Colorsource universal solution

for fast, easy and reliable

quality control of proof and print works

From domestic printers to 10 colors printing presses.

http://www.color-source.net/en/Colorsource_news.htm

COLORSOURCE

What is a control bar ?

A mean of controlling that a print or a proof work
(or a photography) is conforming the color specifications
of its Producer:

Epson 10600 Glossy Paper using a RIP :

With good densitometric calibration (optimized quantities of process
ink per area unit, for a given paper), this control bar matches some
reference measurements of spectra, colors and/or densities.

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What is a control bar ?

Sometimes a mean of controlling that a Print or a Proof is matching some color standard, *when it is judicious (and possible) to fix a color reproduction standard:*

Offset CMYK print matching ISO Coated standard :

With good densitometric settings of the offset press, this control bar matches reference reflection spectra, colors and/or densities which have been fixed by ISO 12647-2 Standard for thick matte or glossy paper.

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Controlling
Print and Proof Works

- Limits of available tools for controlling print works.

- Limits of available tools for controlling proof works.

- Colorsource industrial solution.

- A few applications of Colorsource solution.

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No way of controlling digital color printers driven by color separations

Epson 10600 Glossy paper with RIP:

HP 1050 Uncoated offset Paper with RIP:

Xerox Docucolor 8000 with Creo RIP:

Xerox Phaser 8400 PS using direct CMYK mode on plain paper:

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No way of controlling digital color printers driven by color separations
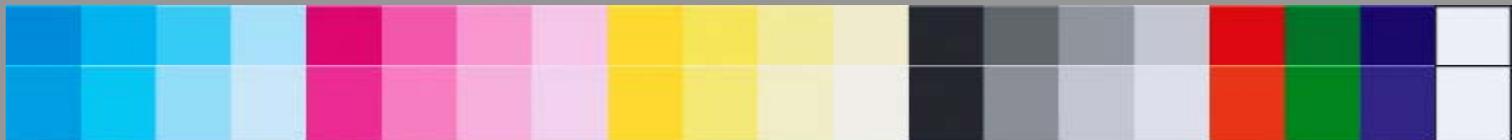
Canon W2200 with Water Resistant Glossy Paper RIP A:

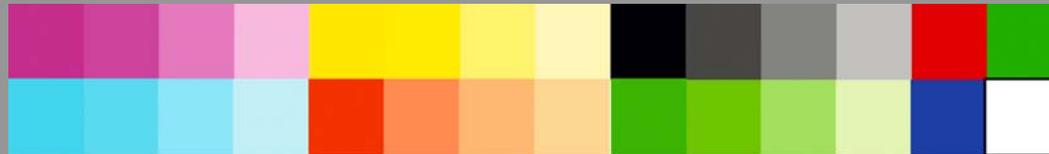Canon W2200 with Water Resistant Glossy Paper RIP B:

Comparison with both RIP models:

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No way of controlling digital color printers driven by color separations

Printer (or printing presses) using 6 process colors:

No way of controlling digital color printers driven by color separations:

The chromatic response of a digital printer considered as normal at a given moment

depends on many parameters:

Model and working state of the printer,

Inks and paper being used,

Print parameters (definition, screening etc.),

Model of the driving software being used…

It is impossible to fix printing standards or standard reference chromatic responses.

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No way of controlling
RGB driven color printers

e.g.: Canon W2200 Paper on Water Resistant Glossy paper with standard Canon RGB Windows driver :

Control bar specified by RGB values :

No density calibration other than declaring of the type of paper in the Windows printer driver menu.

On same paper and with same printing parameters the chromatic response (Printed colors according to RGB file values) drifts in time and slightly differs from one printer to another printer of same model.

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Limits of available tools
for controlling print works.

If you receive a digital Print work provided with a control bar, you to date do not have **any way** of knowing the reference values to be checked on this control bar (in terms of spectra and/or colors and/or densities), because these values cannot be standardized.

Only the Qualified User of the digital printer can determine the reference values to be measured on any control bar, whether this control bar is "standard" or of his own design.

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Limits of available tools
for controlling print works.

- No universal tool to control all kinds of printing presses (Gravure, Flexography, Offset) used with all types of inks and media.

  ISO standardization is only possible for the major types of standard CMYK print works,

  and need fixing:

  Process Inks

  Papers

  Solid Inks densities (Dmax)

  Dot gain curve of each process ink

  Red, green and blue trapping colors

  Screening…

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Limits of available tools
for controlling print works.

ISO standardization is only possible for the major kinds of standard CMYK print works

Gretag control bar for offset printing:

UGRA control bar for offset printing:

There are many different models of control bars for CMYK offset printing

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Limits of available tools
for controlling print works.

ISO standardization is only possible for the major kinds of standard CMYK print works

DuPont Eurosprint CMYK cromalin : (non ISO)

CMYK ISO Coated:

CMYK ISO Uncoated Yellowish:

CMYK ISO Gravure LWC:

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Limits of available tools
for controlling print works.

CMYK control bar found on a Print work:

What should I measure on this control bar?

See ISO standards!

But first make sure of the print technology and paper which have been used.

Requires some expertise. Not so difficult but slow and manual.

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Limits of available tools
for controlling proof works

- Densitometric control of proofs is impossible in practice:

CMYK control bar printed as CMYK ISO Coated:

D = 1,55

1,35   1,45

D = 1,59

1,85

CMYK control bar printed on Canon W2200 simulating ISO Coated:

1,52

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Limits of available tools
for controlling proof works

- Densitometric control of proofs is impossible in practice:

CMYK ISO Coated offset print:

CMYK ISO Coated simulated on Canon W2200:

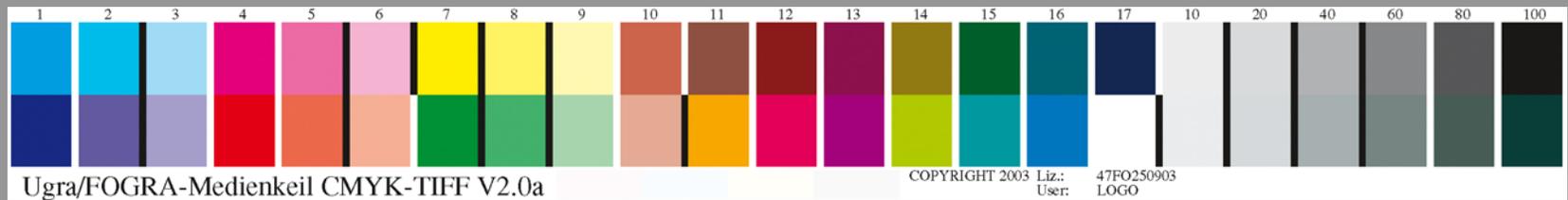CMYK ISO Coated simulated on Epson 4800:

Same colors but 3 different reference densities!

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Limits of available tools
for controlling proof works

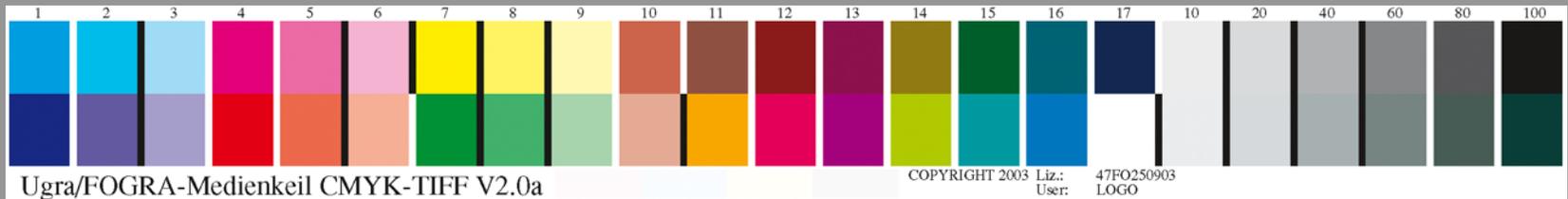- Colorimetric control of proofs is possible :

CMYK ISO Coated offset print:

CMYK ISO Coated simulated on Canon W2200:

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Limits of available tools
for controlling proof works

- Example : Fogra MediaWedge 2 Control Bar

Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a

One single "Fogra Media Wedge 2" CMYK control bar:

Colors of this single CMYK control bar are different depending on the chosen ISO simulated press, and the reference colors to be checked are known in advance according to each ISO CMYK profile.

Color measurements of this control bar matched to the relevant CMYK ISO simulated press, allows checking the proof.

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Limits of available tools
for controlling proof works

- Colorimetric check of control bar Fogra Media Wedge 2:
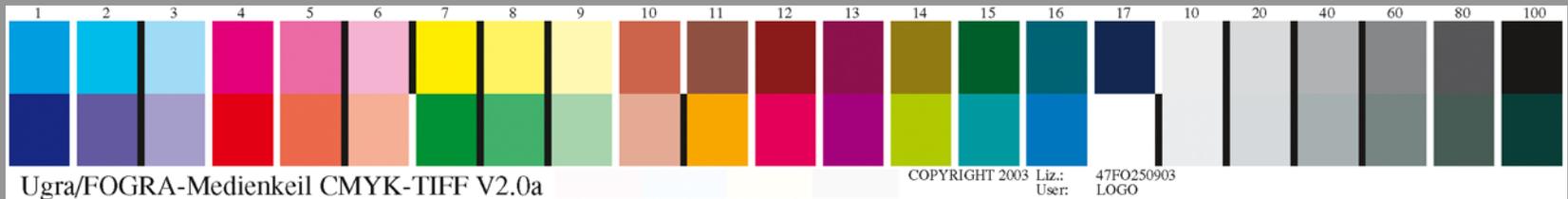
Advantages:

Fast and easy control. (e.g.: by using ProfileMaker MeasureTool which is FREE for this purpose)

Colorimetric reference values known by all Users because published on Internet (Can be found in each ISO profile).

Spectro colorimeter necessary, but quite low cost today.

Control bar use subject to license but freely downloadable for trial test.

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Limits of available tools
for controlling proof works

- Colorimetric check of control bar Fogra Media Wedge 2:
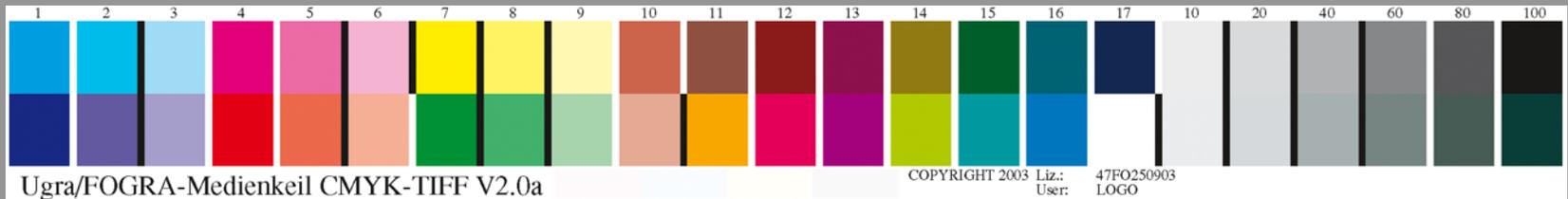
Disadvantages:

Confusion at the Print House: Which one of the CMYK ISO profiles is the proof supposed to simulate?

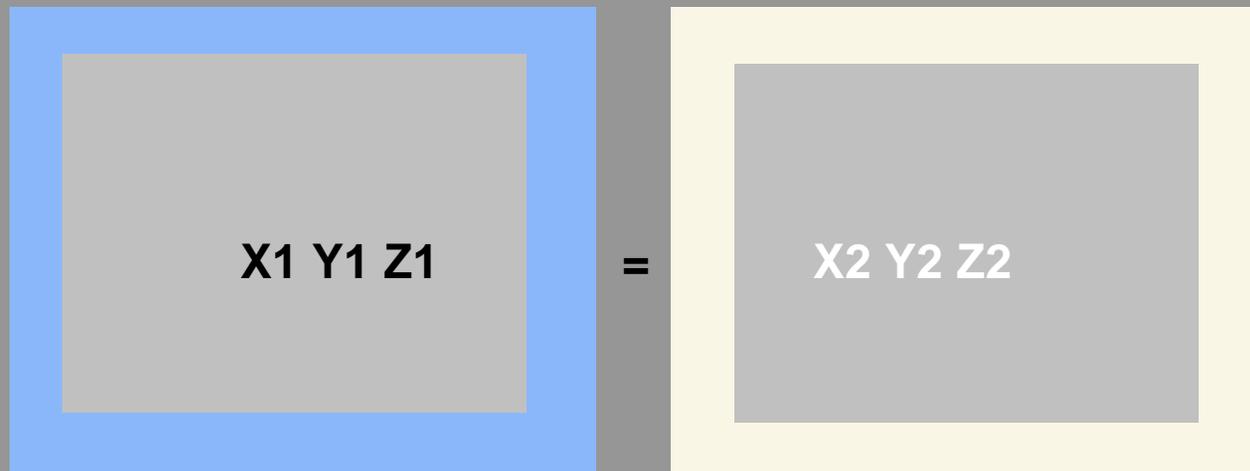**Inaccuracy:** e.g.: Appearance effects not taken into account.

Lack of flexibility: e.g.: Only applicable for color proofing of specific print processes on specific media, and only with only 4 specific CMYK inks.

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Limits of available tools
for controlling proof works

Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a

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User: 1.000   4TP020909

Inaccuracy:

Color appearance effects not taken into account.

X1 Y1 Z1   **=**   **X2 Y2 Z2**

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Limits of available tools
for controlling proof works


Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a

Inaccuracy:

Color appearance effects not taken into account.

A color proof considered as bad by colorimetric comparison of control bars can be excellent visually…

Whereas a proof with very close measurements can be visually deceptive.

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Limits of available tools
for controlling proof works

Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a
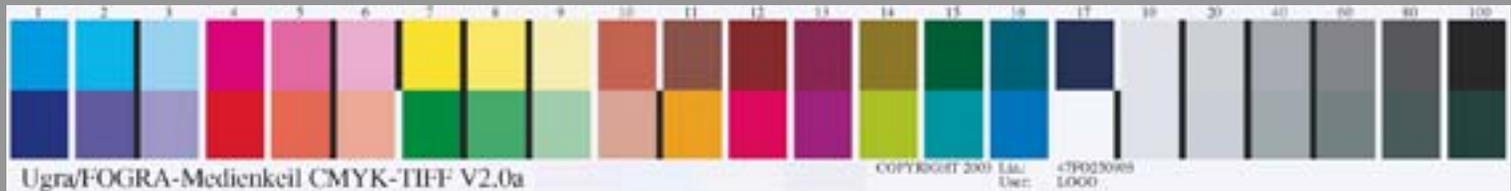
Inaccuracy:

Control bar not allowing a visual monitoring of main drifts problems

It is missing visual monitoring elements such as:

K 50%

CMJ 42% 43% 29%

D50

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Limits of available tools
for controlling proof works

Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a
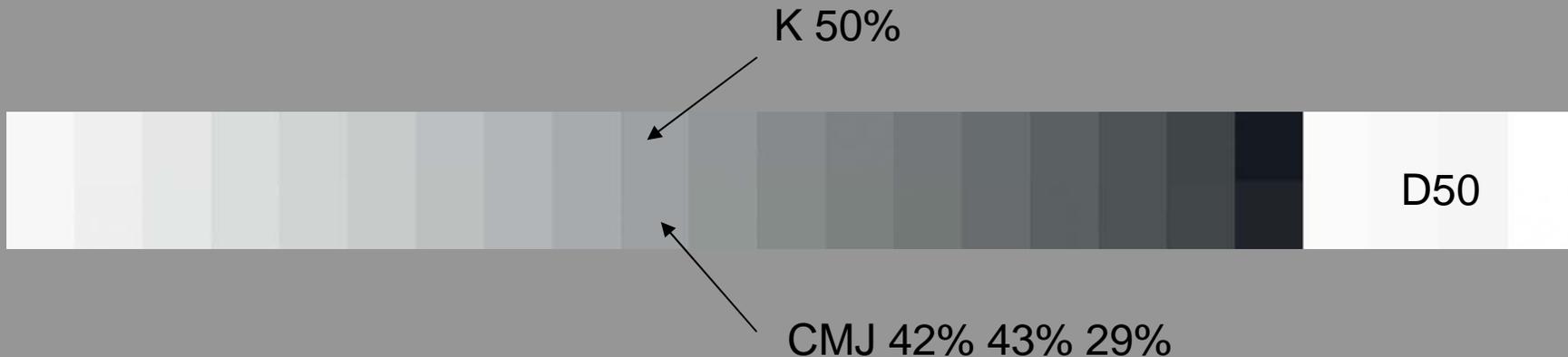
**Lack of flexibility and universality:**

A digital color printer is not always used to produce color proofs by simulation a printing press.

CMYK offset ISO profiles cannot be used when printing on some white coated cardboards.

It will never be possible describing by generic I.C.C. profiles all traditional CMYK print processes on all classical media.

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Limits of available tools
for controlling proof works

Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a
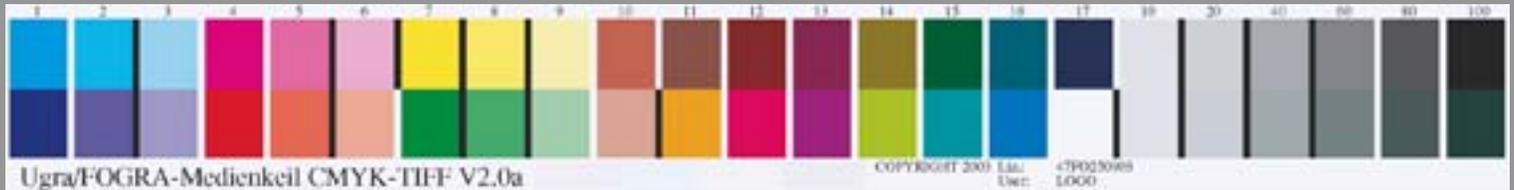
Control limited to color proofs simulating one of standardized ISO CMYK print processes:

But how to control gravure or flexo prints with 8 or 10 process colors AND the according color proofs ?
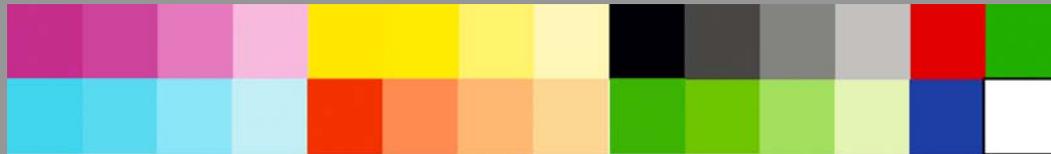
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Colorsource industrial solution

- The qualified Producer is most of the time the only one able in practice to determine the reference values to be checked on any control bar, whether it is "standard" or of his own design.

  For example, I declare that my Laser Office printer, driven under Windows in RGB mode, has a certain chromatic response today, and that you should check such and such reference values on some RGB defined control bar I print today.

Colorsource industrial solution

- The majority of prints and proofs production processes cannot be controlled by using a "standard" control bar, but in a first step ask for the design of a control bar specifically optimized for the printing configuration of the production to be controlled.

K 50%

CMY 42% 43% 29%

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Colorsource industrial solution

- In order to take into account the appearance effects, the reference colors of control bars intended for a colorimetric control of proofs cannot be fixed once and for all.

- These control bars for proofing systems will very usefully be supplemented by color patches allowing densitometric control of the print engine, and visual control of its CMY gray balance.

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Colorsource industrial solution

- The color quality control process of prints produced by a digital printer don't have any reason to be very different whether this printer is used to produce:

  Proofs (simulation of a printing press),

  Or photographs (simulation of photography),

  Or monitors soft copies
  (simulation of monitor for Office printing, for example).

Colorsource industrial solution

Monitor RGB (Office printing)

Calibrated
Printer (if possible)

I.C.C. profile of density calibrated printer

C
M
Y
K
Press
e.g.: ISO Coated.icc
(Color Proofing)

Lab/
XYZ

Scanner or
Digital Camera
RGB
(Photography)

C1 → C'

M1 → M'

Y1 → Y'

K1 → K'
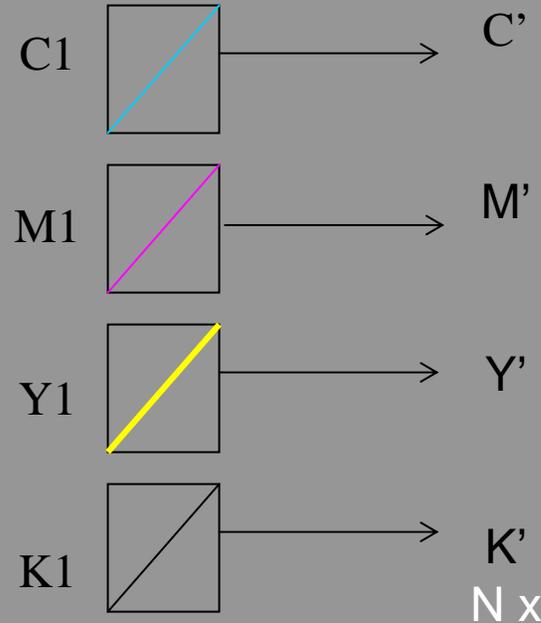
N x
Ink channels

**In these 3 classical color input cases,
we want to control the OUTPUT!**

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Colorsource industrial solution

- There is no reason why the quality control process of a Proof should be very different from the quality control process of any other color print.

- We want to control the PRINT ENGINE which produces the Print OR Proof work, in the arbitrary configuration considered as being optimal by the Qualified Producer.

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AB5461CD45366ZE
Producer commitment

Measure

Visual D 50

02 SEPT 2006 - ULYSSE PACKAGING

C A N 3 3 D F 1 2 5 A D 1 2 5 4 8 8 V
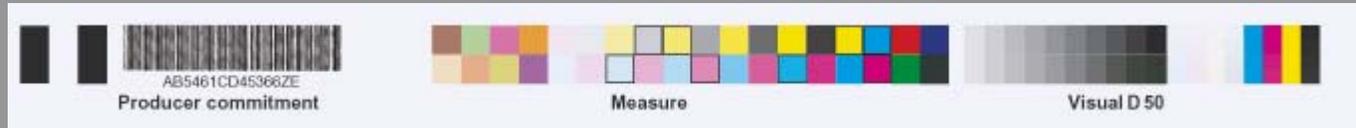
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Colorsource industrial solution

For the Producer of print or proof works:

A software - downloadable on Internet - uses the characterization file of the printer (spectral measurements) in order to calculate and produce automatically an optimized control bar allowing:

- The VISUAL detection of printer engine's drifts.
- The MEASUREMENT of these drifts.

The characterization file is quite simply the measurement file intended to establish the printer I.C.C. profile in its arbitrarily chosen printing configuration.

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Colorsource industrial solution

For the Producer of print or proof works:

The definition of this optimized control bar AND the reference values of are recorded by Internet in a data base.

The producer is given by the web site an alphanumeric IDENTIFIER which is printed with the optimized control bar.

02 SEPT 2006 - ULYSSE PACKAGING

C A N 3 3 D F 1 2 5 A D 1 2 5 4 8 8 V

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Colorsource industrial solution

For the user of the print or proof:

02 SEPT 2006 - ULYSSE PACKAGING

C A N 3 3 D F 1 2 5 A D 1 2 5 4 8 8 V

A software - downloadable on Internet - makes it possible to input the identifier met on any print or proof work, and get ALL useful information for fast, reliable and automated control of this control bar.

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Colorsource industrial solution

Web site managing all control bars
for all arbitrary printing configuration
at a given moment, of all color printers and presses

2

Software 1

1

Software 2

4

An identifier
is delivered

The Producer:
Calibrates (when possible)
then characterizes his
printer or his press
and an optimal control bar
is generated

3

The User:
Checks the
print or proof
work
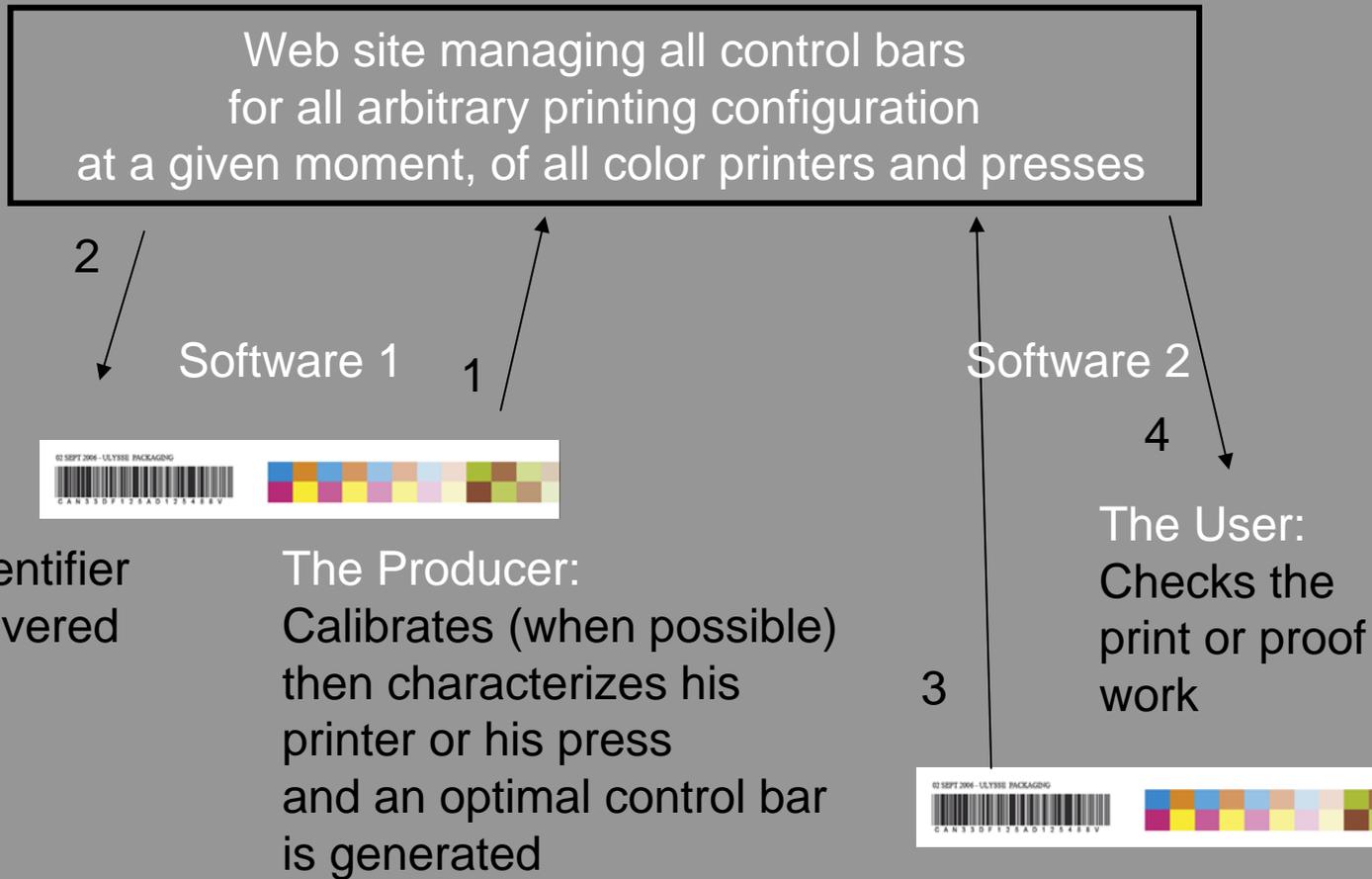
COLORSOURCE

Colorsource industrial solution

The Internet data base also contains many others useful information for color traceability.
For example:

Spectra of the special tints shown on the proof (They are often out of gamut and they are NEVER spectrally accurate), this allowing proper Ink formulation by the Print House,

I.C.C. profile of the printer having produced the print or proof work, for its best reproduction,

Co-ordinates of the Producer and the Person in charge of the Quality,

Etc.

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Colorsource industrial solution

The old problem of quality control of Proof and Print Works IS NOW FINALLY SOLVED, because:

All qualified Producers of Proof or Print Works do use a spectrophotometer…

All qualified Users of Proof or Print Works (Print Houses, End Users) do use a spectrophotometer...

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Colorsource industrial solution

All qualified Producers of Proof or Print Works do use a spectrophotometer:

Because is impossible today to produce professional quality Prints or Proofs without using a color measurement instrument.

A SOLUTION IS HOWEVER PROVIDED FOR DOMESTIC AND OFFICE COLOR PRINTS PRODUCERS.
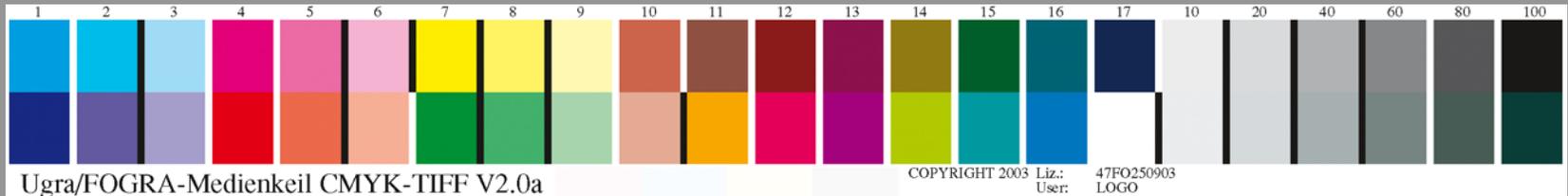
COLORSOURCE

Colorsource industrial solution

All qualified Users of Proof or Print Works (Print Houses, End Users) do use a spectrophotometer:

At least It is highly recommended (995 ,US$ exc. VAT!).

However the color quality control of any Print or Proof Work by using Colorsource system does not require any special competence to quality control USERS,
who are not always Graphic Industries Professionals.

COLORSOURCE

A few applications

Enhancing CMYK ISO proofs control :

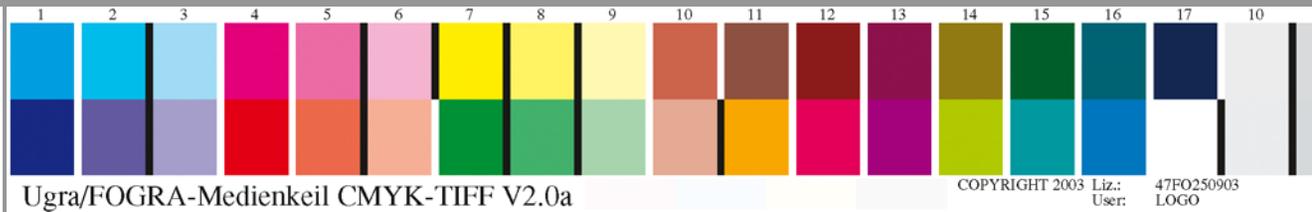Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a

What am I supposed to measure?

Is this simulating gravure or offset printing or is it something else?

I do not know.

COLORSOURCE

A few applications

Enhancing CMYK ISO proofs control :

I know what I should measure, thanks to the Colorsource identifier

COLORSOURCE

A few applications

Enhancing CMYK ISO proofs control :

Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a

D F 1 2 5 A D 1 2 5 4 8 8 V

COPYRIGHT 2003 Liz.: 47FO250903
User: LOGO

I know what I should measure, thanks to the Colorsource identifier

And the Qualified Producer of this proof can record his OWN colorimetric references values when his optimized proofing system color calibration duly takes into account the appearance effects!

COLORSOURCE

A few applications

Enhancing CMYK ISO proofs control :

Ugra/FOGRA-Medienkeil CMYK-TIFF V2.0a

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User:
47FO250903
LOGO

But finally this Control Bar is not terrific because it does not allow any visual monitoring of the proofing printer drifts,

So the control bar generated SPECIFICALLY and AUTOMATICALLY for THIS proofing system by using its characterization file will be much better!

So this control bar will be dropped tomorrow
But we highly recommend its use today!

COLORSOURCE

A few applications

Using good or bad proofs at Print House:

The inevitable differences between:

- Reference values defined by the proof Producer or a by some standard such as ISO,

- And MEASURED values at Print House,

Allow the Print House to easily print the visually accepted proof *IN SPITE OF ITS UNAVOIDABLE TECHNICAL DEFECTS.*

COLORSOURCE

A few applications

Control bars for domestic and office printers driven in RGB mode:

According to the print parameters chosen by the User in the printer software driver (paper type, inks, definition, color mode such as sRGB or another color simulation mode, etc.),

The printer driver will automatically print a generic control bar optimized by using the generic RGB I.C.C. profile of the printer in this selected print configuration, and will print a generic IDENTIFIER with the control bar.

A few applications

Control bars for domestic and office printers driven in RGB mode:

This control bar is very useful, even if the Producer using this color printer is not equipped for measuring it…

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A few applications

Use of customer's RGB file and "Pilot print" by Service Bureaus and Repro Houses:

Customer's RGB File +

Customer's "RGB Pilot print" produced on his office printer
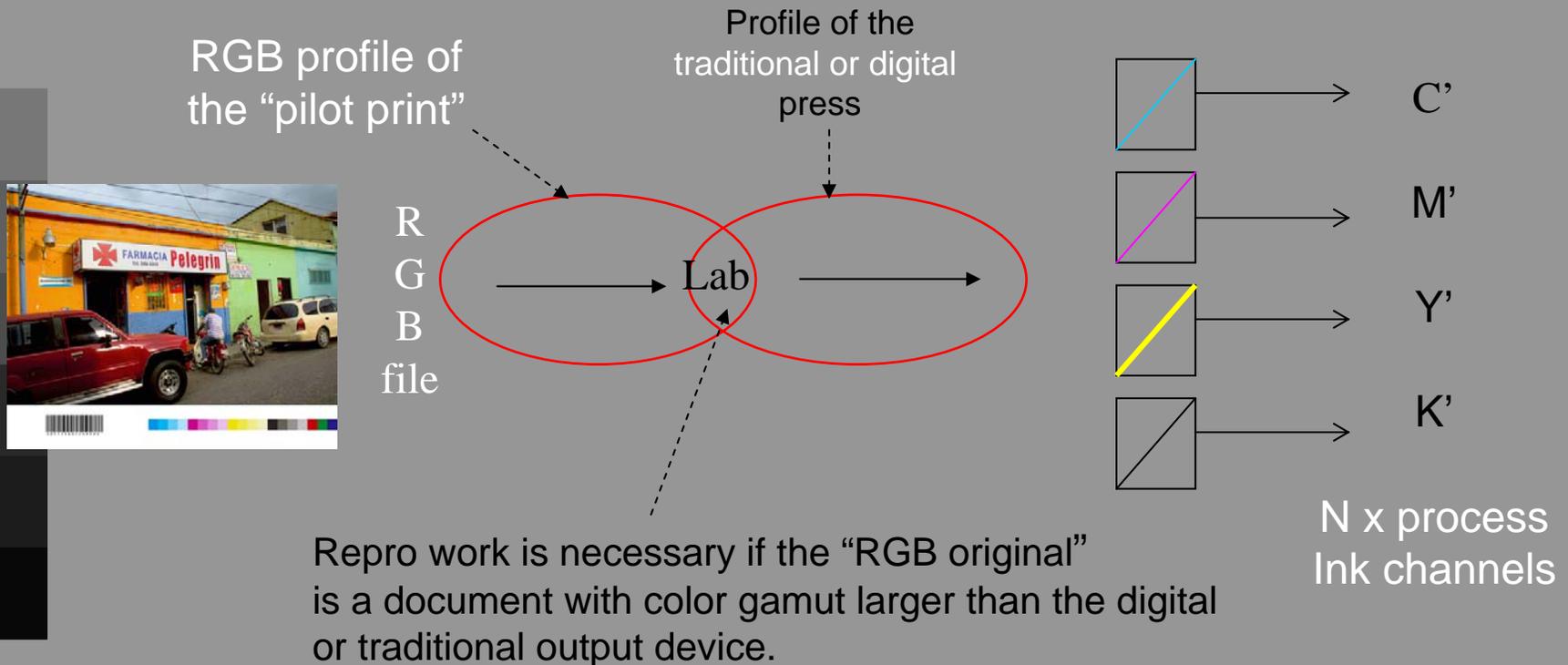
COLORSOURCE

A few applications

Use of customer's RGB file and "Pilot print" by Service Bureaus and Repro Houses:

- The Repro House or Service Bureau know thanks to the Colorsource identifier the generic RGB I.C.C. profile of Customer's color printer of the in the print configuration he has used.

- The MEASUREMENT of this generic control bar enables them to get amore accurate a I.C.C. profile of the print.

- This profile is the input I.C.C. to be associated to Customer's RGB file for the optimized color reproduction of Customer's "RGB Pilot Print".

COLORSOURCE

A few applications

Use of customer's RGB file and "Pilot print" by Service Bureaus and Repro Houses:

RGB profile of the "pilot print"

Profile of the traditional or digital press

R
G
B
file

Lab

C'

M'

Y'

K'

N x process
Ink channels

Repro work is necessary if the "RGB original"
is a document with color gamut larger than the digital
or traditional output device.

COLORSOURCE

Conclusions

- Colorsource quality control system allows to easily use any CMYK or RGB "Pilot print" as a color proof to be printed.

- It is compatible with all existing "standard" control bars designed for CMYK prints or proofs such as Fogra MediaWedge2.

- It allows controlling any Print or Proof Work using any number of process colors, and whether the print engine is driven by color separations or in RGB or Lab or else mode.

- It allows a better, faster and safer quality diagnosis.

- It allows being much more reactive and productive when any quality problem is found on a Proof.

COLORSOURCE

Additional information:
Information complémentaire:

English: http:// www.color-source.net

French: http://www.colorsource.fr

Technical and marketing Frequently Asked Questions about Colorsource Color Control Quality Process:

http://www.color-source.net/en/Colorsource_news.htm

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Thank you for your attention!

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