-color prints ("CMYK inks"), with or without spot color(s),
- Multicolor prints with or without a CMYK base,
- Special media prints,
- Prints with special CMYK inks bases.

MagicPrepress uses a simple i1Pro, **i1Pro2** or **i1Pro3 spectrophotometer** for optimizing the quality and productivity of all your print runs, thus avoiding specialized print shop spectrophotometers, which are far more expensive and far less efficient and productive than our software-based solutions.

You can use as well any other 45/0° spectrophotometer, as long as its spectral measurements files are recorded as classic CGATS format text files.

General structure: MagicPrepress tabs:

Measure tab:

This tab allows importing any CGATS measurement file of any printed color chart or control bar, measured on one or more printed copies.

MagicPrepress can make the best use of any printed color target or control bar, with any number of patches.

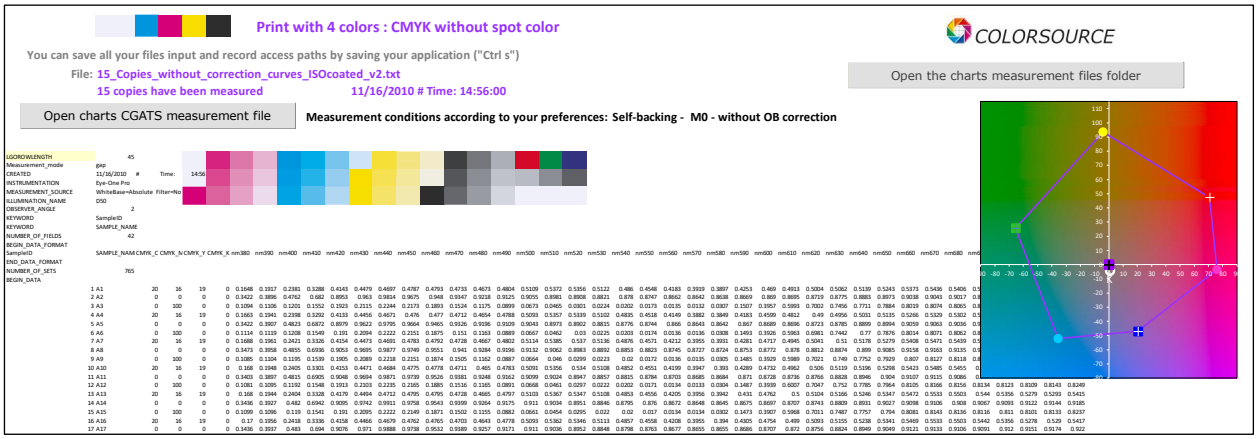
Many examples of control bars with the corresponding CGATS text reference files, and many examples of CMYK test forms are provided on our website https://www.iso12647solution.com/.

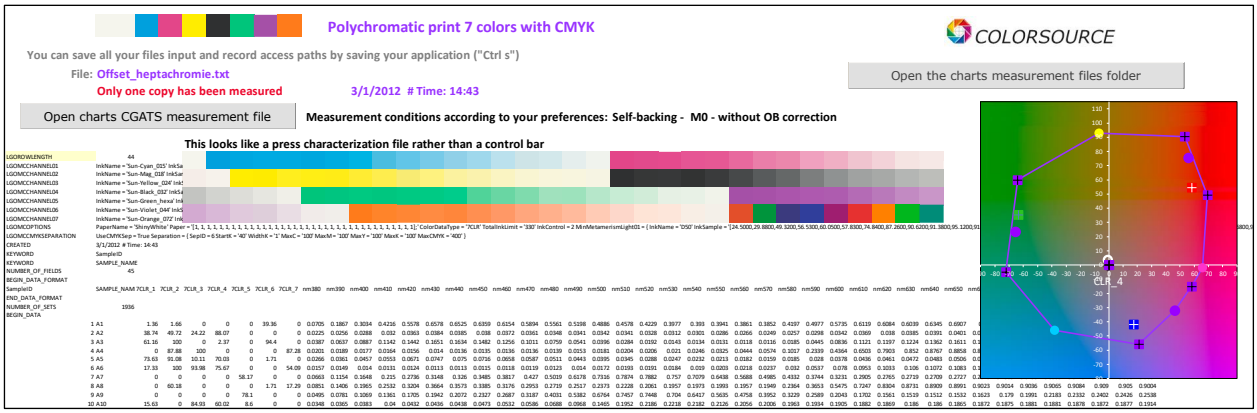
- If the text reference file of a control bar describes one single color bar, it can measure one color bar on a single printed copy,
- If a control bar's text reference file describes 15 times this same control bar, it allows measuring 15 times this control bar over 15 different printed copies, which is much better for allowing **MagicPrepress** working from the **average print run's measured data**.

Note that the free versions of **MeasureTool** or **i1Profiler** applications are enough to take all the necessary measurements. If necessary, check out the Colorsource software installation and brief description guide for more details about their use.

The text measurement file of the color chart should contain the spectral measurements of each patch, rather than mere colorimetric values, in order to allow **MagicPrepress** providing you with the most complete and accurate results.

For experts: If your measurement file contains only XYZ and/or Lab D50-adapted color data, **MagicPrepress** will also work, providing you with all possible results from this poorer measurement data. This keeps sometimes very useful, for example, if you work from a virtual colorimetric measurement file reconstructed from a press I.C.C. profile containing no spectral measurements: This allows you extracting from the I.C.C. profile, the press aim TVI curves (Tone Value Increase curves). The accuracy is not as good as from spectral data, but sufficient for detecting any possible problem: For example, we have found some prepress workflows set up to match press TVI curves …that were very different from those implicitly specified by the I.C.C. profiles used upstream for making the color separations!





MagicPrepress can use any type of CGATS file made by measuring any type of chart printed with one to 10 colors.

- No limit to the number of ink's % control points,
- No limit to the size of the measured color chart,
- Works with spectral values from 380 to 730 nm, but also 400 to 700 nm etc.
- Compatible with files with XYZ values only, with Y standardized at 100 or 1.0,
- Compatible with files with Lab values only,
- The data decimal delimiter can be a dot or a comma.

Using a spectral measurement file is recommended for displaying the most complete and accurate results. If color-only values are available such as XYZ and/or Lab, these values should be D50 adapted data.

DeclareCurves tab:

For each ink, computing the proper press correction curve must take into account:

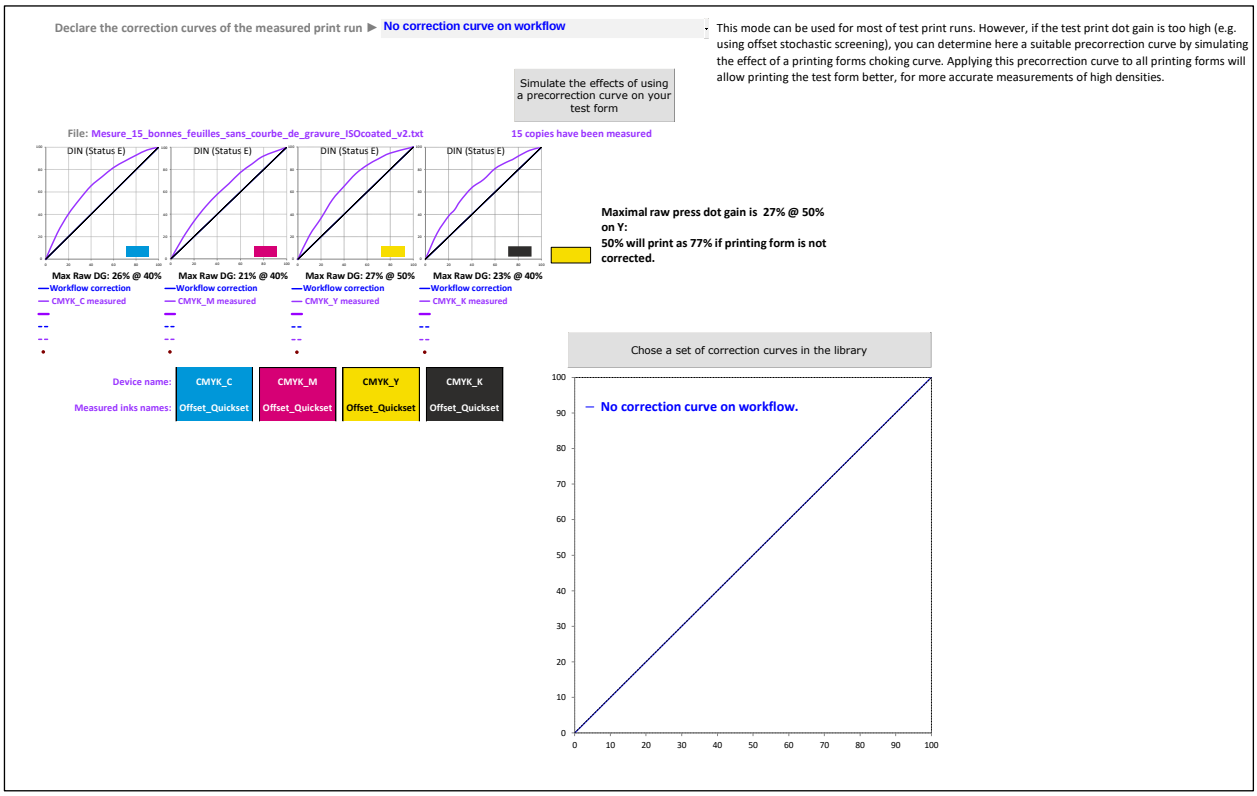
1. The existing correction curve applied to this ink by the workflow for printing of the measured print,
2. The TVI curve measured for this ink,
3. The desired TVI curve (Aim TVI curve) for this ink.

The DeclareCurves tab allows you declaring the correction curve applied to each measured ink on the workflow, with great flexibility. It offers four modes for declaring the applied curves:

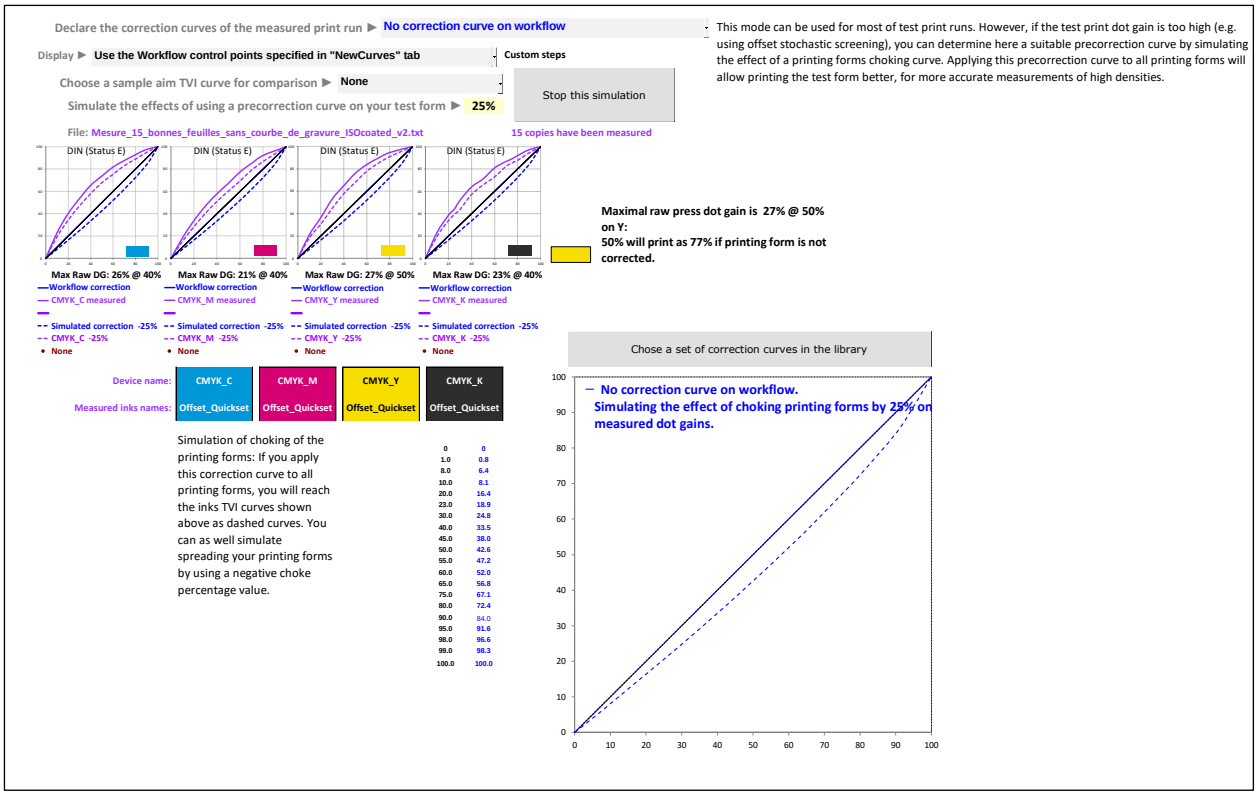
- "**No correction curve on workflow**" mode,
- "**Single precorrection curve on workflow**" mode,
- "**Manual input of the existing correction curves**" mode,
- "**Use a set of correction curves from "CurvesLib" **" mode.

"No correction curve on workflow" mode:

This mode is intended for test print runs made without any correction curve on the prepress workflow. This type of calibration print run is feasible if the chosen print configuration does not result in too high press' dot gains curves, which would make the calibration strip's measurements inaccurate in high densities, if not impossible.



For experts: If it turns out that, without any correction curve on the workflow, the measured press dot gain is too high, you can **simulate the effect on dot gain curves of degreasing the color separations**:



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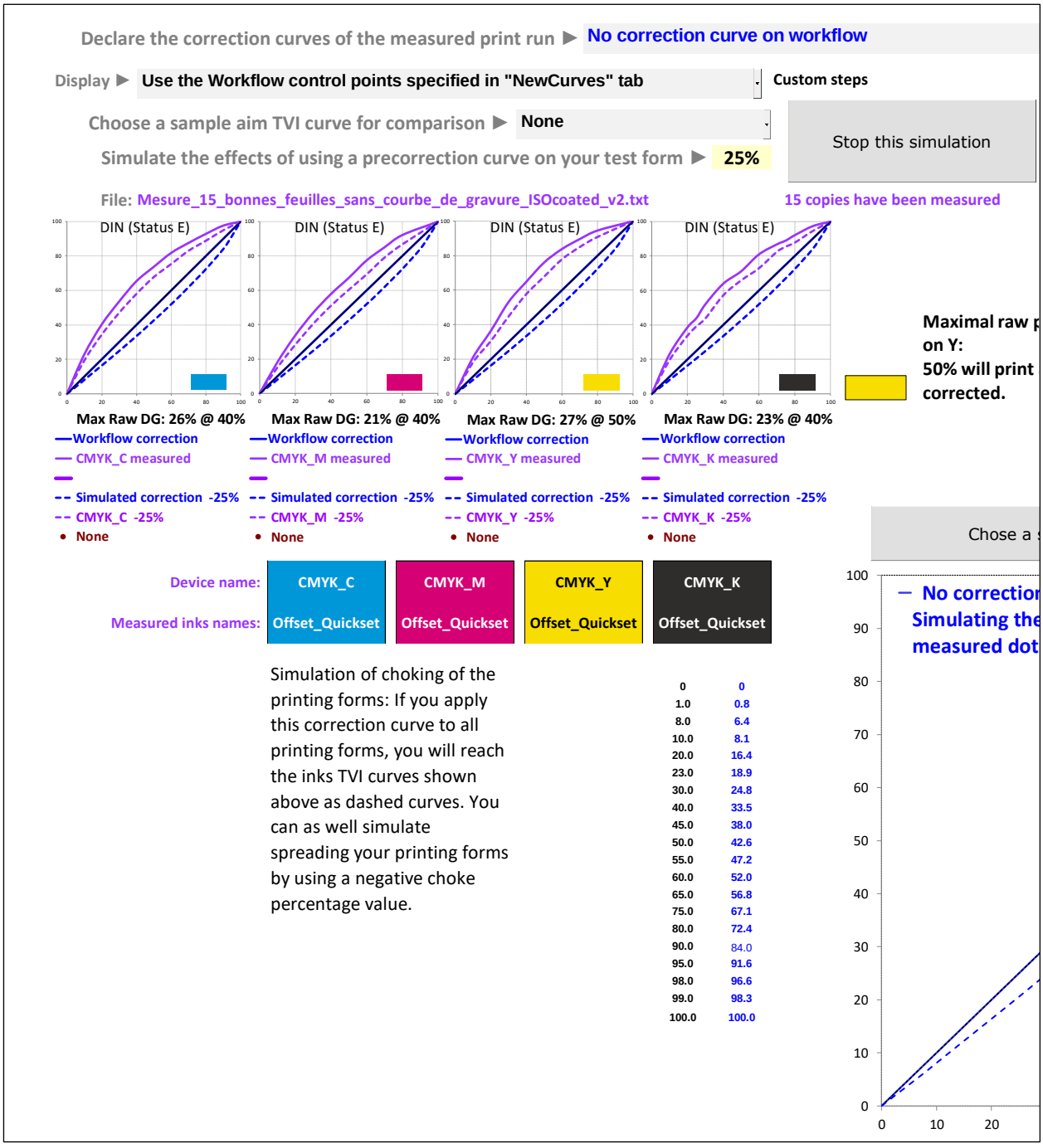
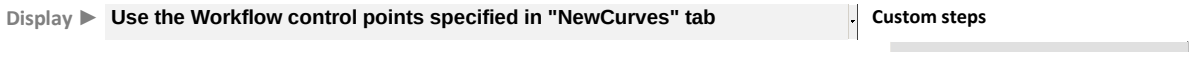
This allows you searching for a single correction curve to be applied to each printing form on the prepress workflow, in order to reprint the test form without getting too much dot gain:



The above view shows how dot gain measured without a correction curve (**purple curves**) could be reduced (**purple dotted curves**) if necessary, by applying a same degreasing curve (**blue dotted curve**) to each printing form, depending on the chosen degreasing parameter (**25%** above).

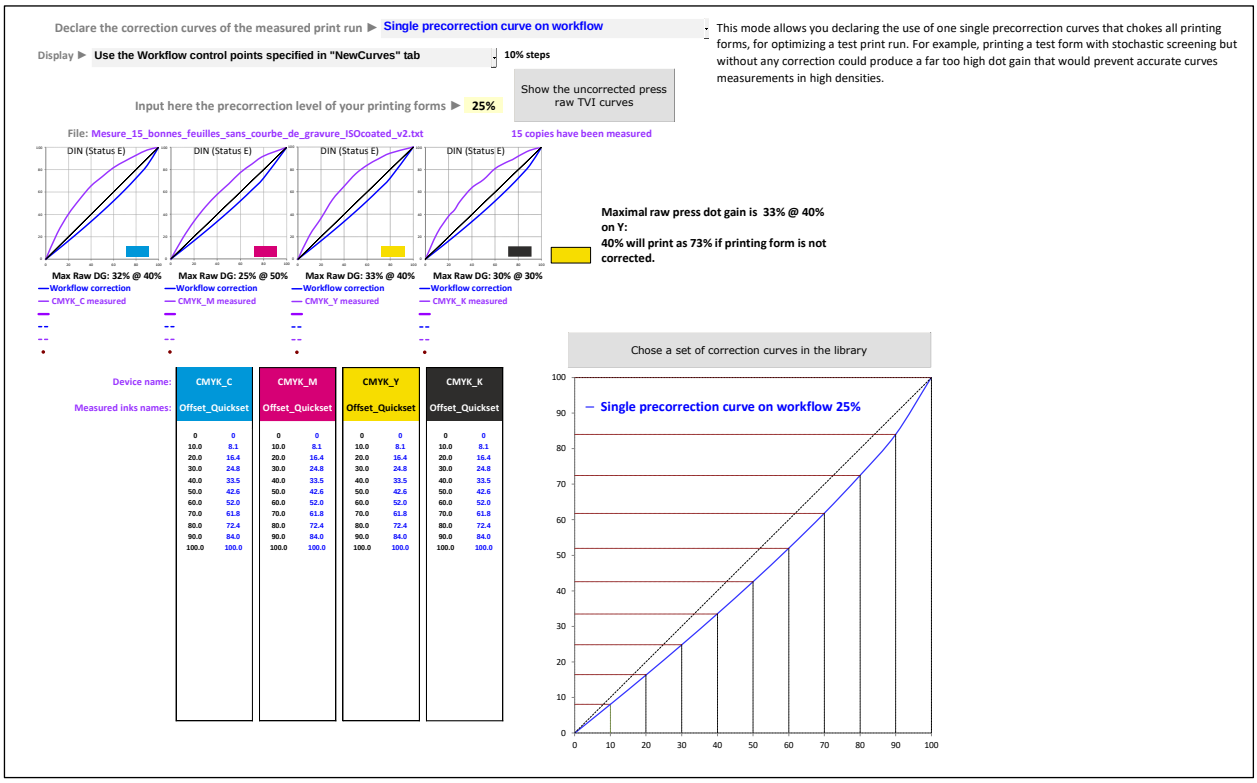
In order to be easily programmed into the workflow, this correction curve is displayed with the desired control points depending on your choice in the **Display** drop-down menu:



This allows you printing a new test form with controlled lower dot gain, ensuring a good printability.

"Single precorrection curve on workflow" mode:

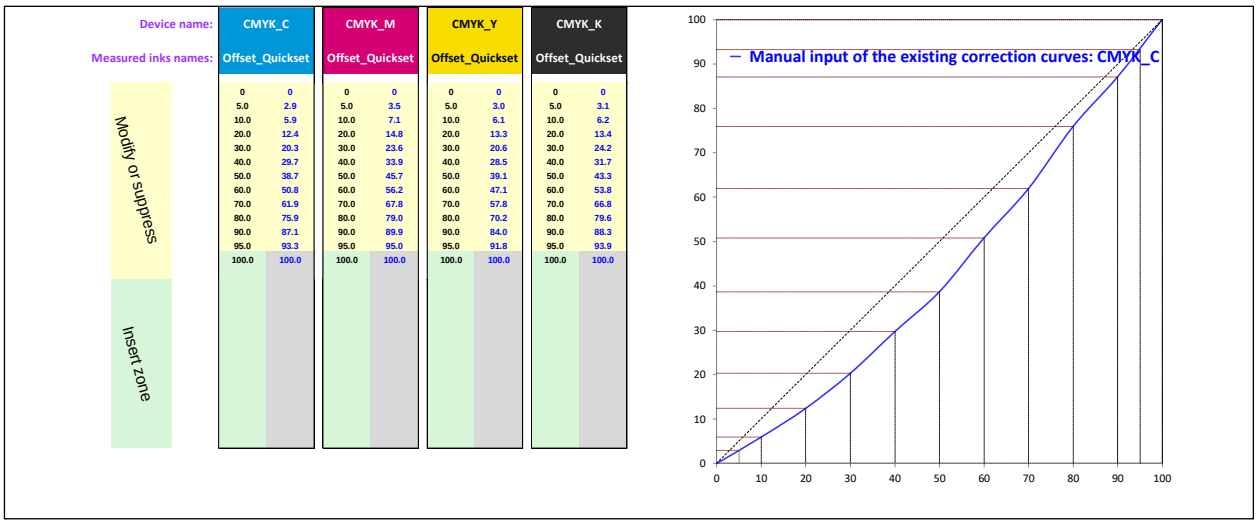
If you have used the **button "Simulate the effect of using a precorrection curve on your test form"** for determining a precorrection curve ensuring a good printability of your test form, this mode will allow you declaring this single precorrection curve when measuring the reprinted test form:



"Manual input of the existing correction curves" mode:

Performing test print runs without any correction curve on the workflow is quite educational and we recommend it during your learning phase, if the press dot gain keeps reasonable in these conditions. However, it is an expensive exercise if you are using a web offset or gravure press.

It is therefore often more convenient establishing and/or updating your correction curves by taking advantage of press' calibration bars measurements made during normal production print runs.
In this case, all you need is to declare to **MagicPrepress** the values of corrections curves applied by the prepress workflow, and the **manual input** mode allows you doing it easily and quickly, and with great flexibility:



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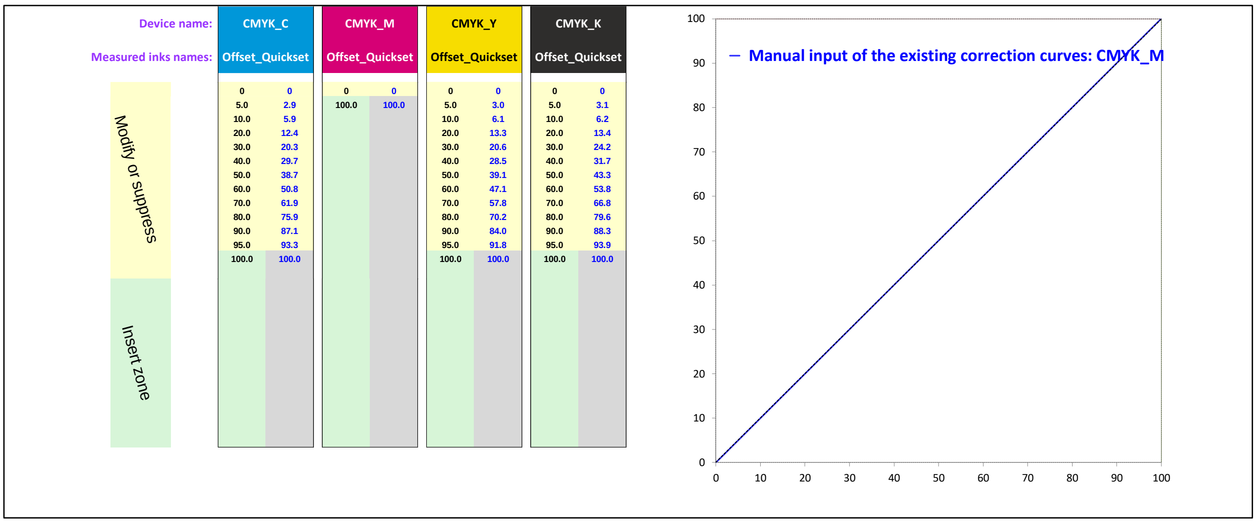
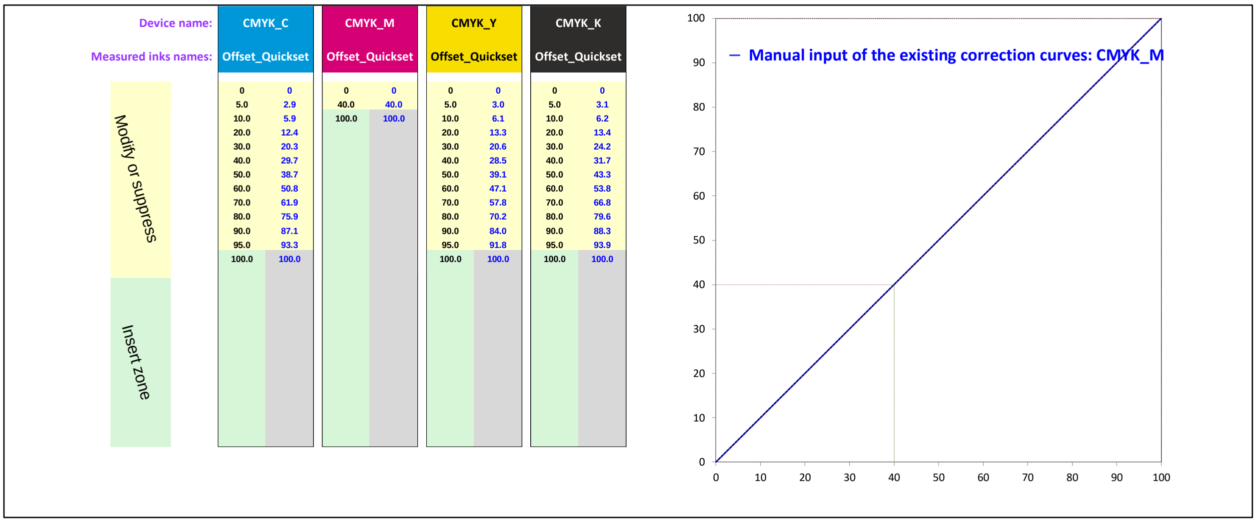
In addition to the 0 and 100% control points that are always present, you can freely enter 1 to 24 control points for specifying the existing correction curve on the workflow for each ink:

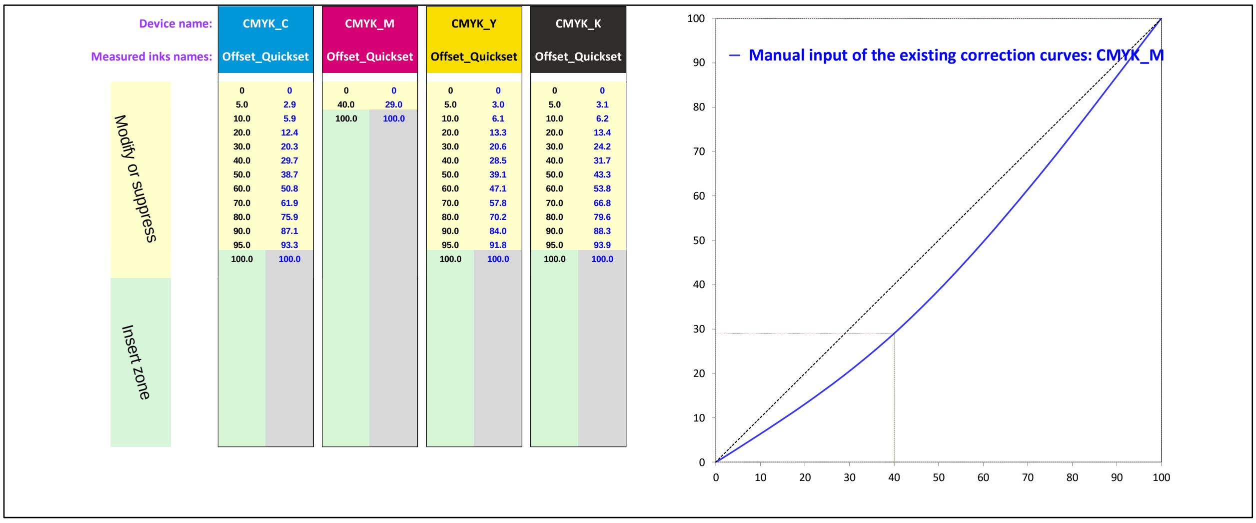
- For clearing one or more control points, select them using your mouse and make **"Suppress"** on your keyboard,
- For inserting a control point, type it on your keyboard after selecting one of the empty green cells in the column,
- For changing an existing control point, select it and type its new value on your keyboard,
- For changing the value of the correction curve, select the value to be changed and type its new value on your keyboard.



Device name:	CMYK_C		CMYK_M		CMYK_Y		CMYK_K	
Measured inks names:	Offset_Quickset		Offset_Quickset		Offset_Quickset		Offset_Quickset	
	0	0	0	0	0	0	0	0
	5.0	2.9	100.0	100.0	5.0	3.0	5.0	3.1
	10.0	5.9			10.0	6.1	10.0	6.2
	20.0	12.4			20.0	13.3	20.0	13.4
	30.0	20.3			30.0	20.6	30.0	24.2
	40.0	29.7			40.0	28.5	40.0	31.7
	50.0	38.7			50.0	39.1	50.0	43.3
	60.0	50.8			60.0	47.1	60.0	53.8
	70.0	61.9			70.0	57.8	70.0	66.8
	80.0	75.9			80.0	70.2	80.0	79.6
	90.0	87.1			90.0	84.0	90.0	88.3
	95.0	93.3			95.0	91.8	95.0	93.9
	100.0	100.0			100.0	100.0	100.0	100.0

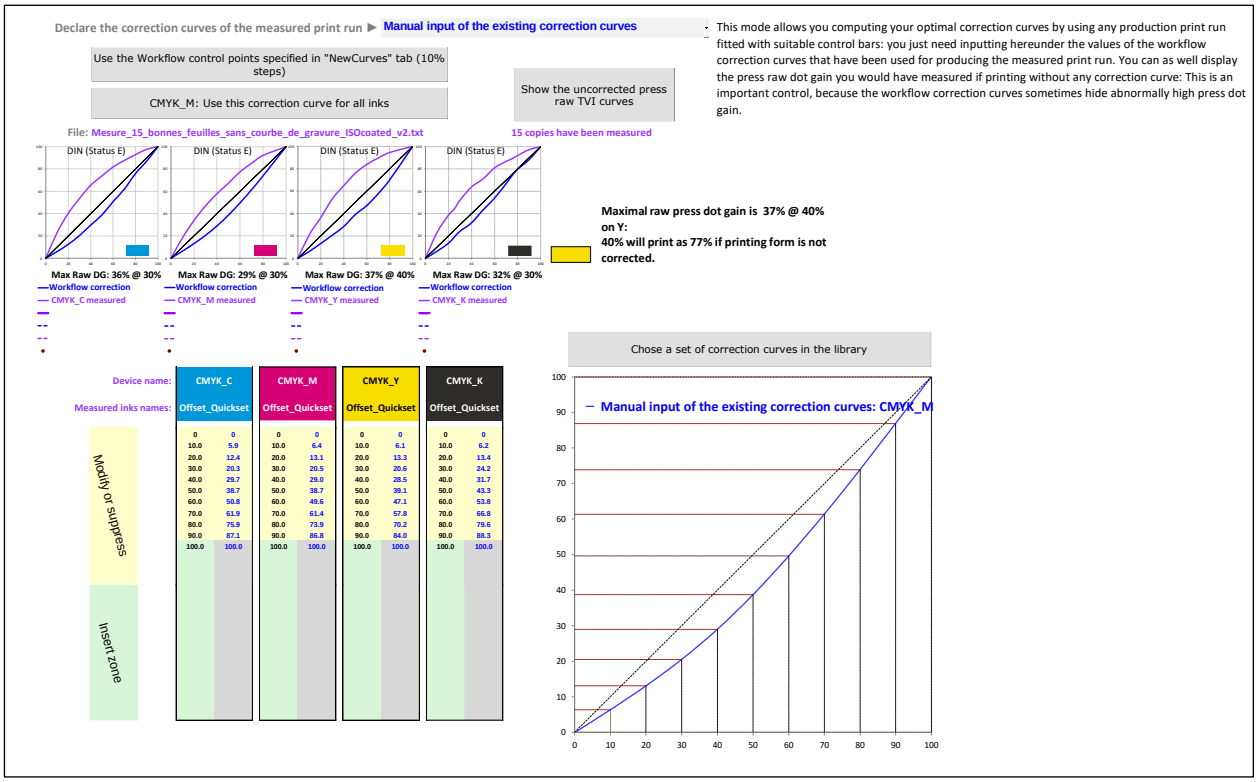


Device name:	CMYK_C		CMYK_M		CMYK_Y		CMYK_K	
Measured inks names:	Offset_Quickset		Offset_Quickset		Offset_Quickset		Offset_Quickset	
	0	0	0	0	0	0	0	0
	5.0	2.9	40.0	40.0	5.0	3.0	5.0	3.1
	10.0	5.9	100.0	100.0	10.0	6.1	10.0	6.2
	20.0	12.4			20.0	13.3	20.0	13.4
	30.0	20.3			30.0	20.6	30.0	24.2
	40.0	29.7			40.0	28.5	40.0	31.7
	50.0	38.7			50.0	39.1	50.0	43.3
	60.0	50.8			60.0	47.1	60.0	53.8
	70.0	61.9			70.0	57.8	70.0	66.8
	80.0	75.9			80.0	70.2	80.0	79.6
	90.0	87.1			90.0	84.0	90.0	88.3
	95.0	93.3			95.0	91.8	95.0	93.9
	100.0	100.0			100.0	100.0	100.0	100.0



Device name:	CMYK_C		CMYK_M		CMYK_Y		CMYK_K	
Measured inks names:	Offset_Quickset		Offset_Quickset		Offset_Quickset		Offset_Quickset	
	0	0	0	0	0	0	0	0
	5.0	2.9	40.0	29.0	5.0	3.0	5.0	3.1
	10.0	5.9	100.0	100.0	10.0	6.1	10.0	6.2
	20.0	12.4			20.0	13.3	20.0	13.4
	30.0	20.3			30.0	20.6	30.0	24.2
	40.0	29.7			40.0	28.5	40.0	31.7
	50.0	38.7			50.0	39.1	50.0	43.3
	60.0	50.8			60.0	47.1	60.0	53.8
	70.0	61.9			70.0	57.8	70.0	66.8
	80.0	75.9			80.0	70.2	80.0	79.6
	90.0	87.1			90.0	84.0	90.0	88.3
	95.0	93.3			95.0	91.8	95.0	93.9
	100.0	100.0			100.0	100.0	100.0	100.0

The **"Use the workflow control points specified in the NewCurves tab" button** allows you programming directly the workflow control points that have been specified in the NewCurves tab:



"Use a set of correction curves from CurvesLib" mode:

This mode can be chosen either by using the **"Declare the correction curves of the measured print run"** drop-down menu, or by pressing the "**Choose a set of correction curves in the library" button**. This button is only present if the CurvesLib library contains one or more sets of correction curves that may be suitable for the current measurement file.

A curve's set in the CurvesLib library is a set of curves for correcting the printing forms:

- When using a specific printing press (and with using the most recent update of this curve's set),
- AND for printing according to a completely specified public or private aim standard.

As a result, each correction curve's set in CurvesLib is associated with:

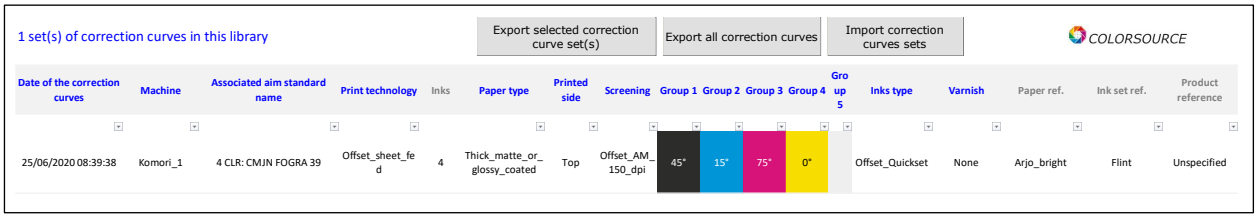
- The **date of establishment or update** of this curve's set,
- The **name of the press** to which this correction curve's set is dedicated,
- The **name of the public or private aim colors standard** for which this curve's set is valid, which is recorded in the StdLib Library,
- Plus, **all necessary other printing parameters recorded with this aim standard** that may influence the press' color response.

This, in order each set of correction curves can be used without mistake or confusion, and can be updated easily by measuring commercial production print runs.

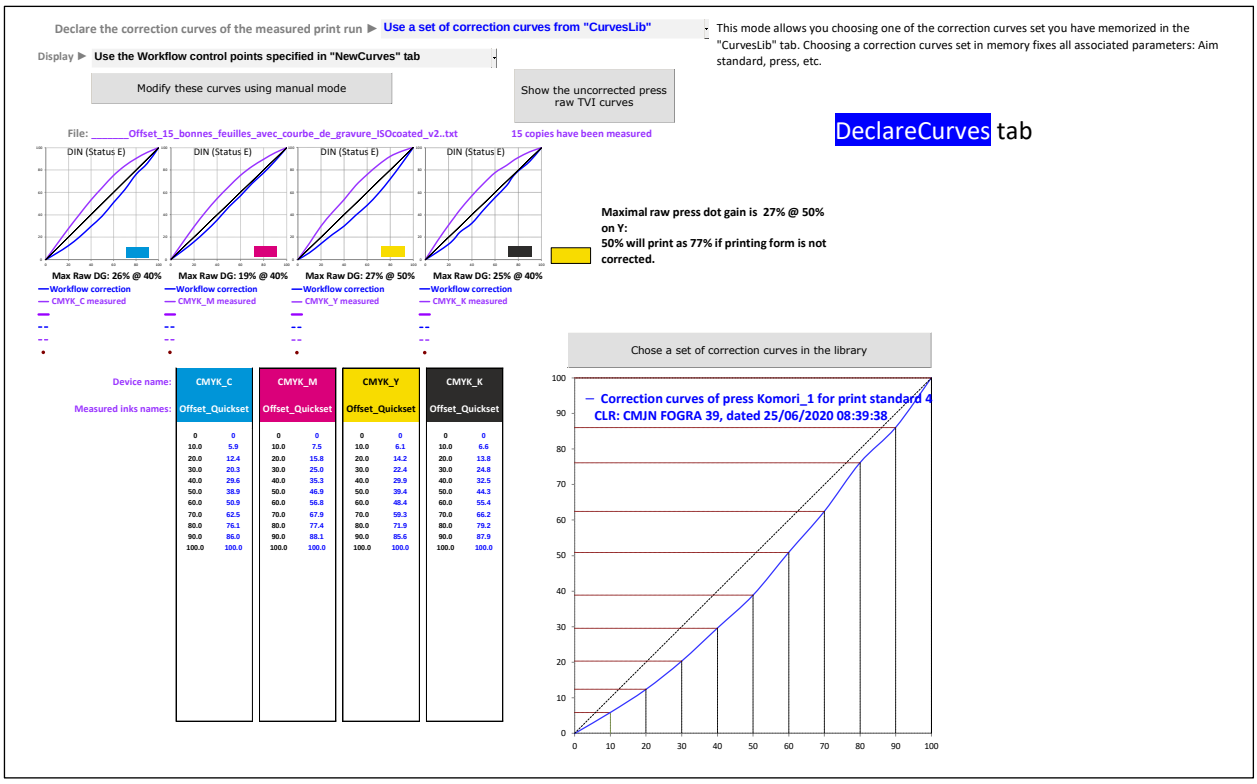
In short, a set of correction curves is only valid for a specific machine, for a completely specified print standard, and with a perfectly specified printing configuration (screening, inks' print sequence etc.).

MagicPrepress makes it easy managing all public or private production print standards, and all associated correction curves sets and print parameters for each one of your presses.

For choosing a set of correction curves, simply select the desired record line in the CurvesLib library and then press the "**Choose**: **[Machine] [Date Hour]**" button.



MagicPrepress then declares the values of the chosen correction curve's set in the DeclareCurves tab, and forces the associated aim printing standard in the AimStandard tab:



For releasing the action of a curve's set and its associated aim standard, and thus resume to **MagicPrepress** manual setting mode, you must press the "**Unfreeze all settings**" button, shown above in AimStandard tab.

If there are only little differences between the "Workflow correction curves" and "New correction curves" computed by **MagicPrepress**, this means there is no need for updating them in the workflow.

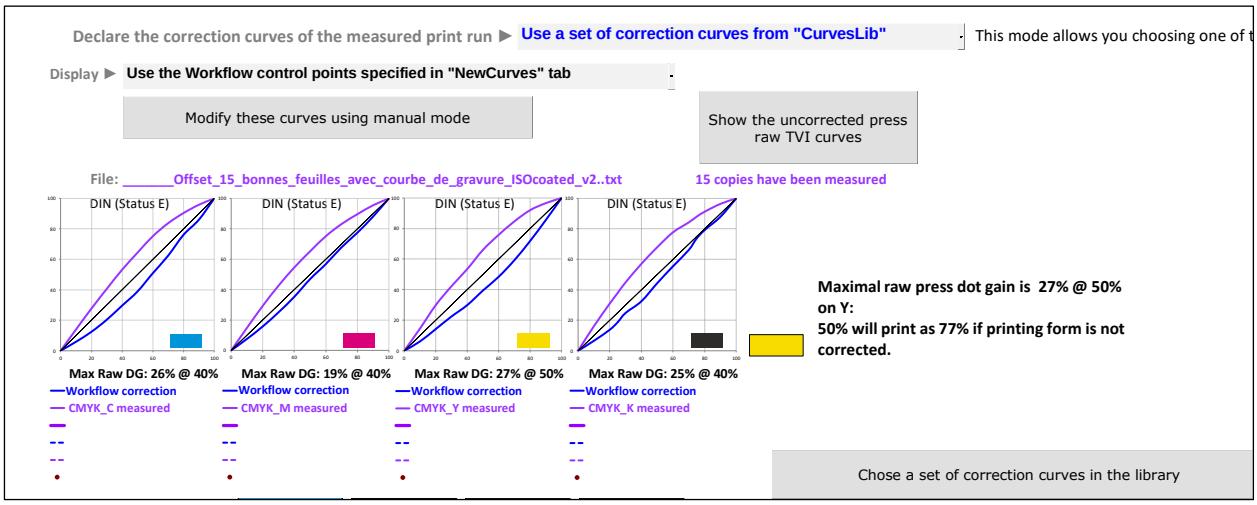
Other features of DeclareCurves tab:

Establishing or updating a set of correction curves allows you matching accurately the print standard's aim TVI curves, even if the raw (uncorrected) press dot gains are very high. However, we recommend checking that the press raw dot gains **are not abnormally high**, as this may indicate the press is needing maintenance. **And when you measure a production print run**, **the correction curves applied on the workflow may hide abnormally high dot gains**, **on one or more of the press' printing groups**.

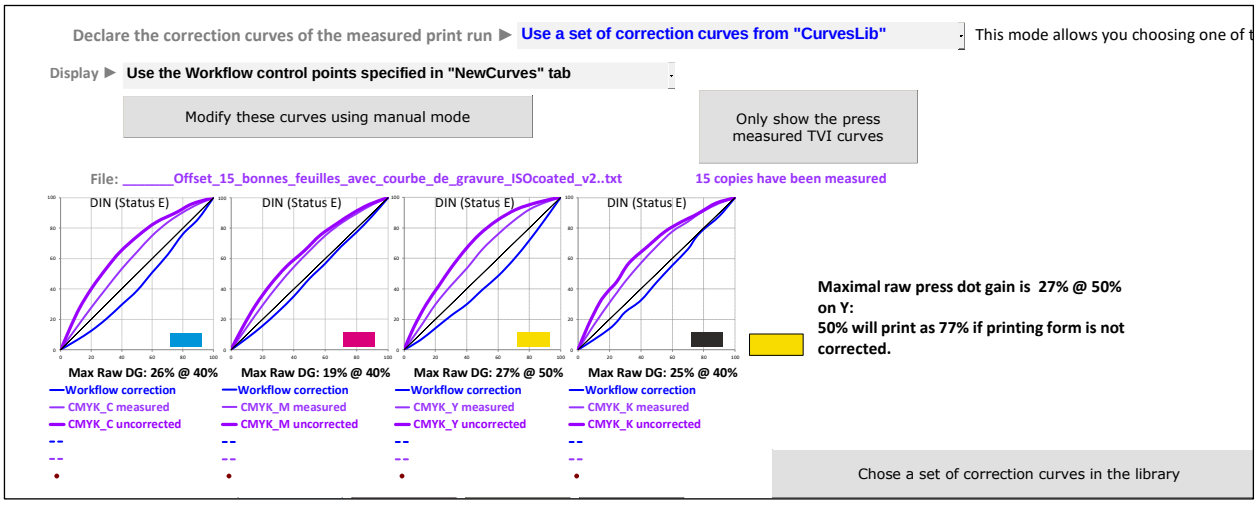
That's why, in all three modes of the DeclareCurves tab where workflow corrections curves are declared:

- "**Single precorrection curve on workflow**" mode,
- "**Manual input of the existing correction curves**" mode,
- "**Use a set of correction curves from "CurvesLib**" " mode,

the DeclareCurves tab displays the maximal gross (uncorrected) press dot gain for each ink, plus the maximal value of this raw dot gain for all inks:



The "**Show the uncorrected press raw TVI curves**" button also allows displaying the raw TVI curves of the **uncorrected** press (purple **bold curves** below):



Thanks to these functions, even when measuring press calibration control bars during calibrated commercial print runs, you can display the raw press TVI curves and maximal press raw dot gain, and thus verify that the press dot gains are not abnormally high.

Finally, note that when printing offset, if you don't know the correction curves applied by the workflow to the measured print run, you can easily measure them on each plate's control bar using a plate reader, or using your **i1Pro 1**, **2 or 3** with Colorsource **PLATE** control software.

AimStandard tab:

The AimStandard tab allows you specifying the aim production standard to be matched by the press:

- Aim Lab color and/or spectral reflectance for each solid ink,
- Aim TVI curve for each ink,
- Densitometric spectral response for calculating the TVI curves,
- Inks print order (Print sequence),
- Colors of the primary ink's 200% overlays (At least for aim standards such as CMYK ISO12647-x).

The AimStandard tab automatically adjusts its menus based on each opened measurement file:

- Files measuring a classic CMYK print run,
- Files measuring a classic CMYK print run with one to six spot color(s),
- Files measuring a multicolor print run with a CMYK base,
- Files measuring a multicolor print run without a CMYK base.

In this scope, **following arbitrary choices have been made**, **for highest simplicity and flexibility**:

1. Any "N-colors" measurement file, where at least one ink has a color close enough to a classic CMY or K primary, is considered being characterizing a print run with a CMYK base (Even if only a Black ink is present): This allows choosing, for the CMY or K ink(s) present in the measurement file, the aim color(s) specified by an ISO12647-2-3-4-6 standard. Because, even if an "N-colors" print only uses black ink and no CMY inks, it is often easier using a classic ISO black ink, which you always have in stock. And anyhow, **MagicPrepress** allows using as well other aim colors than CMYK ISO inks.
2. Any N-colors file with a CMYK base will be considered by **MagicPrepress**:
   - Either as the measurement file of a **CMYK print with spot colors**, if the measurement file does not contain 200% two inks overlays other than **M + Y**, **C + Y** and **C + M**,
   - Either as the measurement file of a **multicolor print**, if the measurement file contains, in addition to **M + Y**, **C + Y** and **C + M** overlays, the measurements of 200% two inks overlays involving inks other than CMY.

   This arbitrary choice makes sense, since two different press control bars will be used for controlling a **CMYK + Orange** print, depending on whether the **orange** ink is used as a spot color, or as an additional primary color for expanding the press color gamut in red-orange tones:
   - **If the Orange ink is used as a spot color**, the control bar will not contain inks overlays with orange ink,
   - **On the other hand**, **in multicolor printing**, it is highly suitable that the control bar contains the **Orange + Magenta** and **Orange + Yellow** overlays, especially when using "wet on wet" printing processes.

Choosing the densitometric spectral response in the AimStandard tab:

MagicPrepress allows you choosing among the following spectral responses for calculating CMYK inks' densities and TVI curves:

- **DIN** (**Status E**): ISO spectral response used for calculating all published ISO 12647-2-3-4-6 CMYK TVI curves,
- **ANSI** (**Status T**): U.S. spectral response designed for old CMYK SWOP inks (With very different yellow ink). Little interest today,
- **Status I**: Self-adaptive narrow-band filter, suited to all non-CMYK inks (and CMYK inks as well).

If you choose **DIN** (**Status E**) or **ANSI** (**Status T**) spectral response, it will only apply for measured CMYK inks, if present. For all non-CMYK inks, spectral response **Status I** will automatically apply.

MagicPrepress also allows you choosing a special density computing mode named Visual Density: In this case densities are not computed from the spectral measurements, but estimated from the apparent color of inks.

Three main applications for **Visual Density**:

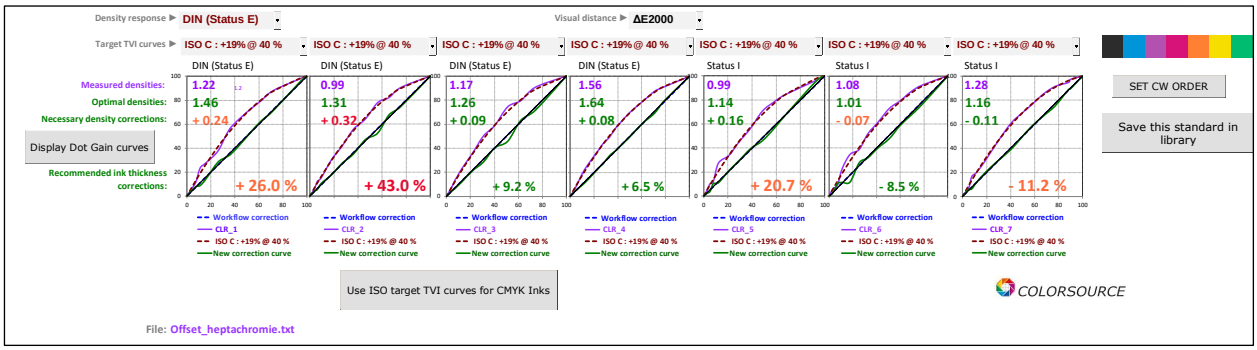
1. If the measurement file does not contain spectral measurements but only XYZ and/or Lab color measurements, **MagicPrepress** automatically uses visual densities calculation for estimating the TVI curves.
   It also uses visual densities for computing **ISO 12647-2-3-4-6** or **Fingerprint** or else aim TVI curves, so that the computed correction curves remain good, even if less accurate than when using a spectral measurement file.

2. If "**Fingerprint**" is used as a target for CMYK and/or non-CMYK inks, and the **Fingerprint** measurement file only contains apparent color measurements (non-spectral measurements), **MagicPrepress** automatically uses visual densities for calculating the aim TVI curves contained in the **Fingerprint**, and also for calculating the measured print TVI curves (Even if the measurement file does contain spectral measurements). So that the computed correction curves remain good, even if less accurate than when using a **Fingerprint** file containing spectral measurements.

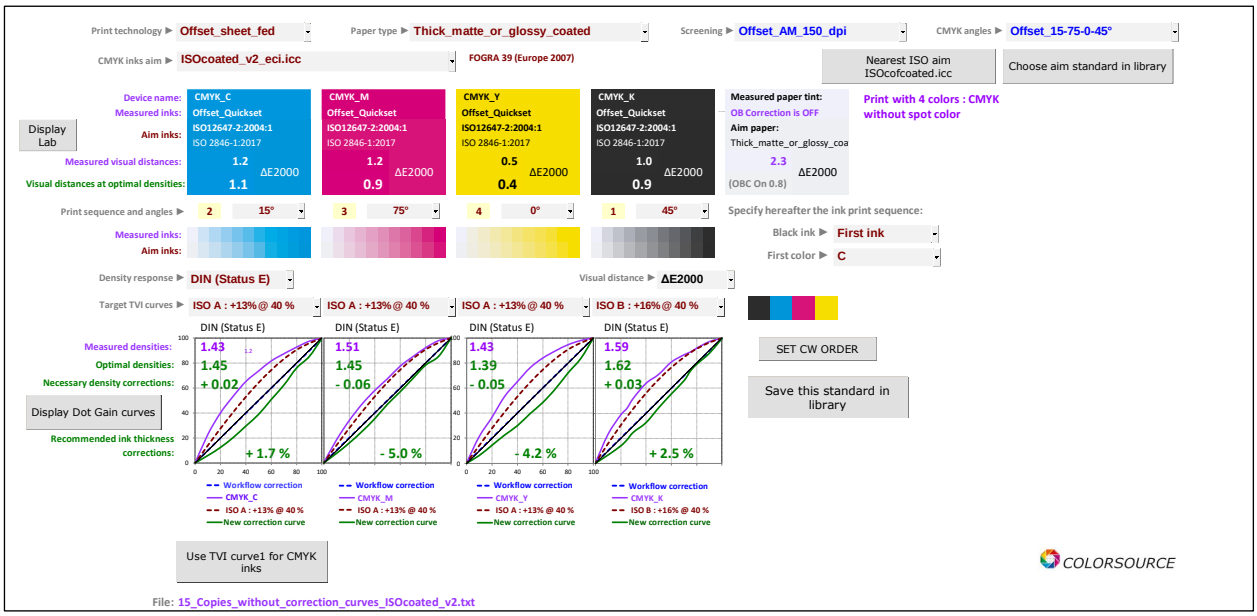
3. **For experts**: For example, if you want to match a CMYK print to the perceived colors of a bad color proof (bad measurement found on the color proof's control bar):

   You can use as a **Fingerprint** the measurement file of a FograMediaWedge3 or else control bar measured on this bad color proof. But **regardless your color proof control bar measurement file is spectral or colorimetric**, **you should choose Visual Density mode for calculating the press correction curves**.
   Because you want to match the press to the color proof. And in this case spectral calculation of TVI curves is not recommended, because the CMYK pigments of the press are very different from those of the inkjet proof, so that you cannot compare the print and proof by spectral measurements: Color base measurements and comparisons are far more relevant here.

In any case, the spectral response actually used by **MagicPrepress** for computing each density is displayed always for each ink:



Using AimStandard tab with traditional CMYK print measurement files:



The **"CMYK inks aim"** drop-down menu specifies the target for each of the CMY and K inks, if present, and it allows choosing:

1. Either a classic CMYK aim standard, such as **ISO 12647-2-3-4-6** or **WAN-IFRA** or **GraCol** or **SWOP**:

   The list of the ISO12647-x targets in the drop-down menu depends on the specified **print technology** and/or specified **paper type** and/or the specified **screening type** (e.g., classic or stochastic screening with offset printing).
   For print technologies such as **Offset**, **Gravure** or **Flexography**, choosing the paper type results in the choosing an appropriate ISO12647 target and vice versa, in order to facilitate your search for standard ISO CMYK aim.
   These automatisms do not occur if you choose a non-ISO CMYK target (e.g., a "**Fingerprint**" target), or declare the print technology is **Hybrid**: In the latter case you can freely choose any CMYK ISO12647-x aim with any paper type in the relevant drop-down menus.
   When choosing an **ISO 12647-x** or **GraCol** or **WAN-IFRA** or **SWOP** target, the appropriate standard aim TVI curves are automatically selected for CMYK inks.

2. Either a print standard specified by the measurement file of a reference print run ("**Fingerprint**" of a press). This reference press measurement file must be opened into the Fingerprint tab and should preferably contain the average measurement of a color chart or control bar, measured on several printed copies. If the **Fingerprint** file only contains non-spectral color measurements, **MagicPrepress** uses the visual density mode for all TVI curves computations.
   Note that when a measured press ink (Present in the press measurement file) is not found in the **Fingerprint** measurement file, then **MagicPrepress** chooses as default color aim the nearest ink found in the InksLib inks library. Since the aim ink is absent from the **Fingerprint**, it is necessary to manually choose its target TVI curve.

3. Either a print standard specified manually by specifying each target ink chosen from the InksLib library, plus the aim TVI curve for each ink.

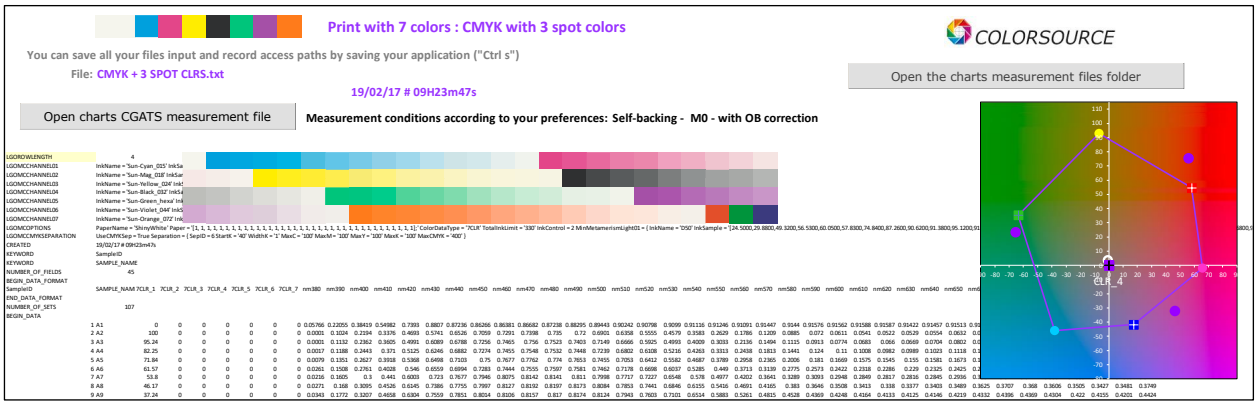
In the above three cases, you can also freely specify the inks' print sequence and the aim TVI curves, but **MagicPrepress** warns you if necessary if your choice of densitometric spectral responses and/or target TVI curves does not comply with the declared aim standards.

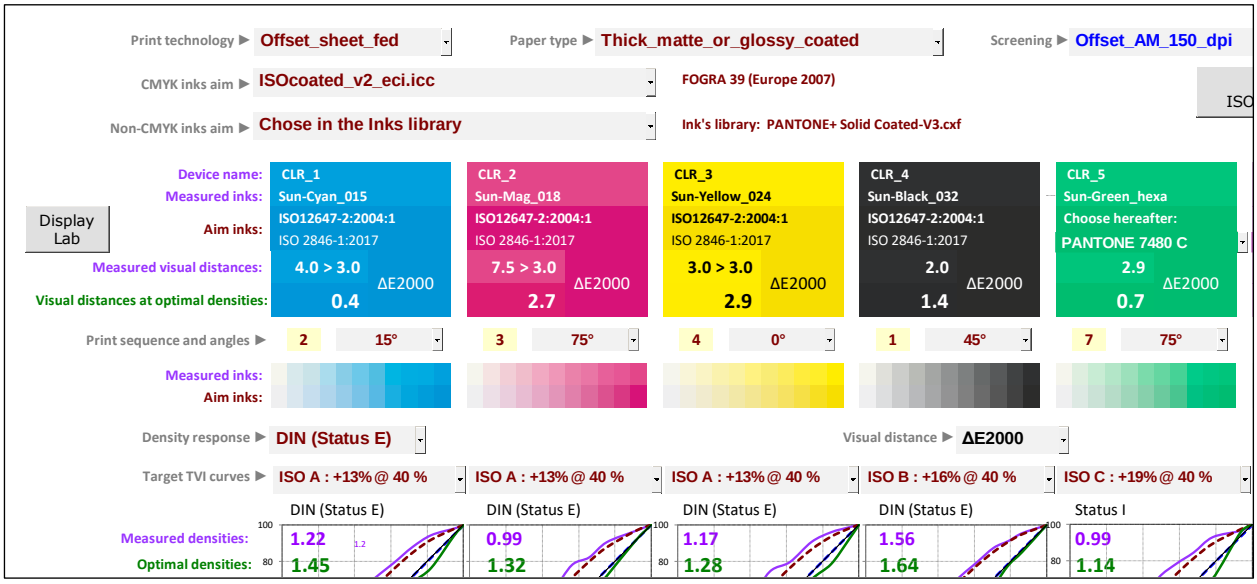
Any specified CMYK production standard, whether ISO 12647-x or not, can be recorded as a target standard in the StdLib Library, using the **"Save this standard in library"** button.

Using AimStandard tab with classic CMYK + spot color(s) print measurement files:

As a reminder, will be considered as a **CMYK with spot color(s**) print measurement file, any file containing at least one C or M or Y or K ink, plus one or more inks other than C or M or Y or K. In addition, the measurement file should not contain two inks 200% overlays other than M + Y, C + Y and/or C + M. (Because spot colors are not used as additional primary colors for expanding the CMYK color gamut of images.)

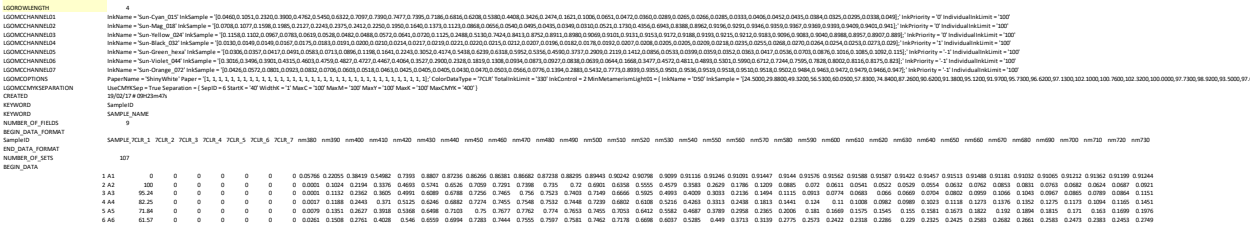
For example, a CMYK print with Green, Violet and Orange used as spot colors: The only 200% inks overlays in the file are those of the CMYK base:



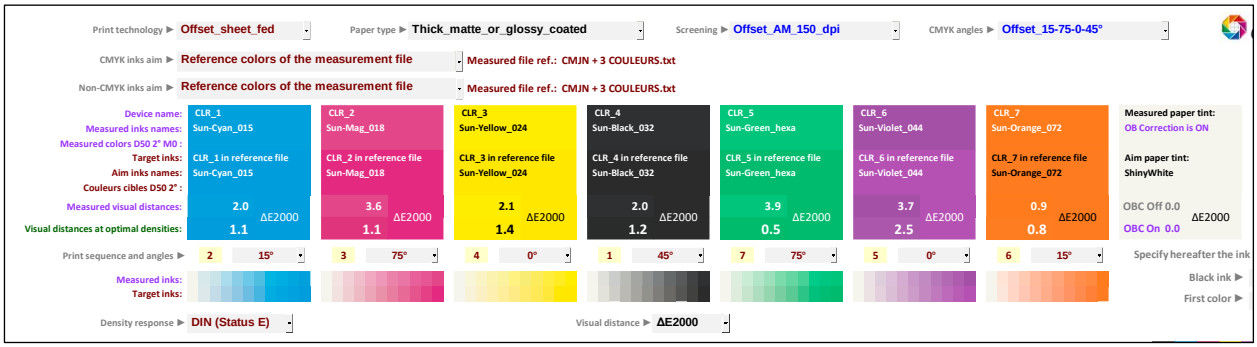


The **"CMYK inks aim"** drop-down menu allows same choices as for CMYK prints without spot colors, plus choosing of the CMYK aim colors named **"Reference colors of the measurement file**".

These **reference colors of the measurement file** are initially present in the header of the measured chart's text reference file, in form of colorimetric or spectral data; and then they are copied into the header of all measurement files made with using this reference file:



For example, in above spectral measurement file's header, the ink's name and its 36 bands spectral reference values are specified for each of the 7 inks: **MagicPrepress** allows you choosing these reference values as aim colors (For CMYK inks and/or non-CMYK inks):



Warning: "**Reference colors of the measurement file"** specifies for aim colors, optional information, which are not often accurate nor even present in the measurement file. This information is often only intended for approximate color display (for example when using **MeasureTool**) of the chart's CGATS reference file. (That contain no color measurements, but only the device specifications of each chart's color patch). **So that using "Reference colors of the measurement file" for CMYK and/or non-CMYK aim inks is only reliable when you build yourself your own reference file and according printable chart**.

The **"Non-CMYK inks aim"** drop-down menu allows you choosing for the non-CMYK inks:

1. Either aim colors and TVI curves specified by the measurement file of a reference print ("**Fingerprint** of a press"). The reference print measurement file must be imported into the Fingerprint tab and should preferably contain the measurement of the same color chart or control bar measured on several reference printed copies, so as to specify the **Fingerprint** aim by the average measurement of a reference print run, and not by measuring a single copy.

   Note that if a non-CMYK ink of the press measurement file is not found by **MagicPrepress** in the "**Fingerprint**" measurement file, **MagicPrepress** chooses as aim color the nearest ink found in the InksLib inks library. Since the aim ink is absent from the **Fingerprint**, choosing manually its aim TVI curve is necessary.

2. Either aim colors and TVI curves by specifying manually each aim ink chosen from the InksLib library, plus its aim TVI curve.

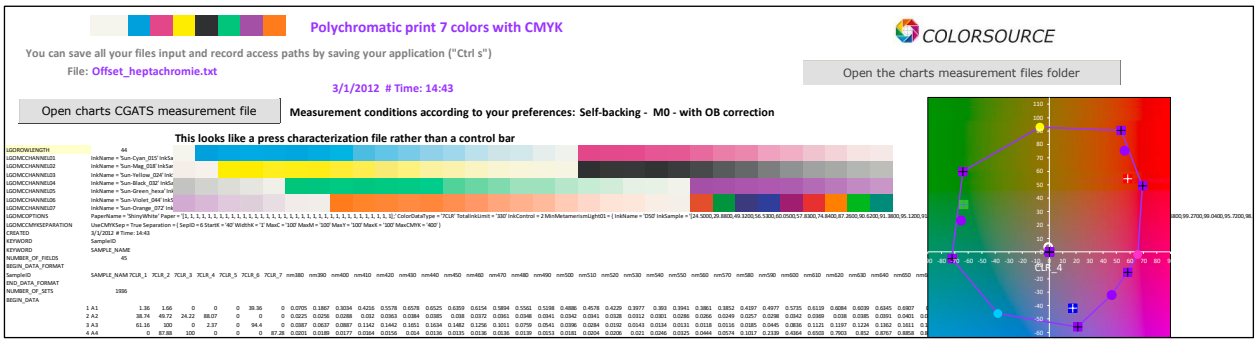
3. Either by choosing **"Reference colors of the measurement file**" as for CMYK inks, and with the same precautions to be taken.

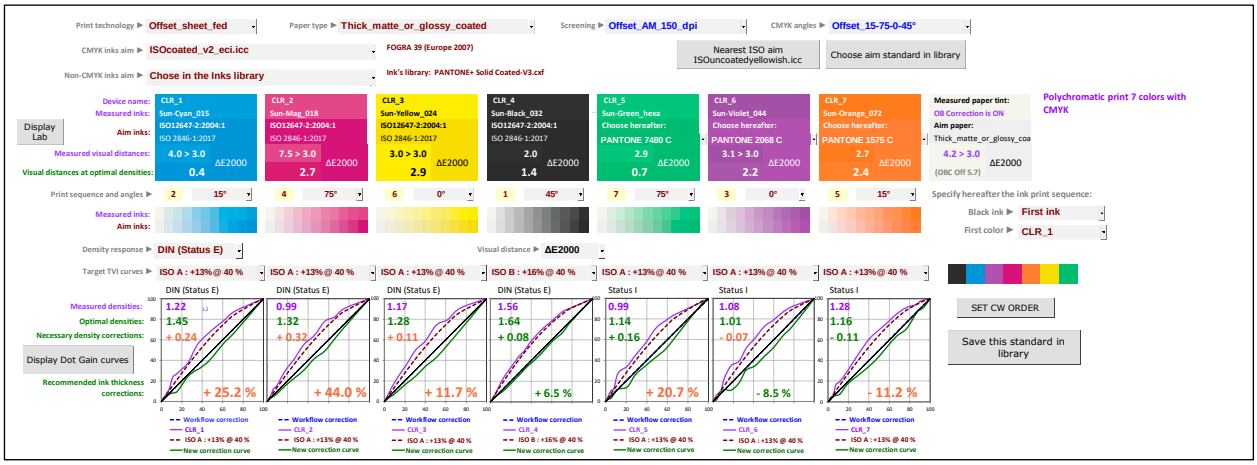
Using AimStandard tab with measurement files of N-Colors prints with CMYK base:

Using the **"CMYK inks aim"** and "**Non-CMYK inks aim"** menus is the same for **N-Colors prints with CMYK base** and for **CMYK prints with spot color(s**).

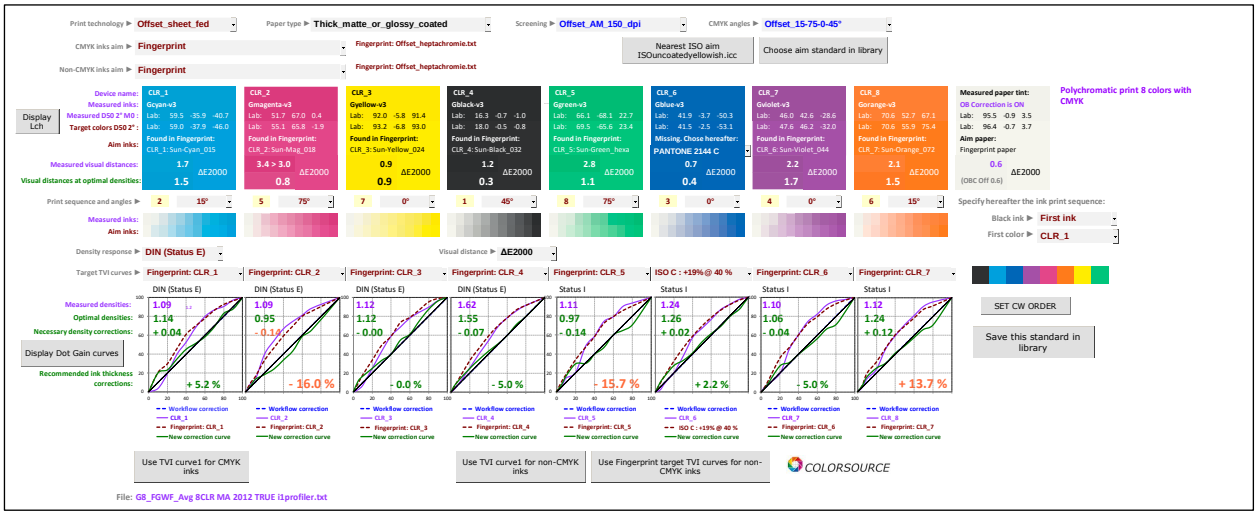
As a reminder, will be considered as **N-Colors prints with CMYK base**, any measurement file containing at least one C or M or Y or K ink, plus one or more inks other than CMYK, and containing one or more two inks 200% overlays other than M + Y, C + Y and C + M. (Non-CMYK process inks are used as additional primary colors for expanding the CMY press color gamut)

For example, a 7-color Multicolor print with CMYK base:





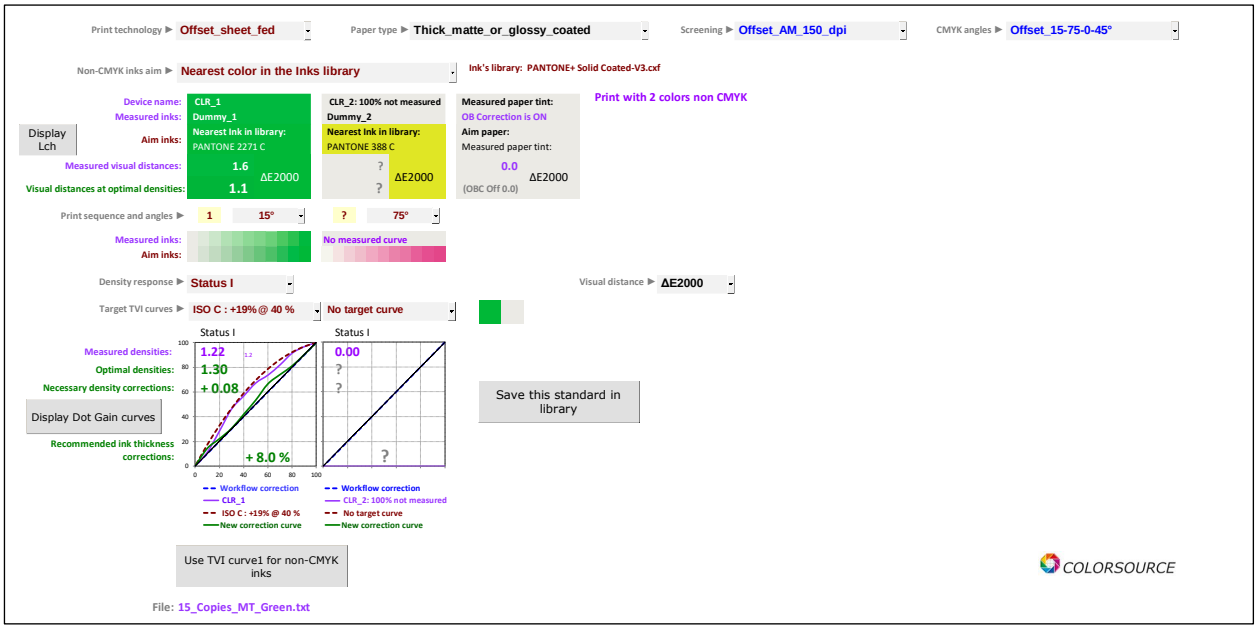
For example, an 8-color Multicolor print with CMYK base:

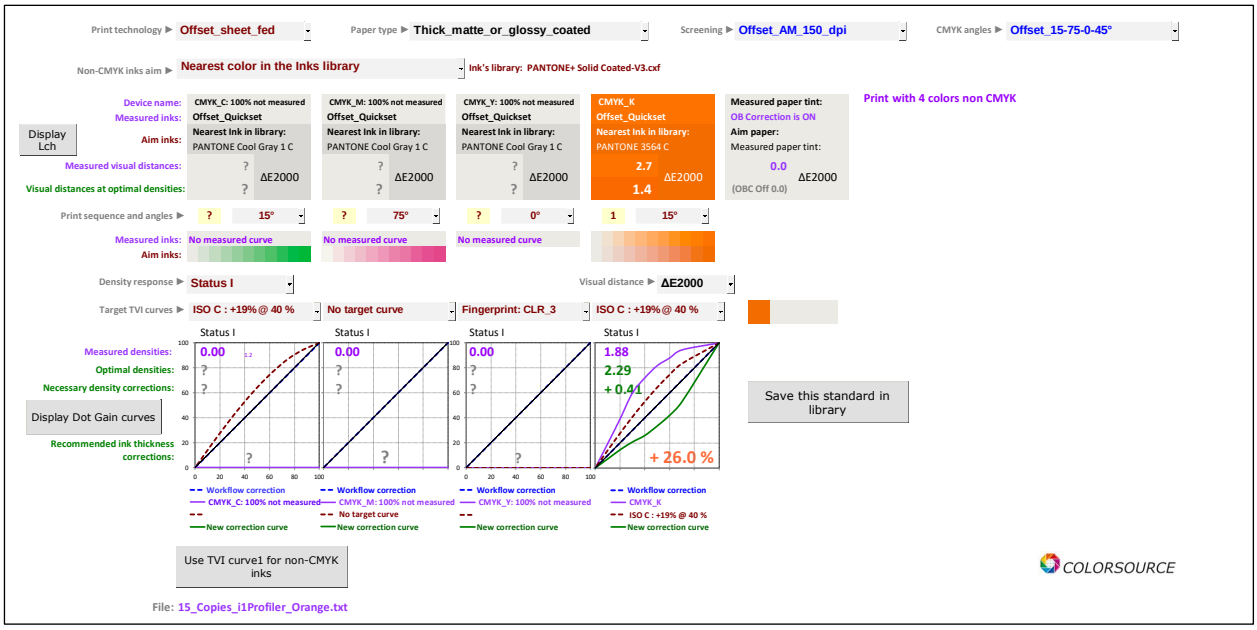


Using AimStandard tab with measurement files of N-Colors prints without a CMYK base:

If no Cyan or Magenta or Yellow or Black ink is found in a measurement file, only the **"Non-CMYK inks aim"** drop-down menu is present, allowing to choose:

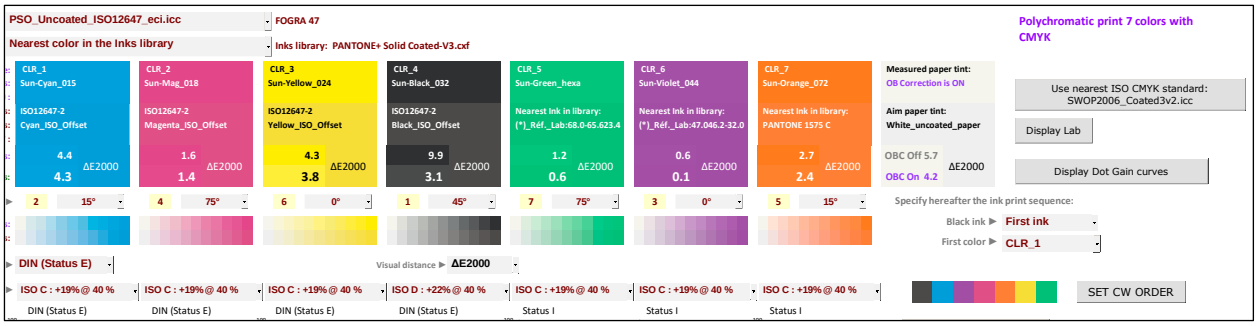
- Either a "**Fingerprint**" reference print,
- Or choose each non-CMYK aim ink from the InksLib library,
- Or choose the **Reference colors of the measurement file**, if these values can be relied.

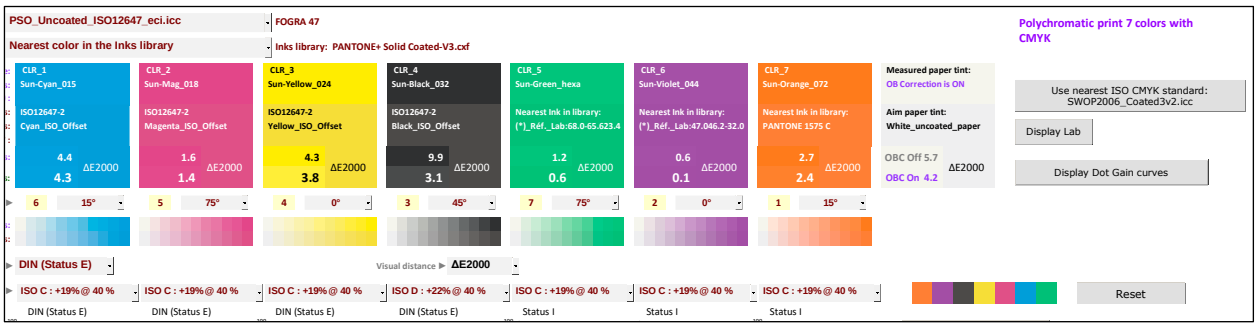




Declaring the inks print order in AimStandard tab:

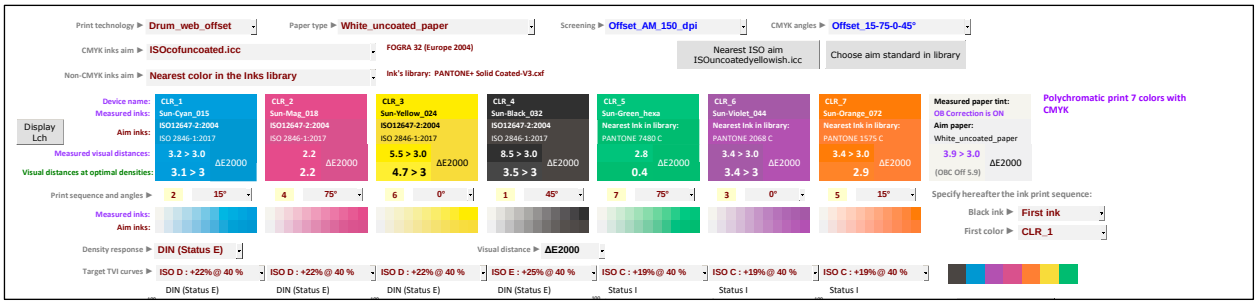
MagicPrepress allows you declaring freely the inks print sequence for any conventional printing process: Simply type the print order number under each ink, as shown below:





MagicPrepress also offers by default a method that is particularly useful for "wet on wet" printing technologies, for optimizing the inks print order settings:

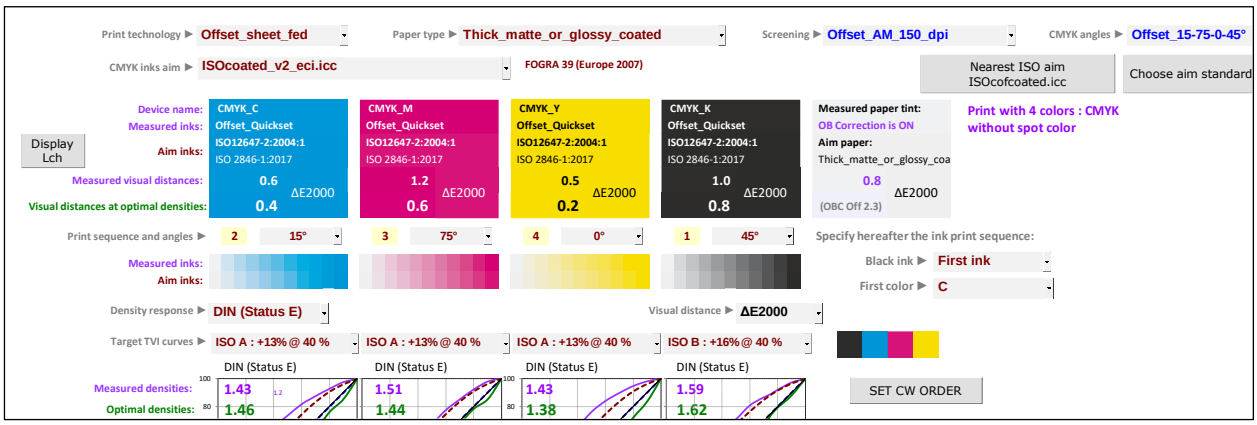
- The darkest ink of the print process may be chosen as the first or last ink in the sequence.
- The other inks are sorted by tint angle, in clockwise order (**CW** for **Clock Wise**), or in the opposite direction (**CCW** for **Counter Clock Wise**), and you only need declaring the first applied ink (other than the darkest ink):



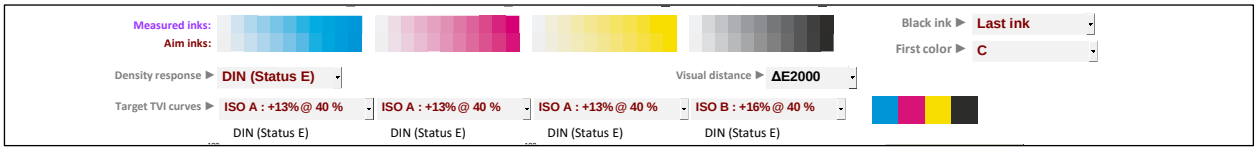
This way of choosing the inks' print order ensures that pollution of an ink pot on an offset press by the previous laid ink, does not have too bad consequences on the printed colors.

Important note: However, make sure that the inks' formulation gives them appropriate surface tensions ensuring that they can properly overlay on each other in the chosen print sequence.

Remind that ISO 12647-x print standards specify KCMY print order as follows:

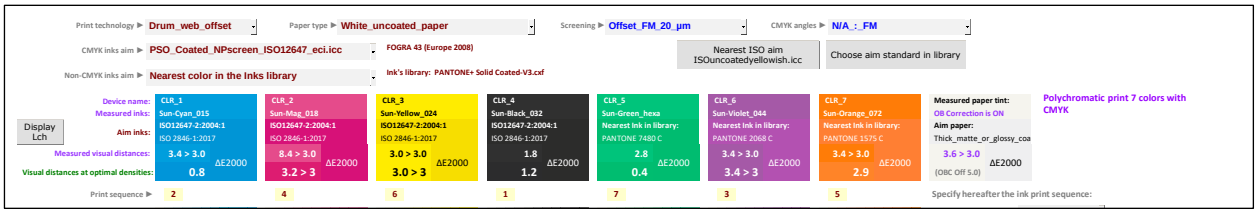


It is quite possible using black ink last, but this requires using a special yellow ink (Yellow for third group) that can support the overlaid black ink:



Declaring screen angles in AimStandard tab:

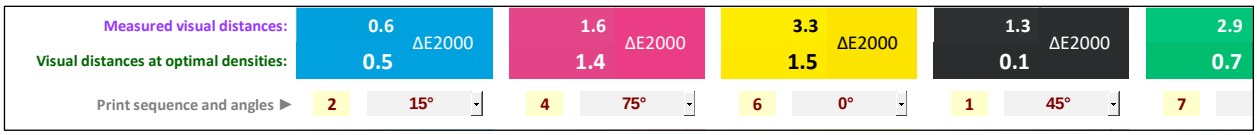
If you declare using stochastic screening (**FM** must appear in the screening name specified in the Admin tab), **MagicPrepress** of course does not offer choosing screen angles:



If declaring classic or hybrid screen, **MagicPrepress** offers choosing among the CMYK screen angles that have been declared in the Admin tab for the declared screening:

For example, for an AM 175 dpi Offset screening (dots per inch):

The four angles shown in the **"CMYK Angles"** drop-down menu will be assigned respectively to the C, M, Y and K inks, if present:

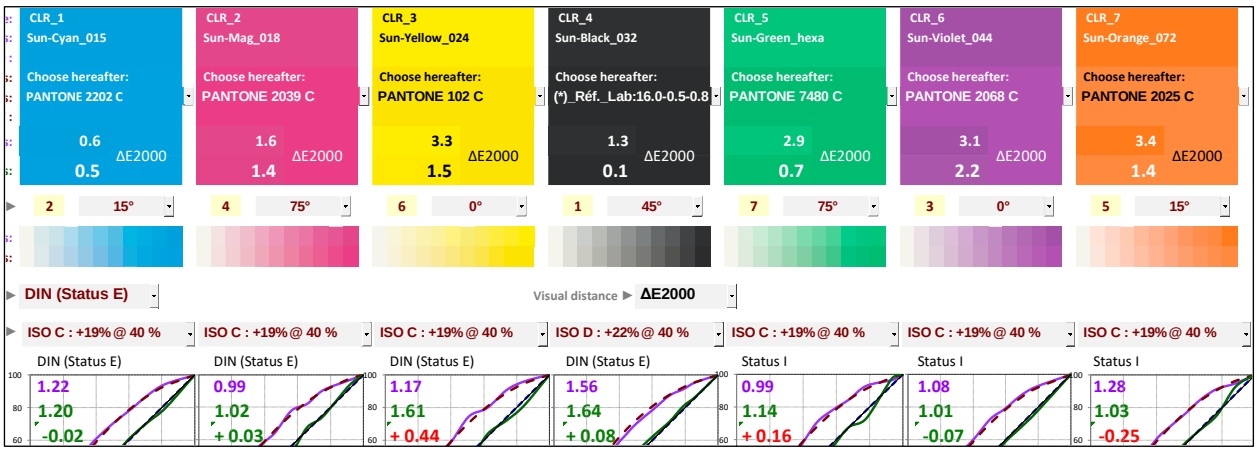


Automatic allocation of screen angles to the non-CMYK inks for N-Colors prints:

The logic consists into assigning the screen angle of each of the CMY primaries to the non-CMYK ink whose color is roughly complementary.

Indeed, if a multicolor separation is done properly, two inks with complementary colors will hardly ever be printed in the same location, and therefore, using the same screen angle for complementary color inks is safe.

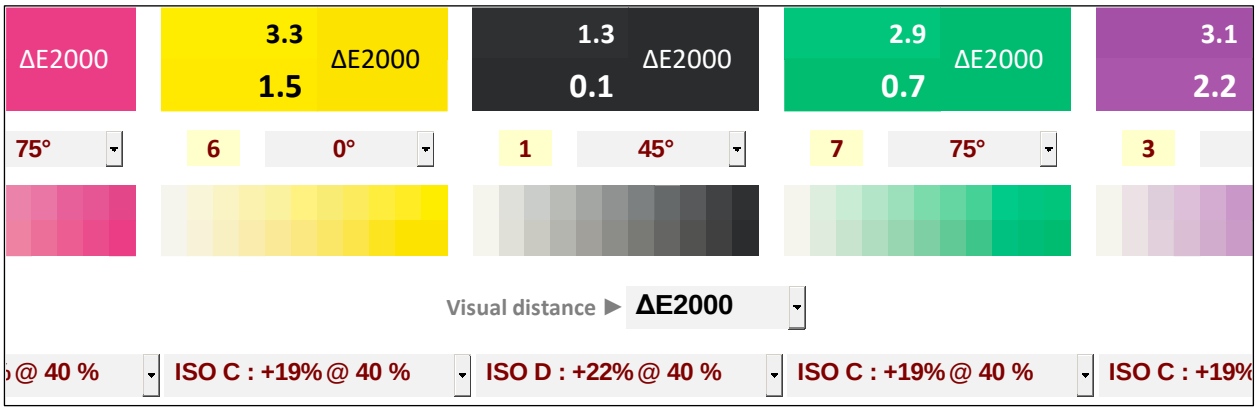
For example, for the following 7 colors production standard (Multicolor with 7 Colors):



- The 0-degree angle is used for Yellow and Violet,
- The 15-degree angle is used for Cyan and Orange,
- The 75-degree angle is used for Magenta and Green.

This is not an exact science, so it keeps possible modifying these choices manually; but at least **MagicPrepress** provides you, by default and automatically, with reasonable and relevant screening recommendations.

Choosing the visual distance estimation formula in AimStandard tab:



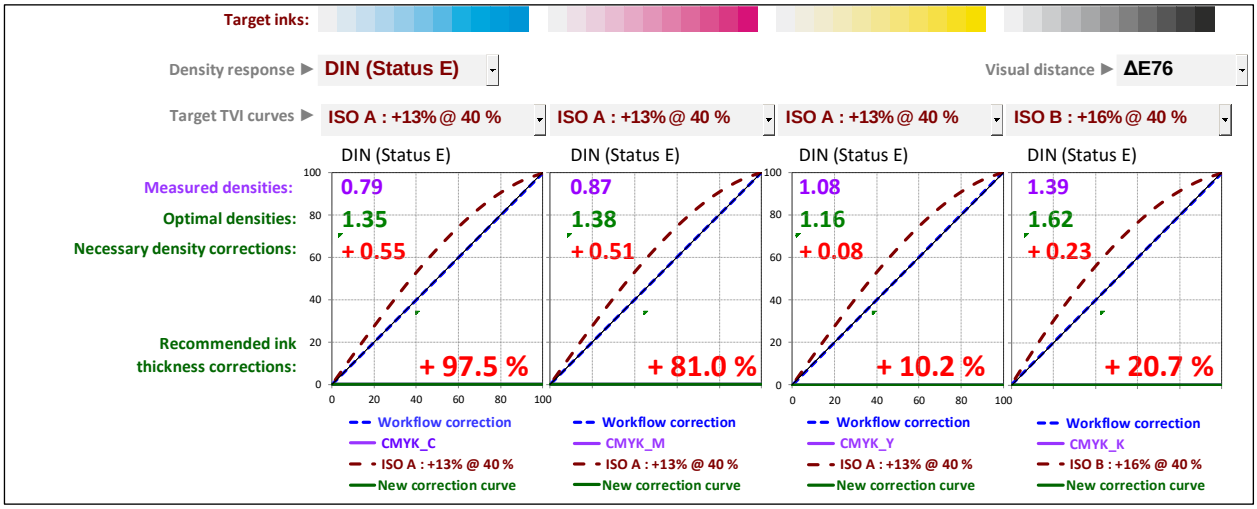
The best formula for estimating the perceived visual distance between two $L_1a_1b_1$ and $L_2a_2b_2$ colors is undoubtedly the **ΔE2000** formula to date. We therefore recommend that you use **ΔE2000** in all circumstances, for estimating the perceived color differences in the way that best matches human visual perception.

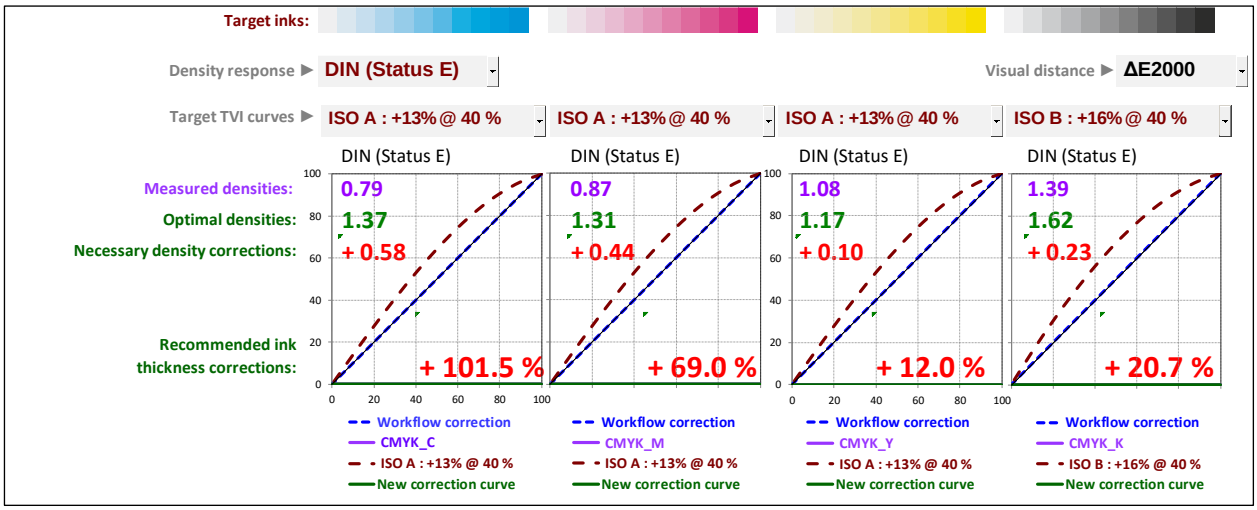
However, **ISO 12647-x** stipulates using the completely obsolete **ΔE76** visual distance, and in addition some Industrial Print Buyers or Print Producers use in-house different visual distance assessment formulas such as **ΔECMC2:1**, significantly better than **ΔE76** before ΔE2000 was available.

For this reason, in addition to **ΔE2000**, **MagicPrepress** offers you choosing, **ΔE76**, **ΔE94**, **ΔECMC2:1** and **ΔECMC1:1** visual distance estimation formula.

Note that your **ΔE** formula choice will influence **MagicPrepress** optimal print densities recommendations:

For example, the optimal density for Magenta ink is worth **1.38** for minimizing its **ΔE76** visual distance with the **Fogra39** Magenta color, but is worth **1.31** for minimizing its **ΔE2000** visual distance:

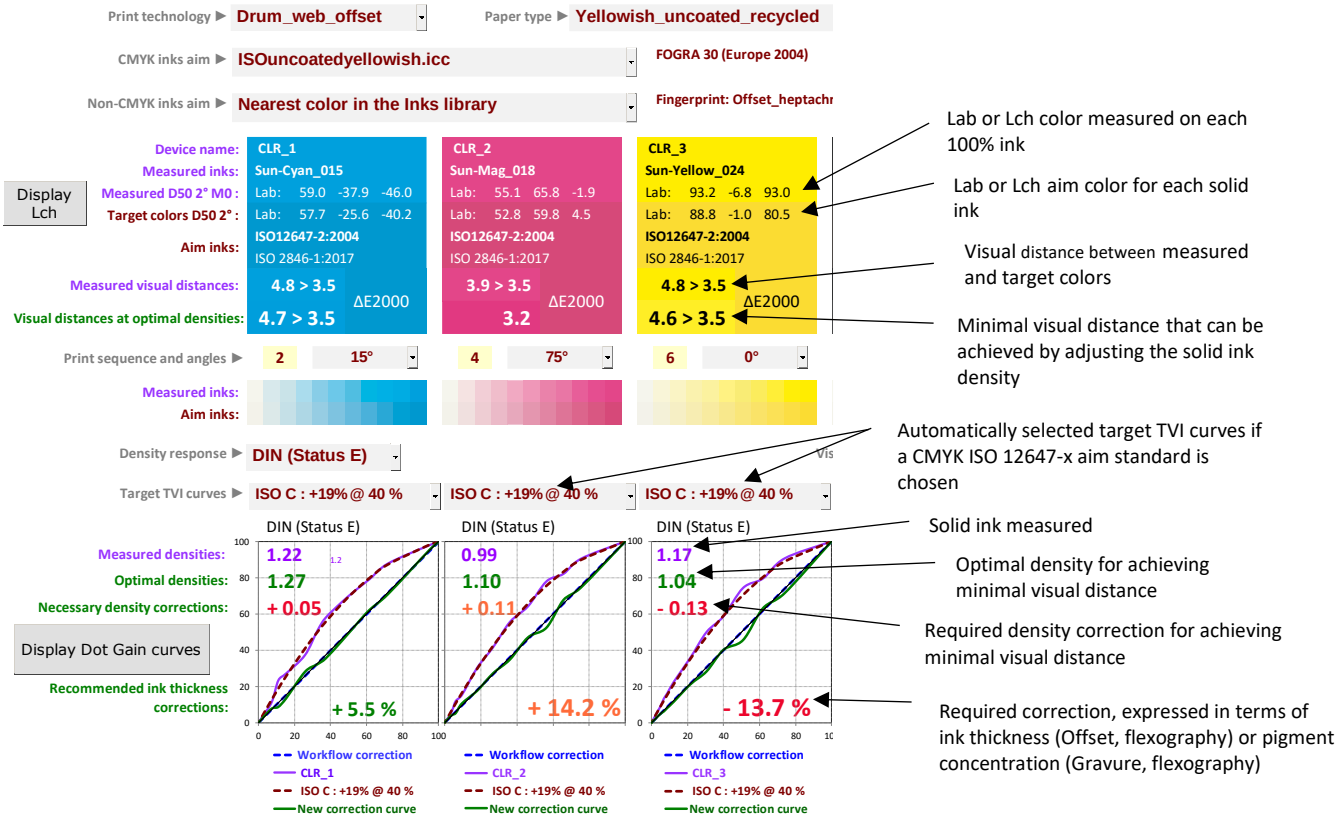




When a production color standard is recorded in StdLib, the chosen visual distance formula is recorded as the default formula for this standard, but it keeps possible changing it when using this recorded standard.

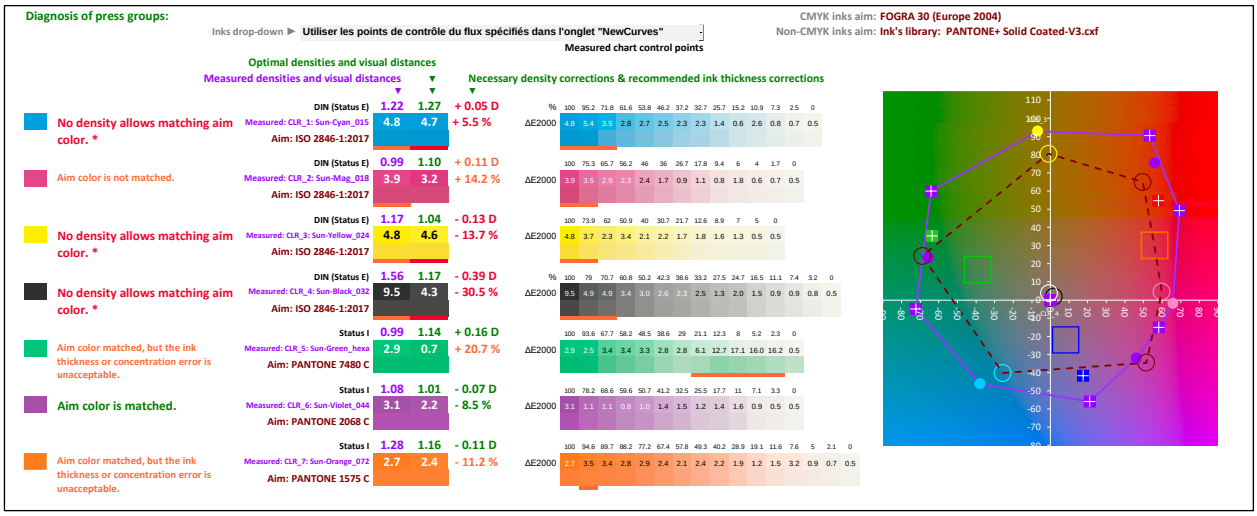
Results displayed by AimStandard tab:

Based on the parameters specified for each aim printing standard, the AimStandard tab displays the main results for assessing the quality of the average measured print run, compared with the specified aim. For this reason, the measurement file should contain several press calibration bars measured on several printed copies. All results are displayed immediately, based on the print run measurement and the target color and TVI curve chosen for each ink:

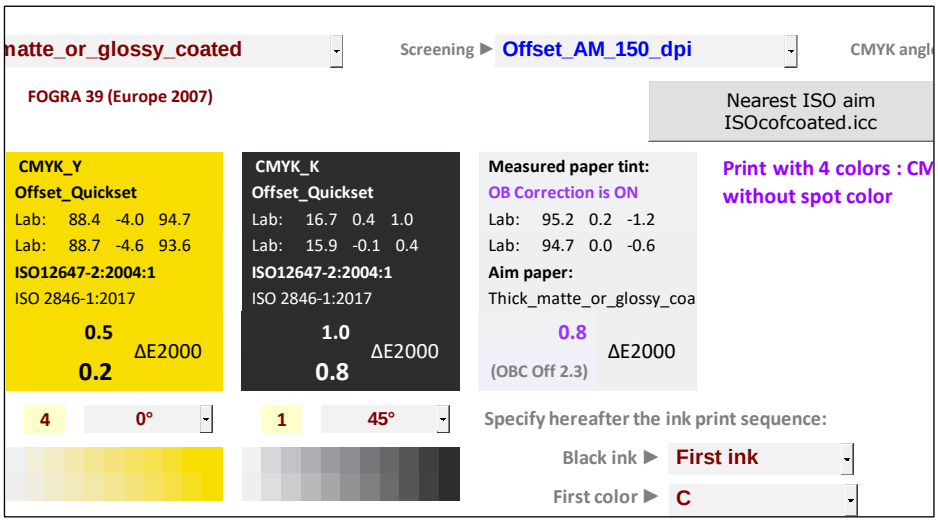


On above example, we see that the measured offset print run cannot be used for computing good CMYK correction curves if the chosen CMYK aim is **Fogra30**: Of course, this should not happen when the press' inks' densities have been properly set using **MagicPress** application: MagicPrepress should confirm each density is close to optimal, when averaging the measured press calibration strip measured on a few copies.

In this scope, the Expertise tab provides ink-by-ink assistance for interpreting the results:



Paper tint display in AimStandard tab:



MagicPrepress can compute C.I.E. Lab colors (Apparent colors compared in D50 lighting with 2 degrees viewing angle (i.e., C.I.E. 1931 average observer), as specified by I.C.C. and ISO 12647), **in two different ways**:

- **WITHOUT OBC** (**Optical Brighteners Correction**): In this case, the important influence of the paper tint on our perception of printed colors, and the paper tint itself, is not taken into account. And this is a deep mistake (unfortunately committed for the establishment of the recent ISO 12647-2 **Fogra51** and **Fogra52** standards!),
- **WITH OBC** (**Optical Brighteners Correction**): In this case, the important influence of the paper tint on our perception of printed and paper colors is duly taken into account.

The choice of computing with or without optical brighteners correction is offered in the Prefs. tab:

We recommend that you always use Optical Brighteners' Correction, which will allow MagicPrepress providing you with the best results, thanks to a much more accurate calculation of the Lab colors as actually perceived on the measured prints.

About these issues, we recommend you to read our updated article on ISO 12647 standards at link:

https://www.color-source.net/en/Docs_Formation/2015_POINT_ABOUT_ISO_12647_STANDARDS.pdf

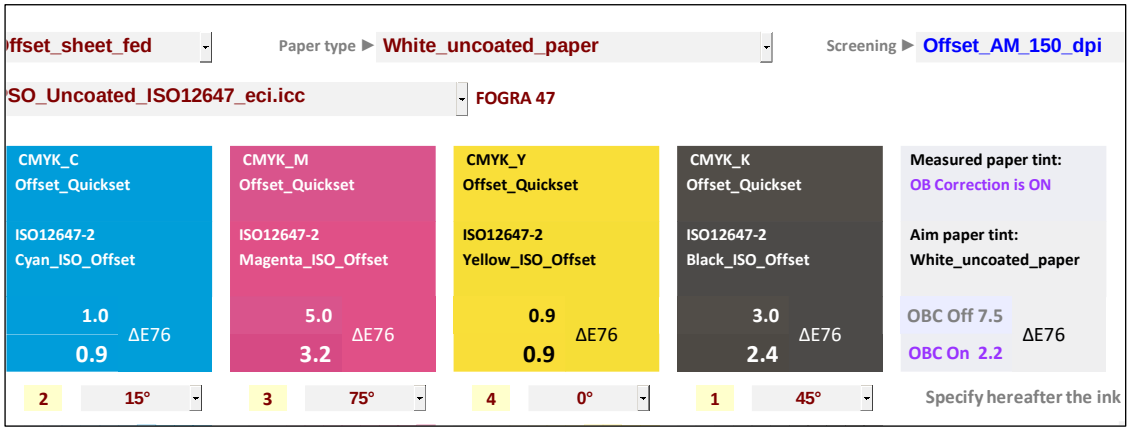
From page 16, paragraph 4), it explains the scope of optical brighteners' correction and its operating principle, **as well as the basic errors made for establishing the Fogra 51** and **Fogra 52** standards: These mistakes had not been made for establishing the **Fogra 39** and **Fogra 47** standards.

Note that **MagicPrepress** corrects the errors of the published in the **Fogra 51** and **Fogra 52** aim colors, and thus makes these ISO12647-2 CMYK aims usable. As demonstrated in our paper, however, **Fogra 51** and **Fogra 52** do not bring any advantage over the older **Fogra 39** and **Fogra 47** profiles, so that you may prefer using the older **Fogra 39** and **47** for your color separation and press calibration.

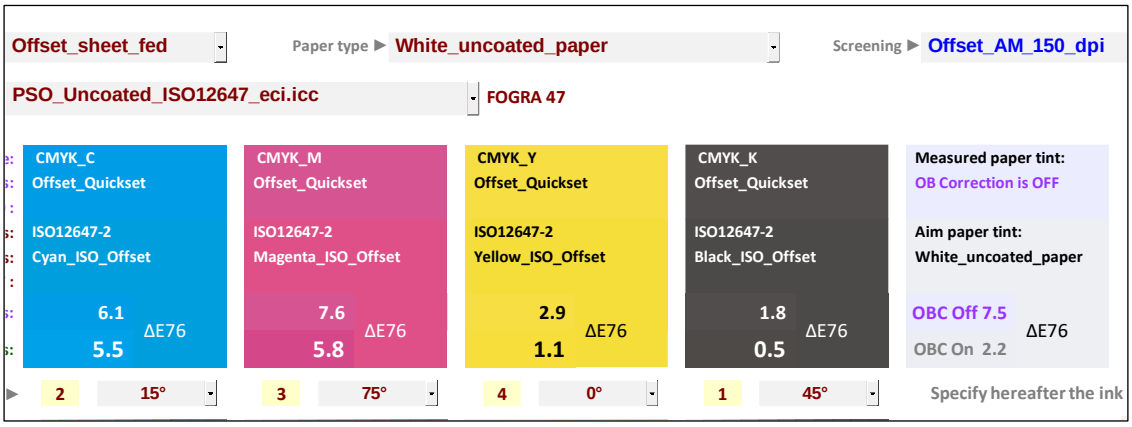
Illustrating the benefits of optical brighteners' correction:

Sample offset printing on high-quality white uncoated white paper: **Active optical brighteners correction** shows below that the visual distance between ISO (**Fogra 47**) and measured paper tint is **2.2** ΔE2000 but that without optical brighteners correction the visual distance would be **7.5** ΔE2000: we would measure a blue paper, which does not match the paper tint we perceived.

With optical brighteners correction **enabled**:



With optical brighteners correction **disabled**: the paper is measured far too blue!



The optical brighteners' correction allows a more realistic calculation of the CIE Lab apparent colors of paper and inks. Using or not optical brighteners correction for computing the C.I.E. Lab colors is therefore part of the specifications of any color printing standard. The "**Optical brightener's Correction**" choice in the Prefs. tab. active or not is therefore recorded in StdLib with all other characteristics of any production standard.

The "Save this standard in library" button in AimStandard tab:

The AimStandard tab allows you specifying all the parameters of any public or private print production standard that you wish to match, and/or communicate to the repro houses or other print sites.

The "**Save this standard in library**" button allows you saving any color printing standard in the StdLib tab.

Of course, the main parameters for specifying a production print standard are:

- The **aim color for each 100% ink**, specified by colorimetric or spectral values,
- The **aim TVI curve** for each ink,
- The **densitometric spectral response** used for calculating the TVI curves,
- The **aim colors of the ink's overlays of interest**, specifically for the "wet on wet" printing processes,

The following parameters must also be recorded with the specifications of the registered standard:

- **The inks' print sequence**, which may significantly influence the printed color,
- **Using or not optical brighteners' correction**, for computing the measured and target C.I.E. Lab colors. (We recommend always using optical brighteners' correction).

Other printing parameters such as **screening type AM or FM**, **AM screen dots periodicity** and **AM screen angles** also influence significantly the press' color rendering, but these printing parameters do not always need being specified by the aim color printing standard:

- Using **periodic** (**AM**) or **stochastic** (**FM**) screening may require creating two different aim standards:

  For example, ISO12647-2 distinguishes offset prints on **thick matte or glossy paper** depending on whether the screening is **periodic** or **stochastic**, and offset prints on **uncoated white paper** depending on whether the screening is **periodic** or **stochastic**.

- On another hand, when you use classic **periodic** screening:

  The **screen dots periodicity** greatly influences the press's dot gain, and thus its chromatic response. But specifying one color standard per paper type is enough, since an appropriate set of correction curves will allow matching the aim TVI curves specified by this standard, for any chosen screen dots periodicity.

  In other words, **a single aim standard** (**e.g.**, **Fogra 39**) **is enough for all offset prints on thick matte or glossy paper**, **regardless of the screen dots periodicity of classic** (**AM or hybrid**) **screening**.

As a consequence, in order not to record in StdLib library many copies of a same print standard specifying the same press' color response, **MagicPrepress** records with each standard some parameters as being only "**Default parameters**", the change of which will not result into creating and recording a new standard:

- The **default print technology** is the default printing technology for which the standard was originally created, but, for example, same standard can often be valid for both sheet-fed and drum web offset print technologies.
- The **default paper type** is the default type of paper on which the standard was originally created,
- The **default screening** is the default type of screening with which the standard was originally created,
- The **screen angles** are the default screen angles with which the standard was originally created.

If one of above **"default parameters"** is changed, which is a typical parameter recorded for purely informational purpose, a user's request for re-registering this standard will only propose updating the default parameter(s) that the user have changed.

Above default parameters are not really necessary for specifying a print standard. But accurate specification on these parameters is compulsory for recording and/or using a set of correction curves allowing to match this print standard on a specific printing press: For a same print production color standard recorded in StdLib, one or more sets of correction curves will be computed and recorded, for each press of the print shop:

For example, for the same popular ISO12647-2 **Fogra 47** standard for uncoated white paper, two sets of correction curves may be recorded, for each offset press of a print shop:

- One set for a **web offset press when using 150 dpi screening**,
- One set for the **same web offset press when using 135 dpi screening**,
- One set for a **sheet fed offset press when using 150 dpi screening**,
- One set for the same **sheet fed offset press when using stochastic screening**.

The default parameters that are recorded in the **standards library** only as being typical parameters for Fogra47 standard (Print techno., paper type, screening and screen angles), should be recorded in the **correction curves library** with their exact values with each correction curve's set, each of these correction curve's set being associated to a specific press used with specific screening parameters.

The "Choose aim standard in library" button in AimStandard tab:

This button is present if the StdLib Library contains at least one standard that could be used as a target for the current press' linearization measurement file.

Note that a print production color standard stored in StdLib may be chosen:

- Either directly by using the **" Choose aim standard in library"** button,
- Either by selecting, in the DeclareCurves tab, a correction curve's set from the CurvesLib library, **which automatically selects the aim standard associated with the chosen correction curve's set**.

The "Unfreeze all settings" button in AimStandard tab:

For cancelling an aim standard selected from StdLib library and switch back to **MagicPrepress** manual aim settings, you need pressing the "**Unfreeze all settings**" button in the AimStandard tab – or open a new measurement file.

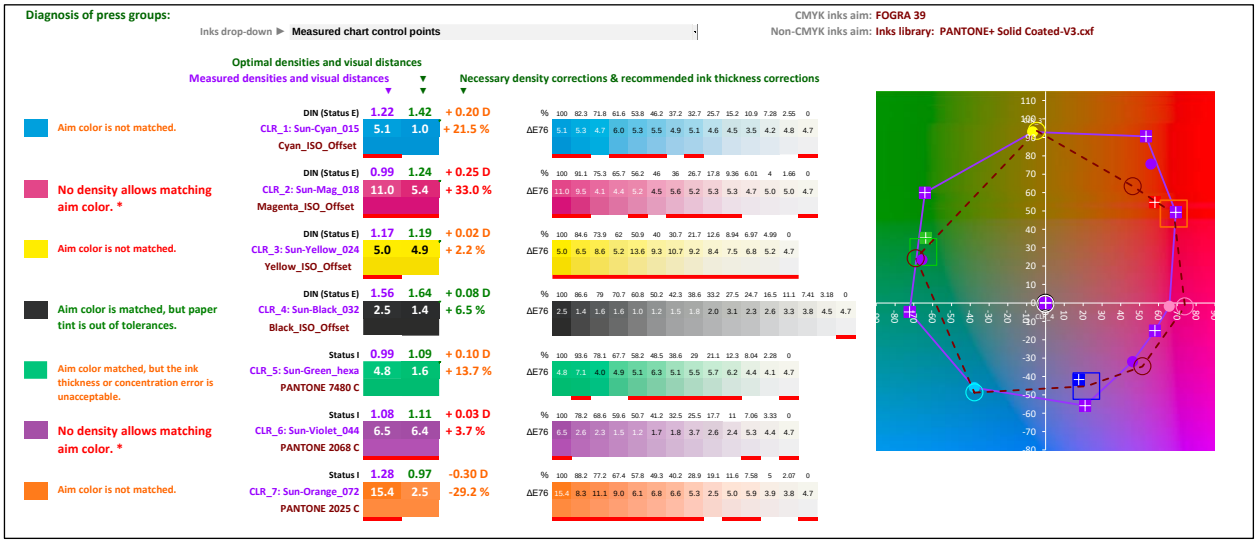
Expertise tab:

Diagnosis for each printed ink in Expertise tab:

This tab allows doublechecking that the measured print run actually allows computing reliable correction curves. Indeed, the most common mistake is programming the production workflow with correction curves computed by measuring print runs produced with bad solid inks densities.

For example, if you lay down too much offset Cyan ink, you will measure an abnormally high dot gain, and therefore the computed cyan correction curve will not produce good prints with the lower Cyan density optimizing Cyan solid color compliance with the Cyan aim color.

Here is an example of a diagnosis for an offset print run:



On this example, we see that the aim **green ink color** is reached in tolerances (**4.8** ΔE76 < **5.0** ΔE76), but with an abnormally low green ink density: **0.99** instead of recommended **1.09**. The green ink thickness should therefore be increased by **13.7**%, which would lead to higher dot gain.

Matching the standard's target colors within the visual distance tolerance is therefore not enough: **Aim colors should be matched with an ink thickness close enough to the optimal thickness**.

Note: Above diagnosis, made using **ΔE76** visual distance, will be different when you choose ΔE2000 visual distance as we recommend.

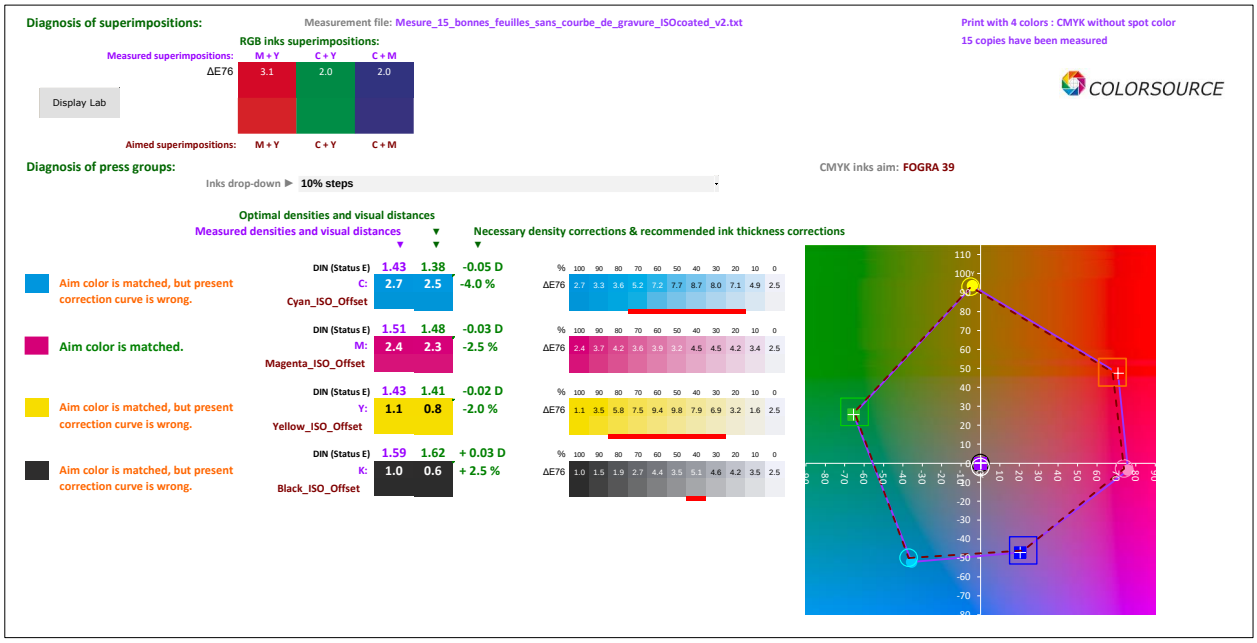
In summary, each ink can be diagnosed as follows:

- **Aim color is matched** (Within tolerances): All is OK on this ink (Solid ink and ink% steps).
- **Aim color matched**, **but the ink thickness or concentration error is unacceptable**: The correction curve calculated for this ink is not very reliable ***since it is printed too far from the optimal ink density, despite being within visual distance tolerance***.
- **Aim color is matched**, **but present correction curve is wrong**: Nothing abnormal if you have measured a test print run that does not use yet the appropriate correction curve for this ink.
- **Aim color is not matched**: the solid ink's thickness or concentration is wrong,
- **No density allows matching aim color**: The ink's formulation is bad, or the ink is dirty, or the print media is not adapted for the current selected aim standard, so that no density will allow matching the aim color within current specified tolerances,
- **Aim color is matched**, **but paper tint is out of tolerances**: Not necessarily a big problem in practice, but good to know. Often occurs when measuring uncoated white paper with OBC correction OFF.

Example of a diagnosis of an offset test print run in the Expertise tab:

The following view shows the diagnosis computed from the average measurement (15 copies measured) of a calibration print run on thick coated paper using classic 175 dpi screening (Fogra 39 aim colors), made without applying any correction curves on the workflow. The visual distance chosen for the diagnosis is ΔE76 according to ISO12647-2 specifications, but we recommend using ΔE2000 in practice.

The aim color is reached for each ink with a print density close to ideal (maximal ink thickness error is **5.2**%). The color differences found on the C, M, Y and K % steps are normal, because no correction curves are applied yet, at this stage. Thanks to the quality of this calibration print run, we can fully trust the correction curves computed by **MagicPrepress**, which are displayed in the NewCurves tab.



Display of visual distances on the overlays of interest:

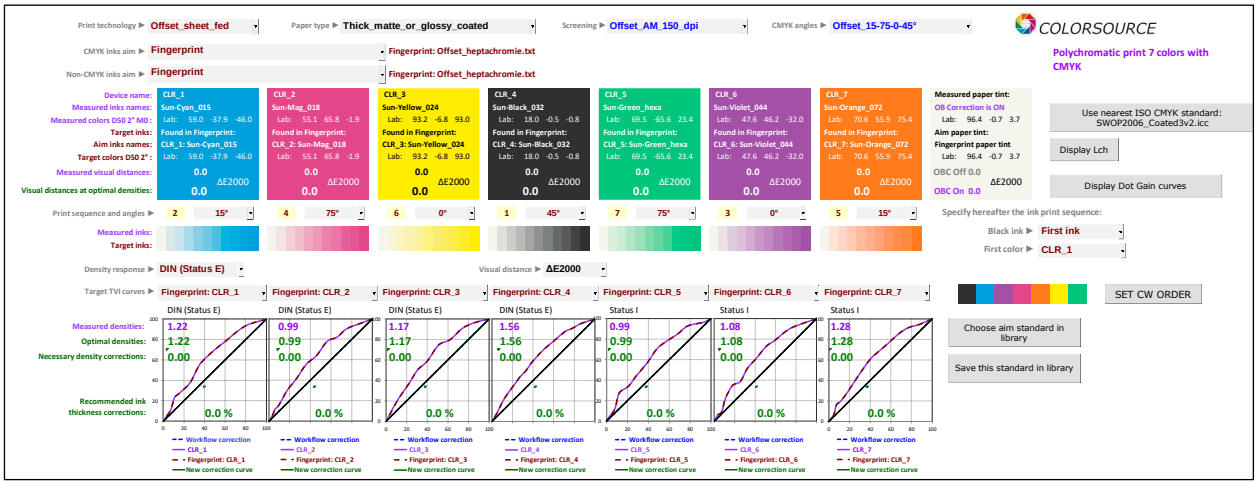
We call **"overlays of interest"** the two-by-two primary 200% inks overlays sorted by tint angle. For example:

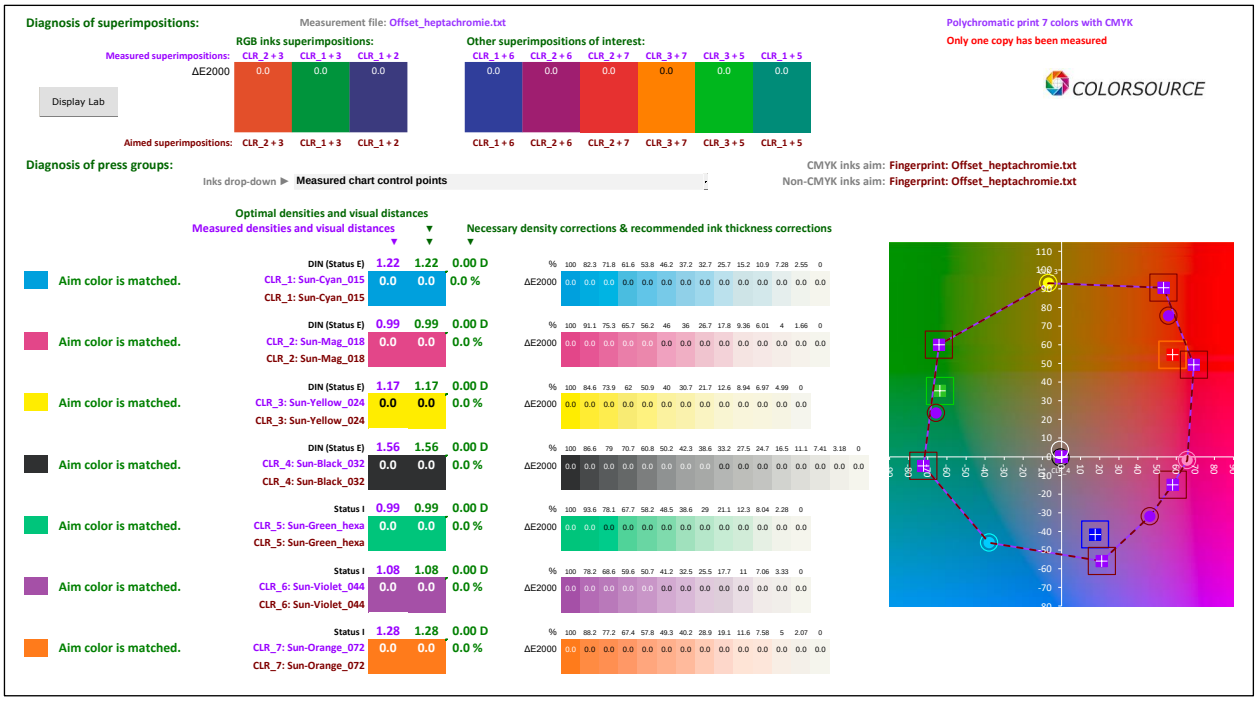
1. For a CMYK four-color print: **M + Y**, **C + Y**, **C + M**,
2. For a multicolor print with CMYK base + Green, Violet, Orange:
   - **M + Y**, **C + Y**, **C + M** (Classic inks overlays of the CMY base),
   - **M + Orange**, **Orange + Y**, **Y + Green**, **Green + C**, **C + Violet**, **Violet + M**.

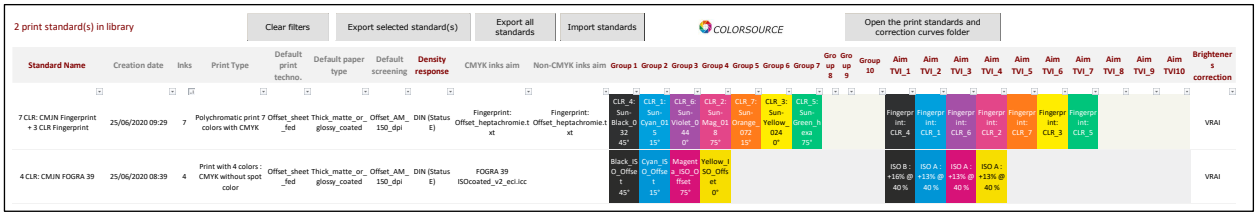
The Expertise tab displays visual discrepancies between "**measured overlays**" and the "**aim overlays**", when the colors of the aim standard's inks' overlays are known.

- If the chosen aim an ISO12647-x standard for CMYK inks, the aim colors for the **M + Y**, **C + Y**, **C + M** aim overlays' colors are known, because they are specified by each ISO12647-x standard.
- On the other hand, when creating a Multicolor standard with an ISO CMYK base, the aim colors of the overlays of interest other than **M + Y**, **C + Y**, **C + M** can only be specified by printing a reference multicolor test form for this standard, which will be used as a **Fingerprint**. The **Fingerprint** is chosen as the aim for both CMYK and non-CMYK inks, and then recorded, with all overlays of interest' colors, as a new standard in the StdLib Library.

Below is the average measurement of ten 7-Colors characterization charts printed on an offset press. We can open this 7-Colors press characterization average spectral measurement file **both as Measured file and Fingerprint file**. This allows saving the 7 colors standard in StdLib with all appropriate aim data including the overlays of interest.







NewCurves tab:

This tab shows each ink's correction curve to be programmed into the workflow, taking into account the existing correction curve applied by the workflow to the measured print run, the measured copies average TVI curve, and the aim TVI curve specified by the chosen aim standard.

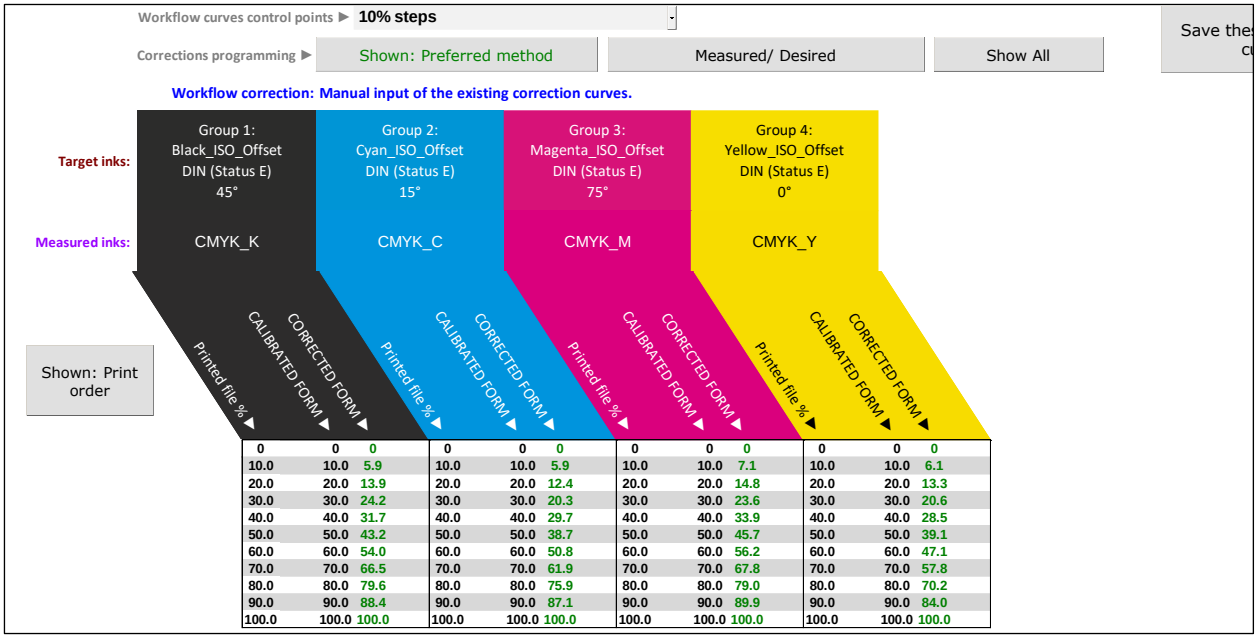
Remember that the computed "**New correction curves**" displayed as **green values** are reliable provided that:

1. The correction curve applied to each ink by the workflow for producing the measured print run was declared to **MagicPrepress** in the DeclareCurves tab,
2. The Expertise tab demonstrates that each solid ink was printed not only within the visual distance tolerance, but also with a density close enough to the optimal density ensuring the minimum possible visual distance. (As a reminder you can print an offset solid yellow ink with the right Lab color but with a huge ink's thickness error making yellow ink's dot gain curve abnormally high).

Under above conditions, the NewCurves tab allows you displaying the best correction values to be programmed in the workflow, and with great flexibility.

Methods for displaying the computed correction curves in NewCurves tab:

Display we recommend for programming your correction curves in the workflow:



Printed file %	CALIBRATED FORM	CORRECTED FORM	Printed file %	CALIBRATED FORM	CORRECTED FORM	Printed file %	CALIBRATED FORM	CORRECTED FORM	Printed file %	CALIBRATED FORM	CORRECTED FORM
0	0	0	0	0	0	0	0	0	0	0	0
10.0	10.0	5.9	10.0	10.0	5.9	10.0	10.0	7.1	10.0	10.0	6.1
20.0	20.0	13.9	20.0	20.0	12.4	20.0	20.0	14.8	20.0	20.0	13.3
30.0	30.0	24.2	30.0	30.0	20.3	30.0	30.0	23.6	30.0	30.0	20.6
40.0	40.0	31.7	40.0	40.0	29.7	40.0	40.0	33.9	40.0	40.0	28.5
50.0	50.0	43.2	50.0	50.0	38.7	50.0	50.0	45.7	50.0	50.0	39.1
60.0	60.0	54.0	60.0	60.0	50.8	60.0	60.0	56.2	60.0	60.0	47.1
70.0	70.0	66.5	70.0	70.0	61.9	70.0	70.0	67.8	70.0	70.0	57.8
80.0	80.0	79.6	80.0	80.0	75.9	80.0	80.0	79.0	80.0	80.0	70.2
90.0	90.0	88.4	90.0	90.0	87.1	90.0	90.0	89.9	90.0	90.0	84.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

We recommend above method for programming your correction curves in your workflow software (Press the **Recommended method** button), since it allows you keeping the same control points programmed in the workflow, and in case of press drift, **it allows easy and fast update of the correction curves by measuring the press calibration strip during commercial production print runs**.

For each ink:

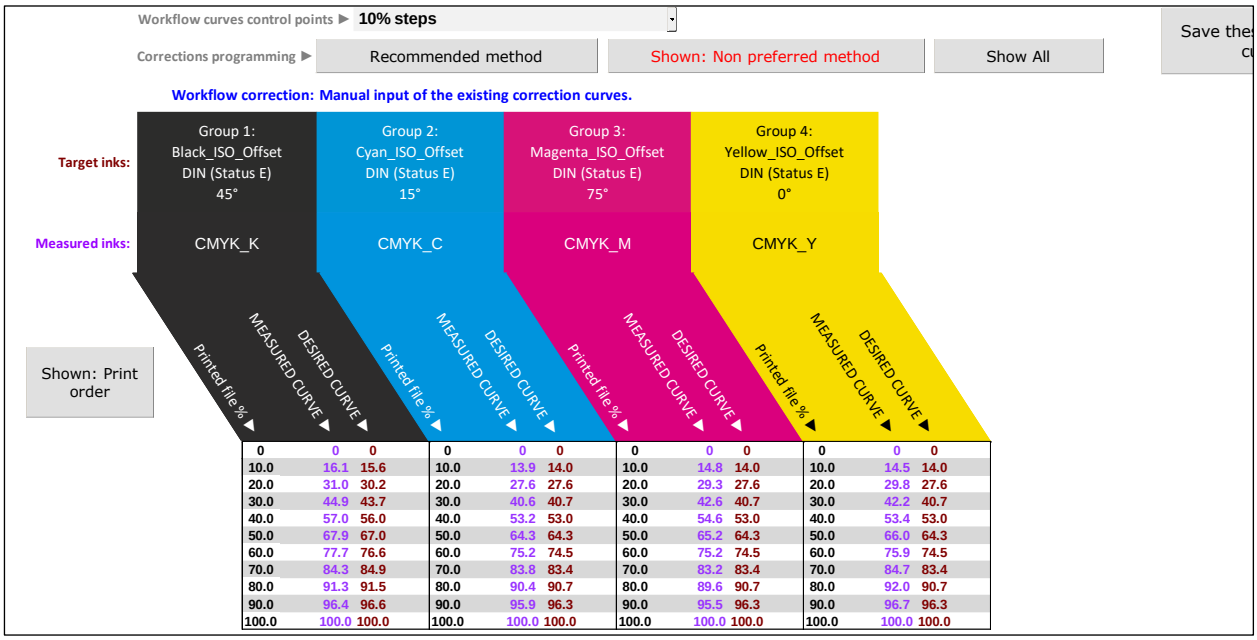
- The **"Measured" column of the workflow** is programmed with the values of the **"CALIBRATED FORM"** column,
- The **"Desired" column of the workflow** is programmed with the values of the **"CORRECTED FORM"** column.

For example, the above **"CALIBRATED FORM"** values were set from 0 to 100% by 10% for all inks. These 10% steps can stay programmed as your "**Measured Values**" in the workflow.

Then, all you need programming the workflow **"Desired Values"** with the "**CORRECTED FORM**" columns displayed as **green values**, which directly specify the values you want to get on each printing form and for each control point.

In case of drift found by measuring a control bar during a commercial print run using these correction curves, it will be enough reprogramming in the workflow the new "**CORRECTED FORM**" values displayed by **MagicPrepress**, as new workflow **"Desired Values"**.

Display of correction curves using the "Measured/ Desired" method:



0	0	0	0	0	0	0	0	0	0	0	0
10.0	16.1	15.6	10.0	13.9	14.0	10.0	14.8	14.0	10.0	14.5	14.0
20.0	31.0	30.2	20.0	27.6	27.6	20.0	29.3	27.6	20.0	29.8	27.6
30.0	44.9	43.7	30.0	40.6	40.7	30.0	42.6	40.7	30.0	42.2	40.7
40.0	57.0	56.0	40.0	53.2	53.0	40.0	54.6	53.0	40.0	53.4	53.0
50.0	67.9	67.0	50.0	64.3	64.3	50.0	65.2	64.3	50.0	66.0	64.3
60.0	77.7	76.6	60.0	75.2	74.5	60.0	75.2	74.5	60.0	75.9	74.5
70.0	84.3	84.9	70.0	83.8	83.4	70.0	83.2	83.4	70.0	84.7	83.4
80.0	91.3	91.5	80.0	90.4	90.7	80.0	89.6	90.7	80.0	92.0	90.7
90.0	96.4	96.6	90.0	95.9	96.3	90.0	95.5	96.3	90.0	96.7	96.3
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Above display is useful **but we do not recommend it for programming correction curves in your workflow software**.

For each ink, the workflow can – also - be programmed as follows:

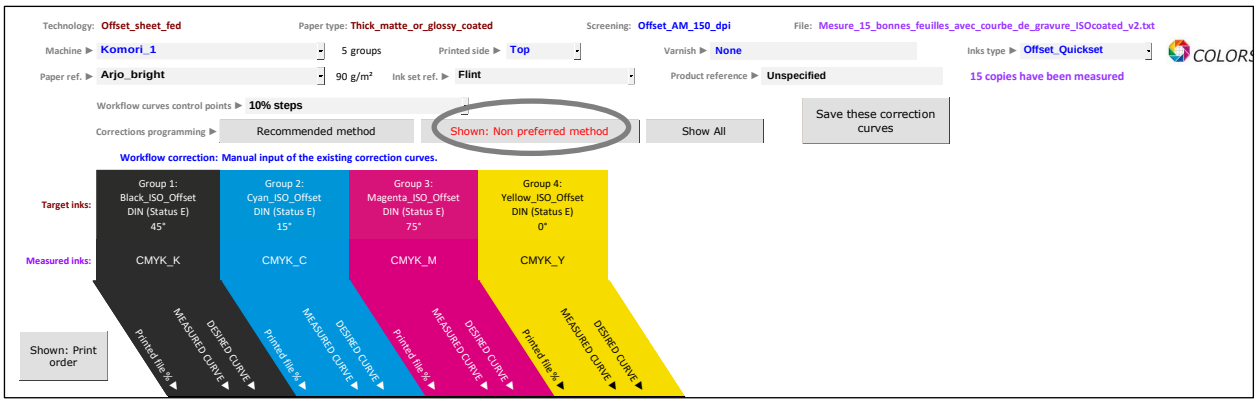
- The **"Measured" column of the workflow** is programmed with the values of the "**MEASURED CURVE**" column,
- The **"Desired" column of the workflow** is programmed with the values of the **" DESIRED CURVE"** column,

And the workflow computes the correction curve for each ink based on theses **"Measured"** and **"Desired"** values.

This works OK: The workflow will correctly compute your correction curves. **But for correcting press drifts afterwards, this method will not allow you updating the workflow correction curves by measuring a control bar during a commercial print run using the existing correction curves**.

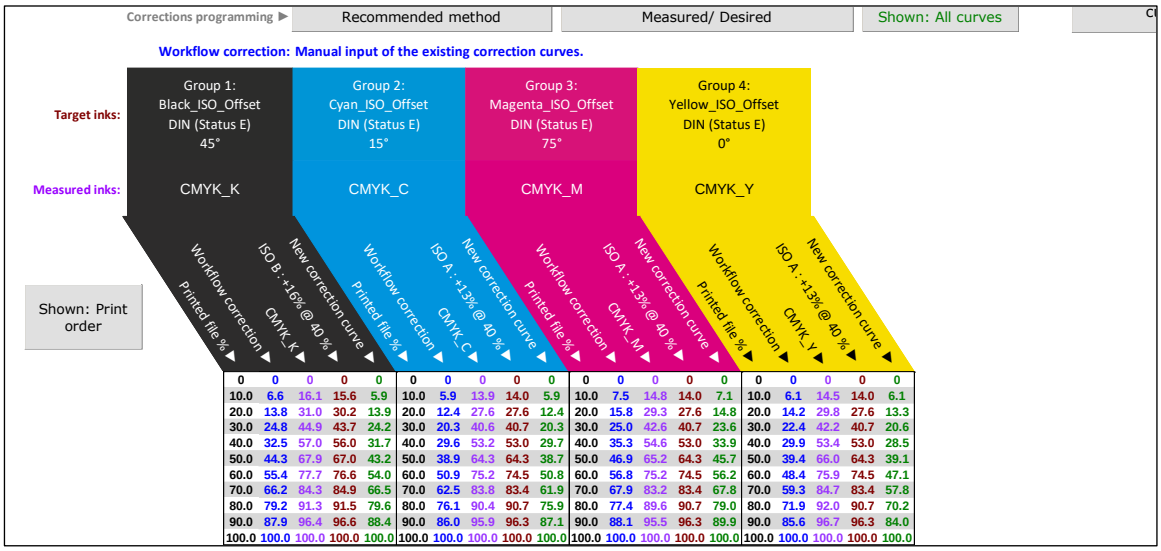
Using this method would then require printing without any correction curve for updating the workflow correction curves, which would be quite expensive and time consuming.

For above reasons, **MagicPrepress** reminds you that this method for programming correction curves in your workflow is not recommended:



Actually, the "**Measured/ Desired"** display method is only interesting for an easy comparison between **Measured Curve** and **Desired Curve** for each ink: If the **measured values** are close to the **desired values**, it shows that updating the workflow correction curves can wait.

Display by “Show All” method:



0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.0	6.6	16.1	15.6	5.9	10.0	5.9	13.9	14.0	5.9	10.0	7.5	14.8	14.0	7.1	10.0	6.1	14.5	14.0	6.1
20.0	13.8	31.0	30.2	13.9	20.0	12.4	27.6	27.6	12.4	20.0	15.8	29.3	27.6	14.8	20.0	14.2	29.8	27.6	13.3
30.0	24.8	44.9	43.7	24.2	30.0	20.3	40.6	40.7	20.3	30.0	25.0	42.6	40.7	23.6	30.0	22.4	42.2	40.7	20.6
40.0	32.5	57.0	56.0	31.7	40.0	29.6	53.2	53.0	29.7	40.0	35.3	54.6	53.0	33.9	40.0	29.9	53.4	53.0	28.5
50.0	44.3	67.9	67.0	43.2	50.0	38.9	64.3	64.3	38.7	50.0	46.9	65.2	64.3	45.7	50.0	39.4	66.0	64.3	39.1
60.0	55.4	77.7	76.6	54.0	60.0	50.9	75.2	74.5	50.8	60.0	56.8	75.2	74.5	56.2	60.0	48.4	75.9	74.5	47.1
70.0	66.2	84.3	84.9	66.5	70.0	62.5	83.8	83.4	61.9	70.0	67.9	83.2	83.4	67.8	70.0	59.3	84.7	83.4	57.8
80.0	79.2	91.3	91.5	79.6	80.0	76.1	90.4	90.7	75.9	80.0	77.4	89.6	90.7	79.0	80.0	71.9	92.0	90.7	70.2
90.0	87.9	96.4	96.6	88.4	90.0	86.0	95.9	96.3	87.1	90.0	88.1	95.5	96.3	89.9	90.0	85.6	96.7	96.3	84.0
100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

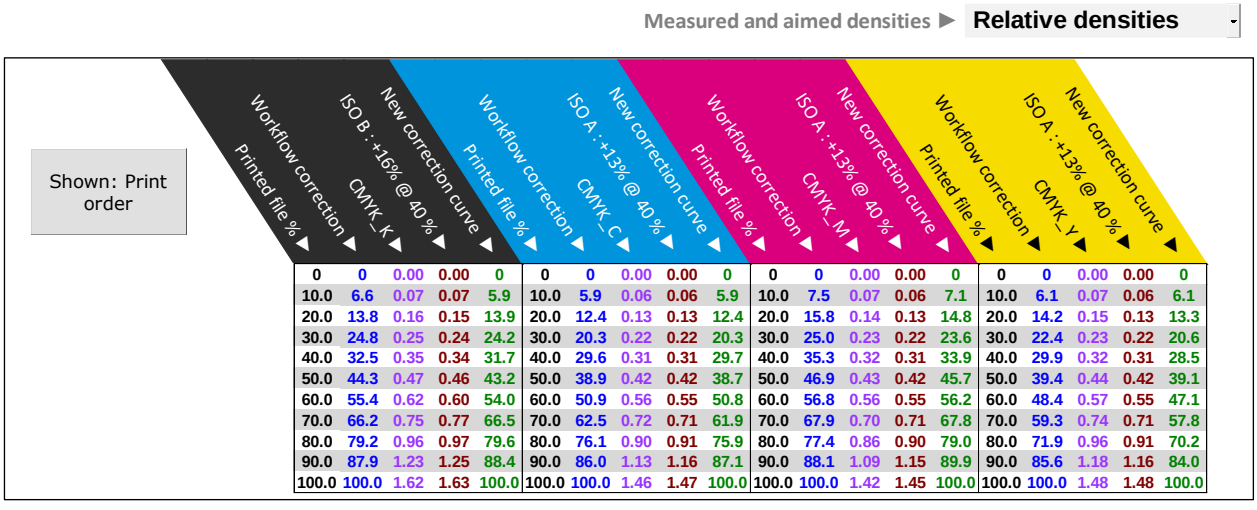
This display summarizes all the curves involved in the process for calculating the **new correction curves** for each printing form:

1. **Black** Column: File % is depending on the chosen workflow control points,
2. **Blue** Column: Values of the **workflow correction curve** (For each ink, printing form correction curve of the measured print run),
3. **Purple** column: Values of the **measured TVI curve** with above corrections for each ink, according to the chosen densitometric spectral response,
4. **Brown column**: **Aim TVI curve** values, depending on the specified public or private production standard,
5. **Green** Column: computed values of the **new correction curve**, to be programmed in the workflow for each ink, but only if significantly different from the existing (**blue**) workflow correction curve.

For example, for Cyan ink the file value **40**% and written at **29.6**% on the plate. It is measured **53.2**% for a target value of **53.0**%. Getting **53.0**% would need on the plate **29.7**% and not **29.6**%.

On above example, **measured** and **desired** TVI curves are very close, so the **new correction curves** are very close to the **workflow correction curves**: updating the workflow correction curves is therefore not necessary.

In this **"Show All"** mode, **measured** and **aim** TVI curves can be displayed as **percentages**, but also as **relative** or **absolute** densities, using the **“Measured and aimed densities”** menu:



0	0	0.00	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0	0	0	0.00	0.00	0
10.0	6.6	0.07	0.07	5.9	10.0	5.9	0.06	0.06	5.9	10.0	7.5	0.07	0.06	7.1	10.0	6.1	0.07	0.06	6.1
20.0	13.8	0.16	0.15	13.9	20.0	12.4	0.13	0.13	12.4	20.0	15.8	0.14	0.13	14.8	20.0	14.2	0.15	0.13	13.3
30.0	24.8	0.25	0.24	24.2	30.0	20.3	0.22	0.22	20.3	30.0	25.0	0.23	0.22	23.6	30.0	22.4	0.23	0.22	20.6
40.0	32.5	0.35	0.34	31.7	40.0	29.6	0.31	0.31	29.7	40.0	35.3	0.32	0.31	33.9	40.0	29.9	0.32	0.31	28.5
50.0	44.3	0.47	0.46	43.2	50.0	38.9	0.42	0.42	38.7	50.0	46.9	0.43	0.42	45.7	50.0	39.4	0.44	0.42	39.1
60.0	55.4	0.62	0.60	54.0	60.0	50.9	0.56	0.55	50.8	60.0	56.8	0.56	0.55	56.2	60.0	48.4	0.57	0.55	47.1
70.0	66.2	0.75	0.77	66.5	70.0	62.5	0.72	0.71	61.9	70.0	67.9	0.70	0.71	67.8	70.0	59.3	0.74	0.71	57.8
80.0	79.2	0.96	0.97	79.6	80.0	76.1	0.90	0.91	75.9	80.0	77.4	0.86	0.90	79.0	80.0	71.9	0.96	0.91	70.2
90.0	87.9	1.23	1.25	88.4	90.0	86.0	1.13	1.16	87.1	90.0	88.1	1.09	1.15	89.9	90.0	85.6	1.18	1.16	84.0
100.0	100.0	1.62	1.63	100.0	100.0	100.0	1.46	1.47	100.0	100.0	100.0	1.42	1.45	100.0	100.0	100.0	1.48	1.48	100.0

Choosing the correction curves display control points:

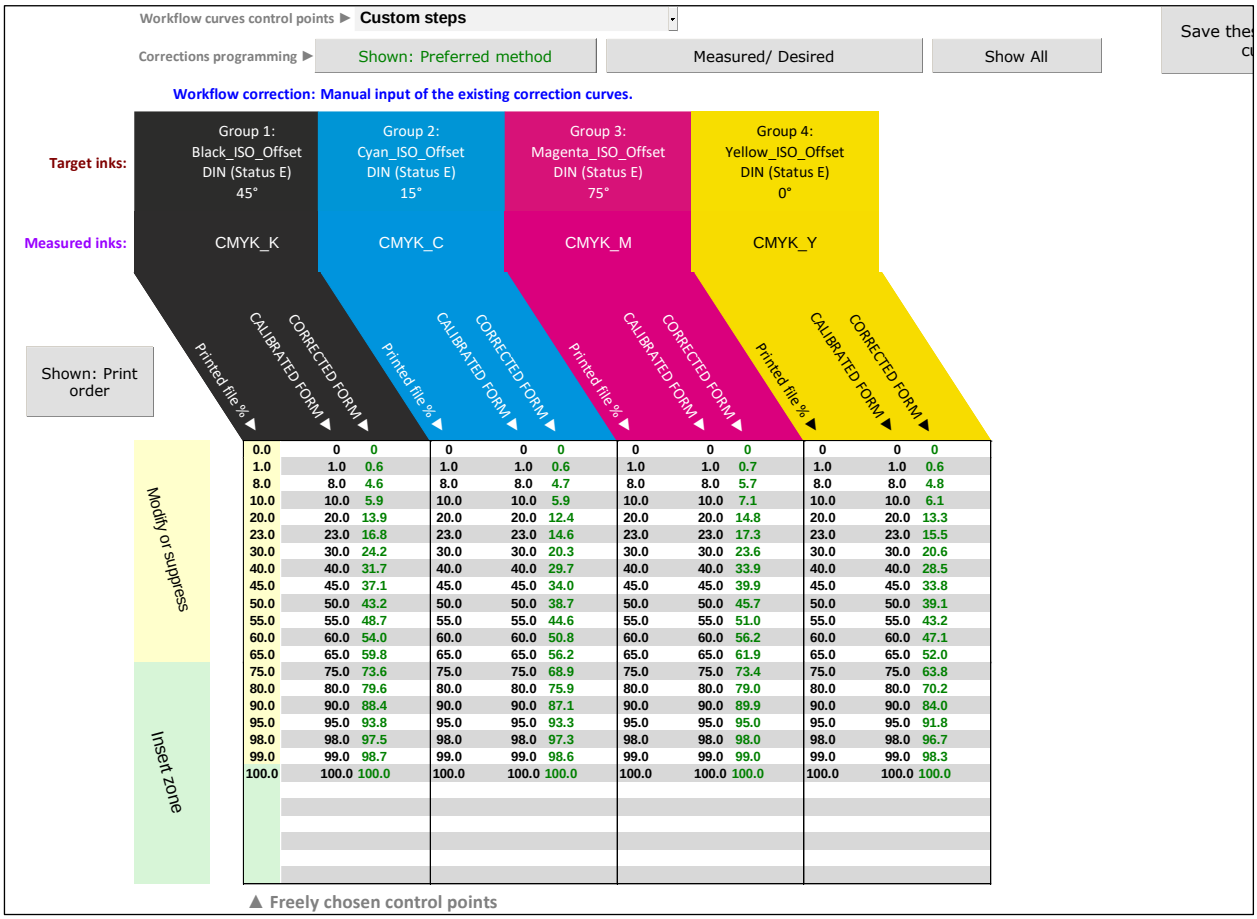
The displayed correction curves control points can be easily adapted to any type of workflow software thanks to the drop-down menu:

This menu offers, among other things, choosing **"Custom steps"**:

The correction curves can then be displayed with freely selected control points, allowing **MagicPrepress** to be adapted to all production commercial workflow software that impose their own arbitrary control points (Harlequin, Rampage etc.).

The manual input of custom control points is as for the DeclareCurves tab: In addition to the 0 and 100% control points that are always present, you can freely enter 1 to 24 control points for displaying the correction curves to be programmed in the workflow:

- For clearing one or more control points, select them using your mouse and make **"Suppress"** on your keyboard,
- For inserting a control point, type it on your keyboard after selecting one of the empty green cells in the column,
- For changing an existing control point, select it and type its new value on your keyboard.



Remember that in all cases, the values shown above for programming the correction curves in the production workflow are interpolated from the raw measurements of the "Ink%" patches measured on the press linearization strip or else printed color chart: The computational accuracy will therefore be lower if the measured control bar has very few distinct Ink% patches for each ink.

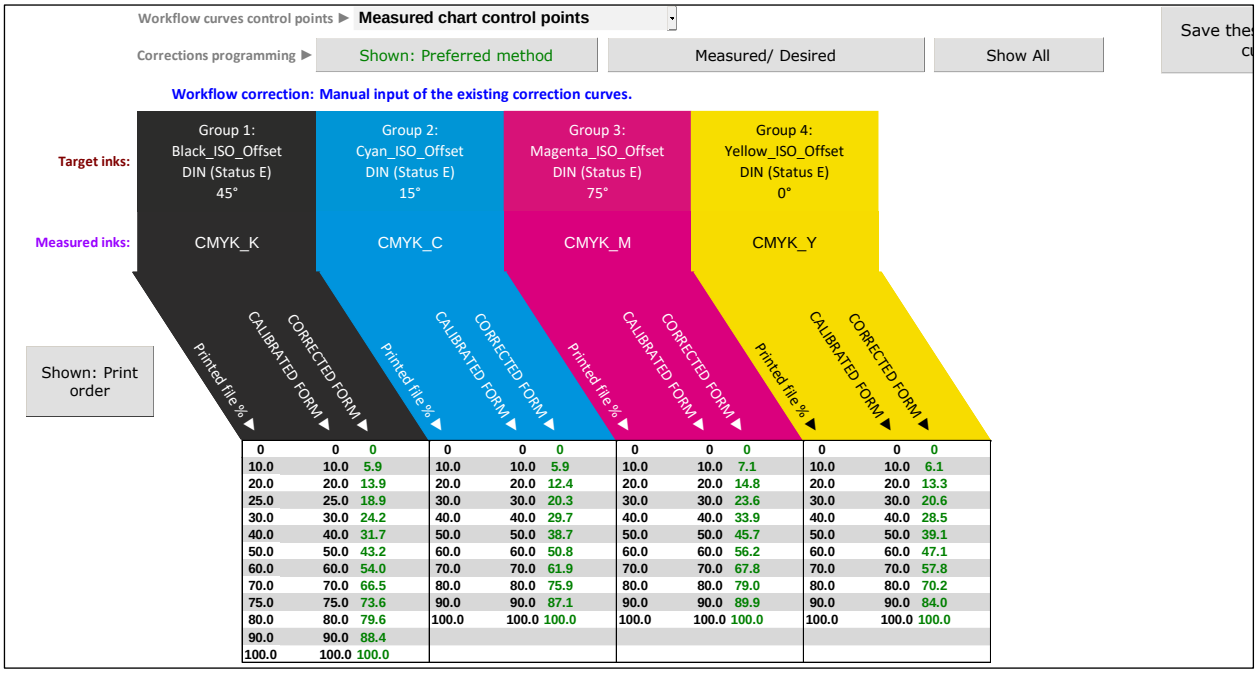
However, thanks to the quality of **MagicPrepress'** interpolation', it is quite possible computing very decent correction curves, even if only a few patches such as 0, 25, 50, 75 and 100% are present for each ink. (Even 0, 40, 80 and 100% could help a lot to get a good print as long as you measure it on enough copies!).

For displaying the patches such as actually present on the measured press control bar or else color chart (and not interpolated values from these patches measurements), you can choose:

Workflow curves control points ► **Measured chart control points**

In this case only the control points actually present on your measured chart will be displayed for each ink:

For example, below, we can see the K%, C%, M% and Y% patches actually present on the control bar that was measured:



0	0	0	0	0	0	0	0	0	0	0	0
10.0	10.0	5.9	10.0	10.0	5.9	10.0	10.0	7.1	10.0	10.0	6.1
20.0	20.0	13.9	20.0	20.0	12.4	20.0	20.0	14.8	20.0	20.0	13.3
25.0	25.0	18.9	30.0	30.0	20.3	30.0	30.0	23.6	30.0	30.0	20.6
30.0	30.0	24.2	40.0	40.0	29.7	40.0	40.0	33.9	40.0	40.0	28.5
40.0	40.0	31.7	50.0	50.0	38.7	50.0	50.0	45.7	50.0	50.0	39.1
50.0	50.0	43.2	60.0	60.0	50.8	60.0	60.0	56.2	60.0	60.0	47.1
60.0	60.0	54.0	70.0	70.0	61.9	70.0	70.0	67.8	70.0	70.0	57.8
70.0	70.0	66.5	80.0	80.0	75.9	80.0	80.0	79.0	80.0	80.0	70.2
75.0	75.0	73.6	90.0	90.0	87.1	90.0	90.0	89.9	90.0	90.0	84.0
80.0	80.0	79.6	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
90.0	90.0	88.4									
100.0	100.0	100.0									

Using the control points specified in NewCurves in other tabs:

In practice, there is no reason for constantly changing the control points specified in the NewCurves tab for adding or updating correction curve's sets in your workflow.

And it may be convenient using these same control points for displaying and/or entering curves into other **MagicPrepress** tabs. This is why the DeclareCurves, Expertise and CustomTVI tabs offer using directly the NewCurves tab 'specified control points if needed:

n ► **Use the Workflow control points specified in "NewCurves" tab**

Measured chart control points

Saving a set of correction curves:

The **"Save these correction curves" button** allows you saving into CurvesLib library, any new correction curve's set displayed in the NewCurves tab.

This function allows the Print House managing and using properly all their public and private print production standards, with each press of their print shop, quickly and without risk of mistakes and confusions.

When you ask for recording a set of correction curves that you are about using in the workflow, **MagicPrepress** first checks whether the associated print production standard is already registered in the StdLib Library, and offers saving this standard, if not already recorded.

Then your set of correction curves is dated and recorded in CurvesLib. If **MagicPrepress** finds one or more older sets of correction curves designed for printing the same color standard on the same printing press, **MagicPrepress** proposes you erasing these older correction curve's sets, which are probably out of date.

With any set of **new correction curves**, are recorded following information's:

Mandatory information for proper use of the correction curve's set:

- **Date** and time when the set of correction curves was established or updated,
- **Machine**: name of the press to be used with this set of correction curves,
- **Associated aim standard name** that this curve's set allows matching,
- **Paper type** to be printed,
- **Printed side** to use (On a two-sided CMYK press, the CMYK correction curves are generally different for both sides of paper),
- **Screening** to be used (for the same aim color standard, screening parameters greatly influences the print TVI curves, hence the correction curve's set to be used),
- **Screen angle** to use for each printing form,
- **Ink** type to be used,
- **Varnish** or other post-treatment to use.

Optional information that can also be specified and recorded in CurvesLib:

- Paper reference,
- Inks reference,
- Product reference/ End user.

Remember that the **Associated aim standard name** (Standard registered in the StdLib Library), allows you knowing all other information needed for calibrating the press:

Mandatory information for timing and press control:

- Aim Lab color or spectral reflectance for each solid ink,
- Aim TVI curve for each ink,
- Densitometric spectral response for computing TVI curves,
- Inks print order,
- Whether or not optical brighteners are corrected for calculating colors,

Optional information for specifying the aim color standard:

- Lab Colors of Overlays of Interest (Specifically needed for "Wet on Wet" Printing Processes),

Information present for purely informational purpose in the standard registration:

- Typical printing technology for which this standard is intended (Actual technology is recorded with the set of correction curves),
- Typical paper type for which this standard is intended (Actual paper type is recorded with the set of correction curves),
- Typical screening for this standard (Actual screening is recorded with the correction curve's set),
- Typical screen angles for this standard (Real screen angles are recorded with the correction curve's set),
- Aim for CMYK inks, if present,
- Aim for non-CMYK inks, if present.

Even in a small Print House, a same public or private standard will generally be associated to several sets of correction curves:

For example, the classic **Fogra 39** standard for offset printing on thick matte or glossy coated paper, may be associated to five different sets of correction curves:

- **Fogra 39** on Komori 1 with 150 dpi screening,
- **Fogra 39** on Komori 1 with 175 dpi screening,
- **Fogra 39** on Komori 2 with 175 dpi screening,
- **Fogra 39** on Komori 2 with 240 dpi screening, as of 06/01/2020,
- **Fogra 39** on Komori 2 with 240 dpi screening, dated 17/02/2020 (The curve's set dated 06/01/2020 is obsolete and may therefore be erased from CurvesLib library).

Using recorded correction curve's sets:

A set of correction curves set up on the workflow and recorded by **MagicPrepress** can be recalled in the DeclareCurves tab, either by using the drop-down menu " **Declare the correction curves of the measured print run"** or by using the **"Choose a set of correction curves in the library "** button.

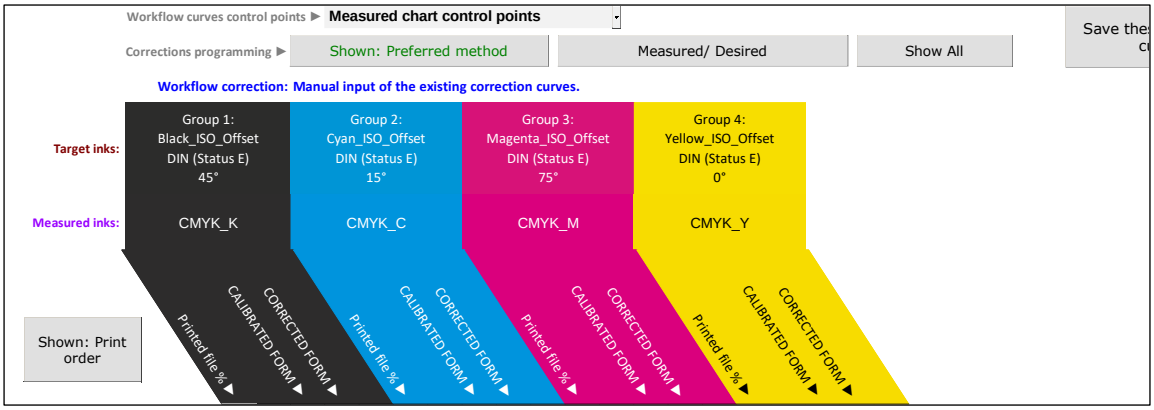
When choosing a set of correction curves in CurvesLib, these curves are declared in the DeclareCurves tab as the curves being applied by the production workflow, and the associated aim color standard is programmed in the AimStandard tab.

This makes it very easy measuring the control bar of a commercial print run for checking the workflow curves and updating them if necessary.

Inks print order display in NewCurves tab:

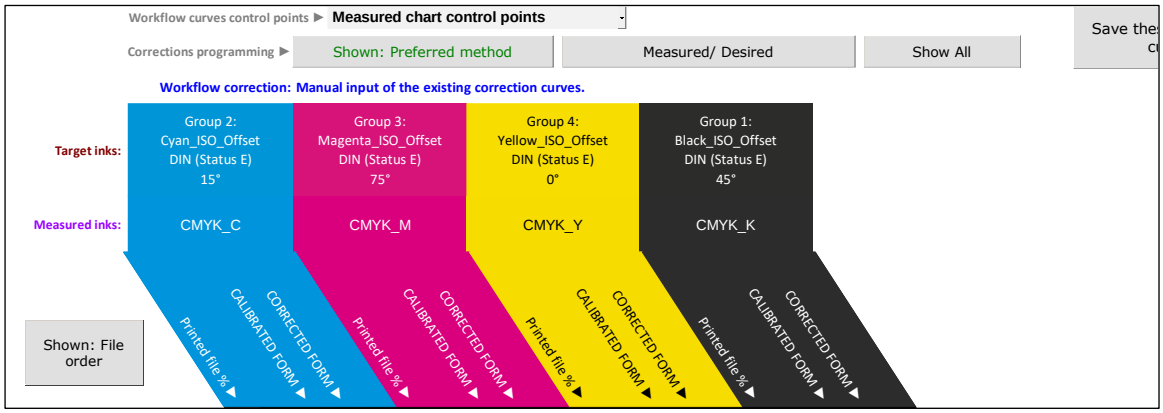
By default, the inks are displayed in the print order as specified in the AimStandard tab

"Shown: **Print Order" button**: KCMY hereafter

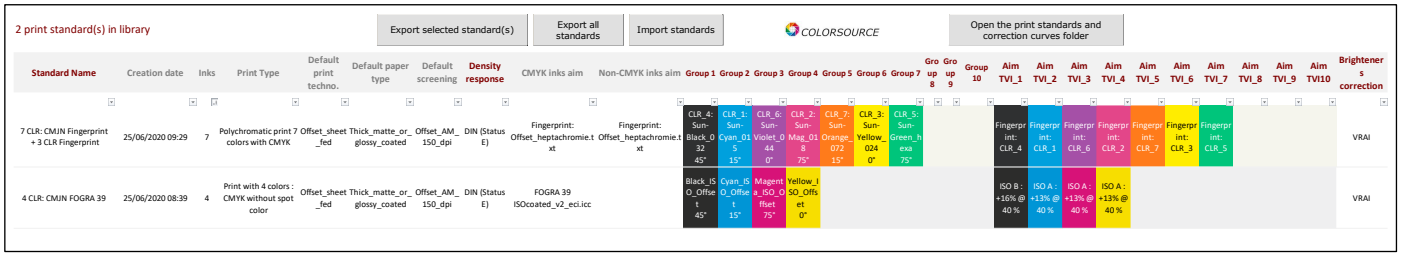


By activating the **"Shown**: **Print Order"** button, you can also display the inks in the measurement file order, which corresponds to the order of the "Device" values in the measured control bar or color chart's reference file, for example C, M, Y, K order in classic CMYK reference files:

"Shown: **File Order" button**: CMYK hereafter



StdLib tab:



The StdLib tab contains all one to ten colors print standards that have been recorded.

Remember that saving a print production standard can be done:

- By pressing the **"Save this standard in library"** button of the AimStandard tab,
- By pressing the **"Save these correction curves"** button of the NewCurves tab: The aim color standard associated with the correction curves is recorded first, if not found present in the StdLib Library.

Remember that using of a recorded print production standard can be done:

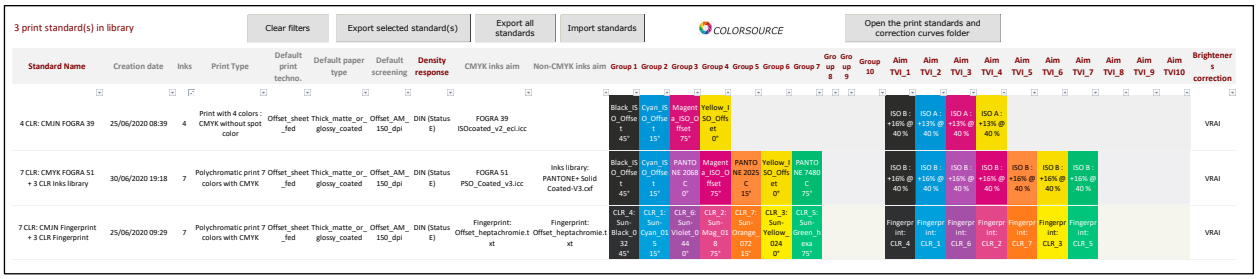
- Directly via the **"Choose aim Standard in library"** button of the AimStandard tab,
- Indirectly via the **" Declare the correction curves of the measured print run "** drop-down menu, or the "**Choose a set of correction curves in the library"** button on the DeclareCurves tab: The standard associated with the chosen correction curve's set will be automatically set up.

When choosing a registered aim standard, the StdLib tab only offers choosing from the recorded standards with same inks number as the current measurement file.

For deleting a print standard, simply select a cell on the line of this standard using your mouse, and press **"Suppress"** on your keyboard. For safety, only one standard can be erased at a time. In addition, the standard can only be suppressed if not in use AND if not associated with any correction curve's set present in CurvesLib. All CurvesLib curve's sets associated with a standard will have to be suppressed before you can suppress this standard.

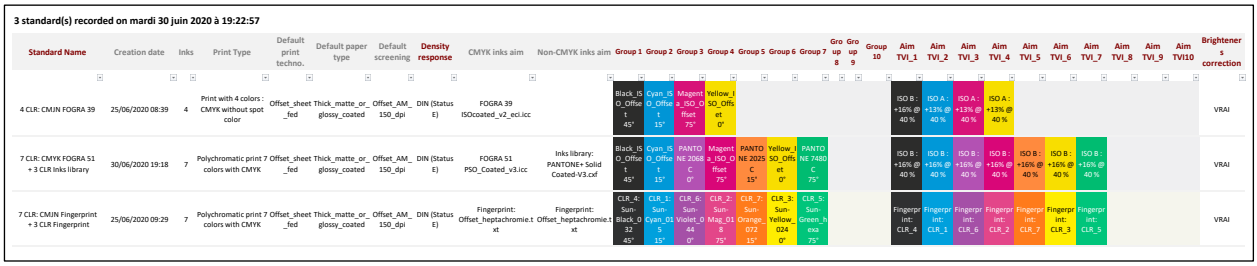
Any standard can be renamed: Select the standard's name with the mouse, and change all or part of this name using your keyboard.

The StdLib tab also offers many features for sorting all registered color printing standards, making it easier to find:



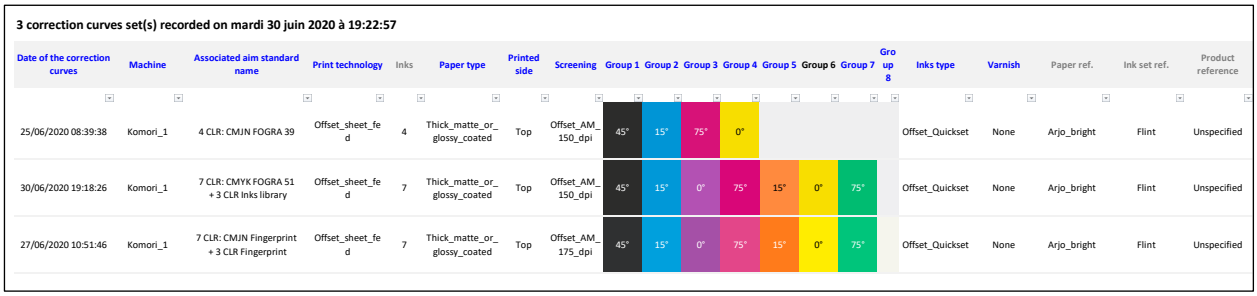
Buttons allow to **export** all or part of the standards recorded in StdLib (with the associated sets of correction curves), in the form of standard Excel files:

These Excel backups containing aim color standards and the associated correction curve's sets can be imported back in **MagicPrepress**, and transmitted to any other production site that must perform prints runs matching these standards. They can be imported as well by **MagicPress**, in order the Press Operators can easily set their presses ink's densities for matching the appropriate aim colors, without risk of mistakes or confusions.



3 standard(s) recorded on mardi 30 juin 2020 à 19:22:57

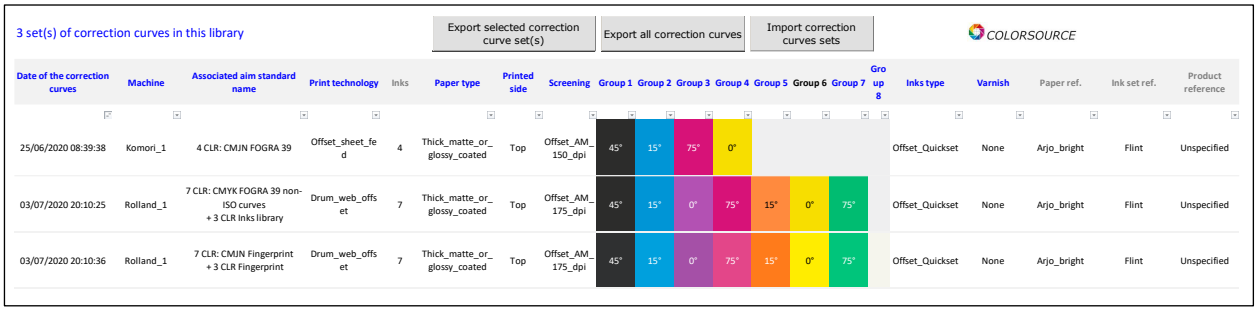
Standard Name	Creation date	Inks	Print Type	Default print techno.	Default paper type	Default screening	Density response	CMYK inks aim	Non-CMYK inks aim	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Aim TVI_1	Aim TVI_2	Aim TVI_3	Aim TVI_4	Aim TVI_5	Aim TVI_6	Aim TVI_7	Aim TVI_8	Aim TVI_9	Aim TVI10	Brightener s correction
4 CLR: CMJN FOGRA 39	25/06/2020 08:39	4	Print with 4 colors : CMYK without spot color	Offset_sheet_fed	Thick_matte_or_glossy_coated	Offset_AM_150_dpi	DIN (Status E)	FOGRA 39 ISOcoated_v2_eci.icc		Black_ISO_Offset: 45°	Cyan_ISO_Offset: 15°	Magenta_ISO_Offset: 75°	Yellow_ISO_Offset: 0°							ISO B : +16% @ 40 %	ISO A : +13% @ 40 %	ISO A : +13% @ 40 %	ISO A : +13% @ 40 %							VRAI
7 CLR: CMYK FOGRA 51 + 3 CLR Inks library	30/06/2020 19:18	7	Polychromatic print 7 colors with CMYK	Offset_sheet_fed	Thick_matte_or_glossy_coated	Offset_AM_150_dpi	DIN (Status E)	FOGRA 51 PSO_Coated_v3.icc	Inks library: PANTONE+ Solid Coated-V3.csf	Black_ISO_Offset: 45°	Cyan_ISO_Offset: 15°	PANTONE 2068 C: 0°	Magenta_ISO_Offset: 75°	PANTONE 2025 C: 15°	Yellow_ISO_Offset: 0°	PANTONE 7480 C: 75°				ISO B : +16% @ 40 %	ISO B : +16% @ 40 %	ISO B : +16% @ 40 %	ISO B : +16% @ 40 %	ISO B : +16% @ 40 %	ISO B : +16% @ 40 %	ISO B : +16% @ 40 %				VRAI
7 CLR: CMJN Fingerprint + 3 CLR Fingerprint	25/06/2020 09:29	7	Polychromatic print 7 colors with CMYK	Offset_sheet_fed	Thick_matte_or_glossy_coated	Offset_AM_150_dpi	DIN (Status E)	Fingerprint: Offset_heptachromie.txt	Fingerprint: Offset_heptachromie.txt	CLR_4: Sun-Black_D32: 45°	CLR_1: Sun-Cyan_D1_5: 15°	CLR_6: Sun-Violet_D44: 0°	CLR_2: Sun-Mag_D18: 75°	CLR_7: Sun-Orange_072: 15°	CLR_3: Sun-Yellow_024: 0°	CLR_5: Sun-Green_hexa: 75°				Fingerprint: CLR_4	Fingerprint: CLR_1	Fingerprint: CLR_6	Fingerprint: CLR_2	Fingerprint: CLR_7	Fingerprint: CLR_3	Fingerprint: CLR_5				VRAI



3 correction curves set(s) recorded on mardi 30 juin 2020 à 19:22:57

Date of the correction curves	Machine	Associated aim standard name	Print technology	Inks	Paper type	Printed side	Screening	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Inks type	Varnish	Paper ref.	Ink set ref.	Product reference
25/06/2020 08:39:38	Komori_1	4 CLR: CMJN FOGRA 39	Offset_sheet_fed	4	Thick_matte_or_glossy_coated	Top	Offset_AM_150_dpi	45°	15°	75°	0°					Offset_Quickset	None	Arjo_bright	Flint	Unspecified
30/06/2020 19:18:26	Komori_1	7 CLR: CMYK FOGRA 51 + 3 CLR Inks library	Offset_sheet_fed	7	Thick_matte_or_glossy_coated	Top	Offset_AM_150_dpi	45°	15°	0°	75°	15°	0°	75°		Offset_Quickset	None	Arjo_bright	Flint	Unspecified
27/06/2020 10:51:46	Komori_1	7 CLR: CMJN Fingerprint + 3 CLR Fingerprint	Offset_sheet_fed	7	Thick_matte_or_glossy_coated	Top	Offset_AM_175_dpi	45°	15°	0°	75°	15°	0°	75°		Offset_Quickset	None	Arjo_bright	Flint	Unspecified

CurvesLib **tab**:



3 set(s) of correction curves in this library

Export selected correction curve set(s) | Export all correction curves | Import correction curves sets | COLORSOURCE

Date of the correction curves	Machine	Associated aim standard name	Print technology	Inks	Paper type	Printed side	Screening	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Inks type	Varnish	Paper ref.	Ink set ref.	Product reference
25/06/2020 08:39:38	Komori_1	4 CLR: CMJN FOGRA 39	Offset_sheet_fed	4	Thick_matte_or_glossy_coated	Top	Offset_AM_150_dpi	45°	15°	75°	0°					Offset_Quickset	None	Arjo_bright	Flint	Unspecified
03/07/2020 20:10:25	Rolland_1	7 CLR: CMYK FOGRA 39 non-ISO curves + 3 CLR Inks library	Drum_web_offset	7	Thick_matte_or_glossy_coated	Top	Offset_AM_175_dpi	45°	15°	0°	75°	15°	0°	75°		Offset_Quickset	None	Arjo_bright	Flint	Unspecified
03/07/2020 20:10:36	Rolland_1	7 CLR: CMJN Fingerprint + 3 CLR Fingerprint	Drum_web_offset	7	Thick_matte_or_glossy_coated	Top	Offset_AM_175_dpi	45°	15°	0°	75°	15°	0°	75°		Offset_Quickset	None	Arjo_bright	Flint	Unspecified

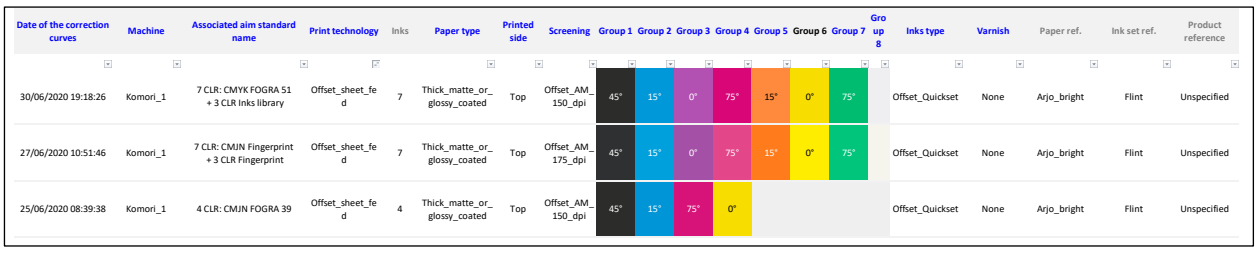
The CurvesLib tab contains all the correction curve's sets that have been stored, each set of curves being intended for matching one of the registered color standards on a specific printing press, with fully specified screen settings and all other print parameters.

- Recording a set of correction curves is done by pressing the **"Save these correction curves"** button in the NewCurves tab.
- Using a set of correction curves is done via the **" Declare the correction curves of the measured print run "** drop-down menu, or the "**Choose a set of correction curves in the library"** button in the DeclareCurves tab: The aim color standard associated with the chosen correction curve's set will be automatically set up.

When choosing a set of correction curves, the CurvesLib tab only offers choosing from the curve's sets with same inks number as the current measurement file.

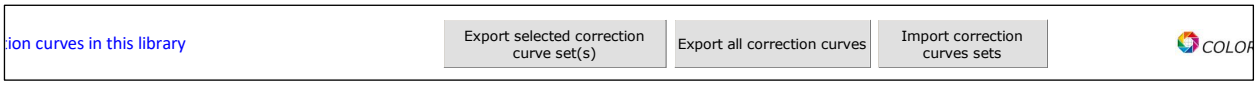
For suppressing a curve's set, simply select using your mouse a cell on the line of this set and make **"Suppress"** on your keyboard. For safety, only one set of correction curves can be erased at a time.

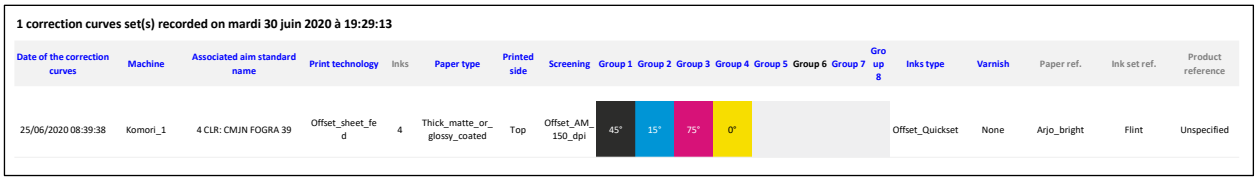
The CurvesLib tab also offers many features for sorting all recorded curve's sets:

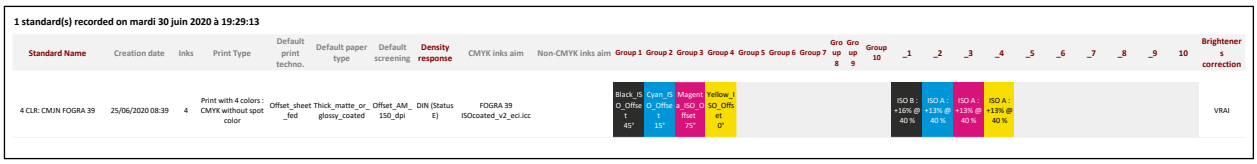


Date of the correction curves	Machine	Associated aim standard name	Print technology	Inks	Paper type	Printed side	Screening	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Inks type	Varnish	Paper ref.	Ink set ref.	Product reference
30/06/2020 19:18:26	Komori_1	7 CLR: CMYK FOGRA 51 + 3 CLR Inks library	Offset_sheet_fed	7	Thick_matte_or_glossy_coated	Top	Offset_AM_150_dpi	45°	15°	0°	75°	15°	0°	75°		Offset_Quickset	None	Arjo_bright	Flint	Unspecified
27/06/2020 10:51:46	Komori_1	7 CLR: CMJN Fingerprint + 3 CLR Fingerprint	Offset_sheet_fed	7	Thick_matte_or_glossy_coated	Top	Offset_AM_175_dpi	45°	15°	0°	75°	15°	0°	75°		Offset_Quickset	None	Arjo_bright	Flint	Unspecified
25/06/2020 08:39:38	Komori_1	4 CLR: CMJN FOGRA 39	Offset_sheet_fed	4	Thick_matte_or_glossy_coated	Top	Offset_AM_150_dpi	45°	15°	75°	0°					Offset_Quickset	None	Arjo_bright	Flint	Unspecified

Export and **Import** buttons allow saving and restoring all or part of the correction curve's sets (and the associated print standards), in the form of standard Excel files:



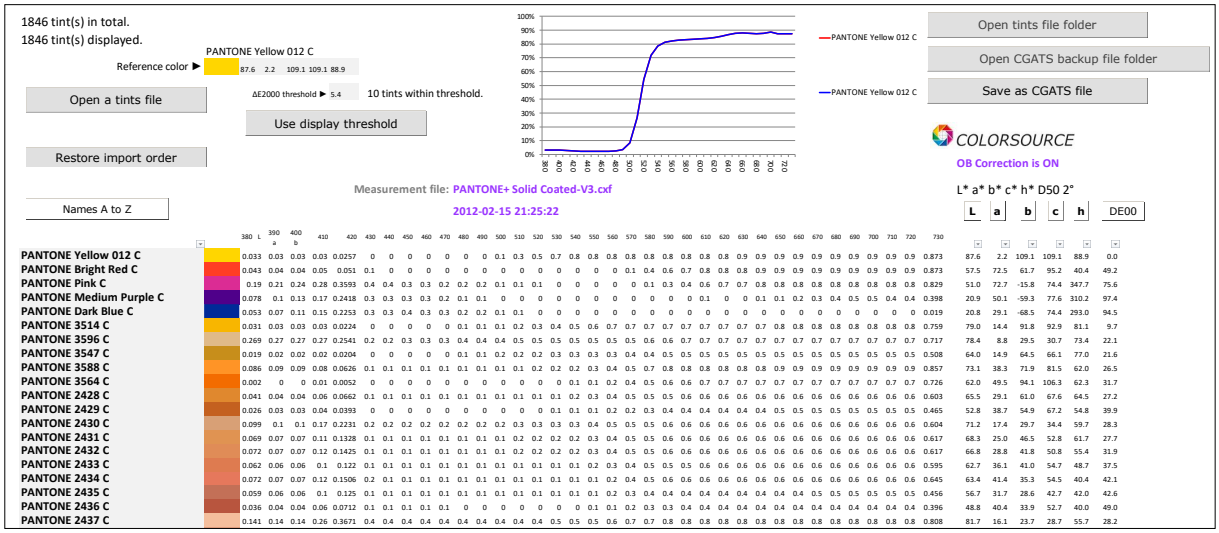


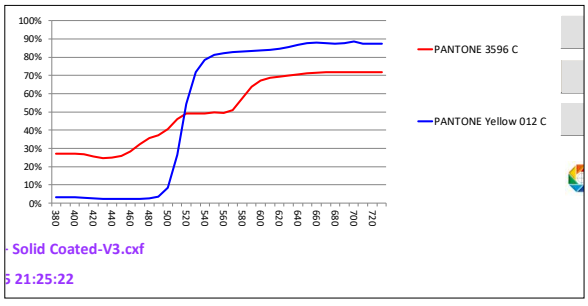


InksLib tab:

For specifying aim color standards, the AimStandard drop-down menus **"CMYK inks aim"** and **"Non-CMYK inks aim"** allow specifying aim colors by specifying ink names chosen in the InksLib library.

Colors displayed in the InksLib tab:





The graph at the top of the **InksLib** tab usually shows the spectral reflectance of two hues:

- The tint located in the first line of the list (here above **PANTONE Yellow 012 C**),
- The current hue on which the mouse points (here above **PANTONE 3596 C**).

The right column **DE00** lists the ΔE2000 visual distances between the reference tint in the first row (Yellow 012 C) and each of the following tints on each following line: For example, the visual distance between PANTONE Yellow 012 C and PANTONE 3514 C in line 6 is 9.7 ΔE2000.

The colorimetric values of each tint are displayed by their D50 2° Lab and Lch co-ordinates (In form of L, a, b, c, h)

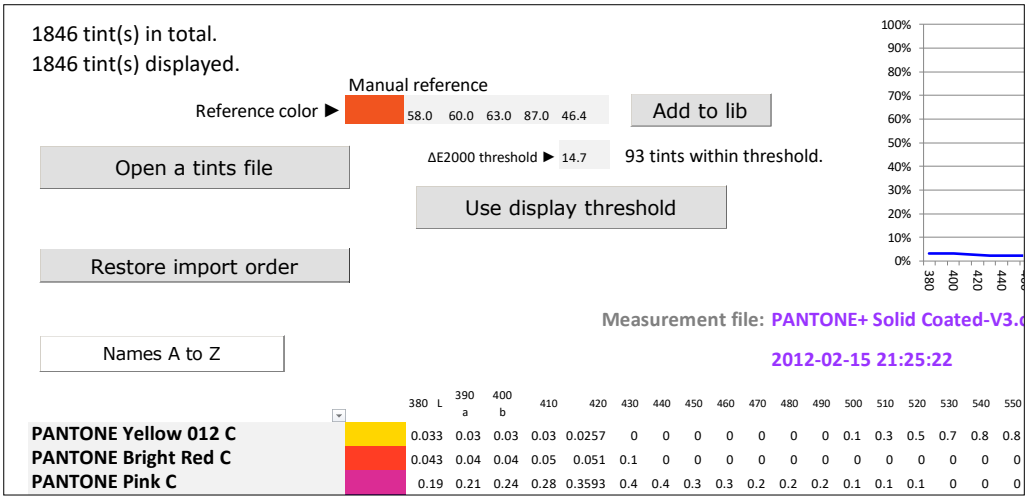
The apparent color shown on the PC's RGB monitor takes into account:

- The measured or specified spectral reflectance curve of the tint, if present*,
- The D50 graphic industries lighting standard,
- The measured technical characteristics of the PC's RGB display monitor, declared in **Prefs.** tab,
- Using or not the optical brighteners' correction, as chosen in **Prefs.** tab: If we choose to correct optical brighteners (which we recommend), the apparent Lab color calculated for each tint will take into account the hue of the measured paper, which of course, influences our color perception.

(*) We recommend using whenever possible color libraries specified by spectral reflectance values rather than by simple Lab apparent colors, but the ink's library may contain non-spectrally specified tints originating from:

- Importing chart measurement's files in CGATS format containing only colorimetric values such as XYZ and/ or Lab. In accordance with I.C.C standard, these Lab and/or XYZ values are always values adapted to D50 lighting, regardless of the original light source.
- Creating a color using the application, by adding a reference tint entered manually by specifying its L, a, b or L, c, h D50 co-ordinates:

For example, hereafter: L, a, b, c, h = 58.0, 60.0, 63.0, 87.0, 46.4

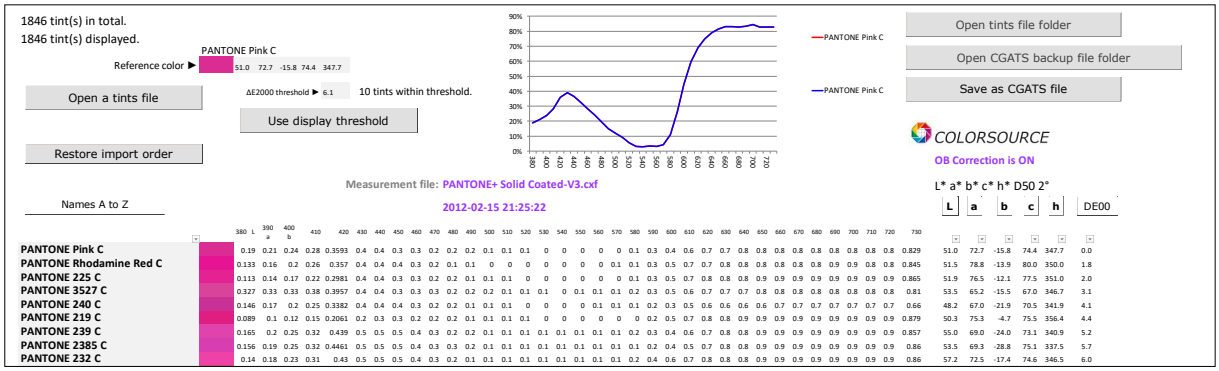


Sorting and searching for tints:

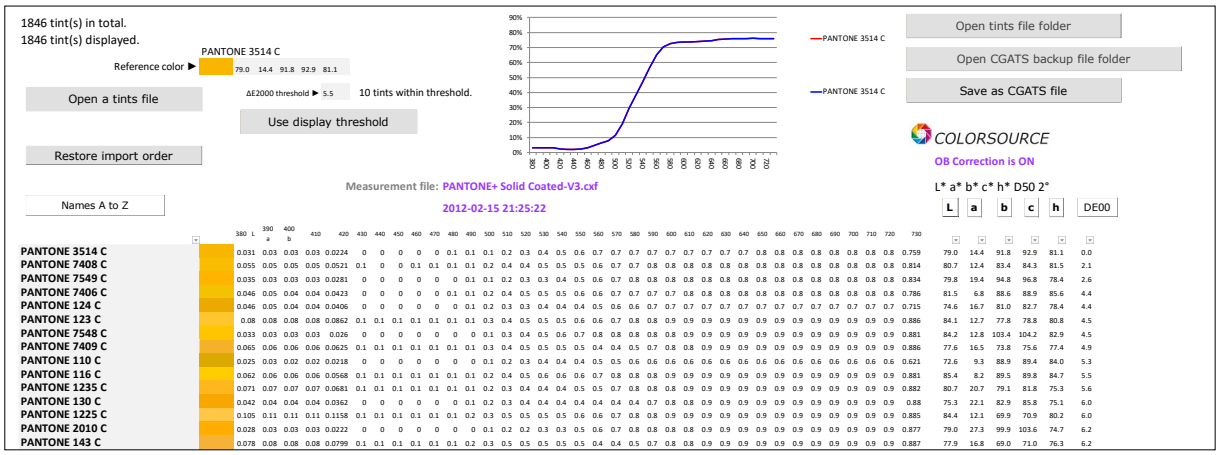
When double-clicking the name of a tint in the library:

1. This shade comes at the top of the list (Line 1) and thus becomes the reference tint,
2. All other shades in the library automatically rank in succession, in order of increasing ΔE2000 visual distance with the reference tint in line 1.

For example, if we double-click on the name "PANTONE Pink C", we get the following display:

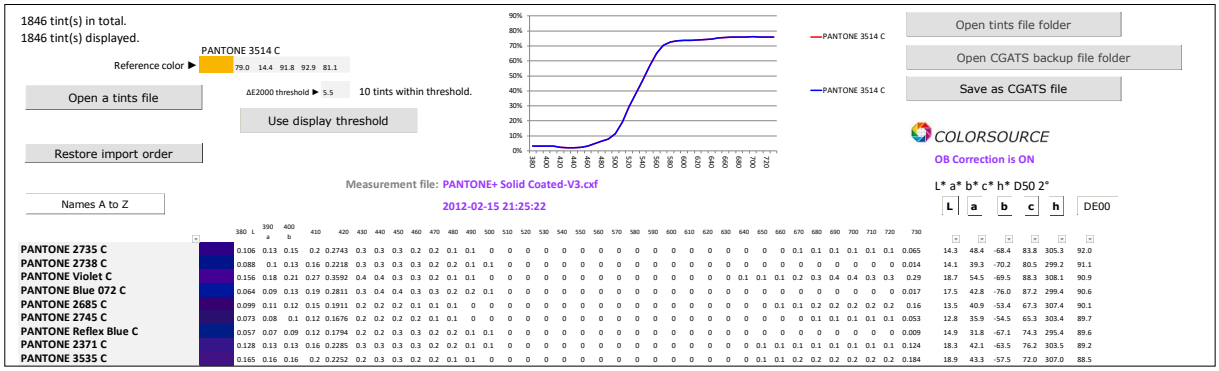


Another example, if we double-click on the name "PANTONE 3514 C", we get the following display:



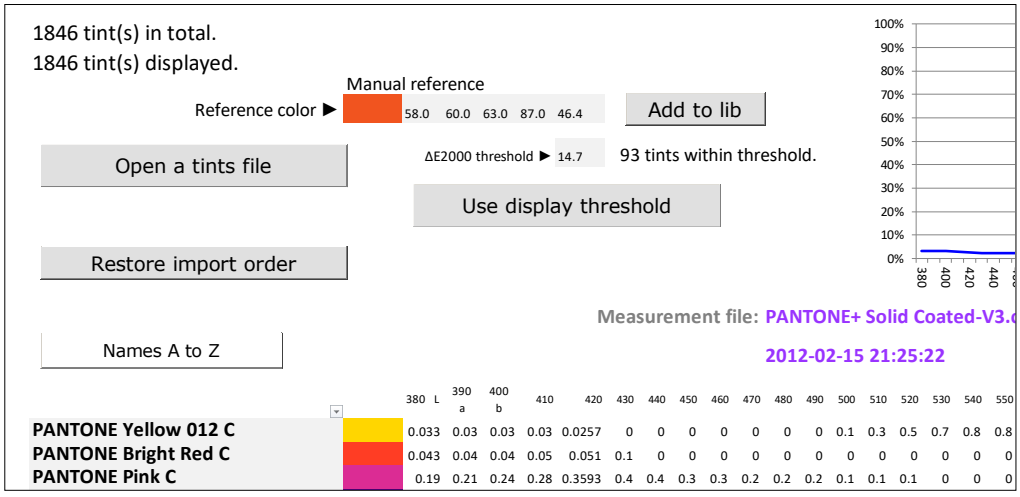
The increasing visual distances between the reference tint and subsequent hues are displayed in the last column **DE00**.

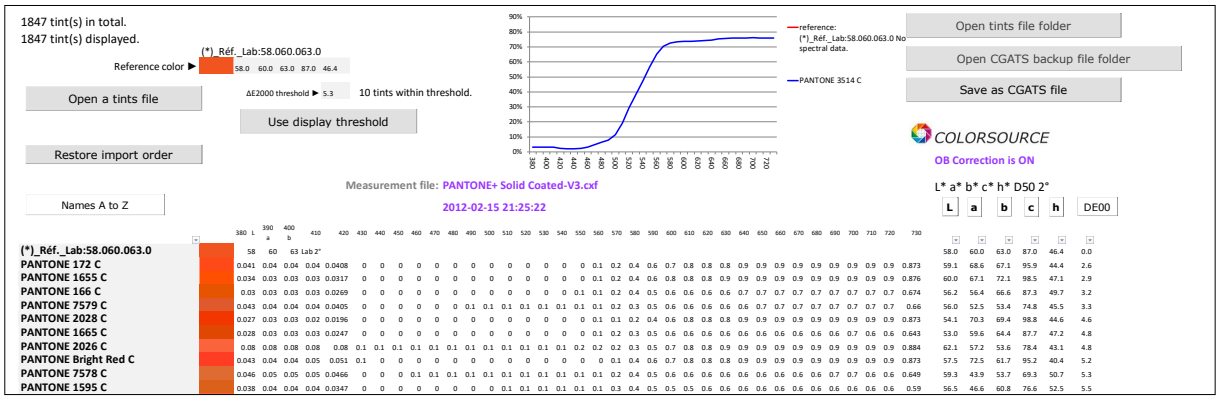
If the **DE00** button is pressed, the colors are no longer displayed in order of increasing visual distance but in order of decreasing visual distance from the reference color:



The reference tint can be chosen by double-clicking the name of any hue in the library, but also by directly typing three Lab or Lch colorimetric co-ordinates for specifying a reference apparent color, and then pressing the "**Add to lib"** button and double-clicking the Lab hue thus created manually.

The hues in the library are then ranked in order of visual distance ΔE2000 with the tint added manually as a reference color:



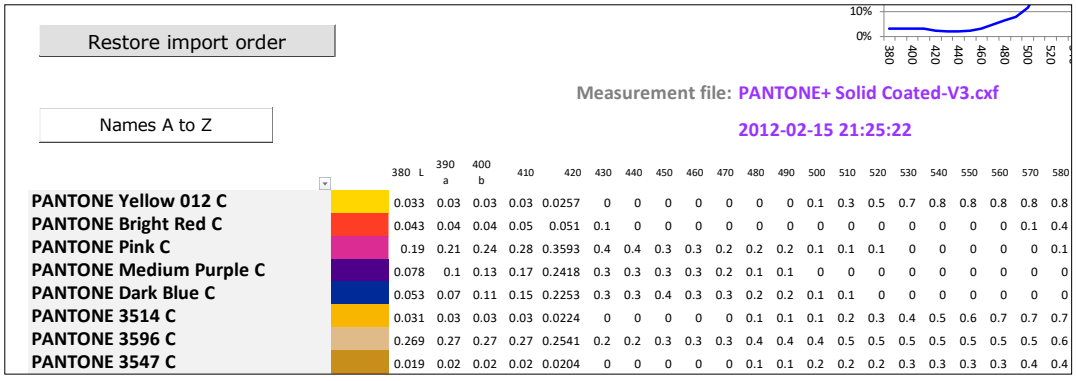


Any manually specified Lab or Lch reference color can thus be added to the library, which allows, for example, an easy and fast search of all available spot colors closest to any measured Lab color.

In summary, if you select a tint name with the mouse:

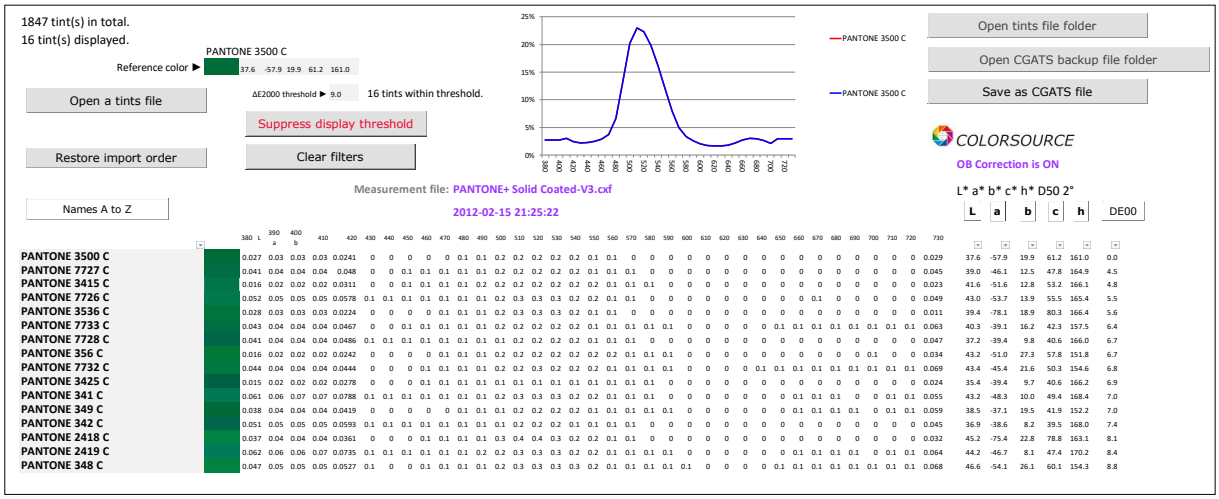
- The spectrum of this tint, if available, is displayed by a curve,
- You can rename the tint,
- You can delete one or more selected consecutive tint ("Suppress" key on the keyboard).
- You can use this tint in reference by double-clicking on its name.

Since it is possible to sort the tints in many ways, the "**Restore import order**" button allows you restoring the original order of the library when it was imported:



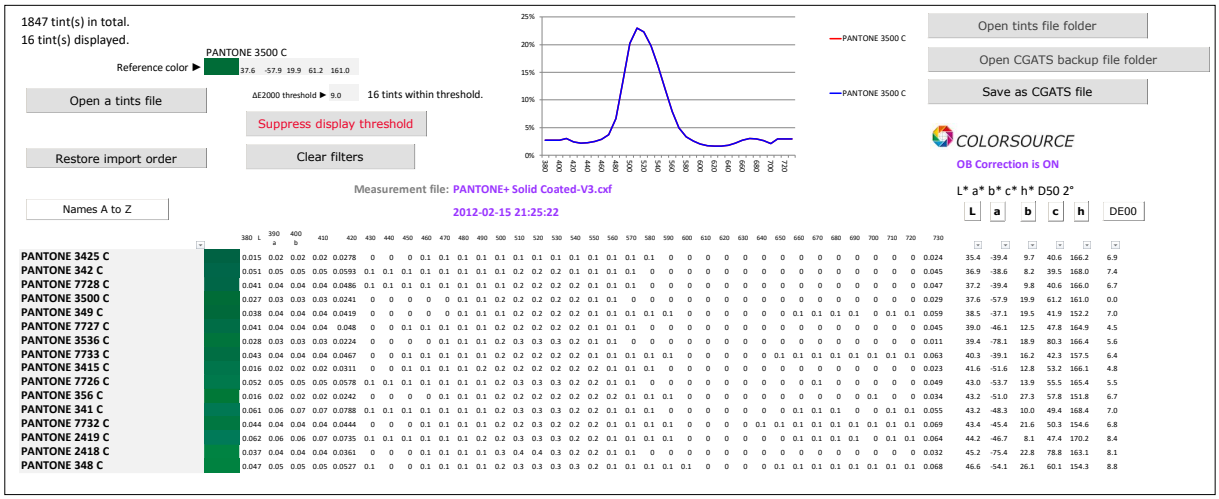
Searching for all shades close to a reference tint within a given tolerance:

Simply designate the reference tint by double-clicking on its name (or add a Lab or Lch-specified reference color manually by using the **Add to lib** button), and then specify a display threshold and then **Use display threshold**:



Sorting the tints by name, L, a, b, c, h or their ΔE2000 distance from the reference tints, is obtained by pressing respectively the buttons **Names A to Z**, **L**, **a**, **b**, **c**, **h** or **DE00**, and always only acts on the hues displayed within the threshold, if any. When a sorting button is pressed several times, the sort order is reversed each time.

For example, the **L** button allows you to sort the tints within the display threshold by order of increasing or decreasing clarity:



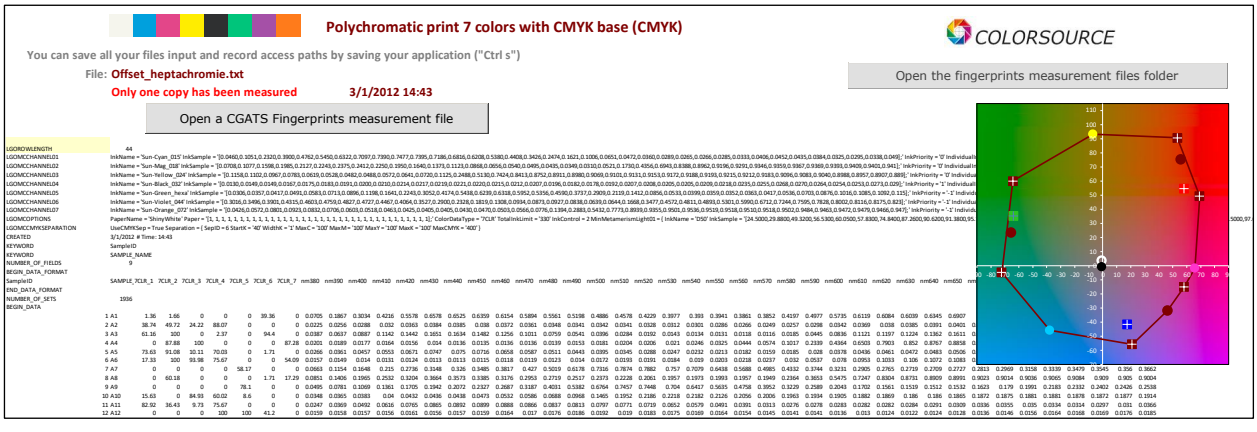
Any tint library in CxFv3 format opened by **MagicPrepress** can be converted and saved in CGATS format, which is much more flexible to use than CxFv3 format, and compatible with many free and good applications. See the manual on this subject: https://www.iso12647solution.com/Applications_downloads/CxF3_to_CGATS_users_guide.pdf

If a library contains both spectral and colorimetric tints, two files in CGATS format will be saved:

- One file containing only the tints specified by spectral values,
- One file containing only the tints specified by colorimetric values (XYZ and Lab),

Fingerprint tab:

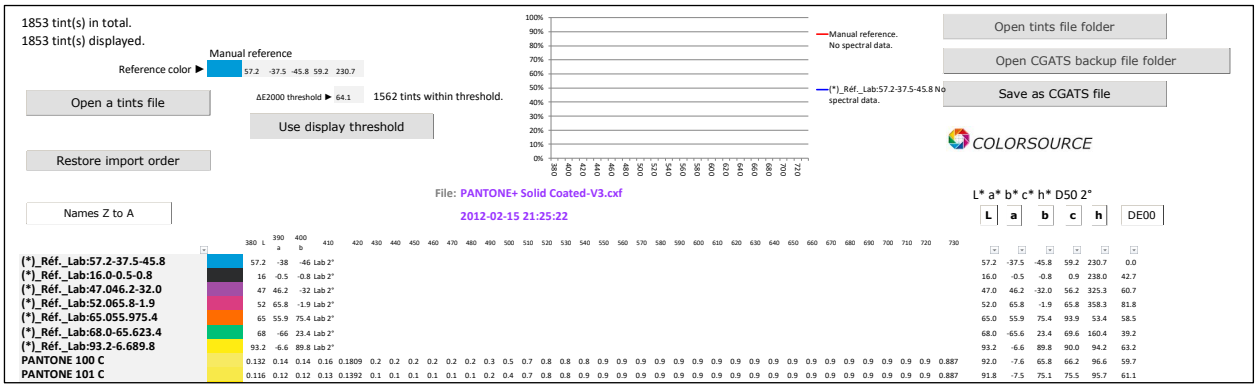
This tab works like Measure tab and allows importing any CGATS measurement file made by measuring any color chart or control bar on one or more printed copies, by using **MeasureTool** or **i1Profiler** software.



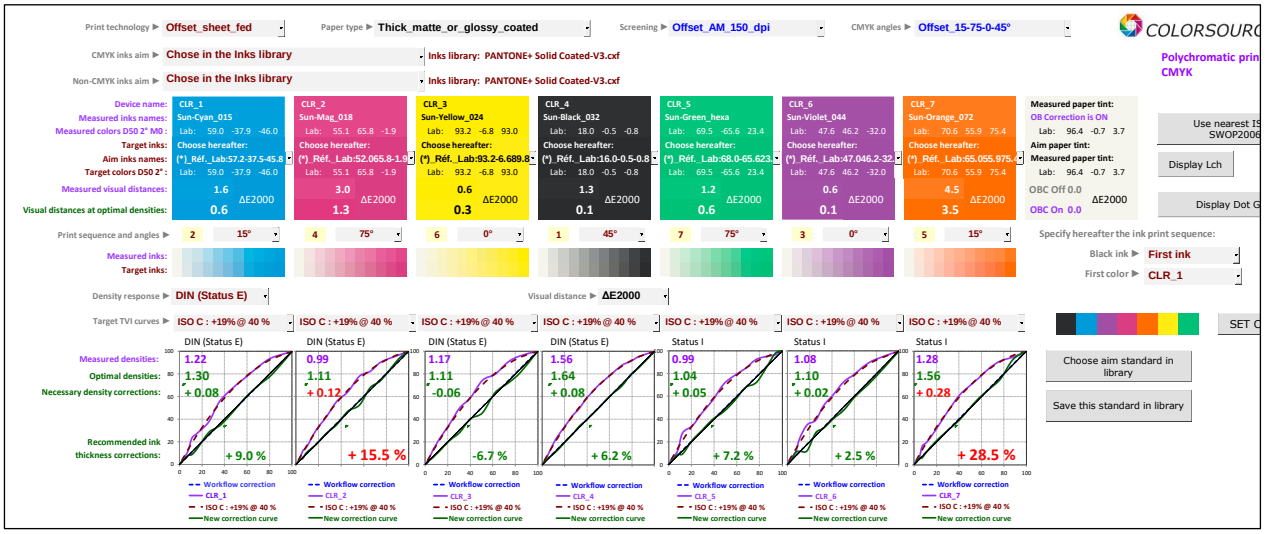
Creating and recording a Multicolor printing standard by printing a Fingerprint:

Using a **Fingerprint** color aim is very convenient for specifying and recording Multicolor print standards. There is no N-Color printing public standard, so the logic for creating a Multicolor color print standard is as follows:

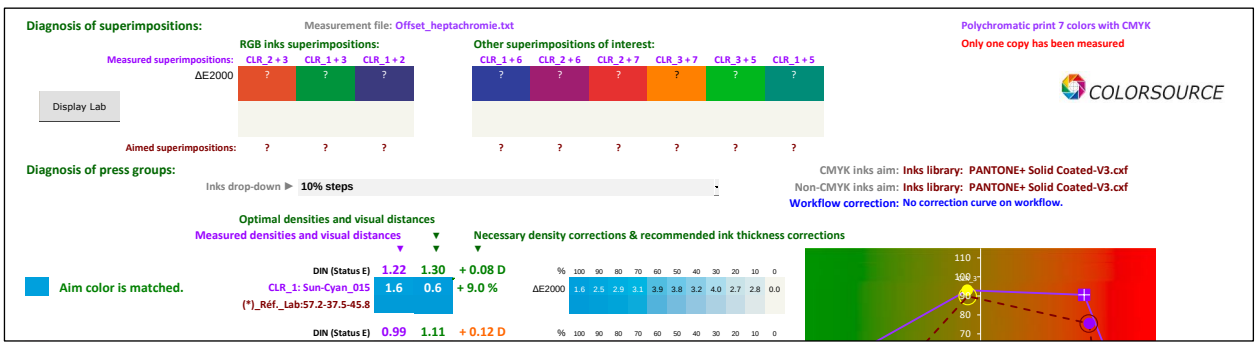
1. Since you don't have a **Fingerprint** yet, you can choose for each ink a target color in the ink's library. One alternative may be using an ISO12647-x target for the CMYK inks and an ink's library target for other inks.



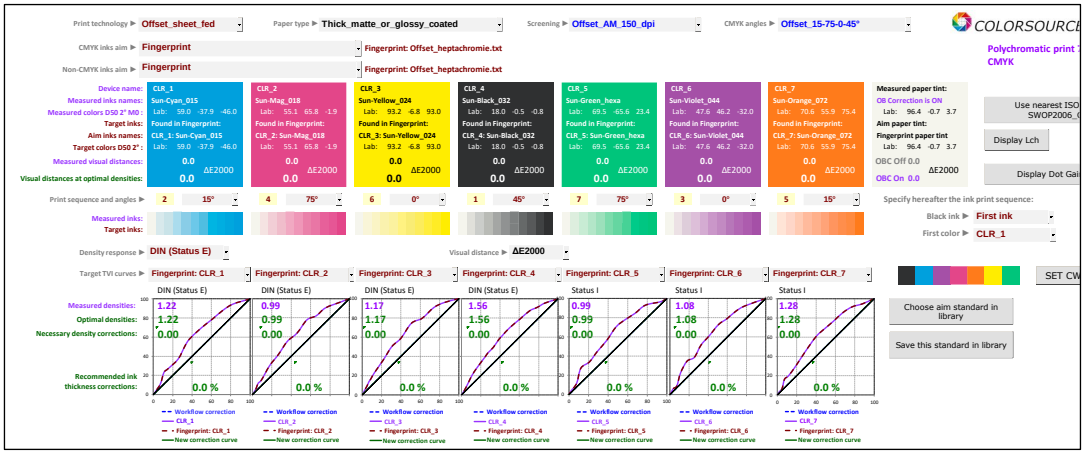
The Multicolor standard is first specified by a target color and a target TVI curve for each ink, and the inks print sequence:



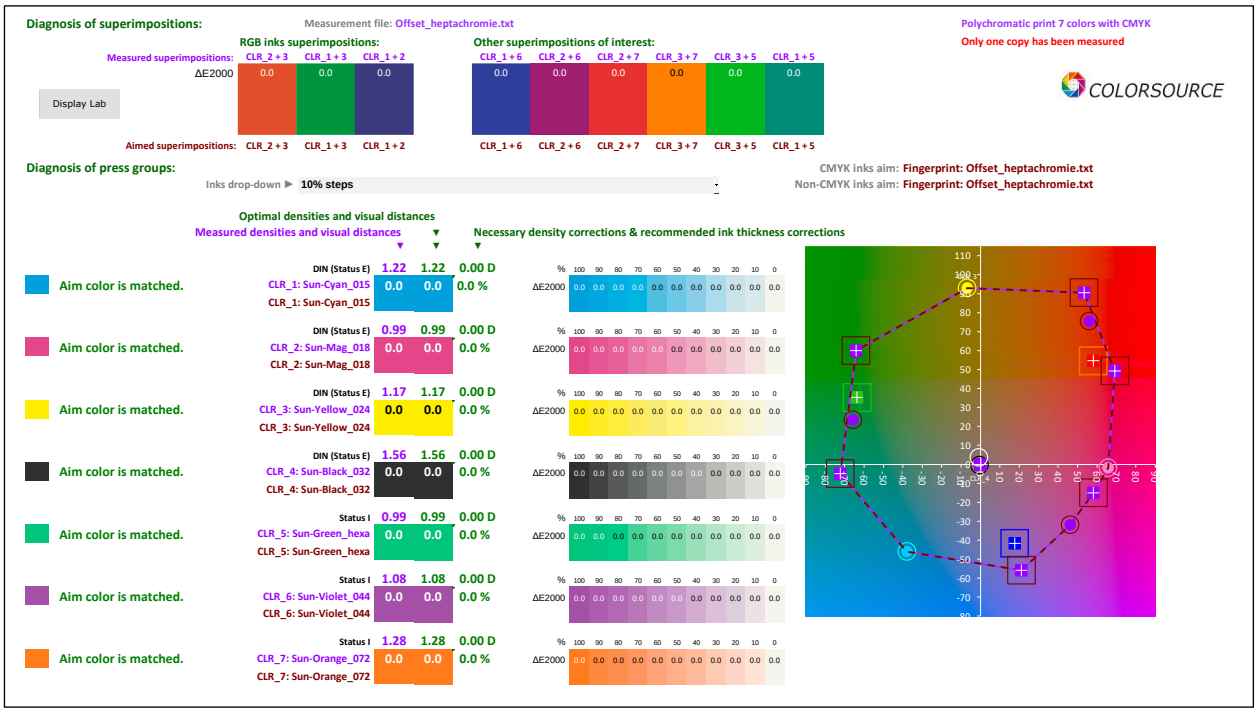
Note that at this stage, the aim colors for overlays of interest are unknown: (Except for RGB aim overlays if an ISO12647-x aim have been chosen for the CMYK ink base)



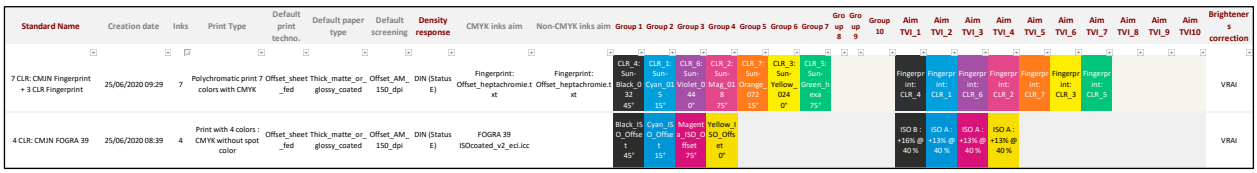
2. After setting the inks densities for matching each ink's aim color within tolerances (and with thickness or pigment concentration errors smaller than 10%), and after programming the correction curves for matching the aim TVI curves in these conditions, you can:
   - Reprint the test form at optimal densities,
   - Measure several press characterization charts or press control bars,
   - Open the resulting file as **measurement file** and as **fingerprint**:



Note that at this stage, the target colors of the overlays of interest are known: (Provided you have designed and used an appropriate press control strip including the overlays of interest)



3. Save this standard in the library:



The Multicolor standard is now completely specified, reusable, and can be communicated to any other printing company that must match it for a print production.

Reminder about Fingerprint-based aim colors:

If **Fingerprint** is selected in AimStandard tab as an aim for CMYK and/or non-CMYK inks:

For each CMYK (and/or not CMYK) ink found in the current measurement file, **MagicPrepress** will search the current **Fingerprint** file for the ink with nearest color.

If this **Fingerprint** ink's color is close enough:

- **MagicPrepress** takes this color as the measured ink's aim color,
- **MagicPrepress** takes its TVI curve as the aim TVI curve,
- If the **Fingerprint** aim ink TVI curve does not exist (no % patch other than the 100% ink in the **Fingerprint**), you have to manually specify a target TVI for the measured ink.

If no **Fingerprint**'s ink's color is close enough:

- **MagicPrepress** chooses for aim color the closest ink found in InksLib,
- You have to manually specify a target TVI for the measured ink.

If the **Fingerprint** only contains colorimetric and not spectral data, visual density is automatically used for computing the measured and aim TVI curves of each ink.

If the current **Measured** file only contains colorimetric and not spectral data, visual density is automatically used for computing the measured and target TVI curves for each ink.

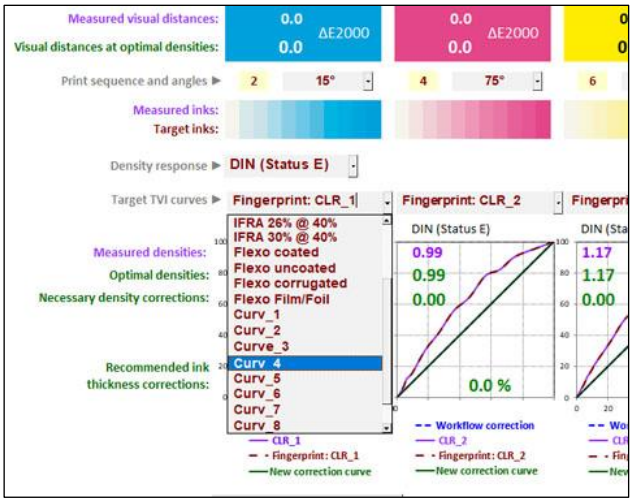
CustomTVI tab:

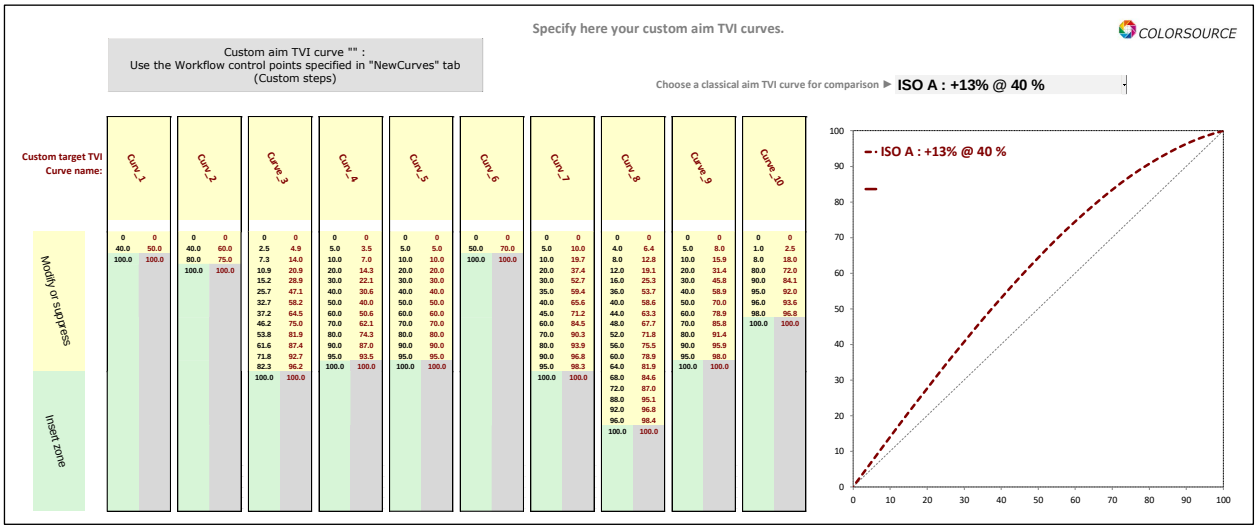
For matching each CMYK ISO12647-2-3-4-6, or WAN-IFRA or GraCol or SWOP standard, **MagicPrepress** automatically uses the appropriate CMYK aim TVI curves, to be computed using **DIN** (**Status E**) **spectral response** if the measurement file contains spectral data as recommended, or computed using **visual density** if the measurement file contains only XYZ and/or Lab color data.

For high quality and productive print runs, creating, recording and communicating new print standards is compulsory every time no public standard is available. Like what:

- Prints with non-standard CMYK inks and/or prints on special non-standard media,
- CMYK prints with spot color(s),
- All Multicolor prints with or without a CMYK base.

For creating of a new print standard, the AimStandard tab allows you choosing for each ink a target TVI curve among classic ISO12647-x target curves, and also from the ten custom TVI curves that you can freely design and name using the CustomTVI tab:





In addition to the 0 and 100% control points that are always present, you can freely enter 1 to 24 control points for specifying each custom target TVI curve:

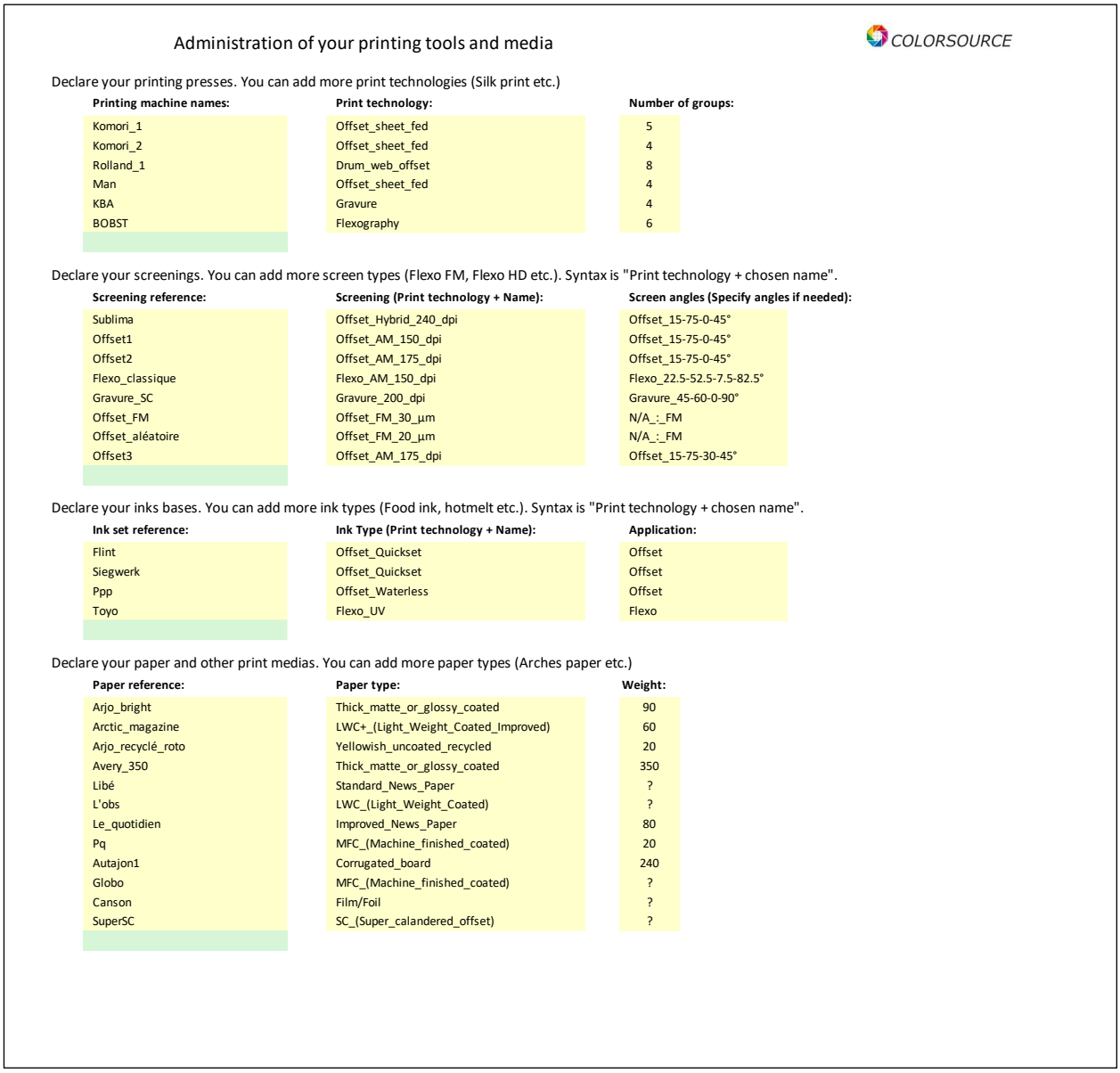
- For suppressing one or more control points, select them using your mouse and make **"Suppress"** on your keyboard,
- For inserting a control point, type its value after selecting one of the empty green cells in the column,
- For changing an **existing control point**, select it and type its value on your keyboard,
- For changing the **value of a curve**, select the value to be modified and type it on your keyboard.

Admin **tab**:

We strongly advise you to spend the time to fill in the Admin tab, so that **MagicPrepress** can properly manage all of your print shop tools, print standards and associated correction curve's sets, in the fastest and most reliable way.

MagicPrepress will always provide you with all the desired results, even if you don't fill in the Admin tab. But, for example, **no set of correction curves can be recorded if it is not associated with a specific press and well specified screening characteristics**.

And so, the various **press machine names** and **screenings specifications** you are using **must** be declared in the Admin tab to allow using **MagicPrepress** as a global tool for creating, managing, updating, and matching all your public and private printing standards using all your presses.



Administration of your printing tools and media

COLORSOURCE

Declare your printing presses. You can add more print technologies (Silk print etc.)

Printing machine names:	Print technology:	Number of groups:
Komori_1	Offset_sheet_fed	5
Komori_2	Offset_sheet_fed	4
Rolland_1	Drum_web_offset	8
Man	Offset_sheet_fed	4
KBA	Gravure	4
BOBST	Flexography	6

Declare your screenings. You can add more screen types (Flexo FM, Flexo HD etc.). Syntax is "Print technology + chosen name".

Screening reference:	Screening (Print technology + Name):	Screen angles (Specify angles if needed):
Sublima	Offset_Hybrid_240_dpi	Offset_15-75-0-45°
Offset1	Offset_AM_150_dpi	Offset_15-75-0-45°
Offset2	Offset_AM_175_dpi	Offset_15-75-0-45°
Flexo_classique	Flexo_AM_150_dpi	Flexo_22.5-52.5-7.5-82.5°
Gravure_SC	Gravure_200_dpi	Gravure_45-60-0-90°
Offset_FM	Offset_FM_30_µm	N/A_:_FM
Offset_aléatoire	Offset_FM_20_µm	N/A_:_FM
Offset3	Offset_AM_175_dpi	Offset_15-75-30-45°

Declare your inks bases. You can add more ink types (Food ink, hotmelt etc.). Syntax is "Print technology + chosen name".

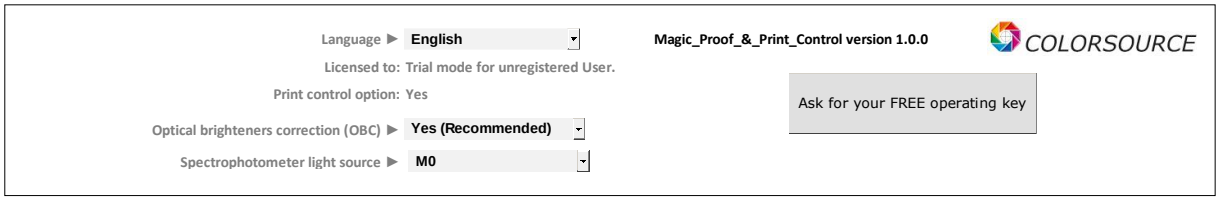
Ink set reference:	Ink Type (Print technology + Name):	Application:
Flint	Offset_Quickset	Offset
Siegwerk	Offset_Quickset	Offset
Ppp	Offset_Waterless	Offset
Toyo	Flexo_UV	Flexo

Declare your paper and other print medias. You can add more paper types (Arches paper etc.)

Paper reference:	Paper type:	Weight:
Arjo_bright	Thick_matte_or_glossy_coated	90
Arctic_magazine	LWC+_(Light_Weight_Coated_Improved)	60
Arjo_recyclé_roto	Yellowish_uncoated_recycled	20
Avery_350	Thick_matte_or_glossy_coated	350
Libé	Standard_News_Paper	?
L'obs	LWC_(Light_Weight_Coated)	?
Le_quotidien	Improved_News_Paper	80
Pq	MFC_(Machine_finished_coated)	20
Autajon1	Corrugated_board	240
Globo	MFC_(Machine_finished_coated)	?
Canson	Film/Foil	?
SuperSC	SC_(Super_calandered_offset)	?

Prefs. tab (Preferences):

Choosing MagicPrepress language:



At **MagicPrepress** very first launch, the language is automatically chosen between French, English or Spanish, depending on Windows' declared language for your keyboard. Of course, you can change this **MagicPrepress**' initial language afterwards.

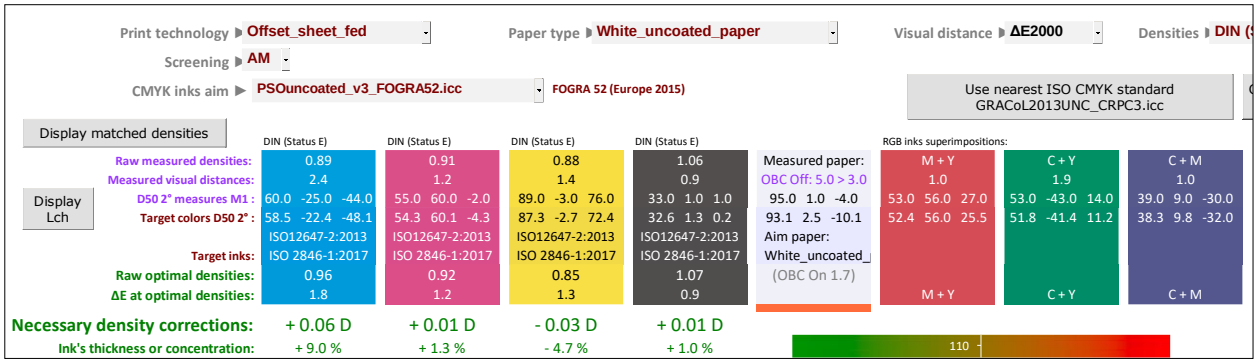
Optical brighteners' correction (OBC):

By default, the correction of paper's optical brighteners is activated: We advise you to always keep it active, because it is essential for calculating, out of your measurement files (Control bars, reference colors used as Fingerprint and ink's libraries), apparent Lab colors that do match the colors you actually perceive under D50 light.

Of course, when activated, the optical brighteners' correction applies to both measured and aim colors. And the mistakes on some target colors published by ISO12647 **are duly corrected**. (Please read our comprehensive paper on ISO12647 that fully explain these issues).

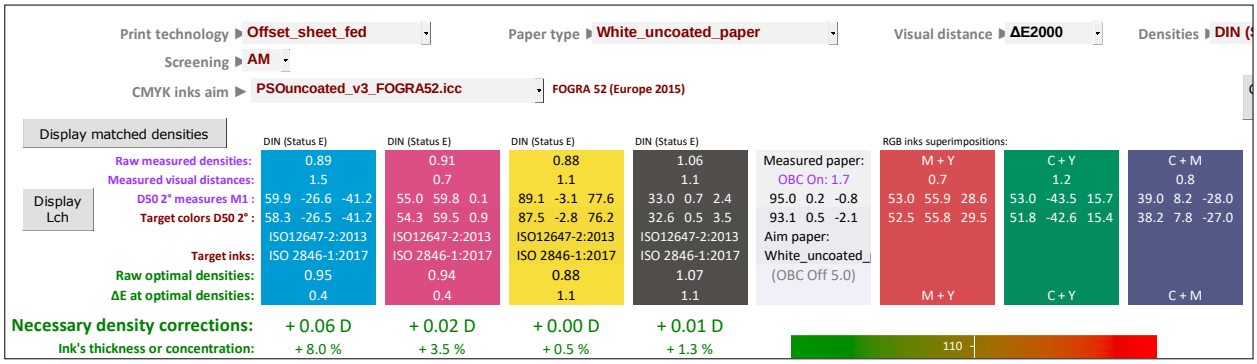
For example, see below:

Without correction of optical brighteners (**OBC OFF**), the paper's aim color published as **Fogra52** (uncoated white) is L, a, b = 93.1, 2.5, -10.1, **which is aberrant because this does not match at all to the color we do perceive**:



Measured print run quality:		Active print tolerances ΔE2000 (Prefs.)
Maximal ΔE pure x% inks:	5.6	4.0
Maximal ΔE inks overlays:	1.9	5.0
Paper ΔE:	5.0	3.0
Average ΔE inks and overlays:	2.6	3.0
Maximal dot gain error:	+ 1.9%	+/- 5%
Maximal ink thickness or concentration error:	+ 9%	+/- 10%

With optical brightener's correction (**OBC ON**), the paper's aim color for **Fogra52** (uncoated white) becomes L, a, b = 93.1, 0.5, -2.1, which does match fairly well to the color we actually perceive:



Measured print run quality:		Active print tolerances ΔE2000 (Prefs.)
Maximal ΔE pure x% inks:	1.5	4.0
Maximal ΔE inks overlays:	1.2	5.0
Paper ΔE:	1.7	3.0
Average ΔE inks and overlays:	1.1	3.0
Maximal dot gain error:	+ 1.9%	+/- 5%
Maximal ink thickness or concentration error:	+ 8%	+/- 10%

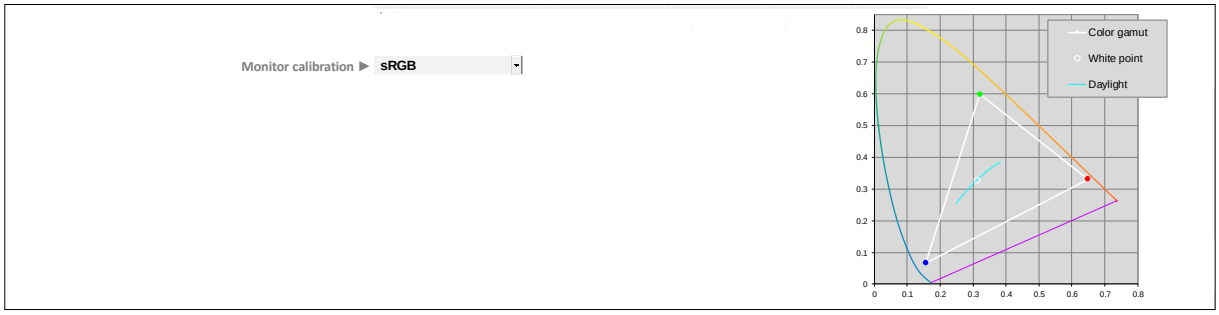
See our reference article about ISO12647-2-3-4-6-7 and G7/IDEAlliance:
https://www.color-source.net/en/Docs_Formation/2021_POINT_ABOUT_ISO_12647_STANDARDS.pdf

Declaring to MagicPrepress the internal light source your 45/0° spectrophotometer is using when measuring colors in reflection mode:

As explained in our reference paper about ISO12647 standards, using in the spectrophotometer a **D50** type light source (Measurement condition **M1**), instead of an **A** light source (2856 K incandescence that is legacy measurement condition post-named **M0**), further exaggerates the blue cast measured on papers containing optical brighteners.

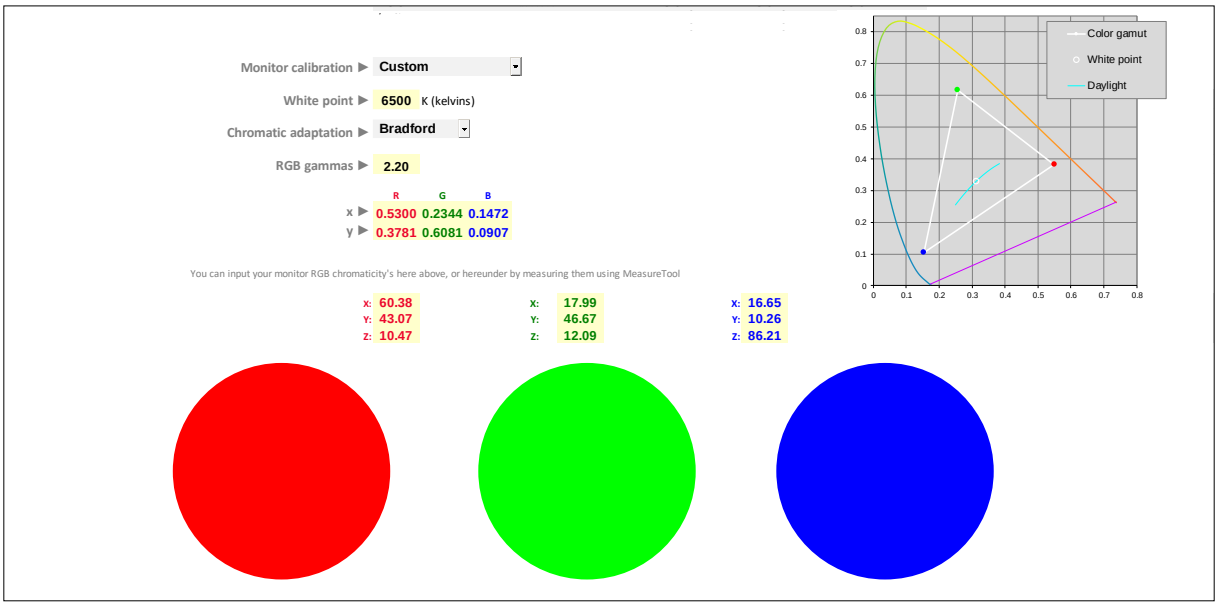
For ISO12647-x target colors, **M0** or **M1** setting is chosen automatically based on each chosen aim. **But for your measured colors, you must declare in Prefs. tab whether you are taking your measurements under M0 or M1 condition**.

Declaring the characteristics of your PC's RGB monitor for more accurate color display:



By default, all Lab colors measured or displayed by **MagicPrepress** are converted to RGB via the standard office work environment **sRGB** I.C.C. profile, which is usually enough for a decent display of tints.

However, if you need a more accurate display of all tints, you can declare to **MagicPrepress** all the characteristics of your monitor, by choosing "**Custom**" from the **Monitor calibration** drop-down menu:



Your monitor's characteristics to be declared are as follows:

- Color temperature of the monitor (White point),
- Chosen chromatic adaptation matrix,
- Common gamma of the three R, G and B channels,
- **xy** chromaticity or XYZ measurements of each R, V and B primary color at 100% (= 255 in general).

In practice – but it is not mandatory – you can calibrate and characterize your RGB monitor using a conventional commercial software (e.g., i1Profiler, used in advanced mode), and choose at calibration stage (Following aim calibration values are only given as an example):

- Monitor color temperature = 6500 K (D65),
- Chromatic adaptation matrix = Bradford,
- Common gamma for the three R, G and B channels = 2.2,

The commercial monitor calibration application will allow you reaching the arbitrary calibration parameters specified above, and then it will calculate the I.C.C. profile of your monitor under these calibration conditions, which will be used by Photoshop and other desktop publishing applications.

And because Excel does use your monitor's I.C.C. profile, you just need to declare to **MagicPrepress** the **xy** chromaticity or **XYZ** measurements of each R, G and B primary.

These colorimetric **xy** and/or **XYZ** co-ordinates values are sometimes displayed by your monitor's calibration application, in its calibration summary, at the end of the monitor calibration and characterization process.

It is also very easy to measure directly on your monitor the **XYZ** values of the three red, green and blue circles, for example by using an i1Pro 1 or 2 in "emission" measurement mode with free **MeasureTool** application (Measurement module of the ProfileMaker application, which probably keeps the most flexible measurement application to date).

Controlling color proofs and print works:

As we have often seen Press Operators try to print the colors of bad digital proofs (unverified proofs made on poorly calibrated printers), we have provided **MagicPrepress** with the features that allow to easily and quickly check all the color proofs received before any print, and also check the color prints produced during the print run.

The Control tab allows controlling the quality of printworks according to ISO12647-2-3-4-6 standards or according to your own criteria, and controlling proofs according to ISO12647-7 standards or according to your own criteria.

In this tab **MagicPrepress** offers ten control modes in a drop-down menu:

Control mode	Purpose of the control
Proof check according to **ISO 12647-7**	CMYK color proofs, according to ISO12647-7*
Proof check according to **G7/IDEAlliance**	CMYK color proofs, according to US interpretation of ISO12647-7*
Proof control using ΔE2000	CMYK color proofs controlled with ΔE2000, **future standard**
Proof control using ΔE94	CMYK color proofs controlled with ΔE94, private standard
Proof control using ΔECMC2:1	CMYK color proofs controlled with ΔECMC2:1, private standard
Print check according to **ISO 12647-2-3-4**	Offset or gravure prints according to ISO 12647-2-3-4 standards*
Print check according to **ISO 12647-6**	Flexo prints according to ISO 12647-6*
Print control using to ΔE2000	Print works controlled with ΔE2000, **future standard**
Print control using to ΔE94	Print works controlled with ΔE2000, private standard
Print control using to ΔECMC2:1	Print works controlled with ΔECMC2:1, private standard

(*) See our up-to-date whitepaper summarizing all the modern ISO12647-2-3-4-6-7 and G7/IDEAlliance CMYK print standards: https://www.color-source.net/en/Docs_Formation/2021_POINT_ABOUT_ISO_12647_STANDARDS.pdf

Controlling print works:

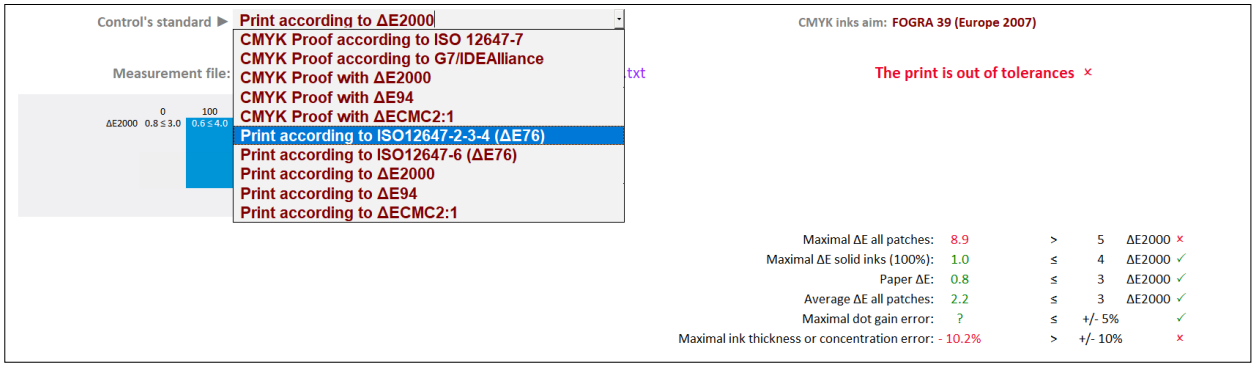
Users can specify their own tolerances in **Prefs.** tab for each one of the control modes proposed for print works. Of course, controlling prints according to the official **ISO 12647-2-3-4-6** CMYK standards requires using the **ISO12647-2-3-4-6** ΔE76 print tolerances by default, which are duly reminded at the bottom of **Prefs.** tab. The "**Restore default print tolerances**" button restores all default print tolerances.

For checking prints using visual distance assessment formulae ΔECMC2:1, ΔE94 or **ΔE2000** – much better than ΔE76 but not standardized - you can specify your own default print tolerances values at the bottom of **Prefs.** tab.

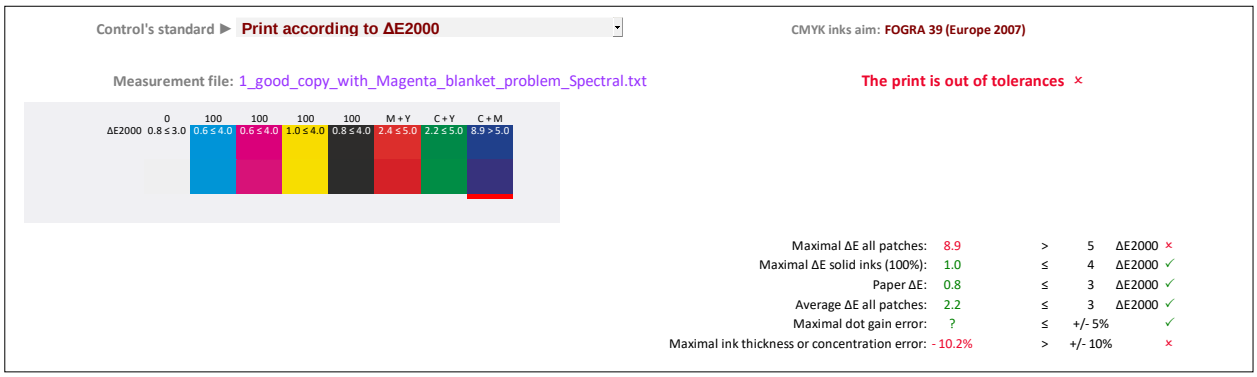
For CMYK presses calibrated for matching **ISO 12647-2** (Offset), **12647-3** (Newspapers), **12647-4** (Rotogravure), or **12647-6** (Flexography), **MagicPrepress** allows checking prints' color compliance according to following standards:

1. **ISO 12647-2-3-4**: Control of **offset** and **rotogravure** CMYK prints,
2. **ISO 12647-6**: Control of **flexographic** CMYK prints,
3. Or control of prints works according to your own standards (Color differences estimated using ΔECMC2:1, ΔE94 or **ΔE2000**).

Print check according to **ISO 12647-2-3-4**	Offset or gravure prints according to ISO 12647-2-3-4 standards
Print check according to **ISO 12647-6**	Flexo prints according to ISO 12647-6
Print control using to ΔE2000	Print works controlled with ΔE2000, **future standard**
Print control using to ΔE94	Print works controlled with ΔE2000, private standard
Print control using to ΔECMC2:1	Print works controlled with ΔECMC2:1, private standard



Displaying the diagnosis of a color print work:



Main differences between checking color proofs and color prints are as follows:

1. For the CMYK print works control modes that are standardized by ISO12647-2-3-4, the checked color criteria and associated tolerances are specific. Of course, ISO12647-2-3-4 tolerances are wider for controlling printed works than for controlling the associated color proofs (ISO12647-7).

For non-ISO controls, that are using much better formulae such as ΔE2000 for estimating the actually perceived visual distances, it is logical (and realistic) to also allow wider tolerances for print works than for the afferent color proofs.

2. For controlling offset, gravure and flexo prints' color quality, we are also interested by the TVI curve of each ink, since, for complying with any public or private standard, it is almost always enough to adjust the Lab color of each solid ink by playing on its density (So easy by using **MagicPress** application), and then match its aim TVI curve (So easy when using **MagicPrepress** application).

   This is why, in its five printed control modes, **MagicPrepress** also displays in its Control tab, in addition to the diagnosis of visual distances, an informative densitometric control of the print:

   - The maximal measured dot gain error.
   - The maximum ink thickness or concentration's error, which indicates whether the print was made under conditions for which the correction curves programmed in the prepress workflow are valid or not.

Controlling color proofs:

Control mode	Purpose of the control
Proof check according to **ISO 12647-7**	CMYK color proofs, according to ISO12647-7
Proof check according to **G7/IDEAlliance**	CMYK color proofs, according to US interpretation of ISO12647-7
Proof control using ΔE2000	CMYK color proofs controlled with ΔE2000, **future standard**
Proof control using ΔE94	CMYK color proofs controlled with ΔE94, private standard
Proof control using ΔECMC2:1	CMYK color proofs controlled with ΔECMC2:1, private standard

Users can specify their own tolerances in **Prefs.** Tab, for each one of the five modes offered for checking color proofs. Of course, controlling CMYK proofs according to the official **ISO 12647-7** CMYK proof control standard, requires using the default **ISO 12647-7** proofing tolerances, which are duly reminded at the bottom of **Prefs.** tab. The "**Restore default proof tolerances**" button restores all default proofing tolerances.

For checking color proofs using ΔECMC2:1, ΔE94 or **ΔE2000** - better but not standardized by ISO12647-7, you can specify your own default proofing tolerances values at the bottom of **Prefs.** tab.

MagicPrepress allows checking proofs simulating a CMYK press matching **12647-2** (Offset), **12647-3** or **WAN-IFRA** (Newspapers), **12647-4** (Rotogravure) or **G7/IDEAlliance**, according to following standards:

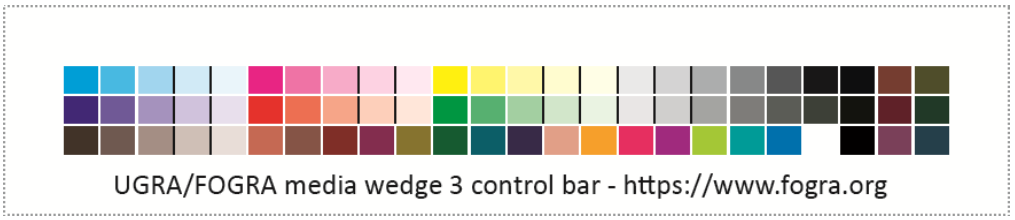
1. **ISO 12647-7**: Checks visual distances using ΔE76 and ΔH hue deviations of primary colors and CMY greys, according to **ISO 12647-7** specifications,
2. **G7/IDEAlliance**: Checks visual deviations using ΔE76 and ΔH and ΔF according to the specifications of G7/IDEAlliance. This is an interpretation of **ISO 12647-7** promoted by the American organizations **SWOP** (SWOP stands for Standard Web Offset Print) and **GRACoL** (GRACoL for General Requirements for Applications in Commercial Offset Lithography). In principle this interpretation of ISO 12647-7 is applicable only for the inspection of CMYK proofs simulating one of the published **SWOP** or **GRACoL** offset printing standards.
3. Or according to your own standards and tolerances (Control of proofs using ΔECMC2:1, ΔE94 or **ΔE2000** visual distance's assessment formula).

List of the classic CMYK proof control bars MagicPrepress can check:

For conventional CMYK control bars, the type of measured control bars is **automatically determined** from the following well-known control bars:

- **Fogra Media Wedge 2** control bar (Obsolete but still in use),
- **Fogra Media Wedge 3** control bar,
- **IDEAlliance 2009** control bar,
- **IDEAlliance 2013** control bar,
- **ISO 12647-7 Colorsource** control bar.

UGRA/FOGRA media wedge 2 control bar - https://www.fogra.org



UGRA/FOGRA media wedge 3 control bar - https://www.fogra.org

IDEAlliance free ISO 12647-7 2009 control strip - https://www.idealliance.org

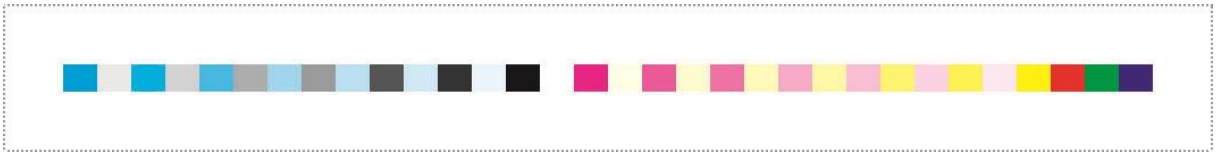
IDEAlliance free ISO 12647-7 2013 control strip - https://www.idealliance.org

Colorsource free ISO 12647-7 control bar - https://www.iso12647solution.com/

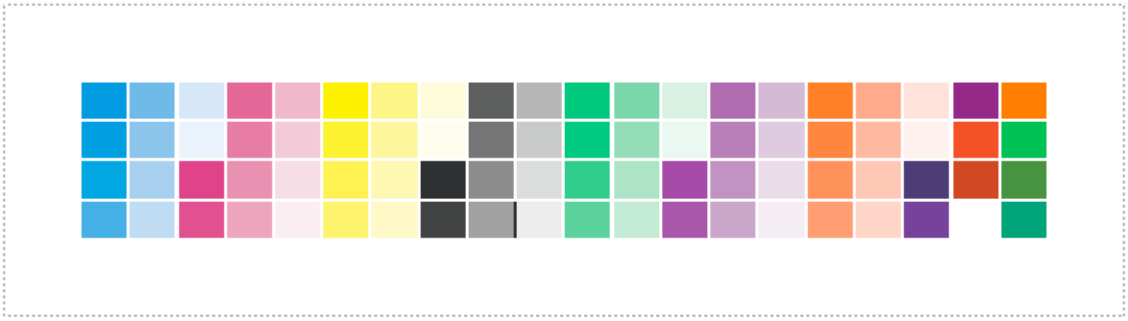
More generally **MagicPrepress** allows checking any CMYK or non-CMYK control bar printed with up to 10 different inks, and including all pure ink% steps, paper, and the two-by-two solid inks overlays.

Like what:

CMYK strip on one line, easy to use for CMYK prints works with **MagicPress** and **MagicPrepress** press calibration applications:

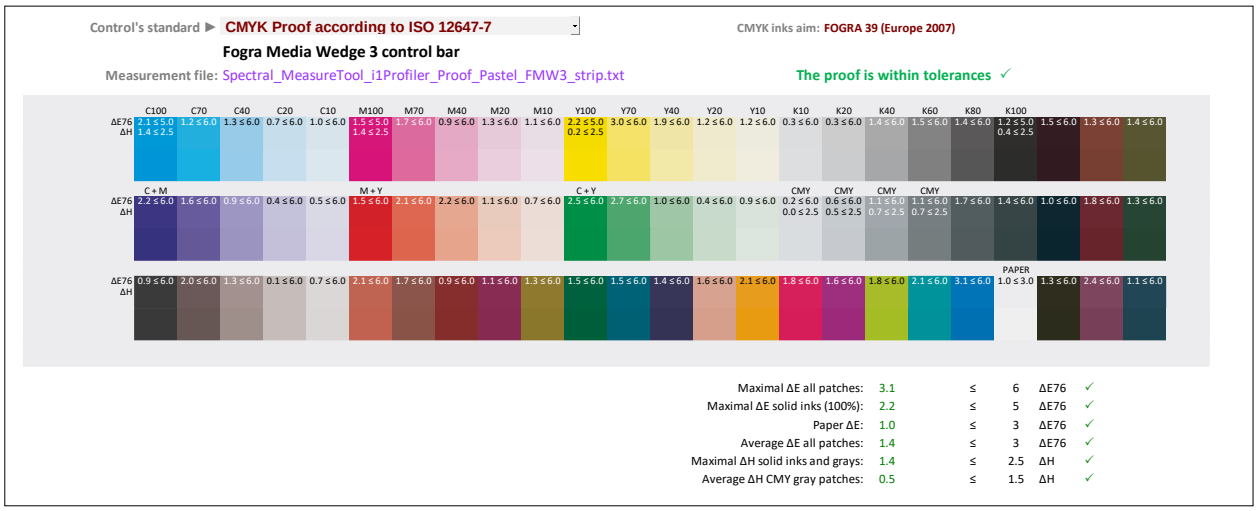


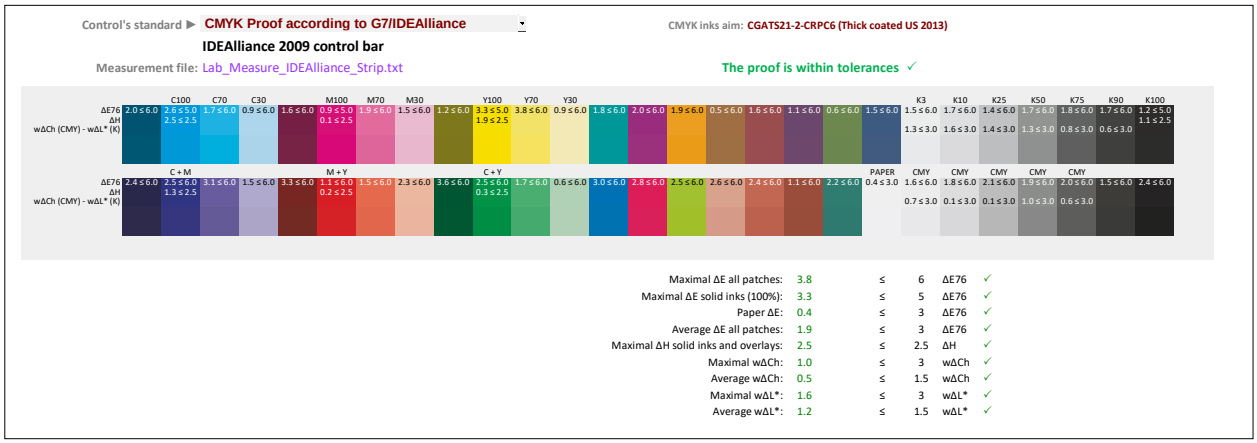
CMYK + Orange + Green + Purple control bar, e.g., for setting 7 colors offset press on cardboard using **MagicPress** and **MagicPrepress** applications:



Automatic closest ISO12647 CMYK aim standard detection:

When opening the measurement file of any classic CMYK control bar, **MagicPrepress** automatically detects the type of the control bar, and also the ISO12647-2-3-4-6 or GRACoL or SWOP or WAN-IFRA CMYK standard whose colors are closest to your proof measurement file: **This closest standard is then automatically proposed and used as the default CMYK aim standard** for checking your color proof:





This automatic choice of the closest public ISO12647 CMYK target is quite relevant, as long as your CMYK color proof, without necessarily being good … is not catastrophic!

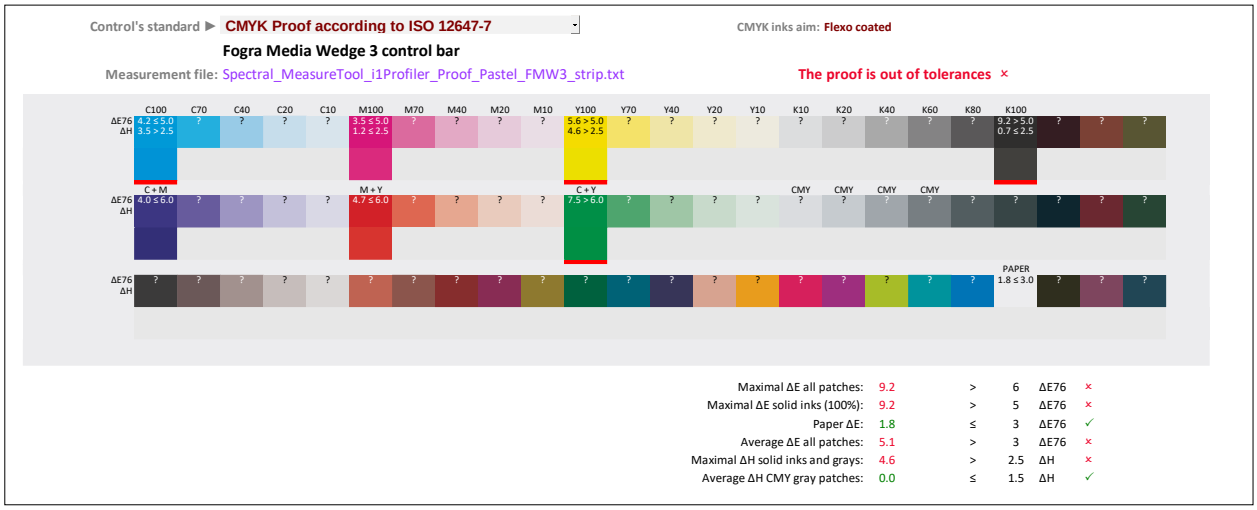
And nothing prevents you from manually specifying another target by using the **CMYK inks aim** drop-down menu in the Optimal_Densities tab.

Checking flexographic color proofs or printouts matching ISO12647-6 standards:

Please note that **ISO12647-6** standard specifies the Lab D50 2° colors of the solid CMYK inks and their RGB overlays, as well as the CMYK aim TVI curves, for each major type of flexographic print media.

However, given the wide variety of flexo clichés, screenings, and anilox that are used in the field, it was not possible publishing a standard CMYK I.C.C. profile for each major type of flexographic printing media.

Consequently, all patches of any classic CMYK proof control bars can only be checked if the CMYK I.C.C. profile of the flexographic press is known, and this profile I.C.C. can only be published and guaranteed by the flexographic print house.



It is therefore essential that print houses know how to calibrate their presses matching CMYK ISO12647-6 standards, and know how to establish and publish their presses CMYK I.C.C. profiles under these standardized printing conditions that fix their CMYK solid colors, RGB overlays colors and CMYK TVI curves.

Because in any case, without a press CMYK I.C.C. profile, it is impossible to perform optimized color separations and color proofs upstream.

Our **MagicPress** and **MagicPrepress** applications allow any Print House to easily set their flexo presses matching **ISO 12647-6** standards, using for example one of our free CMYK test forms that also include a press characterization chart, for establishing the CMYK profiles of their presses calibrated for matching ISO12647-6 standards.

Then by using the I.C.C. profile of any flexographic press, you can calculate easily with **Colorlab** the Lab colors produced by the flexo press for all patches of "**Reference including all classic control bars.txt**" file.

The resulting virtual measurement file can then be used as a reference **Fingerprint** for checking the color proofs simulating the flexographic press, provided they are fitted with one of the classic **Fogra** or **G7/IDEAlliance** or **Colorsource** CMYK control bars.

Please note that if the measurement of a control bar, on a color proof approved visually by the Customer, shows that the proof is slightly out of tolerances, the Press Operator may open this proof control bar measurement file as a Fingerprint, so as to print the solid CMYK inks as close as possible to the CMYK colors of the wrong color proof.

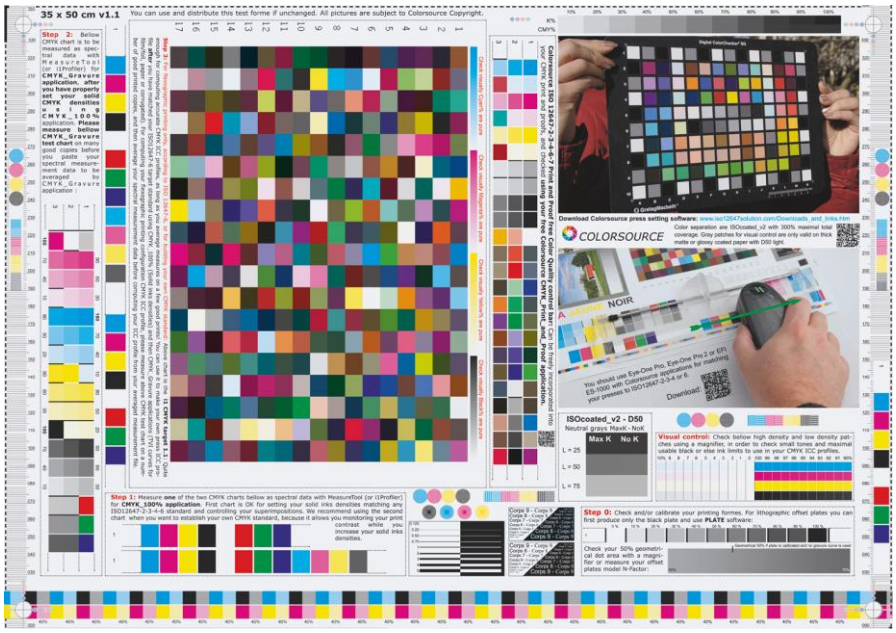
In the event of a color proof largely out of tolerances, the measurement file of the proof's control bar can also be used upstream as a Fingerprint with **MagicPrepress** to temporarily modify the CMYK correction curves on the workflow.

Workout: Determining the CMYK correction curves for calibrating a CMYK press according to ISO12647-2-3-4-6 or WAN-IFRA or IDEAlliance print standards:

You can build your own CMYK test form including the press CMYK control bars we supply, or your own color targets provided you build the appropriate text reference files for measuring them. Or you can use one of the free ready-to-use Colorsource CMYK print test forms available at:

https://www.iso12647solution.com/Colorsource_universal_CMYK_print_test_formes.htm

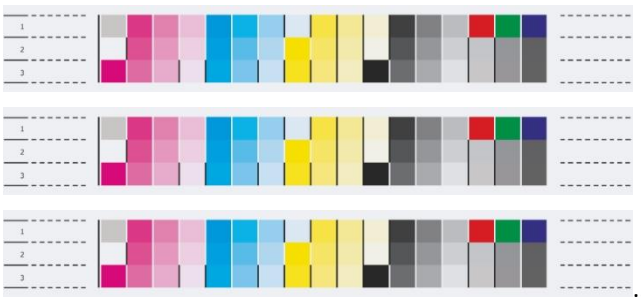
If this test form is too large, **do not resize it** but crop it (or use one of the smaller SRA3 test forms):



Do not forget adding an ink keys' control bar at imposition stage if you own dedicated measurement equipment. But please check **that the solid inks' densities on the ink key control bar** (E.g., on the four solid colors bands down the test form) **are the when measured on control bars in the test form**. Because defective offset plate mounting often results into bad measurements of your dedicated ink keys setting system on paper edge control bars. In this case, only the densities and colors you measure inside the test form are valid.

You will find as well that many ink keys measurement systems are bugged and give you bad density recommendations, **while Colorsource applications give you the good setting density recommendations**, **allowing you programming your ink key's reader with the appropriate aim densities**.

Once your solid inks densities have been properly set thanks to **MagicPress** application, print 20 to 30 good prints and then measure the 10% steps test charts dedicated to **MagicPrepress** application:



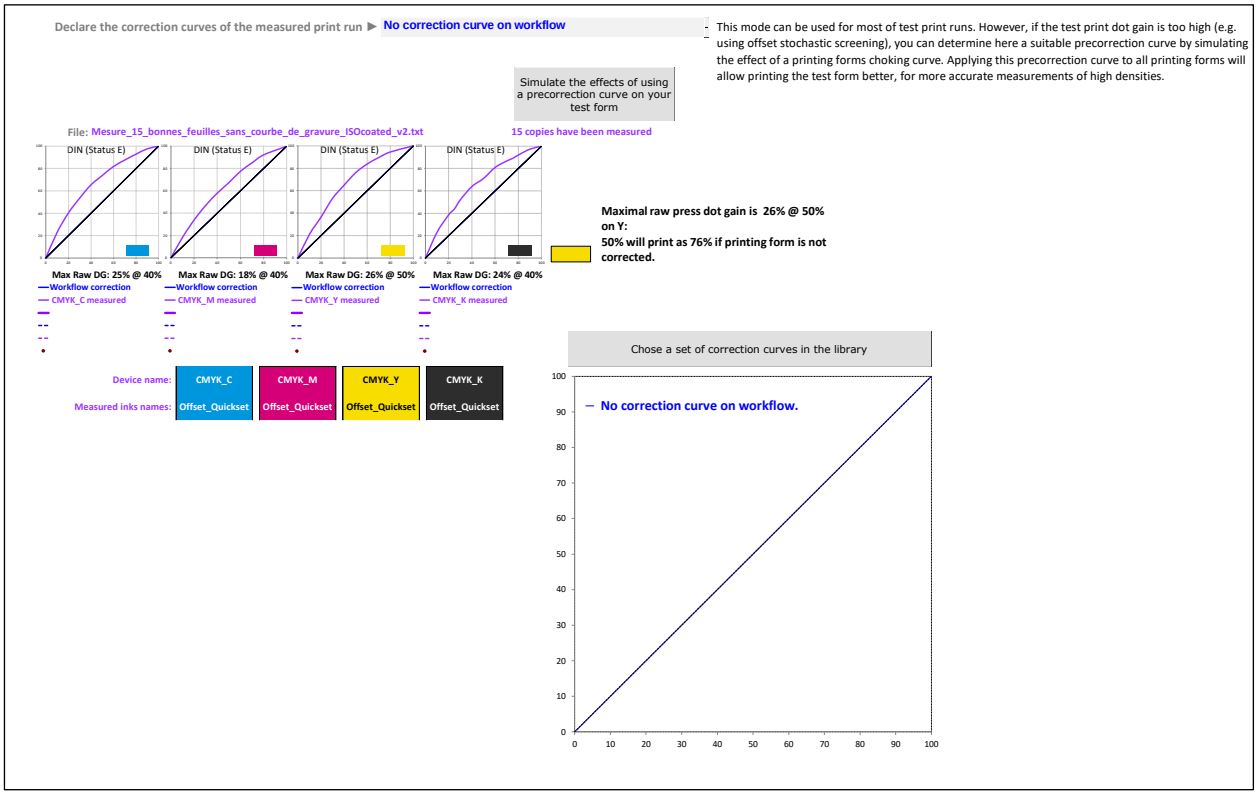
... Etc.

Save your spectral measurement file and import it into **MagicPrepress** Measure tab.

Now declare to **MagicPrepress** the four printing curves applied by the Workflow for producing the print run you are measuring.

Declaring the workflow correction curves applied to the measured print run:

In DeclareCurves tab, declare the values of the correction curves that were applied by the workflow for producing the CMYK printing forms:

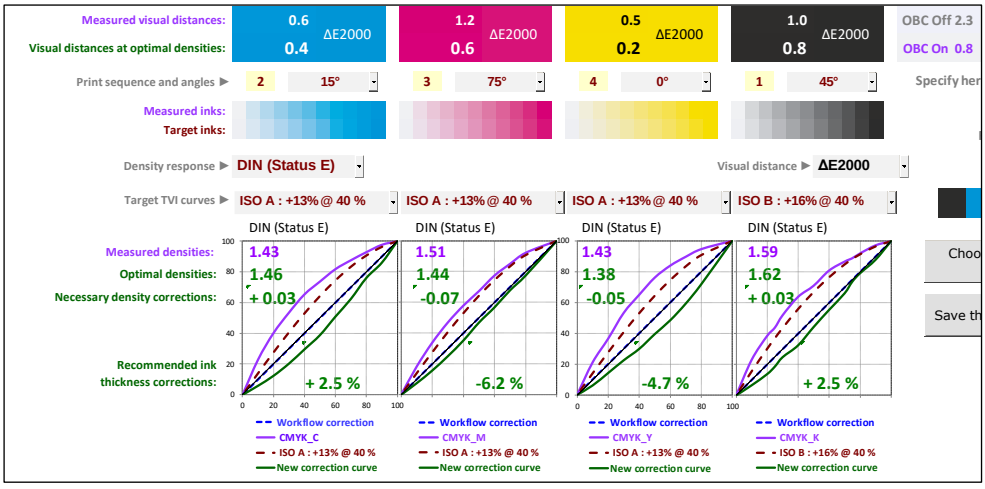


Specifying the aim colors standard to be matched:

The AimStandard tab allows you specifying all the characteristics of your aim standard (here Fogra 39), and checking that:

- The visual distances between the average print's measured inks solid colors and standard's inks colors stay within the tolerances,
- And that the average solid inks densities are close enough to the ideal densities:

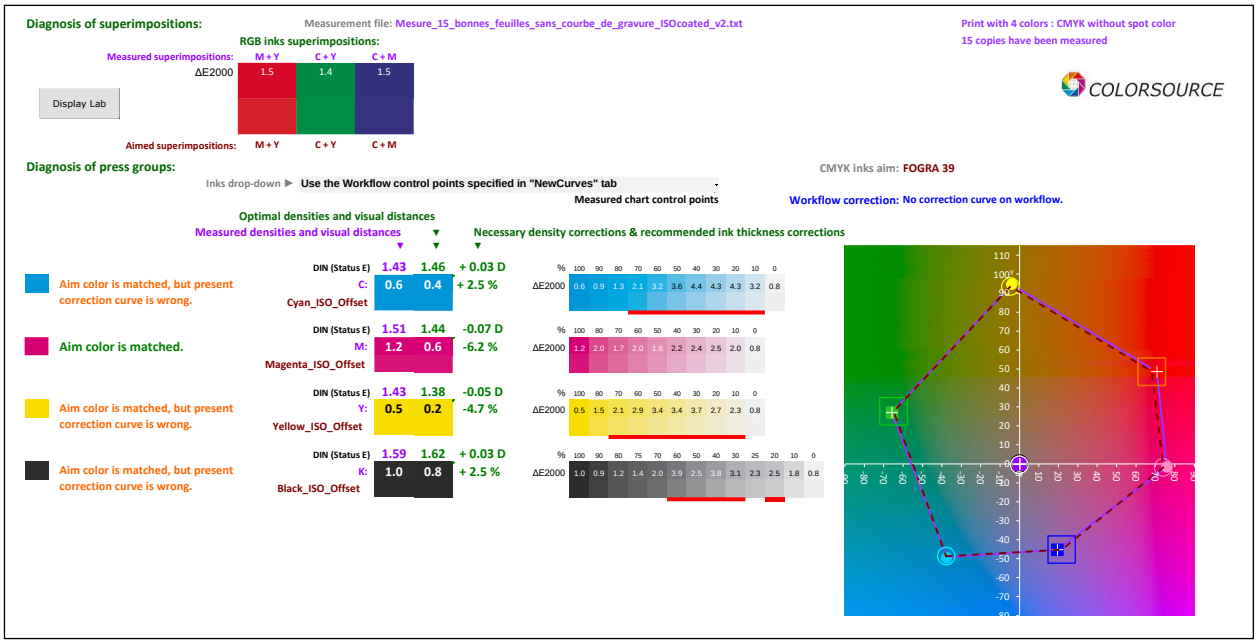
We recommend using **ΔE2000** visual distance, significantly more relevant than the obsolete **ISO12647-x ΔE76**:



COLORSOURCE S.A.S. - R.C.S. ÉVRY 453 219 768 - SIRET 453 219 768 00018 - CODE APE 7022Z

Synthetic diagnosis of the average print run quality:

The Expertise tab provides a complete quality diagnosis of the average measured print run, for the ink's overlays of interest and for each ink%:



Above diagnosis shows this calibration print run was carried out with densities near enough to ideal and thus allows computing reliable correction curves:

The C, M, Y and K primaries inks are well within the Lab D50 2° ΔE tolerances specified by **ISO 12647-2** for matte or glossy thick coated papers since the gap is very low: The printed densities are close to ideal for the four CMYK primaries, thanks to good press densities calibration using **MagicPress** application.

Even with little visual distance, if an ink's thickness is too far from the optimal (e.g., more than 10% difference), the correction curve calculated for the ink's printing form will be unreliable, because the press dot gain strongly depends on the ink's thickness or pigment concentration.

It is therefore essential any calibration print run be done:

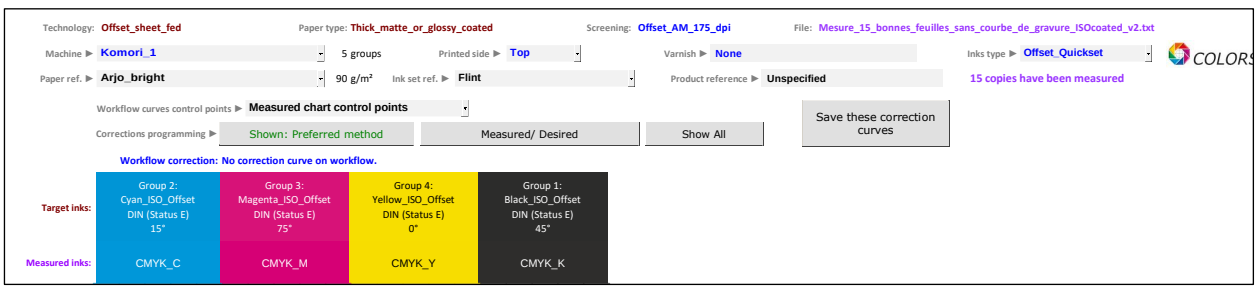
- Not only with small visual distances between solid and aim inks' colors,
- But also, with inks' densities close to ideal densities: Those that ensure a minimal visual distance.

It is always in the best interest to measure several targets on several printed copies for optimizing the accuracy of the correction curves computed by **MagicPrepress**. We are interested in the **average** behavior of the press.

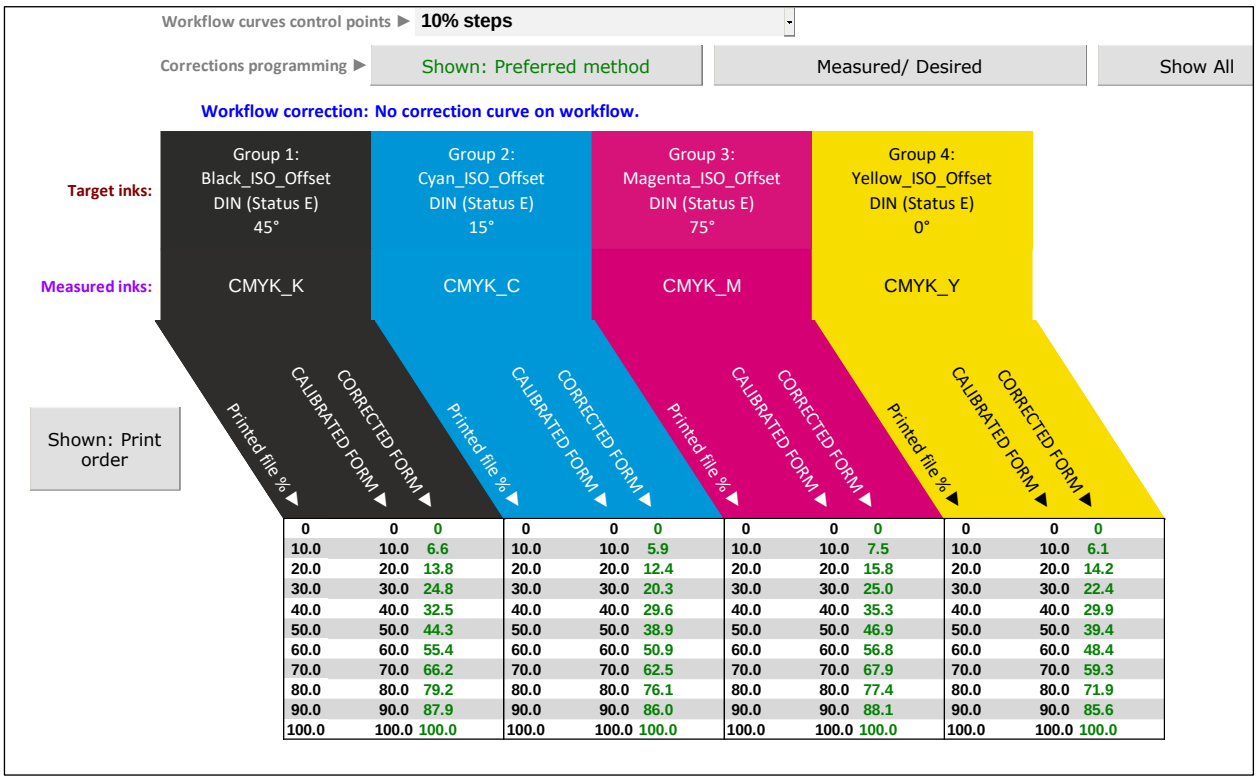
Display correction curves to be programmed in the workflow:

The NewCurves tab provides the correction curve to be applied by the workflow for each printing form.

Use **Recommended method** button for displaying the correction curves as they should be programmed in the workflow:

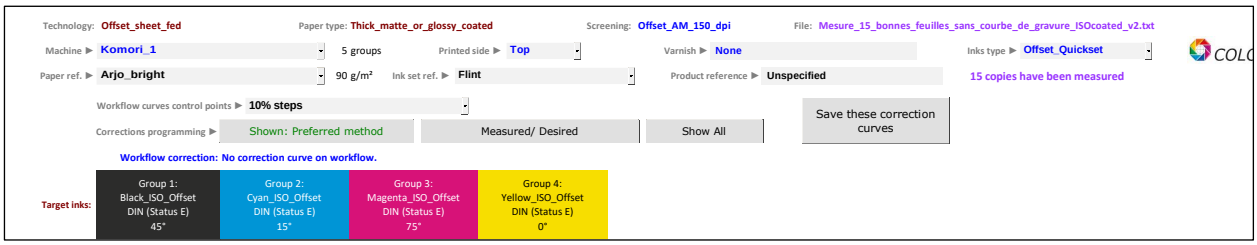


On below example, Cyan **40%** file value must be written **29.6%** on the Cyan plate:



Recording the set of CMYK correction curves:

Note that to be of practical use, and for being updated easily in case of drift (e.g., following change of plate's model or blanket type on an offset press), any set of correction curves to be recorded MUST be perfectly documented:

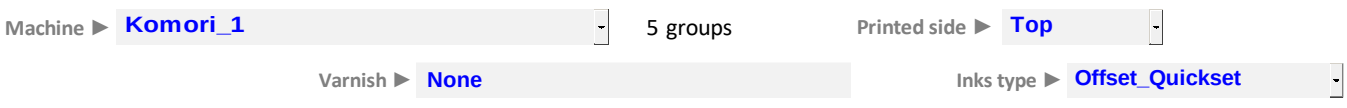


Checking that the conditions of use of the curve's set are present and accurate:

Make sure you've declared in the AimStandard tab the **screening** type and screen **angles** in use:

Make sure you've declared in the NewCurves tab:

- The **Machine** name for which the set of correction curves is intended,
- The **Printed side** of the paper to which the curve set is intended (at least for recto/verso presses),
- The **Varnish** or other post-processing that may be used (which affects the press dot gains),
- The **ink type** (which may also condition the measured dot gains).



The **"Save these correction curves"** button then allows you recording your curve's set and reported using conditions. If the **associated aim color standard** is not found in the StdLib library, it will be automatically saved before recording the curve set in CurvesLib.

Set of correction curves:

Date of the correction curves	Machine	Associated aim standard name	Print technology	Inks	Paper type	Printed side	Screening	Group 1	Group 2	Group 3	Group 4	Group 5	Inks type	Varnish	Paper ref.	Ink set ref.	Product reference
25/06/2020 08:39:38	Komori_1	4 CLR: CMJN FOGRA 39	Offset_sheet_fed	4	Thick_matte_or_glossy_coated	Top	Offset_AM_150_dpi	45°	15°	75°	0°		Offset_Quickset	None	Arjo_bright	Flint	Unspecified

Associated print standard:

Standard Name	Creation date	Inks	Print Type	Default print techno.	Default paper type	Default screening	Density response	CMYK inks aim	Non-CMYK inks aim	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	Group 8	Group 9	Group 10	Aim TVI_1	Aim TVI_2	Aim TVI_3	Aim TVI_4	Aim TVI_5	Aim TVI_6	Aim TVI_7	Aim TVI_8	Aim TVI_9	Aim TVI10	Brightness correction
4 CLR: CMJN FOGRA 39	25/06/2020 08:39	4	Print with 4 colors : CMYK without spot color	Offset_sheet_fed	Thick_matte_or_glossy_coated	Offset_AM_150_dpi	DIN (Status E)	FOGRA 39 ISOcoated_v2_eci.icc		Black_ISO_Offset 45°	Cyan_ISO_Offset 15°	Magenta_ISO_Offset 75°	Yellow_ISO_Offset 0°							ISO B : +16% @ 40 %	ISO A : +13% @ 40 %	ISO A : +13% @ 40 %	ISO A : +13% @ 40 %							VRAI

If you made mistakes when declaring one or more parameters recorded with the correction curve's set, don't worry: just correct them and re-record the curve's set with the **"Save these correction curves"** button.

Checking the correction curves:

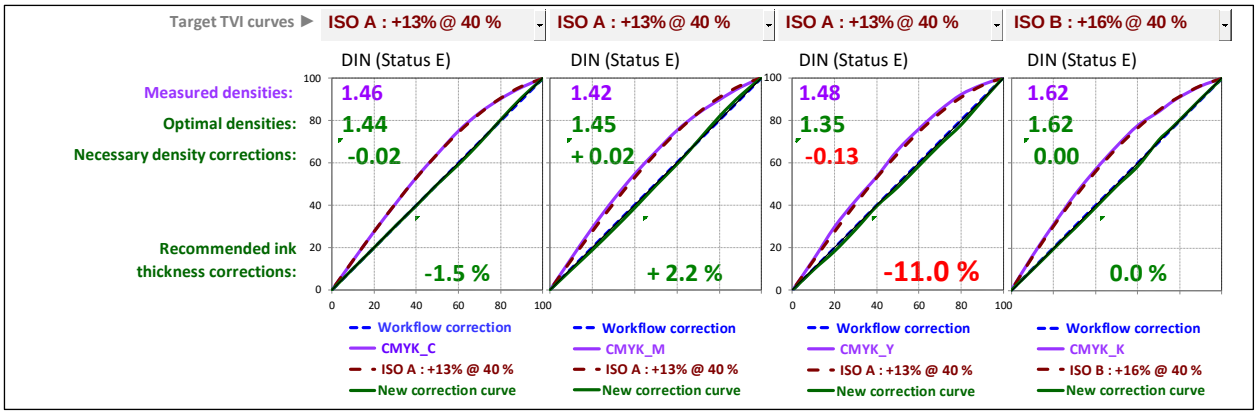
Not necessary in practice but educational. Such a calibration check is useful for training, and demonstrates the merits of modern methods of calibrating presses.

For checking the quality of the new correction curves programmed in the workflow, we can apply these correction curves for producing new CMYK plates of the test form, reprint them at the right unchanged densities, re-measure the average print run in these conditions, and open the measurement file in **MagicPrepress**:

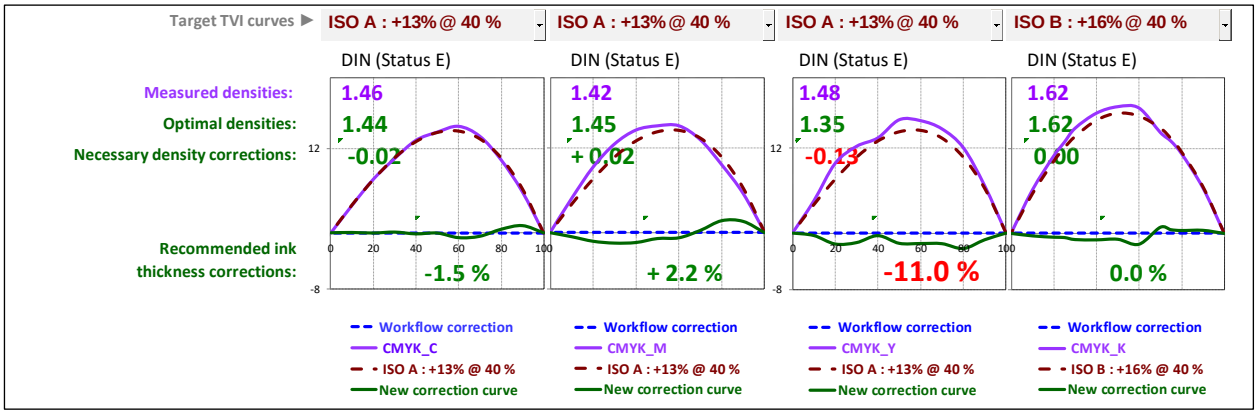
Checking the correction curves quality in the AimStandard tab:

The AimStandard tab must display measured TVI curves consistent with aim TVI curves:

Displaying measured and desired TVI curves:



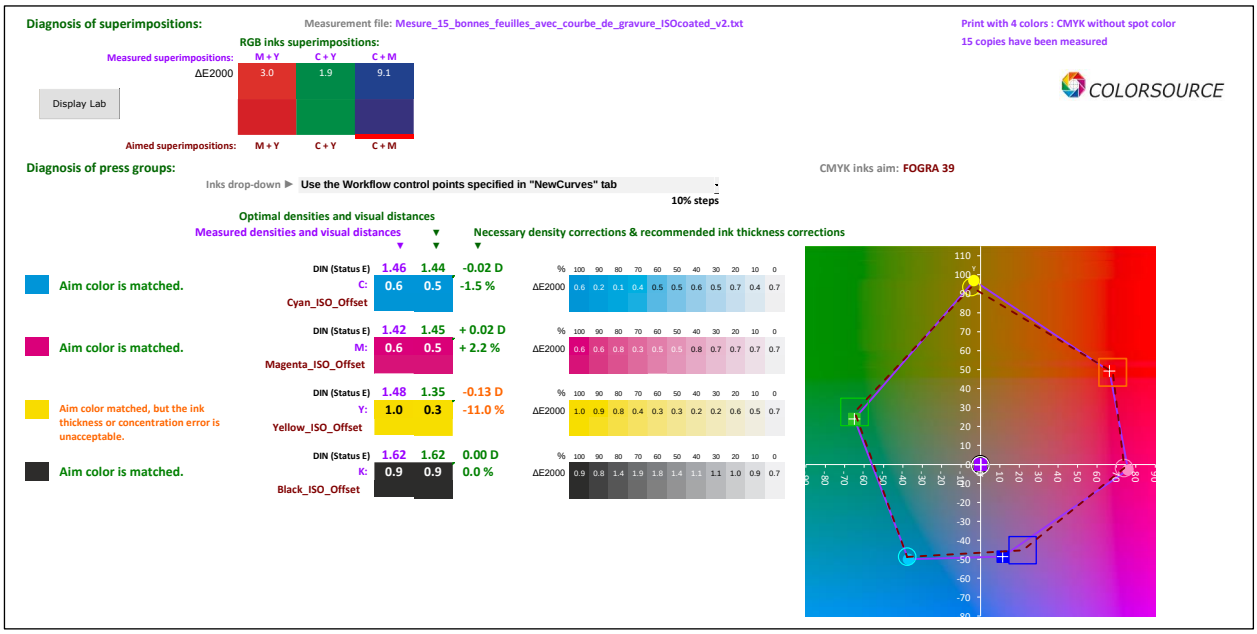
Displaying measured and desired dot gain curves:



Checking the correction curves quality in the Expertise tab:

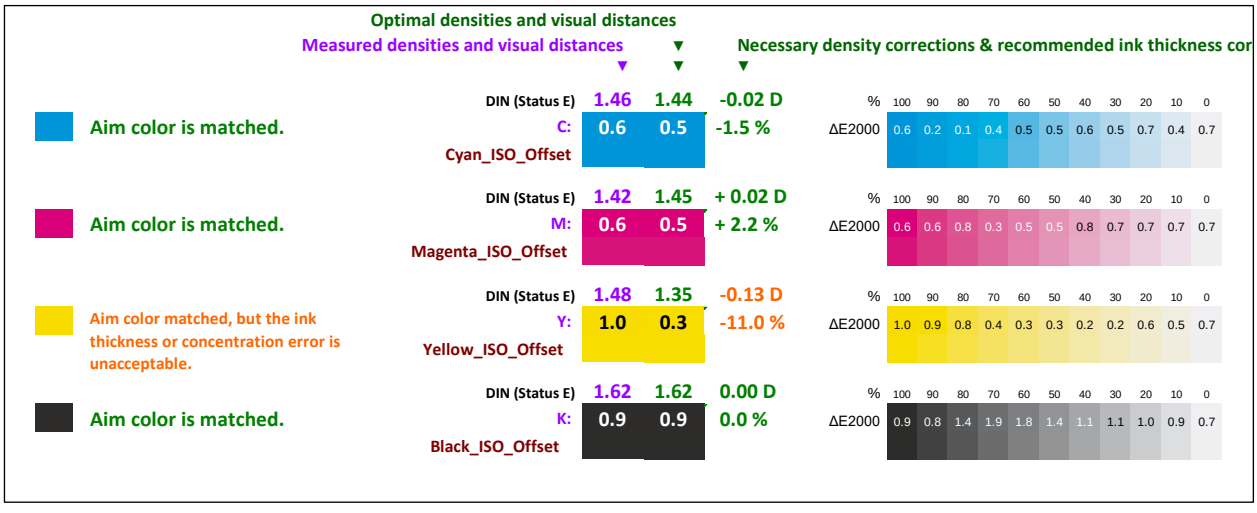
The Expertise tab must show good results across all the ink% patches of the CMYK chart as well for the 100% solid inks and their overlays.

Your CMYK press now perfectly matches the aim ISO 12647-2 standard:



On above example, we see that everything is good EXCEPT for blue (C + M) color and yellow density a little far from the optimal: This because the Magenta blanket has been changed between calibration and check print runs, and **MagicPress** software has not been used before reprint for checking the solid inks densities and their overlays!

This example shows that **MagicPress** software should be used for **EVERY** press setting, not just for calibration print runs! **Especially since the optimal printing densities depend on the reference of the coated paper used**, **and on the reference and manufacturing batch of CMYK inks**.

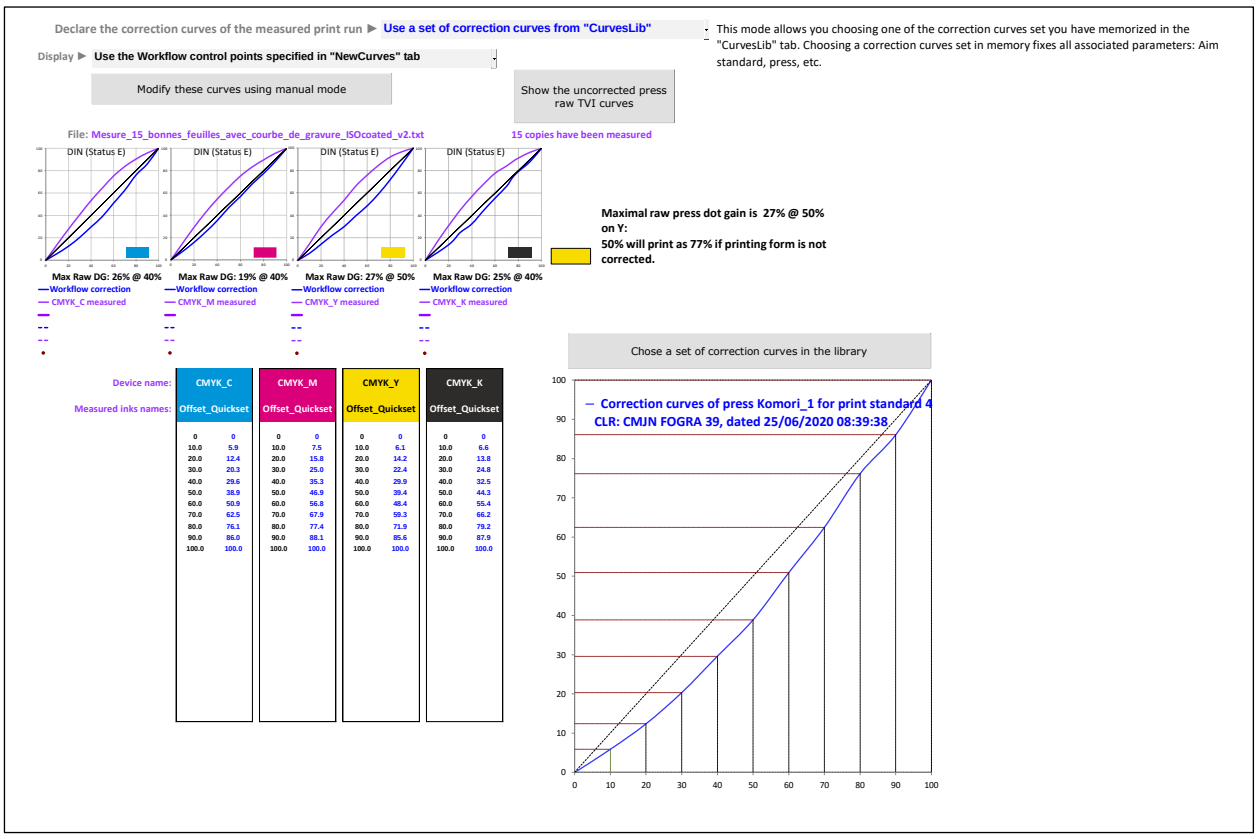


The slight residual errors are easily explained by using of two different yellow ink densities during the calibration and the check print runs. These errors are consistent with displayed results for both print runs.

Note that in order to assess in this paragraph the quality of the Fogra 39 calibration check print run, at no time did we need declaring in **MagicPrepress** the correction curves applied by the workflow for producing that print. (We took care to record them in CurvesLib, but did not declare them in DeclareCurves)

Using the workflow correction curve's set recorded in CurvesLib for controlling, and if necessary, updating this curve's set:

When the **correction curves** were checked in the previous paragraph, the correction curve's set could have been declared to **MagicPrepress**, by using the "**Choose a set of correction curves in the library**" button in DeclareCurves tab:



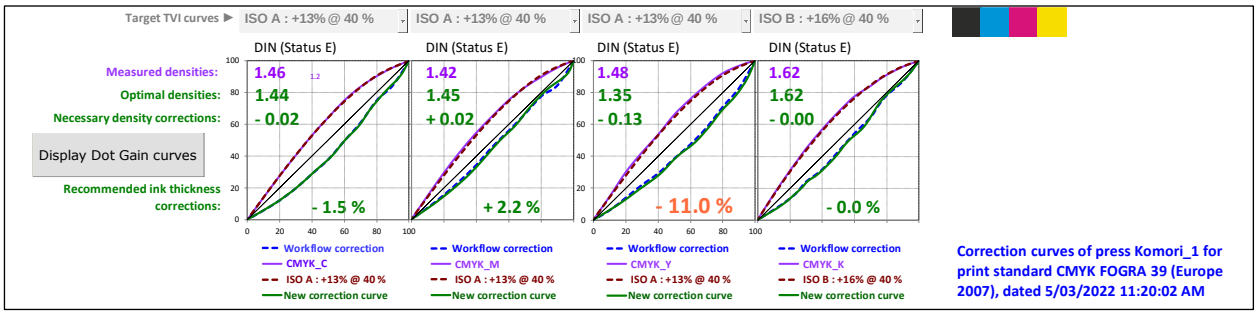
The aim color standard, screen settings, screen angles, print order, machine name, etc. associated to this set of correction curves are then automatically programmed into the AimStandard and NewCurves tabs:

The display of the AimStandard tab remains unchanged whether the correction curves applied by the workflow are declared or not, with the exception of course of the **workflow** and **new correction curves** on the graphs.

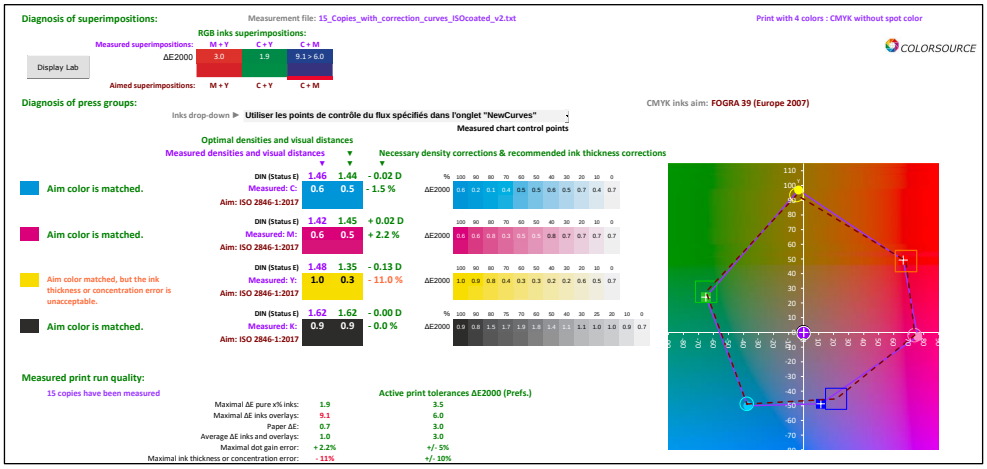
In the AimStandard tab:

- The **correction curves** applied by the workflow are displayed in **blue**,
- The computed **new correction curves** are displayed in **green**.

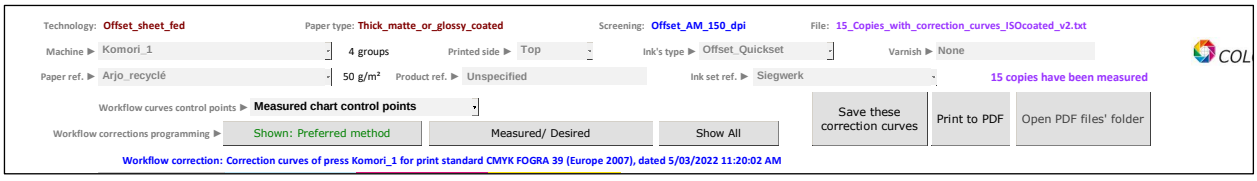
Because the **New correction curves** are virtually identical to the **Workflow correction curves**, we see that the **Workflow correction curves** do not need being updated:



The Expertise tab display remains unchanged, whether or not the **Workflow correction curves** are declared:



The NewCurves tab shows all the conditions under which the declared curve's set is valid:

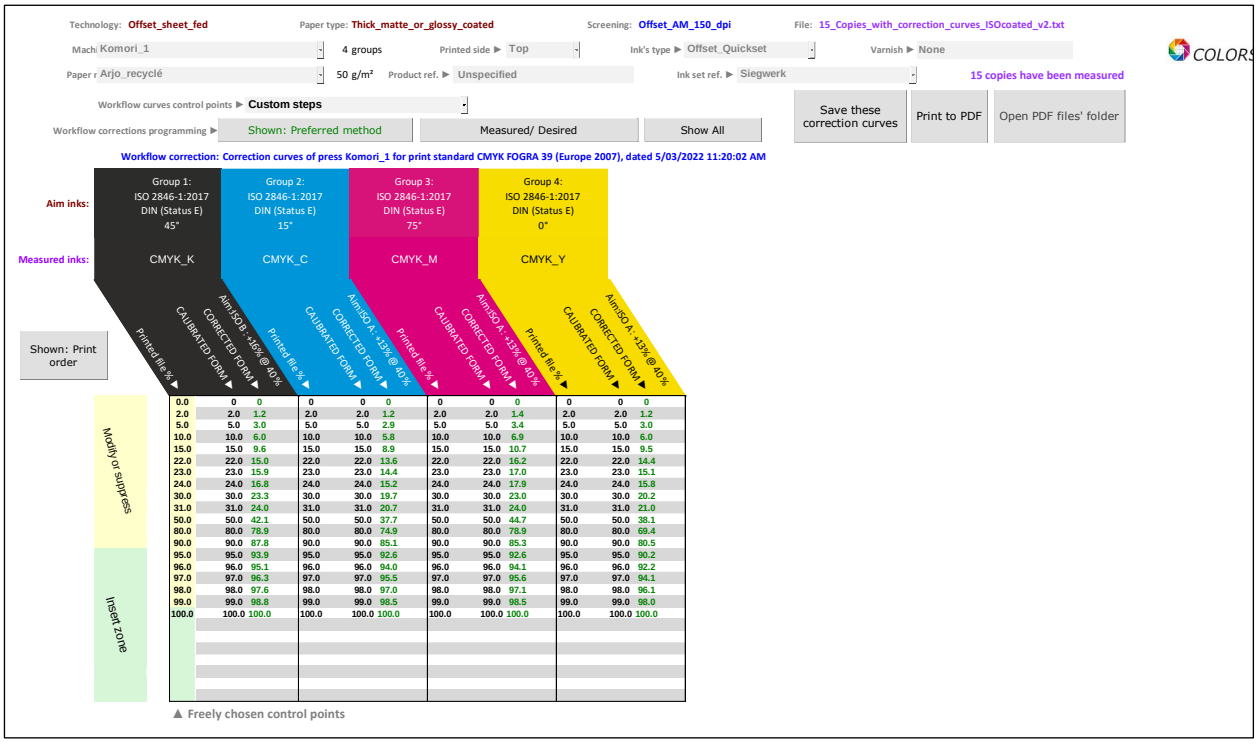


The numbers confirm what we saw on the curve's graphs: For each ink, **measured TVI curves** and **aim TVI curves** are very close: There is therefore no need to program in the production workflow the **new correction curves** in place of the **workflow correction curves**:

Shown: Print order

Workflow correction Printed file %					New correction curve ISO B : +16% @ 40 % CMYK_K					Workflow correction Printed file %					New correction curve ISO A : +13% @ 40 % CMYK_C					Workflow correction Printed file %					New correction curve ISO A : +13% @ 40 % CMYK_M					Workflow correction Printed file %					New correction curve ISO A : +13% @ 40 % CMYK_Y				
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10.0	6.6	16.1	15.6	6.2	10.0	5.9	13.9	14.0	5.9	10.0	7.5	14.8	14.0	7.1	10.0	6.1	14.5	14.0	6.1	10.0	13.8	31.0	30.2	13.4	20.0	12.4	27.6	27.6	12.4	20.0	15.8	29.3	27.6	14.8	20.0	14.2	29.8	27.6	13.3
20.0	13.8	31.0	30.2	13.4	20.0	12.4	27.6	27.6	12.4	20.0	15.8	29.3	27.6	14.8	20.0	14.2	29.8	27.6	13.3	30.0	24.8	44.9	43.7	24.2	30.0	20.3	40.6	40.7	20.3	30.0	25.0	42.6	40.7	23.6	30.0	22.4	42.2	40.7	20.6
30.0	24.8	44.9	43.7	24.2	30.0	20.3	40.6	40.7	20.3	30.0	25.0	42.6	40.7	23.6	30.0	22.4	42.2	40.7	20.6	40.0	32.5	57.0	56.0	31.7	40.0	29.6	53.2	53.0	29.7	40.0	35.3	54.6	53.0	33.9	40.0	29.9	53.4	53.0	28.5
50.0	44.3	67.9	67.0	43.2	50.0	38.9	64.3	64.3	38.7	50.0	46.9	65.2	64.3	45.7	50.0	39.4	66.0	64.3	39.1	60.0	55.4	77.7	76.6	53.8	60.0	50.9	75.2	74.5	50.8	60.0	56.8	75.2	74.5	56.2	60.0	48.4	75.9	74.5	47.1
70.0	66.2	84.3	84.9	66.8	70.0	62.5	83.8	83.4	61.9	70.0	67.9	83.2	83.4	67.8	70.0	59.3	84.7	83.4	57.8	80.0	79.2	91.3	91.5	79.6	80.0	76.1	90.4	90.7	75.9	80.0	77.4	89.6	90.7	79.0	80.0	71.9	92.0	90.7	70.2
90.0	87.9	96.4	96.6	88.3	90.0	86.0	95.9	96.3	87.1	90.0	88.1	95.5	96.3	89.9	90.0	85.6	96.7	96.3	84.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

But if this were not the case, it would be very simple and fast programming the new correction curves in the workflow, and if necessary, with freely chosen control points:



When done, just press the **"Save these correction curves"** button, in order to be ready for the next curve's set update.

COLORSOURCE

Work procedure for using Colorlab for computing Fingerprint aim colors from any CMYK or N-Colors I.C.C. profile:

Because it is not possible, not even desirable, normalizing as public standards billions of different printing configurations, using **Fingerprint** aim colors is quite useful for a wide range of traditional and digital color printing applications.

For example, if you use a digital color printer not for producing CMYK proofs but for printing wide color gamut documents, setting up your own **Fingerprint** color target is compulsory. And same considerations prevail for most of CMYK or N-Colors Packaging print applications.

You can easily configure your **MagicPrepress**, **MagicPrepress**, and free **Magic_Proof_&_Print_Control** control applications for setting and controlling your offset, gravure, or flexographic presses in order to match any future ISO 12647-x or more relevant private CMYK or N-Colors print standards.

This paragraph shows you how to generate a CMYK measurement file form any CMYK I.C.C. profile. Works OK for generating a N-Colors measurement file form any N-Colors I.C.C. profile.

For this purpose, you have to set your **Fingerprint** aim colors and aim TVI curves.

Free **Colorlab v2.8.13** software allows you computing the Lab colors you will get when printing any CMYK chart or N-Colors chart (with N < 9), according to any ISO or non-ISO CMYK or N-Colors I.C.C. profile.

This works of course for the optimized color charts designed for Colorsource applications, and allows you computing easily **Fingerprint** aim colors files for your **MagicPrepress**, and **Magic_Proof_&_Print_Control** applications.

Free **Colorlab** software link:

http://www.xrite.com/service-support/downloads/C/ColorLab-Utility-Freeware-V281x

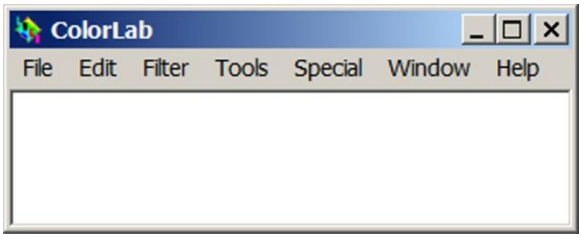
Let us for example configure MagicPress application for setting an offset press CMYK densities on high quality Light Weight coated paper with AM screening:

For this purpose, you need to set into the **MagicPress'** **Fingerprint** tab, the ***C.I.E. Lab D50 2°*** target colors specified by **PSO_LWC_Improved_eci.icc** CMYK I.C.C. profile, this for the 8 patches of **MagicPress_CMYK_RGB_chart.tif** or even better the 12 patches of the **MagicPress_CMYK_RGB_CMYK75%_chart.tif** chart. (Computed **Fingerprint** target colors will then be valid for both charts).

This can be done easily, by computing *the **Lab*** color produced by all CMYK patches of chart text reference file "**MagicPress_CMYK_RGB_CMYK75%_Ref.txt**", via the reference CMYK target I.C.C. profile "**PSO_LWC_Improved_eci.icc**"

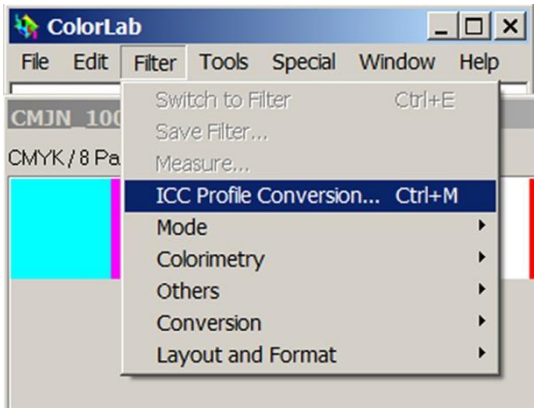
Of course, you do not need to do so because the ISO12647-2 standard "PSO_LWC_Improved_eci.icc" CMYK target is already programmed in your Colorsource applications, but the process keeps the same for extracting your CMYK aim colors from any other reference CMYK (or N-Colors) target I.C.C. profile.

1. Launch **Colorlab** application: The following window appears:

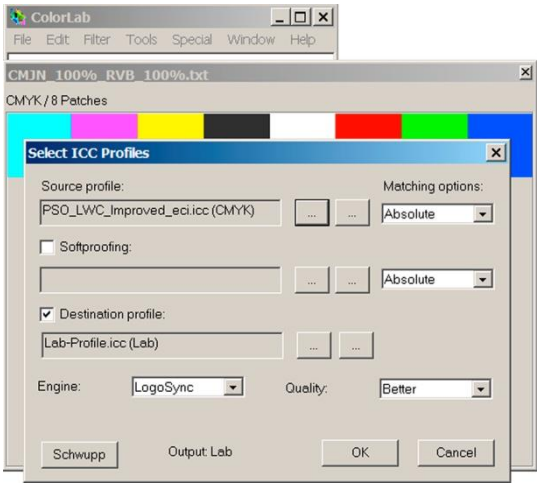


2. Drag and drop the **MagicPress_CMYK_RGB_CMYK75%_Ref.txt** text reference file on this window. The following window appears:

3. Call **Colorlab** menu allowing converting the reference file CMYK values into C.I.E. Lab:

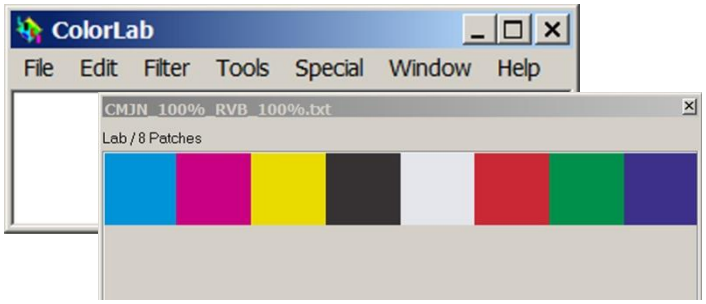


4. Choose **PSO_LWC_Improved_eci.icc** as source profile and **Lab-Profile.icc** as destination: Of course, **Absolute** has to be chosen as the source profile Rendering Intent:



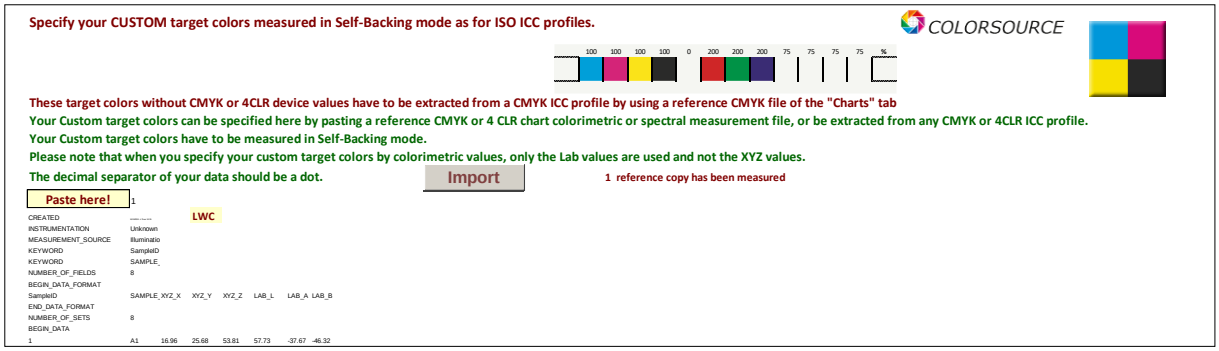
Then press **OK**.

5. You then get Lab text reference file of **MagicPress_CMYK_RGB_CMYK75%_Ref.txt** for **PSO_LWC_Improved_eci.icc** CMYK ISO profile:



6. Make "**File/Save as**..." to save your **Fingerprint** target colors text file with some meaningful name such as "**MagicPress_CMYK_RGB_CMYK75%_Ref _to_Lab_via_PSO_LWC_Improved_eci.txt"**

7. For configuring **MagicPress** Lab target, import it to the **Fingerprint** tab and name your **Fingerprint** color target:



For computing from a reference I.C.C. profile up your **Fingerprint** target for **MagicPrepress**, you should follow the same work procedure, but using one following the CGATS text reference files:

"MagicPrepress_CMYK_1_x_3_lines_10%_steps_chart_Ref.txt"
or **"MagicPrepress_CMYK_5_x_3_lines_10%_steps_chart_Ref"**.

Please note that when using **Colorlab** you should use **I.C.C**. **v2.0 format** I.C.C. profile. Using I.C.C. v4.0 can only offer little advantages if you are not using a D50 workflow.

Please note as well that for performing above procedure with non-CMYK 4 colors I.C.C. profiles, you should not use a CGATS **CMYK** text reference file but a CGATS **four colors** text reference file: Appropriate sample 4_CLR reference files are supplied with **MagicPress**, **MagicPrepress** and **MagicPrepress** distribution kits on the web.

Do not forget that you can also create your **Fingerprint** target colors not by using a reference CMYK or four colors I.C.C. profile (that is not often available when you are creating a new standard), but by using averaged spectral or colorimetric measurements files of target reference prints or proofs. For importing a very large CMYK chart measurement file into **Fingerprint** tab, you can first extract automatically all useful spectral data from your large measurement file by using our free **ICC_Normalize** application.

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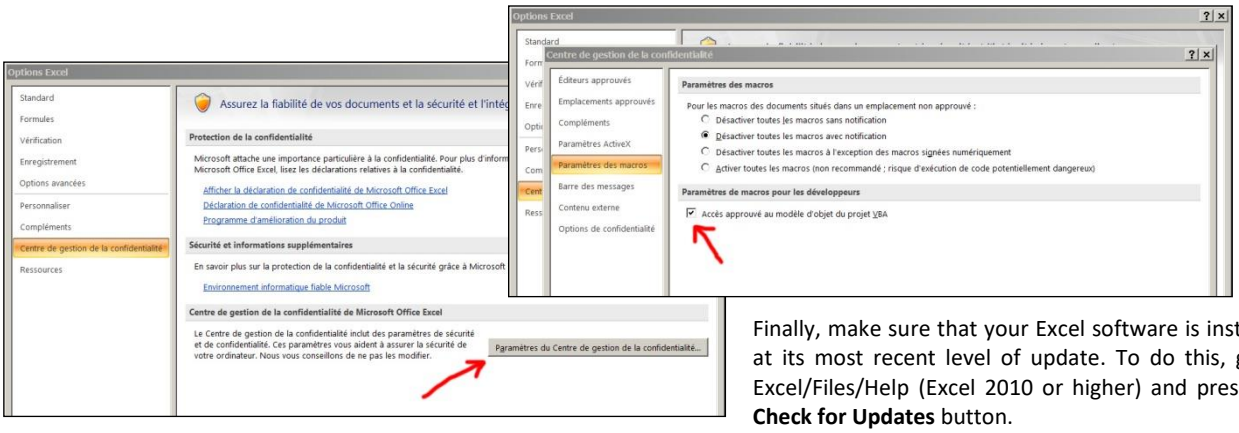
Troubleshooting and FAQS:

Use Microsoft **Excel 2010**, **365 or higher**. Note that Excel (or Microsoft Office) must be installed with some sometimes-optional components such as Visual Basic, otherwise the applications will not start.

Launch Excel and go to Excel Options, Trust Center, and "**Trust Center Settings**" button: Check the box "**Trusted access to VBA project object model**":



Finally, make sure that your Excel software is installed at its most recent level of update. To do this, go to Excel/Files/Help (Excel 2010 or higher) and press the **Check for Updates** button.

If the application does not launch, disable your antivirus: Most antiviruses do not cause any problems: AVG, Avira, native antivirus protection of Microsoft Windows etc. but rare antivirus can prevent the application from starting.

For the same measurement file, MagicPrepress displays Lab values different from MeasureTool, i1Profiler or Colorlab or other:

General purpose measurement applications compute their Lab D50 2° colors without correcting paper's optical brighteners, which is quite normal because they do not know what their measurements are intended for.

If we disable the optical brighteners' correction in their **Preferences** tab, Colorsource applications compute exactly the same Lab D50 2° colors than any other measurement application such as MeasureTool. But in practice we recommend that you always activate the optical brighteners' correction, in order our applications can compute Lab colors that actually match the colors we do perceive, even when the paper contains strong optical brighteners. The optical brighteners' correction modifies, if necessary, not only on the calculation of the paper's Lab color, but also on all other printed colors.

The results are showing too big or too small on my monitor:

Zoom in on each tab to optimize the display according to the model of your screen: **Use the mouse wheel by holding down the "Ctrl" key**. You can hide the Excel ribbon (Right-click the ribbon, hide menu). You can also use the Full-SCREEN Excel view (**View menu** ... **Full screen**) because you don't need Excel menus to use Colorsource software. To exit the full-screen display mode, use the Esc key. (Escape).

MagicPress, MagicPrepress and Magic_Proof_&_Print_Control applications offer me all modern ISO 12647-x, G7/IDEAlliance and WAN-IFRA CMYK aim colors, but I want to check if my press or my proof matches "Euroscale Coated.icc" aim colors!

See the procedure in **MagicPrepress' user's guide**, for calculating, from your aim standard's I.C.C profile, your C.I.E. Lab aim colors, as a Fingerprint reference text measurement file.

For any other technical questions or suggestions: mailto:support@color-source.net

Magic_Proof_&_Print_Control PLATE MagicPress **MagicPrepress** SPOT_Color_Manager

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