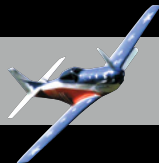
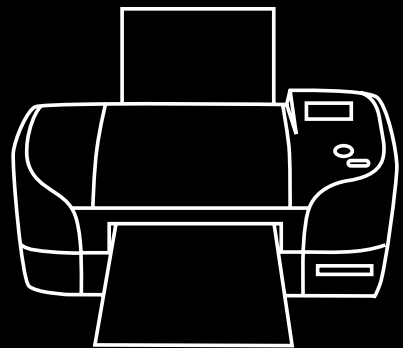
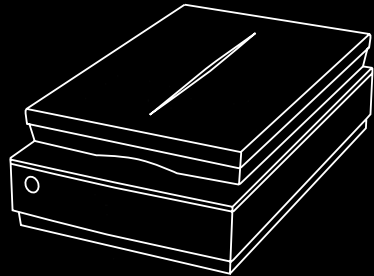


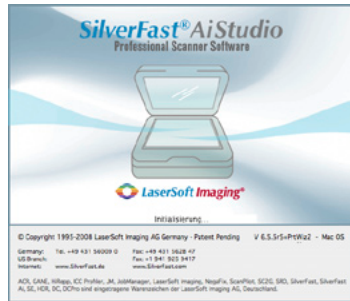
# SilverFast®

*Printer Calibration with Profiler*





## Introduction



Dear Reader,

We are happy to present the new *SilverFast Printer-Calibration* Guide so that you can get an overview of the concept and workflow of our new product.

When we first began work on *SilverFast*, we conceived of it as an application that would be applicable to beginners as well as professionals, and provide a reliable and productive tool so that our users could get the most out of their scanners, and achieve the best quality scans. Today more than one million users all over the world are working and successfully relying on *SilverFast* in their photographic workflow. The desire to calibrate scanners, led to a new feature in later versions of *SilverFast*, which integrated the ability to use IT-8 test targets to easily calibrate your scanner. In 2007, continued development culminated in our being able to make IT8-Calibration process completely automatic. As a result, the ease of control, reliability and precision offered by our technology is unprecedented in the industry.

As many of you know, the continued need for a colour calibrated workflow hasn't diminished, and despite significant progress in the area, there is still room for innovation and improvement. As a result, we are proud to announce that we have taken the results of our research, and applied them to the printing process, and we can now offer not only calibration of scanners but also for printers. We feel that our approach is both precise, yet easy to use, presenting a unique and cost-effective solution for output calibration.

We hope that this *SilverFast Printer Calibration Guide* will help to explain our concept and workflow. We look forward to your comments and feedback.

I remain with best wishes,

Karl-Heinz Zahorsky  
Präsident & CEO  
LaserSoft Imaging AG

Kiel, May 2008

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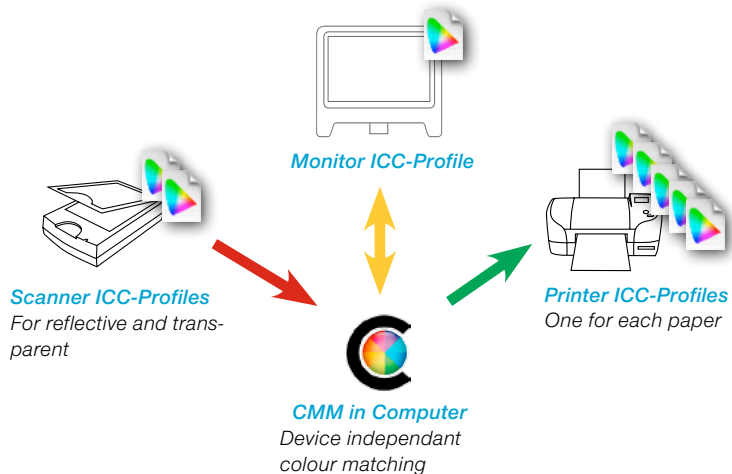
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# SilverFast Printer Calibration

## Input - Monitor - Output

The output or printer calibration is the final necessity for obtaining predictable and reproducible colours. Each part consists of an individual ICC profile.



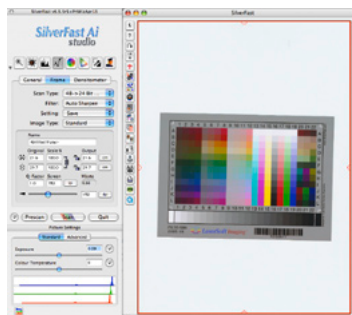
### Workflow with ICC-Profiles

Input - Monitor - Output

## Monitor

The Monitor is the centre of colour corrections on a computer. The quality of the monitor is very important – if it does not display accurate colours, this will continue throughout the entire workflow resulting in an unpredictable image.

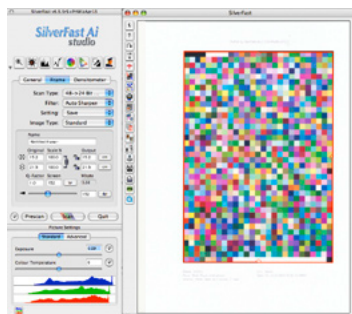
A high quality monitor with calibration is imperative. A USB connected colour spectrometer or colorimeter are required for calibration of the monitor and should be seen as standard equipment as this will have to be used again and again over time. As a rule of thumb, a monitor should be re-calibrated very 2 to 4 weeks.



## Input

Any scanner or digital camera is regarded as an input device. A scanner can be used as a colour correct device only after the *IT8 calibration* has been done and an ICC profile has been generated and assigned, it is also recommended to re-calibrate the scanner in regular intervals. Those users using *SilverFast Ai IT8* already have the perfect means to calibrate their scanner.

*\* The calibration of digital cameras only makes sense for Studio-photography, where the lighting conditions are kept constant. Scanners keep these conditions constant by default.*



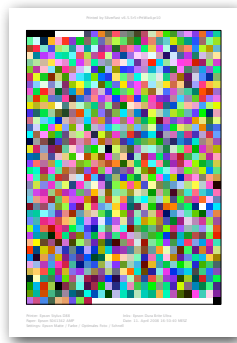
## Output

In general, the last link of the chain will be a printer. Again, ICC profiles are required for a predictable workflow. A correctly profiled printer will ensure that the printed colours are correct.

It is advised to generate separate profiles for each set of ink and paper used. If, for example, you are using 5 different kinds of paper, you will require 5 individual ICC profiles – one for each paper type.

In order to generate an ICC profile for a printer, some quite expensive measuring equipment is required – unless you wish to use your own scanner for this and use the new feature of *SilverFast Ai*; the output profiling.

## Printer Calibration – Objective and value



An output or printer calibration makes sense whenever it is important to reproduce the colour and colour tones of an image to a printer.

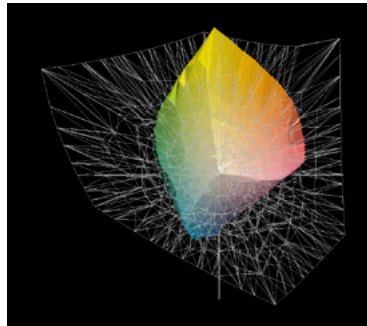
The limits for this are set by the different colour spaces of the monitor and the printer. Modern expert monitors are able to display a very large colour space. E.g. (almost) the complete colour space „eci RGB v2“. The printer's much smaller colour space almost gets lost in this huge colour space – see image in the lower left. Image lower right - the direct comparison of an inkjet printer to a highend offset printout



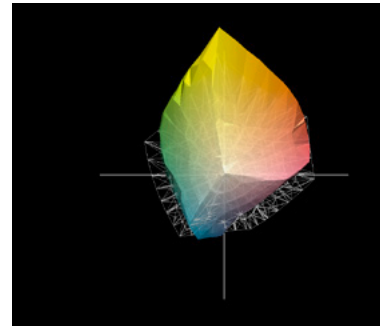
*Visual comparison of ICC profiles:*

Source: <http://www.iccview.de/>

Profiles may be uploaded and viewed in 3d.



*Left: Comparison of an inkjet printer colour space with the RGB colour space "eci RGB v2"*



*Right: Comparison of an inkjet printer colour space with the offset CMYK colour space "ISO coated v2 300%" (Framed)*

*SilverFast's* printer-profiling target consists of 1026 fields. The ICC profile is generated from these tonal values which describe the entire colour space that the specific printer can reproduce.

The size of the displayable colour space does not only depend on the printer. The paper in conjunction with the type of used ink plays a certain role in this process. The largest possible colour space is usually obtained by using special high gloss photo-paper. The standard "typewriter paper" will only be able to display a smaller colour space.



*SilverFast's* big advantage is that the input and the output calibration can all be done from within one single software. Everything works together smoothly and only the monitor calibration is to be done separately.

## Printer + Ink + Paper + Scanner

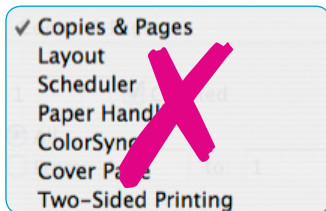
### Which printers are suitable?

Not all printers are able to produce perfect printouts for different reasons:

#### a) Printer driver

Some printer drivers do not allow the de-activation of certain colour properties of the printer. This can easily be seen in the printer driver's software menu if, for example, the menu options do not allow this. Sometimes it is not possible to determine if the colours will still be manipulated within the driver – in this case the only solution is trial and error when altering the driver's settings.

This occasionally is the case with cheaper printers, but also more expensive devices can have these issues. (e.g. colour laser printers)



**In general only printers which allow a complete de-activation of the complete colour management can be profiled correctly.**

#### b) The printer's reproducible colour space

The advertised resolution, the speed and the number of colour cartridges usually only tell a small part of the quality of the printer. Important is the number of colour tones that the printer is able to reproduce – this is mainly influenced by the paper type and the quality of the used ink.

Depending on the paper and ink, the reproducible colour space can vary in size. If everything is optimised the colour space can be maximized when using the best suitable combination of paper, ink and printer.

No one will ever be able to achieve the quality of high gloss photo paper when using the standard “typewriter paper”. The reproducible colour spaces are just too different in size.

### c) Inks

In general it is advised to use only the manufacturer’s own original inks. This is the safest way to achieve constant and reproducible printouts. 3rd part inks and refills usually lead to inconsistent quality and make any printer calibration ineffective.

### d) Suitable printers

Any output calibration targets those users that demand high quality. For these customers, special printers which are ready to be profiled are available.



*In general only printers which allow a complete de-activation of the complete colour management can be profiled correctly.*

### What paper types and media are suitable?

Remember that the output profiling was initially developed for the printing of images. In turn, the large spectrum of graphic, photo and art paper is suitable. Glossy or matt surfaces play a secondary role.

Not every paper can be correctly profiled with any printer – some restrictions apply. Due to the vast number of paper types in the market today, we cannot give a specific recommendation.



**It is important that the paper works well with the used ink!**

Ignoring this can result in long drying times or running colours or even a sticky surface of the printout.

To be on the safe side, use the manufacturers paper and ink. Anything else will lead to a trial and error system.

### Which scanners are suitable?

Flatbed scanners and drum scanners are suitable, but NOT film scanners.

Further restrictions are not know at this time – as long as the scanners are in good mechanical condition and run smoothly with *SilverFast Ai's IT8* calibration.

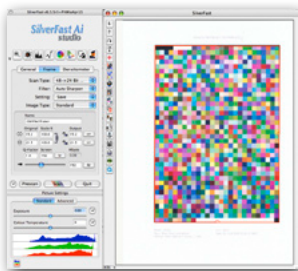
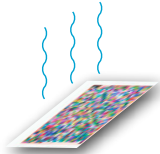
### System requirements

- Flatbed or drum scanner with *SilverFast Ai IT8 (Studio)*
- Calibrated monitor
- Profilable printer

In general only printers which allow a complete de-activation of the complete colour management can be profiled correctly.

- Apple Macintosh OSX 10.2, 256 MB RAM, 150 MB free disk space
- Windows 98SE, Me, 2000, XP, Vista. CPU 1 GHz, 256 MB RAM, 150 MB free disk space

## Overview of the SilverFast Printer Calibration Workflow



- **Printer preparation**
  - Clean ink jets, insert paper
  - Please note down the optimal printer driver and paper settings
- **Scanner preparation**
  - Perform IT8 calibration
- **Launch printer profiling wizard**
  - Enter printer and paper details
  - Click on "Print printer-profiling target"
  - De-activate the printer's internal colour management
  - Select paper type
  - Launch printing of the profiling target
- **Let the printer target dry!**
- **If needed, re-launch the printer profiling wizard**
  - Prepare scanner
    - Warm up the lamp, position the target and additional pieces of the same paper on the scan bed.
  - Scan the target
  - Measure the target
  - Name and save the ICC profile
  - Safe keep the target in the paper box.

# Running *SilverFast* Printer Calibration

The printer calibration is divided into 4 parts:

1. Preparation of printer
2. Preparation of scanner
3. Printing of output target
4. Profiling the target

## 1. Preparation of printer

### 1.1 Inkjet printers

It is recommended to use the nozzle check and cleaning before profiling ink jet printers



It is recommended to always use the manufacturer's original ink!

This is the safest way to obtain consistent and reproducible results. Using 3rd party inks and refills often lead to inconsistent print quality and make a printer calibration rather useless.

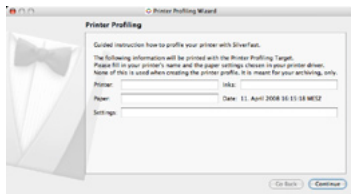
Ideally, the entire profiling workflow should be performed under the same, standardized conditions. Room temperature and humidity have an immense effect on the printing quality. This makes it necessary to create different profiles for the varying environment conditions.

## 1.2 Determining the optimal parameters of the printer driver

In order to achieve predictable printing results it is very important to have the same exact settings within the printer driver. The settings influence the amount of ink that the printer will use on the paper.

The “correct” parameters depend upon the paper type and also on the user’s personal “taste”. The basic parameters can be found on the information sheets of printer or paper manufacturer. Many paper types have useful information written on the packing or on an accompanying info sheets. It may be helpful to print out a test image and adjust only the paper and quality settings.

Additionally, some manual work is required as most printer driver do not allow saving and reloading entire settings. It is advised to note the respective printer settings or make a screenshot of them and re-enter these settings when printing.



*SilverFast* offer a little help for this: Right after launching the output calibration, a small dialogue allows to enter the current printer settings.

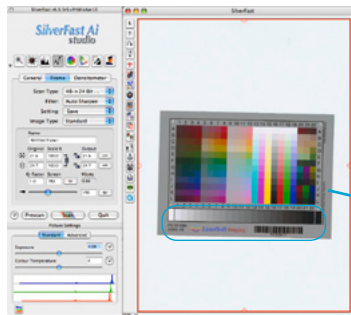
Printer:	<input type="text"/>	Inks:	<input type="text"/>
Paper:	<input type="text"/>	Date:	11. April 2008 16:15:18 MESZ
Settings:	<input type="text"/>		

This information will be printed on the output target for future reference. Please store the target with the paper package. By doing so, you can easily re-set the values at a later time.

## 2. Preparation of scanner

### 2.1 IT8 scanner calibration

The simplest way is to use *SilverFast's* IT8 automatic calibration with a *LaserSoft Imaging* IT8 target. The patented barcode technology makes the IT8 calibration a fully automatic process.



### 2.2 Calibration successful – check *Delta E* value

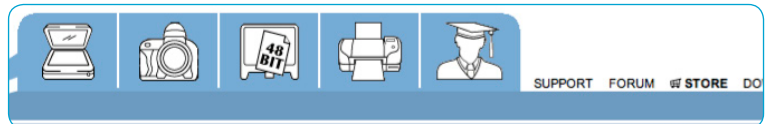
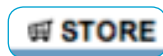
Once the IT8 calibration was successful, the value of the *Delta E* shows the accuracy of the calibration.



A *Delta E* value of less than 2 is perfect. If the value is above 4, it might be time for a newer target. Since IT8 targets are manufactured by a photochemical process, they will undergo some aging. Depending on how the target is stored (dark and cool preferred) the aging can cause a target to become unusable and new ones should be purchased.

These targets are readily available in our online shop.

[https://www.silverfast.com/order/en.html?productline=scanner&special=it8order\\_no\\_sf](https://www.silverfast.com/order/en.html?productline=scanner&special=it8order_no_sf)



Another reason for a high *delta E* value could be caused by the hardware itself – the scanner's light sources also undergo an aging process and will eventually fail.

## 3. Printing of the printer target

### 3.1 Launch printer calibration



The calibration is started by clicking the respective button in the vertical tools palette.

The button for output calibration will only be visible after an IT8 calibration has been done for the scanner, and the respective ICC profile has been assigned.

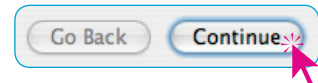
### 3.2 Printer profiling wizard

The dialogue window of the printer profiling wizard will open. Enter the previously noted information (ref. [Chapter 1.2](#)) for printer, paper and the optimal ink settings. The information will be automatically printed out on the target.



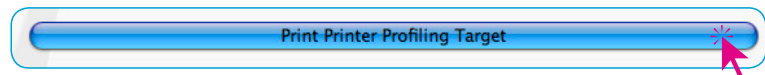
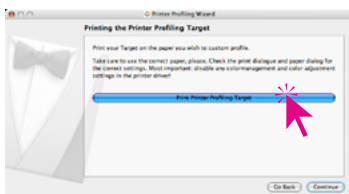
Printer:	<input type="text"/>	Inks:	<input type="text"/>
Paper:	<input type="text"/>	Date:	11. April 2008 16:15:18 MESZ
Settings:	<input type="text"/>		

Click "Continue".



### 3.3 Printing the output profile target

The new dialogue window allows the target to be printed out. Please make sure that the printer is turned on and at least 1 US letter format or A4 format paper is inserted. Next, click the button called "Print printer target"





### 3.4 Printer driver dialogue

The type of printer dialogue is determined by operating system, the manufacturer of the printer as well as the specific printer type. Since there are a large number of different drivers, only some examples are given in this manual.

However – all printer drivers require 3 basic principles:



**De-activate any kind of color management within the printer driver!**



**Note down paper settings!**

*This is very important as you will need the exact same settings you used when generating the ICC profile for that specific paper.*

- a) De-activate any kind of colour management within the printer driver!
- b) The paper settings must be exactly the same for the generated ICC profile.

The “correct” settings are dependent on the paper, and on personal taste. Basic settings for useable results can be found in the information that comes with the paper and the printer manufacturers. Many paper types have useful information printed on the packing.

Additionally, some manual labour is required since only a few printer drivers allow a complete saving and loading all the adjusted settings. To be safe, it is best to note down the parameters, or even make a screenshot of these settings at the time they are entered (ref. chapter “[1.2 Determining the optimal parameters of the printer driver](#)”)

- c) If a profiled printout is required in future, steps a and b are to be repeated. Additionally, printing applications like Photoshop must have that generated ICC profile activated. A complete example of how everything works together is given in the chapter “[Applying a printer ICC profile](#)”

Due to the large variety of printer drivers, this documentation can only show a few specific examples.

### 3.4.1 EPSON Inkjet Printer

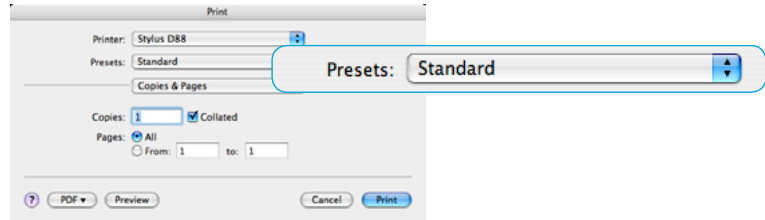
Example: Stylus D88 under Mac OS 10.4 Tiger



Epson Stylus D88

#### Printer menu “Copies and pages”

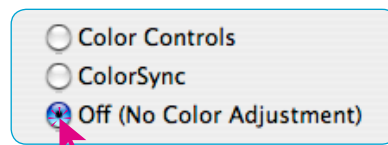
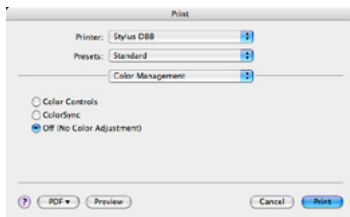
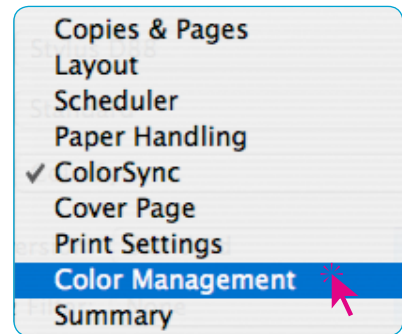
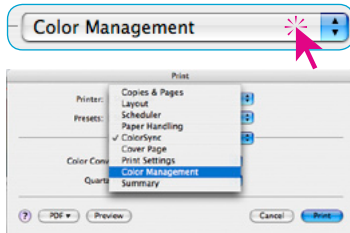
Do not change any settings. Please make sure that “Standard” is selected in the Presets options.

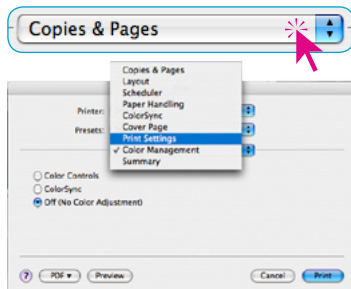


#### Printer menu “Colour Management”

After switching from “Copies and Pages” to “Colour Management”, the checkbox should be set to “Off (No colour adjustment)”.

The colour management is now de-activated.

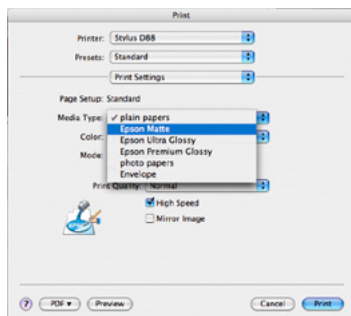
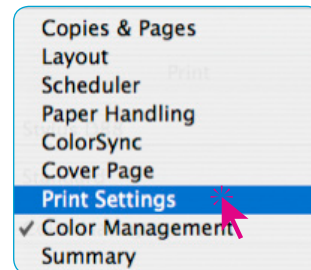




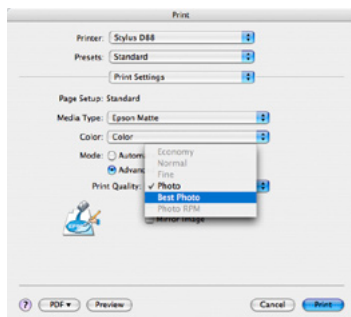
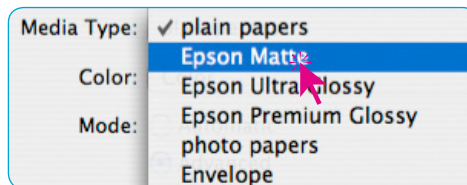
### Printer menu “Print settings”

This allows selecting the paper (“Media”) which is to be profiled. Please note that these settings have to be exactly the same when printing at a later time.

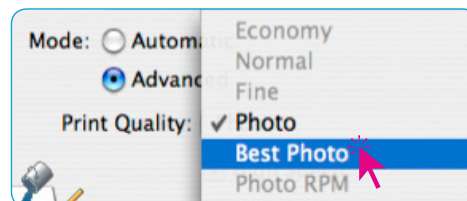
The best way is to note down the settings or even make a screenshot of these setting, print them out and store this them with the paper. This help to keep an overview if many different paper types are being used.



The example shows media type as “Epson Matte”.



The print quality was set to “Best Photo”.



### Which “Print settings” are correct?

This should be tried out! A small help might be the manufacturer’s notes on the paper packaging.

Clicking on “Print” will start the printing of the target.

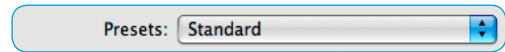
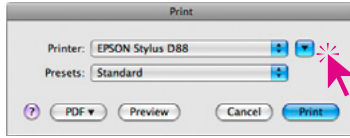


Go on with “3.5 Printing of the output target”

## Example: Stylus D88 under Apple MacOS10.5 Leopard

### Dialogue „Print“

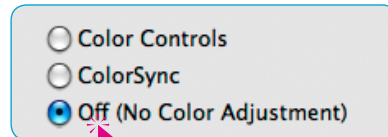
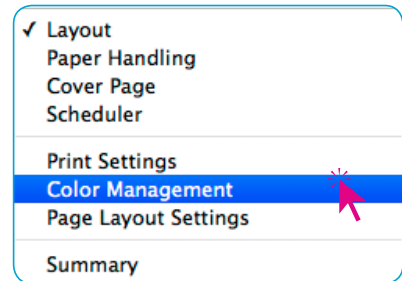
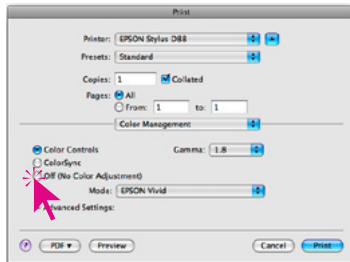
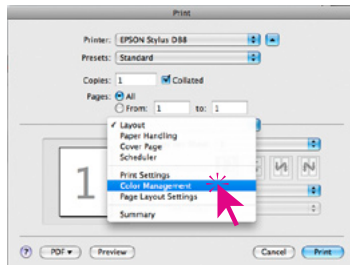
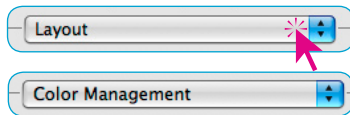
Under Leopard, the print dialogue initially appears in a small, condensed view. Clicking on the “down arrow” button will open the dialogue to its full size. Do not change any settings. Please make sure that “Standard” is selected in the Presets options.

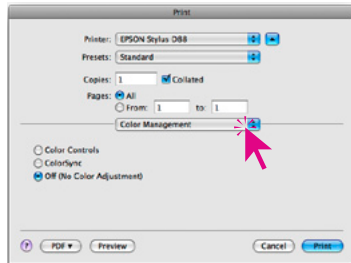


### Printer Menu „Colour Management“

After switching from “Layout” to “Colour Management”, the checkbox should be set to “Off (No colour adjustment).”

The colour management is now de-activated.

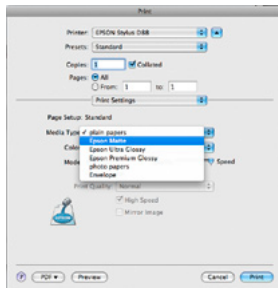
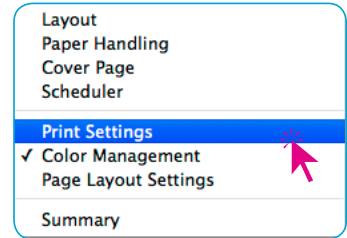




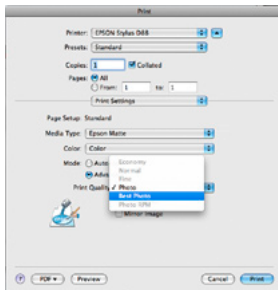
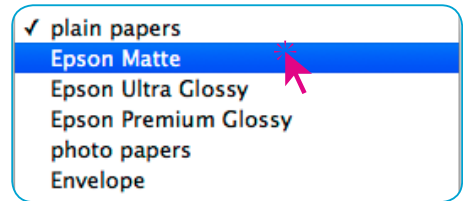
### Printer menu “Print settings”

This allows selecting the paper (“Media”) which is to be profiled. Please note that these settings have to be exactly the same when printing at a later time.

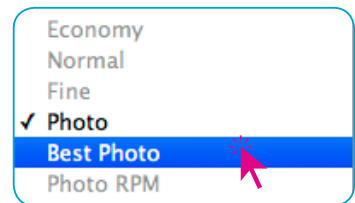
The best way is to note down the settings or even make a screenshot of these setting, print them out and store this them with the paper. This help to keep an overview if many different paper types are being used.



The example shows media type as “Epson Matte”.



The print quality was set to “Best Photo”.



### Which “Print settings” are correct?

This should be tried out! A small help might be the manufacturer’s notes on the paper packaging.

Clicking on “Print” will start the printing of the target.

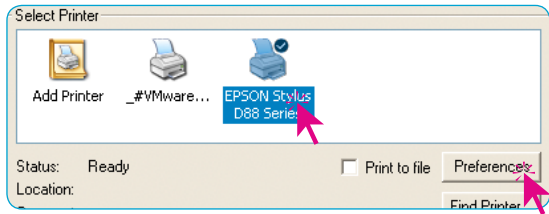
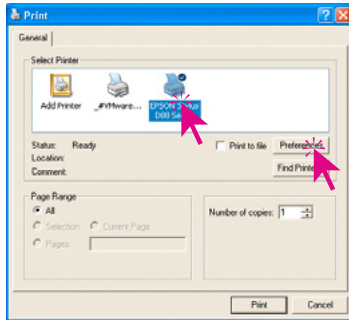


Go on with “3.5 Printing of the output target”

### Example: Stylus D88 under Windows XP

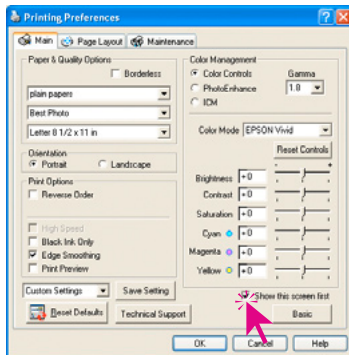
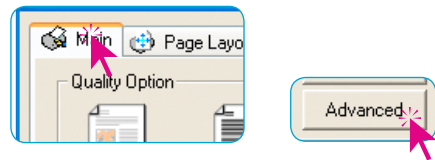
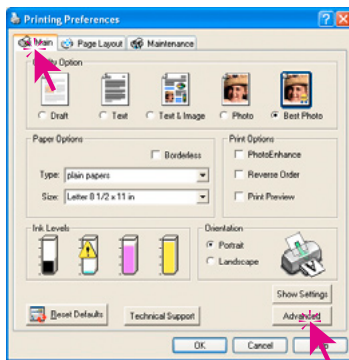
#### „Print“ dialogue

Select the desired printer and then click “Preferences”



#### „Printing Preferences“ dialogue

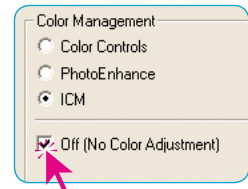
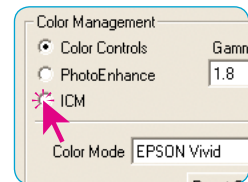
Select “Advanced” on the main palette.

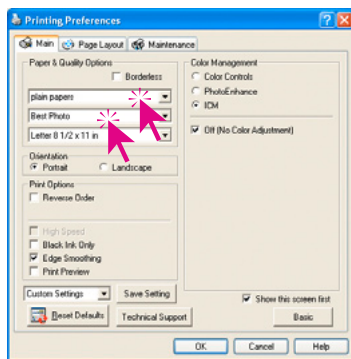


Check the box “Show this screen first” to get to this point directly in future.

In order to de-activate the printer’s own colour management, select “ICM” in the “Colour management”

The dialogue now shows the checkbox “Off (No Colour Adjustments)” – choose this to de-activate it.





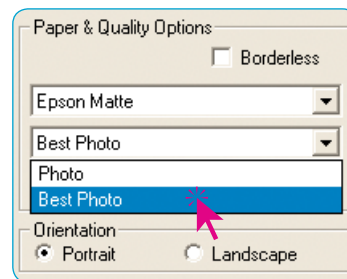
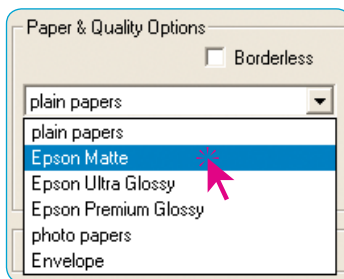
Go to „Paper & Quality Options“ so enter the settings for the paper (Medium) that is to be profiled.

Please remember that these settings have to be identical for any further printing on that specific paper type!

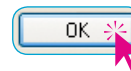
Please note that these settings have to be exactly the same when printing at a later time.

The best way is to note down the settings or even make a screenshot of these settings, print them out and store this them with the paper.

In our example the medium “Epson Matte” is selected and the quality is set to “Best Photo”.



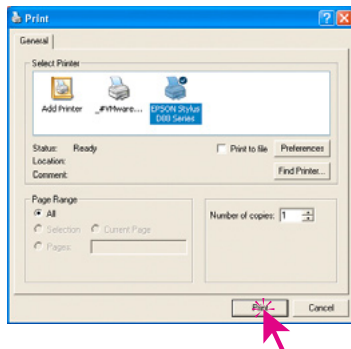
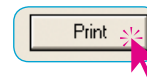
Click “OK” to close the dialogue.



### Which “Printer settings” are correct?

This should be tried out! A small help might be the manufacturer’s notes on the paper packaging.

Clicking on “Print” will start the printing of the target.

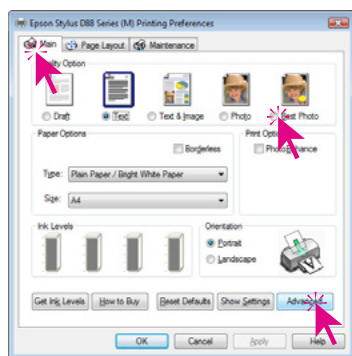
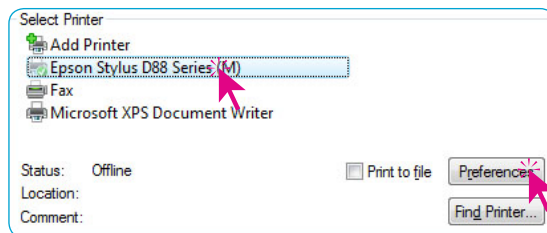
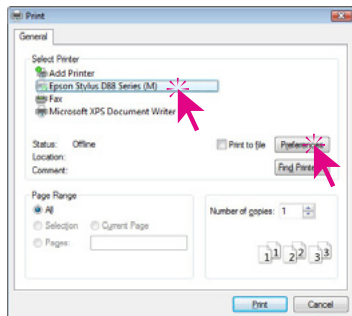


Go on with “3.5 Printing of the output target”

## Example: Stylus D88 under Windows Vista

### “Print” Dialogue

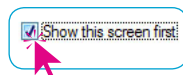
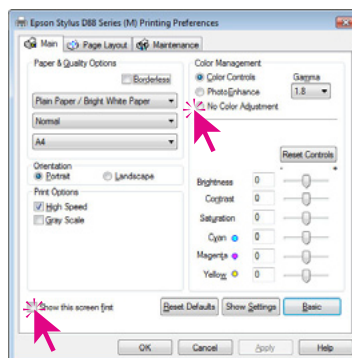
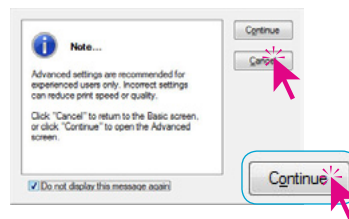
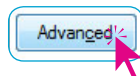
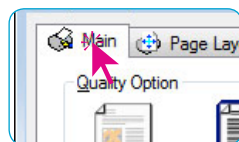
Select the desired printer and then click “Preferences”



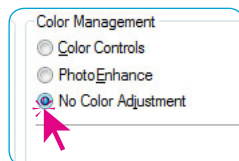
### „Printing Preferences“ dialogue

Please select the output quality (in this case „Best Photo“) from the “Main” palette.

Click on “Advanced” in order to make extended adjustments.

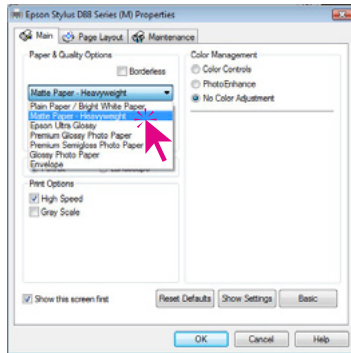


Check the box “Show this screen first” to get to this point directly in future.



In order to de-activate the printer's own colour management, select “No Colour Adjustment” in the menu “Colour management”

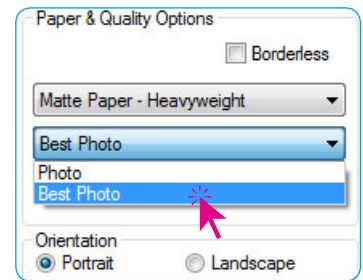
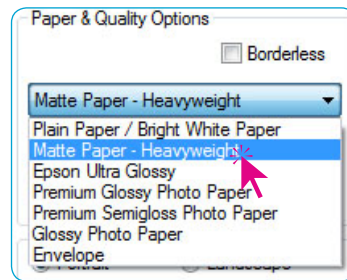




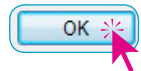
Go to „Paper & Quality Options“ so enter the settings for the paper (Medium) that is to be profiled.

Please remember that these settings have to be identical for any further printing on that specific paper type!  
Please note that these settings have to be exactly the same when printing at a later time.  
The best way is to note down the settings or even make a screenshot of these settings, print them out and store this them with the paper.

In our example the medium “Matte Paper” is selected and the quality is set to “Best Photo”.



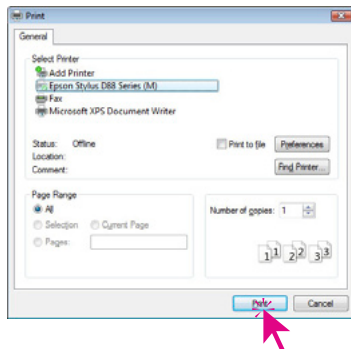
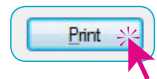
Click “OK” to close the dialogue



### Which “Paper & Quality Options” are correct?

This should be tried out! A small help might be the manufacturer’s notes on the paper packaging.

Clicking on “Print” will start the printing of the target.



Go on with “3.5 Printing of the output target“



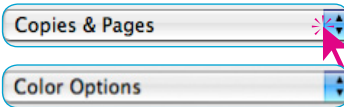
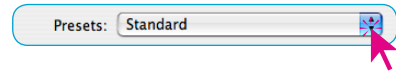
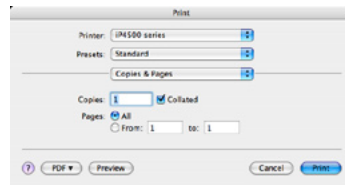
Canon PIXMA iP4500

### 3.4.2 CANON Inkjet Printer

Example: PIXMA iP4500 under Apple MacOS10.4 Tiger

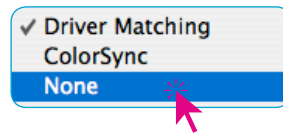
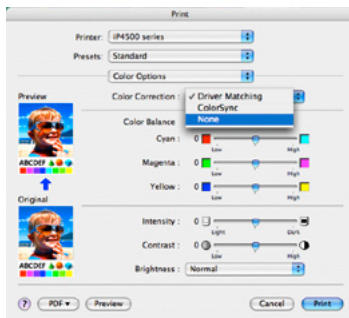
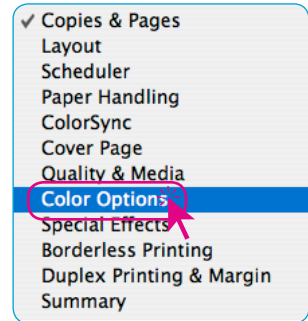
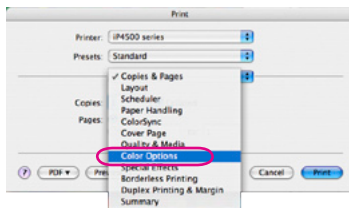
#### Printer menu „Copies & Pages“

Please do not change any settings. Make sure that you have selected “Standard” in the “Presets”



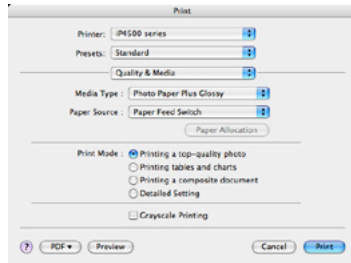
#### Printer menu „Colour options“

After switching from „Copies & pages“ to „Colour options“ the point „Colour correction“ should be set to „None“ – this will de-activate the printer driver’s own colour management.



Copies & Pages

Quality & Media



## Printer menu „Output settings“

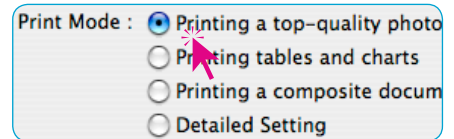
The settings for the profiled paper type can be selected. Please note that these settings have to be exactly the same when printing at a later time.

The best way is to note down the settings or even make a screenshot of these settings, print them out and store this them with the paper. This help to keep an overview if many different paper types are being used.

The example shows media type as “Photo Paper Plus Glossy”.

Media Type : Photo Paper Plus Glossy

The print quality was set to “Printing a top-quality photo”.



## Which “Quality & Media” settings are correct?

This should be tried out! A small help might be the manufacturer’s notes on the paper packaging.

Clicking on “Print” will start the printing of the target.

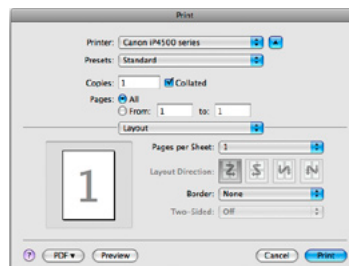
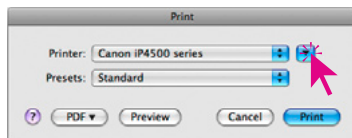


Go on with “3.5 Printing of the output target“

## Example: PIXMA iP4500 under Apple MacOS10.5 Leopard

### Dialogue “Print”

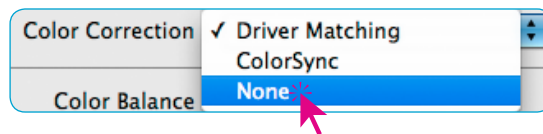
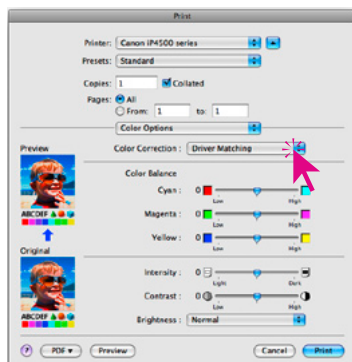
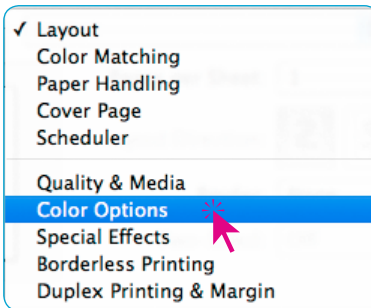
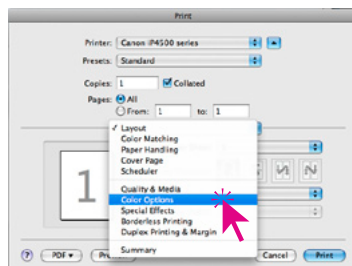
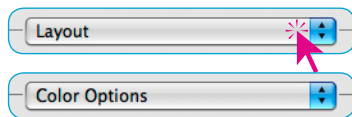
Under Leopard, the print dialogue initially appears in a small, condensed view. Clicking on the “down arrow” button will open the dialogue to its full size. Do not change any settings. Please make sure that “Standard” is selected in the Presets options.

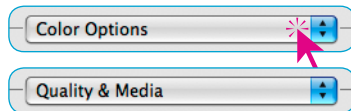


### Printer menu “Colour Options”

After switching from “Layout“ to “Colour Management”, the pop-up “Colour Correction” should be set from “Driver Matching” to “None”.

The colour management is now de-activated.

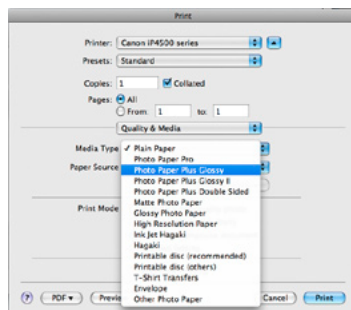
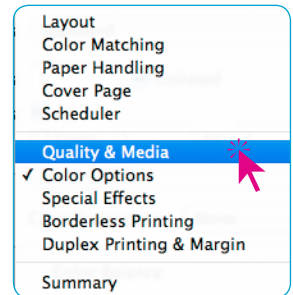
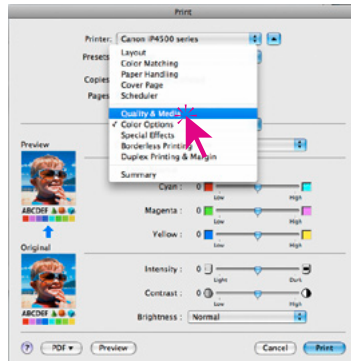




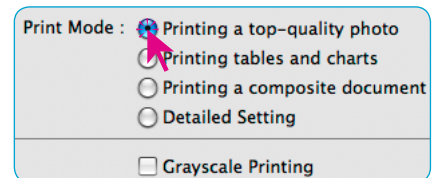
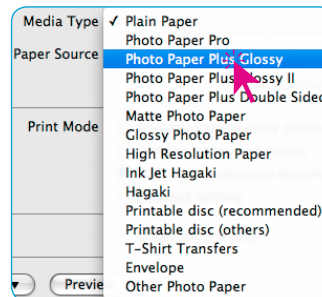
## Printer menu “Quality & Media”

Here the paper (Medium) settings can be selected. Please note that these settings have to be exactly the same when printing at a later time.

The best way is to note down the settings or even make a screenshot of these settings, print them out and store this them with the paper.



In our example the medium “Photo Paper Plus Glossy” is selected and the quality is set to “Printing a top-quality photo”.



## Which “Quality & Media” settings are correct?

This should be tried out! A small help might be the manufacturer’s notes on the paper packaging.

Clicking on “Print” will start the printing of the target.

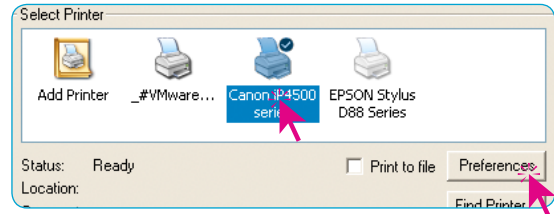
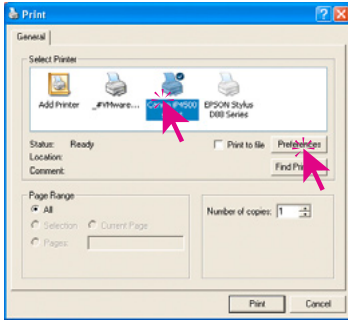


Go on with “3.5 Printing of the output target”

### Example: PIXMA iP4500 under Windows XP

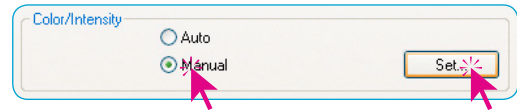
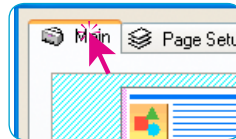
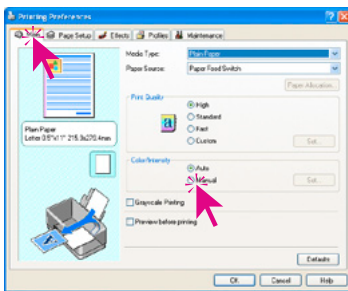
#### “Print” dialogue

Select the desired printer and click “Settings”

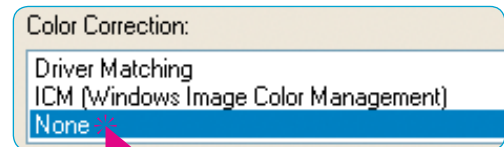
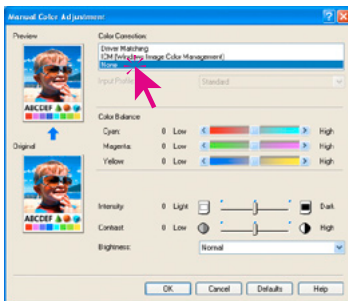


#### „Print settings“ dialogue

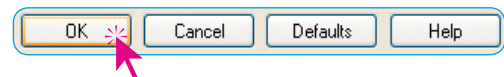
In the „Options“ palette, under „Color / Intensity“ click the button “Manual” to view the advanced settings.

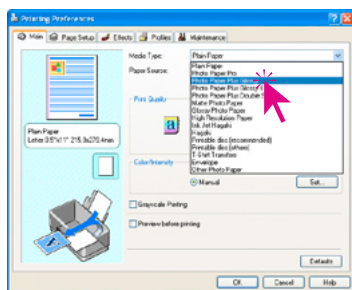


In order to de-activate the printer's own color management, select “None” in the “Color correction” menu.



Confirm this by clicking “OK”.



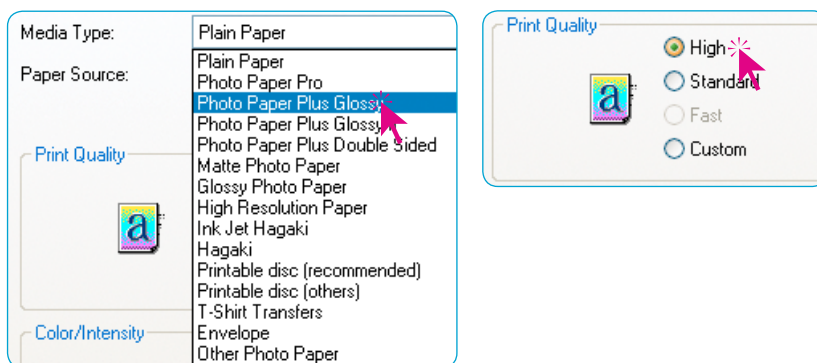


Next, select the settings for the paper you are want to profile.

Please note that these settings have to be exactly the same when printing at a later time.

The best way is to note down the settings or even make a screenshot of these settings, print them out and store this them with the paper.

In our example the medium “Photo Paper Plus Glossy” is selected and the quality is set to “High”.



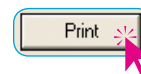
Click “OK” to close the dialogue.



### Which “Printing Settings” are correct?

This should be tried out! A small help might be the manufacturer’s notes on the paper packaging.

Clicking on “Print” will start the printing of the target.

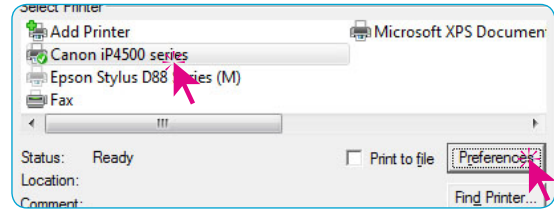
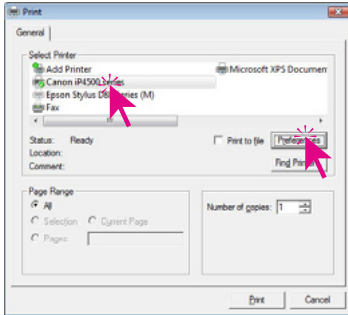


Go on with “3.5 Printing of the output target”

## Example: PIXMA iP4500 under Windows Vista

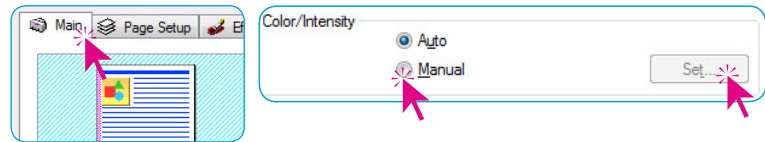
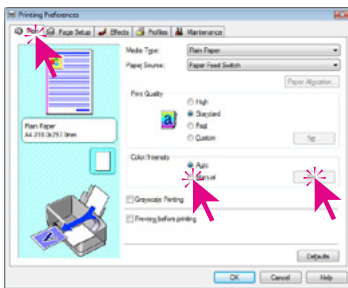
### “Print” dialogue

Select the desired printer and click “Settings”

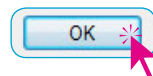
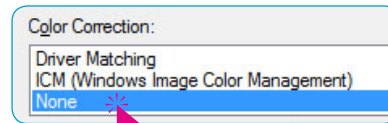
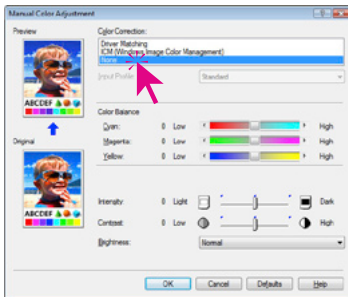


### „Print settings“ dialogue

The extended settings can be send and changed by selecting “Color/Intensity” on the main palette, and then clicking on “Manual” and “Set”.

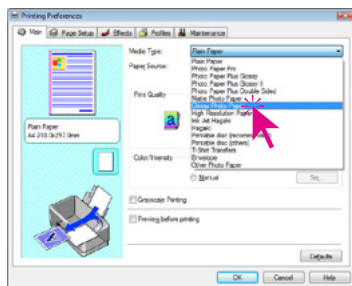


In order to de-activate the printer's own colour management, select “None” in the “Colour correction”



Confirm this by clicking “OK”.





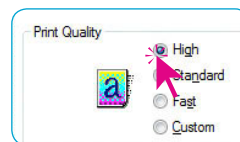
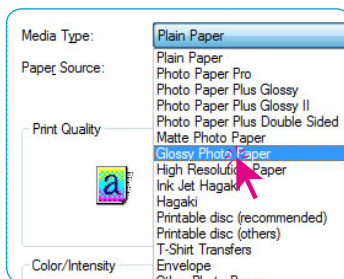
Enter the settings for the profiling “medium” (paper) here.

Please remember that these settings have to be identical for any further printing on that specific paper type!

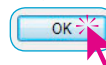
Please note that these settings have to be exactly the same when printing at a later time.

The best way is to note down the settings or even make a screenshot of these settings, print them out and store this them with the paper.

In our example the medium “Glossy Plus Paper” is selected and the quality is set to “High”.



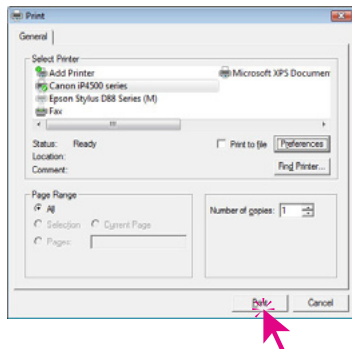
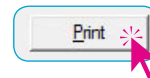
Click “OK” to close the dialogue.



### Which “Printer settings” are correct?

This should be tried out! A small help might be the manufacturer’s notes on the paper packaging.

Clicking on “Print” will start the printing of the target.



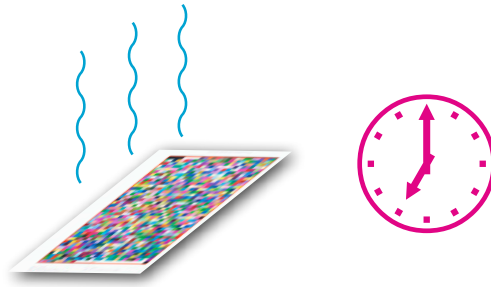
Go on with “3.5 Printing of the output target”

### 3.5 Printing of the output target

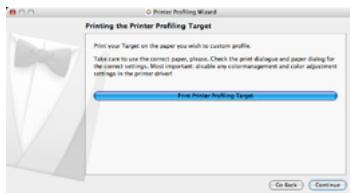
The printer will now print the output target.



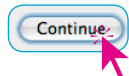
*Please make sure that the printout is completely dry!*



Depending on the used medium and ink, the drying time may be extremely long – in some cases over 24 hours!  
The printout may change while it is drying – only then can a correct profiling take place.



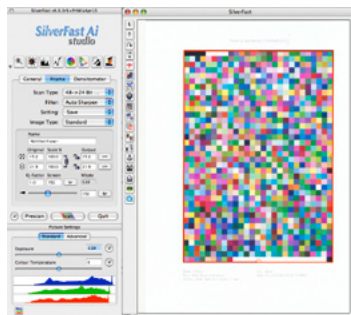
It may be advisable to cancel the ongoing workflow and quit the profiling assistant.  
Else, click “Continue”



## 4. Profiling (Measuring the output profile target)

### 4.1 Scanning the output target for profiling

If needed, re-launch *SilverFast*. Place the completely dry target on the scanner.

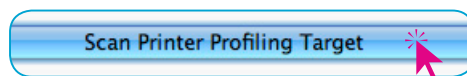
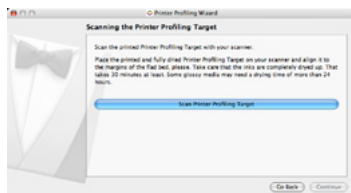


Please place 2 or 3 additional sheets of the same paper on to the rear of the printout!

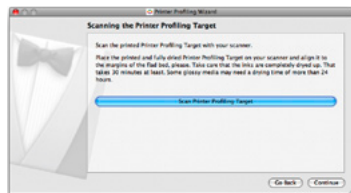
This will stop excess light passing through the image – this is very crucial for thin paper types (less than 200 g/m<sup>2</sup>). For Canvas paper on the other hand, it makes sense to place a matte black carton behind the target on the scanner.

**Attention!** If the scanner has not been used for a longer period of time, please make several Prescans as this will ensure the correct operating temperature of the scanner's light source.

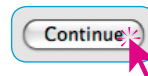
If necessary, please re-launch the output profiling. Continue to the point "Scanning the printer profiling target". Then, click the button "Scan Printer Profiling Target"



The scanner will then do a prescan, and *SilverFast* will automatically align the grid pattern with target.

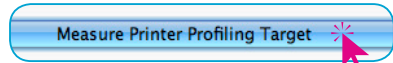
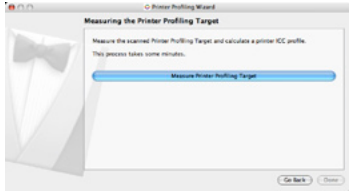


Click "Continue".

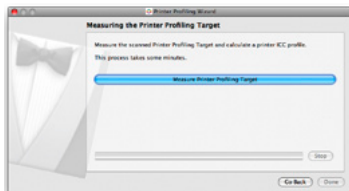
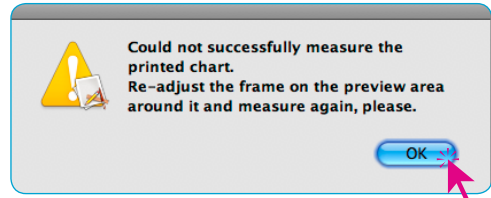


## 4.2 Measuring the output profiling target

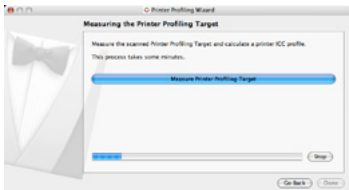
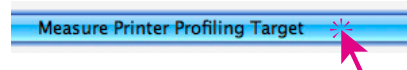
Click the button “Measure Printer Profiling Target”.  
*SilverFast* will then start the calculations of the printer profile.



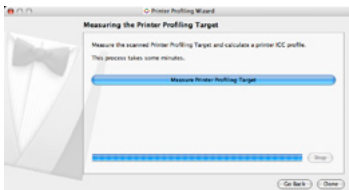
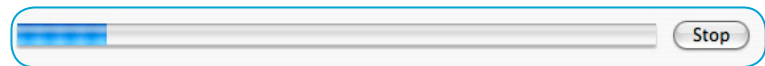
In case the measured frame was not found correctly, you will be prompted to align the position of the red frame in the preview window by click-dragging the mouse. For scanners which have a black undercover, it might make sense to cover the entire flatbed with white paper.



Click the button “Measure Printer Profiling Target” again.



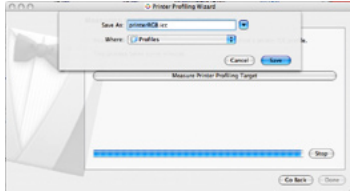
This calculation may take several minutes.  
A progress bar will be displayed.



After the calculation has ended, click “Done”.



### 4.3 Save the ICC profile



After generating the ICC profile, it has to be saved and named. In our example the printer model, paper name and date are added before the extension “.icc”.

Save As: D88 ColorCopy100 LSI 190308.icc

The path for saving the ICC profile also has to be set.

If you are the “Administrator” of the computer, *SilverFast* will copy the profile into the user directory and also into the respective folder of the root directory.

If you are only a “user” on that PC, *SilverFast* will only copy the ICC profile into the respective user directory.

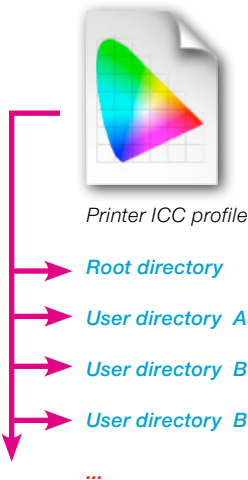
Where: Profiles

Once the name and path have been selected, click “Save”.

Save As: D88 ColorCopy100 LSI 190308.icc

Where: Profiles

Cancel Save



#### Shared workspaces

The printer ICC profile should be copied into the respective ColorSync folder used by all users. By this, each user can reload the saved ICC profiles.

The printer profiling has now been completed.



#### Macintosh only !

It is advised to also save the ICC profile into the ColorSync root folder:

**System / Library / ColorSync / Profiles / ...**

Some applications only refer to the profile folder ion the root directory and ignore user directories!

# Application of a printer ICC profile

## Macintosh example

This example is meant only for demonstrating the principle of the workflow with printer ICC profiles.

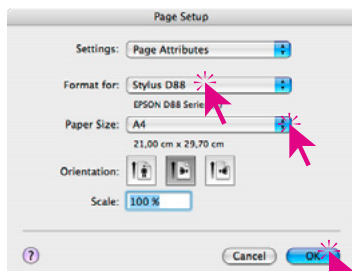
As discussed in the chapter “Printing of the output target”, the exact entering of the identical print parameters carries extreme importance. This is why the setting should be noted when profiling!

### Adobe Photoshop CS3, Macintosh OS 10.4 Tiger

The image to be printed using an ICC printer profile is opened in Photoshop. The printout commences after the necessary parameters are set in both Photoshop menus “Page Setup” and “Print with preview”, as well as in the printer driver menu have been entered.

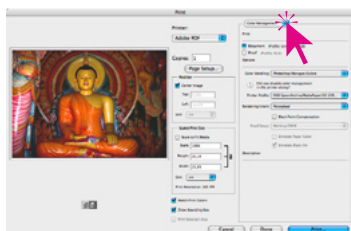
#### 1. Photoshop menu “Page setup”

Select the printer, paper format, alignment and size.

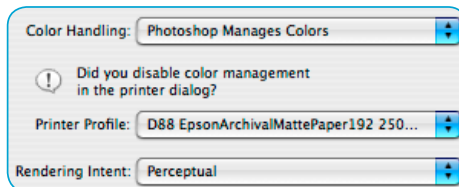


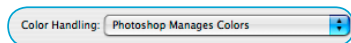
#### 2. Photoshop menu “Print with preview”

Apart from the usual format settings, the menu “Colour management” is extremely important. This menu might not always be visible – in this case the popup menu “Output” has to be switched to “Colour Management”.

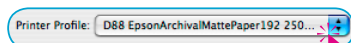
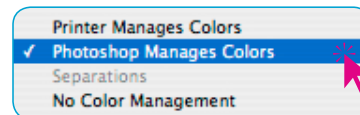


The parameters can then be entered under “Options”.

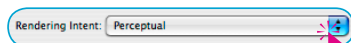




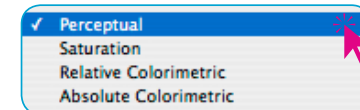
The menu "Colour handling" should be set to "Photoshop determines colours".



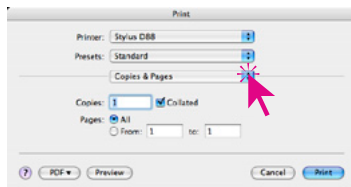
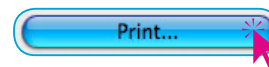
The menu "Printer profile" is then used to select the generated paper profile.



The menu "Rendering" should be set to the desired rendering intent. Form photos, usually "Perceptual" or "Saturation" should be selected.



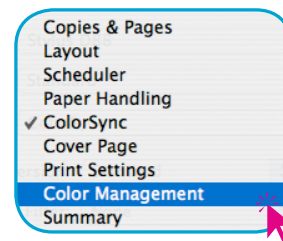
Clicking on "Print" will launch the printing process.



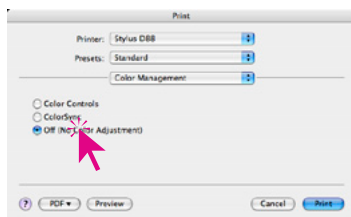
### 3. Printer driver menus (Example\* Epson Stylus D88)

The menu "Copies and pages" should be checked for the correct printer again and the number of print-outs can be set.

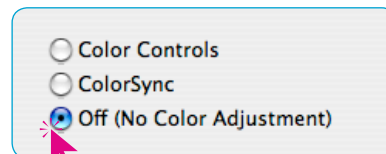
After that, switch to the menu "Colour Management"

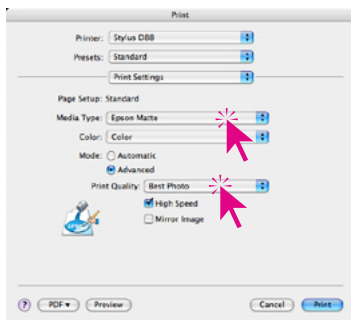


\* The mentioned printer merely serves the illustration of the workflow.

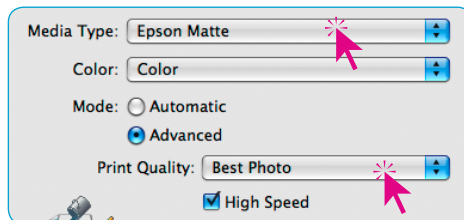


Shown here is the de-activation of the printer driver's color management; set this to "Off (No colour management).

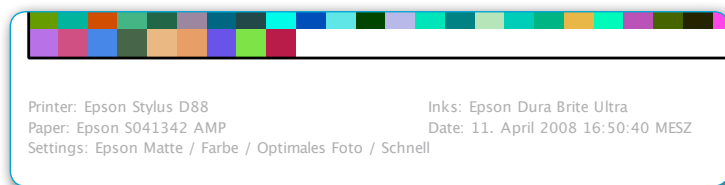




Finally, the paper and printer settings are to be set. It is important to have the same setting here that was used for printing the printer target.



The necessary information should ideally already be displayed on the printer target. ([Chapter 1.2](#) and [Chapter 3.2](#)).



Click "Print"



\* The mentioned printer merely serves the illustration of the workflow.

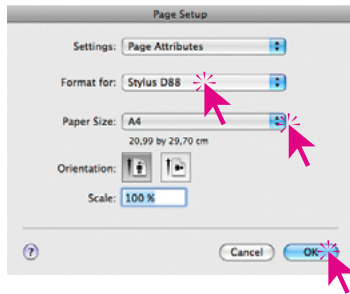


## Adobe Photoshop CS3, Macintosh OS 10.5 Leopard

Open the image which has an ICC printer profile in Photoshop. Printing is done after the necessary parameters are set in the two Photoshop menus “Page setup” and “Print” as well as within the printer driver’s own menu.

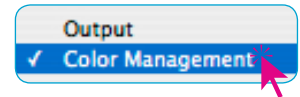
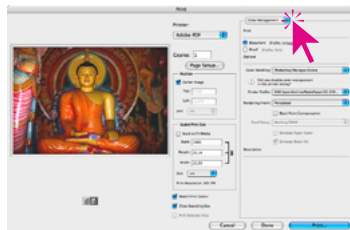
### 1. Photoshop-Menü “Page setup“

Select printer, paper format, layout and size.

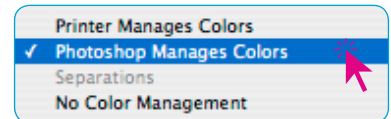
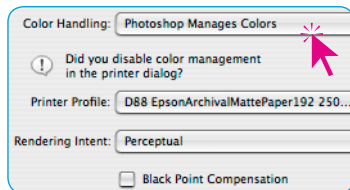


### 2. Photoshop-Menü “Print“

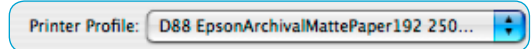
Apart from the usual format settings, only the menu “Colour management” is important here. If needed, open the menu “Output” and then “Colour management”.



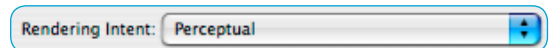
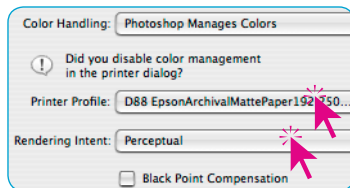
The menu “Colour handling” should be set to “Photoshop Manages Colours”.

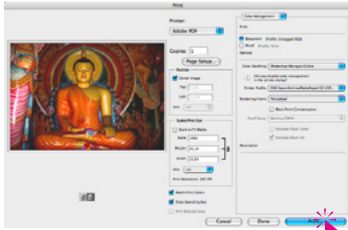


The menu “Printer profile” should be used to select the generated ICC printer profile.

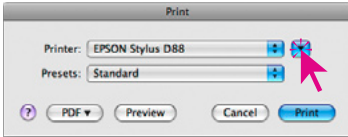
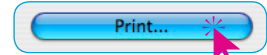


The menu “Rendering intent” is used to set the intent; usually “Perceptual” or “Saturation” should be activated.



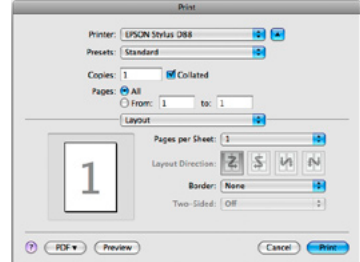


Clicking the “Print” button will launch the printing process.

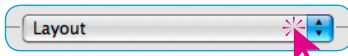


### 3. Printer driver menus (Example Epson Stylus D88)

“Print” **dialogue:** Under Leopard, the print dialogue initially appears in a small, condensed view. Clicking on the “down arrow” button will open the dialog to its full size.

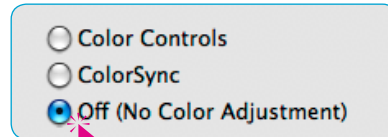
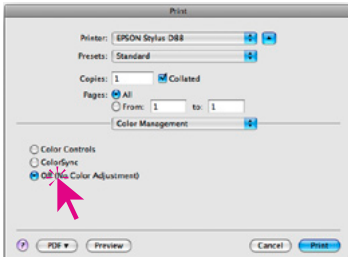
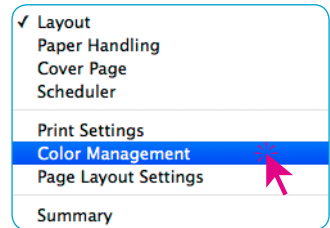
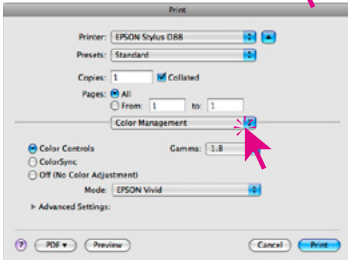


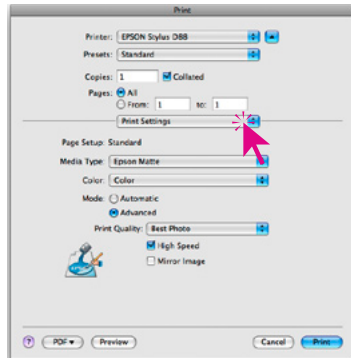
Do not change any settings. Please make sure that “Standard” is selected in the Presets options.



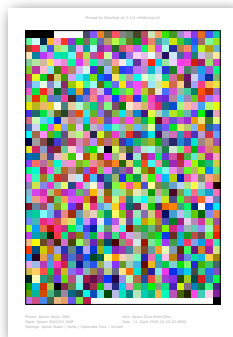
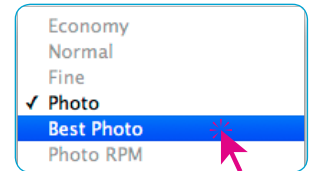
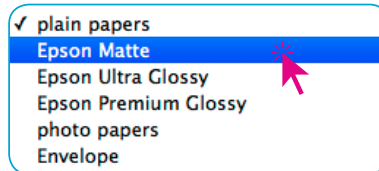
Printer Menu “Colour Management“: After switching from “Layout” to “Colour Management”, the checkbox should be set to “Off (No colour adjustment).

The printer’s own colour management is now de-activated.

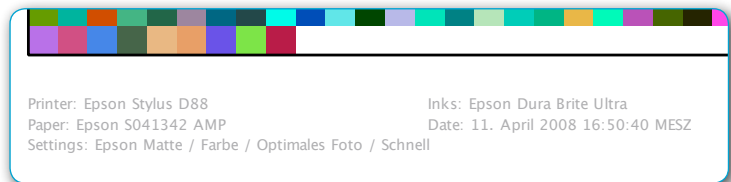




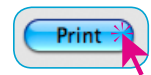
Finally, the paper and printer settings have to be specified. Please make sure that the same settings that were used when profiling the paper are used again.



Ideally, these settings have been noted down as described earlier (ref. [Chapter 1.2](#) and [Chapter 3.2](#)).



Launch the printing process by clicking “Print”



\* The mentioned printer merely serves the illustration of the workflow.

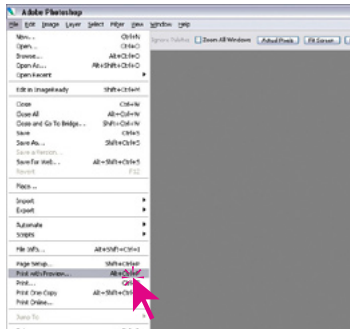
## Example Windows

### Adobe Photoshop CS2, Windows XP

Open the image which has an ICC printer profile in Photoshop. Printing is done after the necessary parameters are set in the two Photoshop menus “Page setup” and “Print with preview” as well as within the printer driver’s own menu.

#### 1. Photoshop Menu “Print with preview“

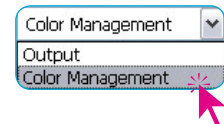
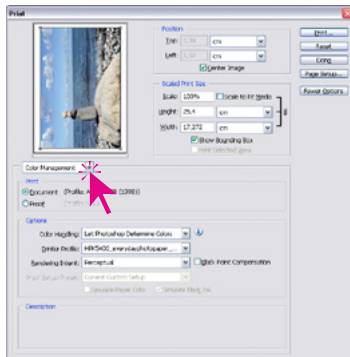
Select the menu “Print with preview“



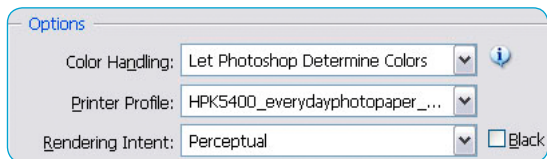
#### 2. Photoshop Menu “Print“

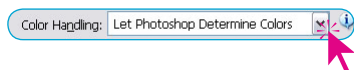
Apart from the usual format settings, only the menu “Colour management” is important here.

If needed, open the menu “Output” and then “Colour management”.

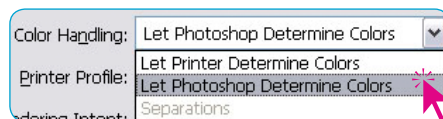


Under “Options” more settings may be entered.

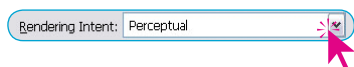




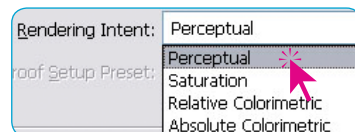
The menu “Colour handling” should be set to “Let Photoshop Determine Colours”.



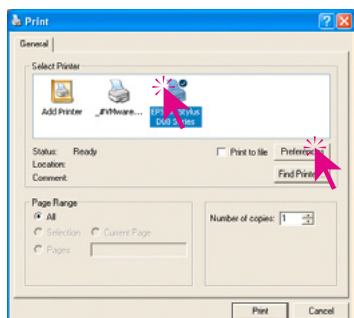
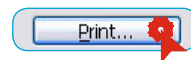
The menu “Printer profile” should be used to select the generated ICC printer profile.



The menu “Rendering intent” is used to set the intent; usually “Perceptual” or “Saturation” should be activated.



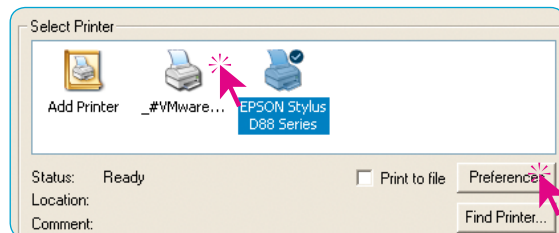
Clicking the “Print” button will launch the printing process.



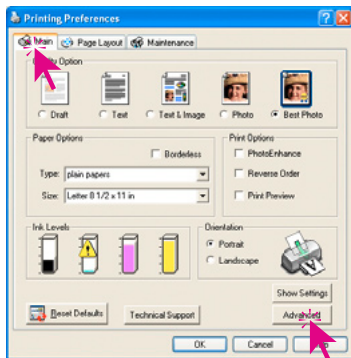
### 3. Printer driver menus (Example\* Epson Stylus D88)

#### “Print” dialog

Select the desired printer and click “Settings”.

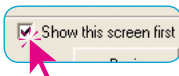
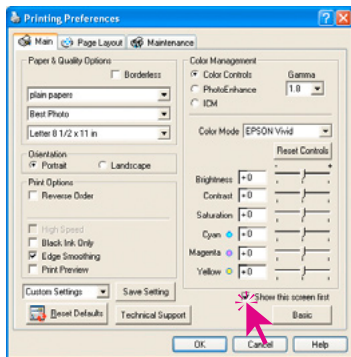
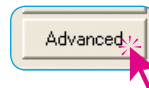
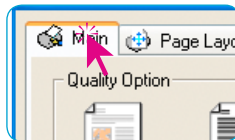


\* This printer has been chosen only for illustrating purposes.



## “Printer settings“ dialogue

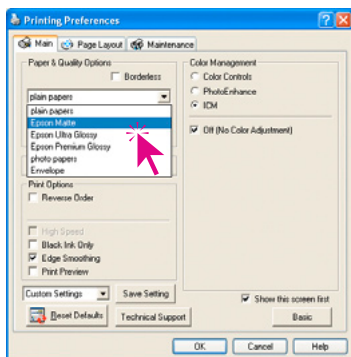
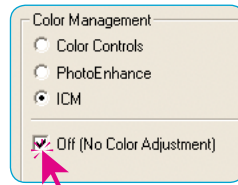
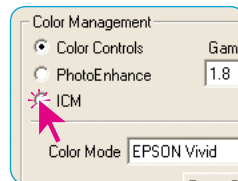
Select “Advanced“ on the main palette.



Check the box “Show this screen first” to get to this point directly in future.

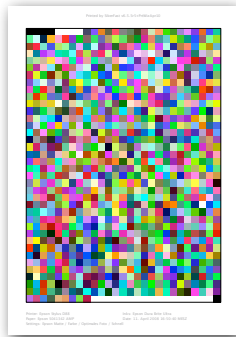
In order to de-activate the printer’s own colour management, select “ICM” in the “Colour management”

The dialogue now shows the checkbox “Off (No Colour Adjustments)” – choose this to de-activate it.

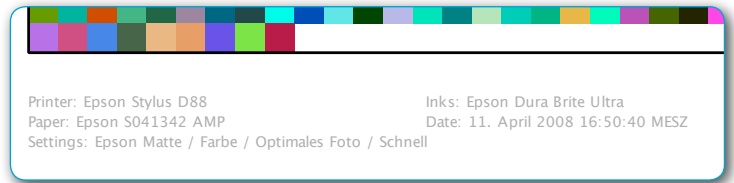


Finally, the paper and printer settings have to be specified.

Please make sure that the same settings that were used when profiling the paper are used again.



The necessary information should already be noted on the output target (ref. [Chapter 1.2](#) and [Chapter 3.2](#)).



Clicking the “Print” button will launch the printing process.

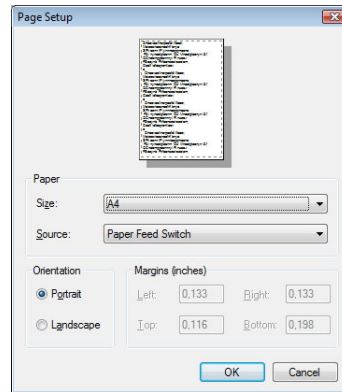
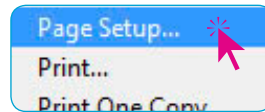
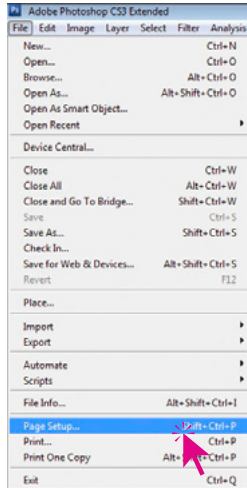


## Adobe Photoshop CS3, Windows Vista

Open the image which has an ICC printer profile in Photoshop. Printing is done after the necessary parameters are set in the two Photoshop menus “Page setup” and “Print” as well as within the printer driver’s own menu.

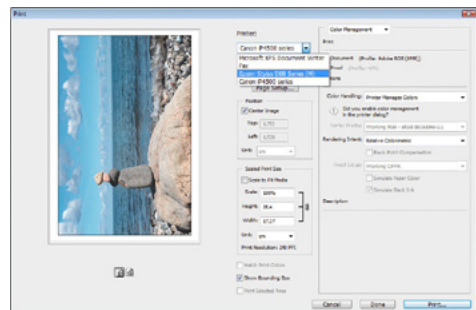
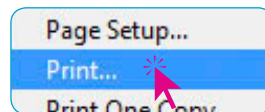
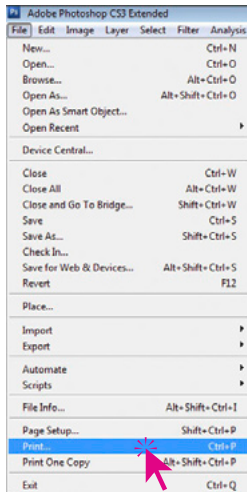
### 1. Photoshop Menu “Page setup”

Select paper format, alignment and size here.

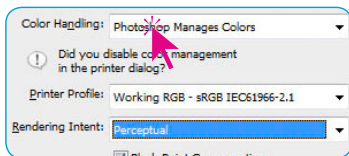


### 2. Photoshop Menu “Print”

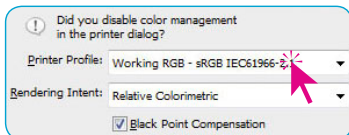
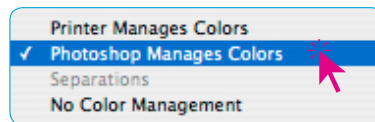
Enter the settings for the colour management here.



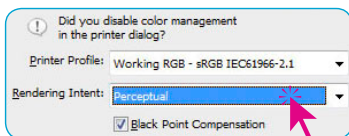
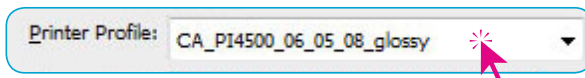




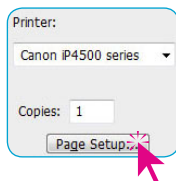
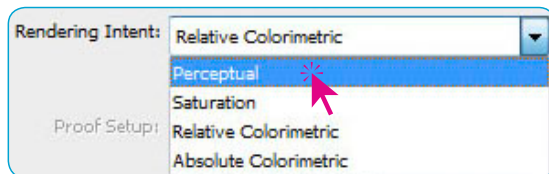
The menu “Colour handling” should be set to “Colour management by Photoshop”.



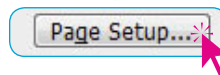
The menu “Printer profile” should be used to select the generated ICC printer profile.



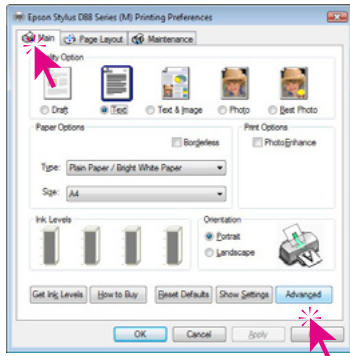
The menu “Rendering intent” is used to set the intent; usually “Perceptual” or “Saturation” should be activated.



The printer driver properties can be viewed and changed by clicking on “Page setup”



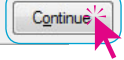
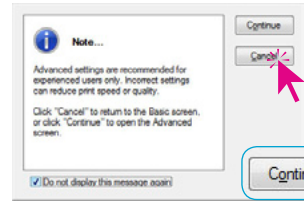
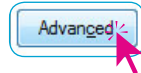
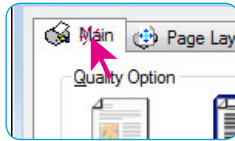
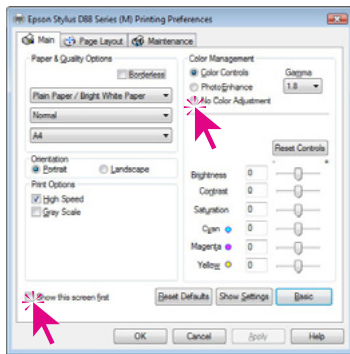
\* This printer has been chosen only for illustrating purposes.



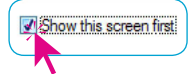
### 3. Printer driver menus (Example\* Epson Stylus D88) Dialogue „... Printing Preferences“

Select the output quality (in this case “Optimal Photo”) from the “Main” palette.

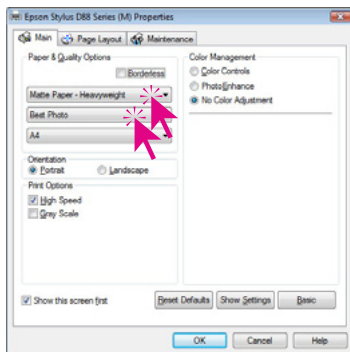
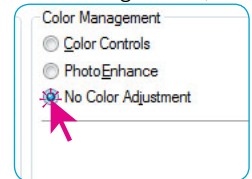
Clicking on “Advanced” will allow additional settings to be entered.



Check the box “Show this screen first” to get to this point directly in future.



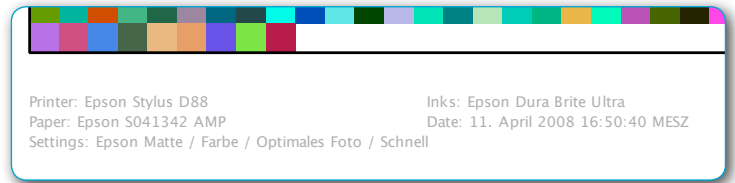
In order to de-activate the printer’s own colour management, select “No Colour Adjustment” in the menu “Colour management”



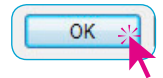
Finally the paper and printer settings must be specified. (under “Paper & quality options”). Once again, make sure that the settings are identical to the settings used when the output target was printed.



The necessary information should already be noted on the output target (ref. [Chapter 1.2](#) and [Chapter 3.2](#)).

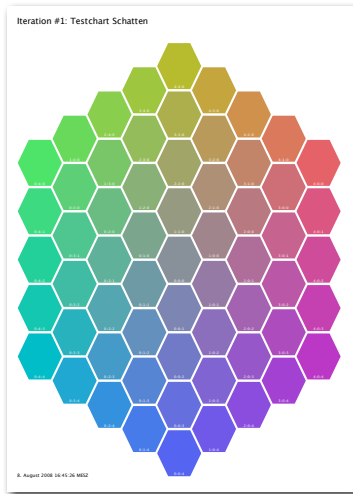


Clicking the “OK” button will launch the printing process.



# Editing a Printer ICC-Profile

## The Profile Editor



A profile editor has been integrated in the latest versions of the SilverFast printer calibration. The Profile Editor is used retrospectively to finely adjust existing printer ICC Profiles to give better neutrality.

### When is the Profile Editor needed?

The Profile Editor is needed when, for example, the profile still produces prints with colour cast and that have to be adjusted to more precise neutrality.

### How does a Profile Editor work?

Based on the printer profile to be corrected, a set of neutral targets for highlights, midtones and shadows is printed.

The dried target prints are assessed visually for colour neutrality. In order to do this, in each of the three prints choose the colour fields which most closely match neutral grey.

The position numbers of these colour fields are then typed into a matrix and a new profile is calculated. Finished.

If a slight colour cast still remains, the procedure should be repeated but this time with colour fields finely graduating among one another in the neutral targets. This process is called "iteration".

In this way, one can approach in a controlled manner, step by step, iteratively, the desired result. In principle, this iteration can be repeated as often as needed, but normally the first step is enough.



### Set of neutral targets

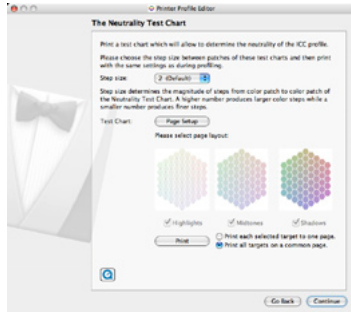
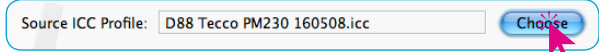
From left to right: highlights, mid-tones, shadows

## Workflow Overview



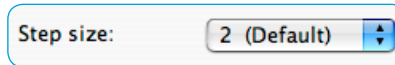
### 1. Choose profile

- Choose the profile to be edited and open in Profile Editor.



### 2. Selection and printing of neutral targets

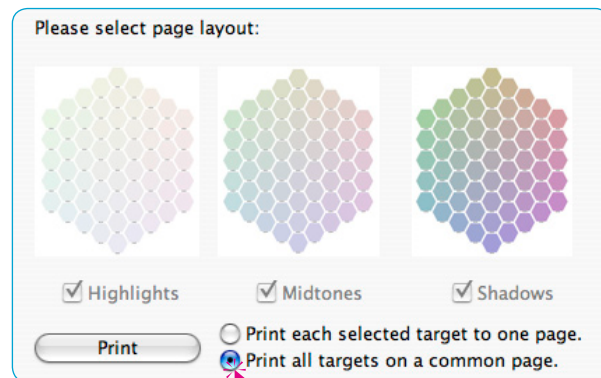
- Setting the colour distance (step size) between the colour fields of the neutral targets. The preset step size “2” is optimal for the first test check.



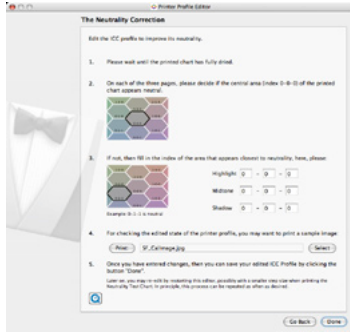
- Choose whether the three neutral targets should be printed on a single page, each on a separate page or if only selected targets should be printed. It is recommended for the first test chart to print all three neutral targets on a single page.



Left: Relationship between all three neutral targets on a single page.  
Right: Selected neutral target (here shadows) on one page.

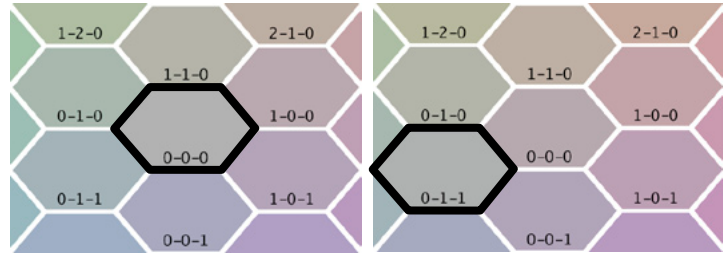


- Print neutral targets



### 3. Determining correction value

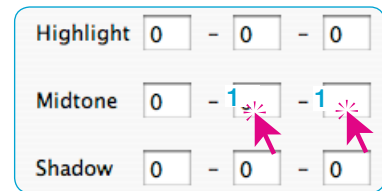
- Ensure the targets are completely dry!
- Now, select the neutral colour field in each of the three targets and type its position number into the matrix.



Example: left-hand image, highlight: The colour field in position “0-0-0” appears neutral compared with the adjacent fields.

Right-hand image, midtone: here, the colour field “0-0-1” is neutral.

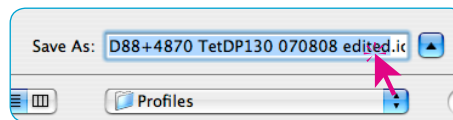
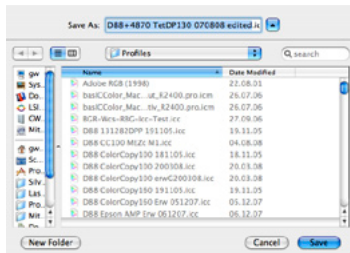
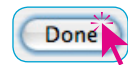
Accordingly, the matrix needs to be changed only for midtone.



### 4. Saving the corrected profile

- These changes can be now saved as a changed profile.

By clicking on “Done”, the relevant Save-dialogue opens.



Enter a meaningful name for the changed profile.

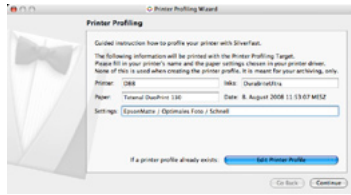
By clicking “Save” the profile is saved.



## Workflow in detail

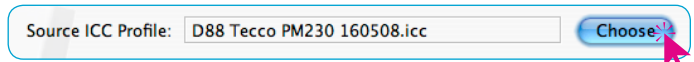
### Step 1: Dialogue „Printer Profiling“

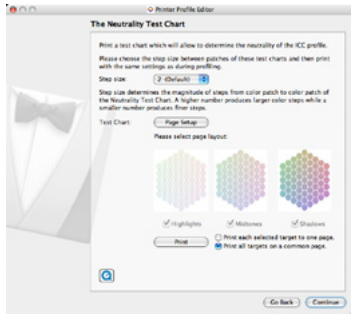
After starting the printer calibration assistant, the button “Edit Printer Profile” will activate the Profile Editor.



### Step 2: Dialogue „The Profile to Edit“

The printer ICC profile to be edited is chosen under “Source ICC-Profile”.

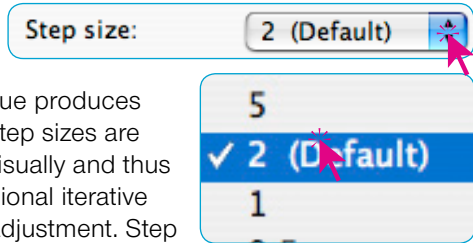




### Step 3: Dialogue „The Neutrality Test Chart“

Here, the parameters and the form of the neutral target are set.

In the pop-up menu the colour distance (step size) can be set between the colour fields of the neutral target. The step size defines the magnitude of the steps between colour fields in the neutral target. A large value produces a coarse colour gradation and a small value produces fine colour steps. Small step sizes are more difficult to assess visually and thus are only needed for additional iterative steps, such as final fine adjustment. Step size “2” is set as the default.

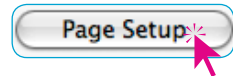


#### Step size

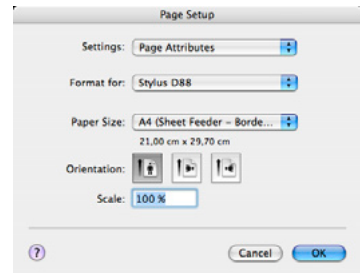
Neutral targets for shadows in step sizes 5-2-1-0.5 (from left to right)



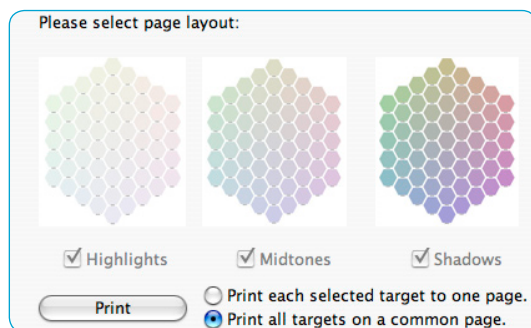
Next, set the printer and pages to be printed. This is done as normal using the “Page Setup” button.



Please make sure that there is enough paper in the printer.



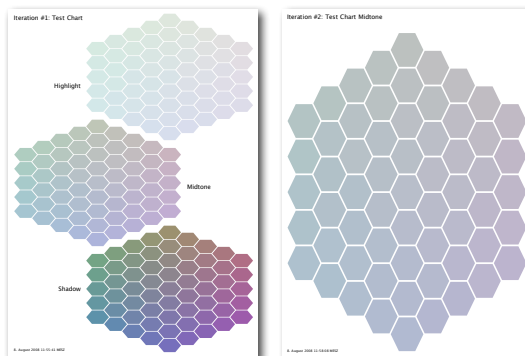




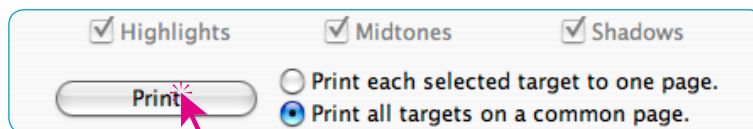
The final step before the starting printing is to set the form of the neutral targets. Either all (or individual) targets are printed each on a separate page, or all three targets are printed together on a single page. Although the latter procedure saves paper, it might be more difficult to assess the individual colour fields because of their reduced size. Recommendation: Print the three targets together on a single page for the first and second iterative steps. Only when precise corrections are required is it necessary to print targets on separate pages.

### Comparison of sizes

Left: Relationship between all three neutral targets on a single page.  
 Right: Selected neutral target (here shadows) on one page.

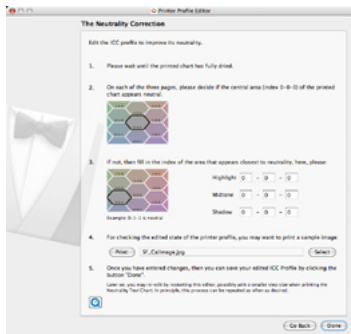


Selecting the required option can be done using check boxes. The combined print on a single page is the default setting.



By clicking “Print” the print driver of the connected printer is opened.

It is absolutely essential to set precisely the same parameters for the print driver as used previously for the printer calibration (see section “[1. Preparation of printer](#)”).

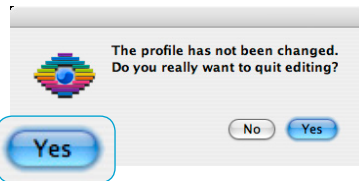


#### Step 4: Dialogue „The Neutrality Correction“

After the neutral target(s) have been printed successfully, they must be allowed to dry completely. Only then should one continue.



Profile Editing in SilverFast can be stopped at any time and continued from the same stage at a later date. This might be the case, for example, for longer drying periods. As long as no changes have been typed into the matrix, clicking on “Done” will activate the termination. By clicking on “Yes” in the subsequent dialogue, profile editing is terminated. If returning later to edit the same profile, one can access the dialogue by clicking on the “Done” buttons, until the matrix dialogue is reached.



Now, the visual assessment can be carried out by identifying the individual colour fields for each target closest to neutral grey. In a perfect profile, the middle field with position number “0-0-0” would represent neutral grey.

If the colour fields closest to neutral grey lie somewhere outside the position “0-0-0”, corrections are necessary.



Now, the position numbers of the colour fields with neutral grey must be read for each target and entered into the matrix for highlights, midtones and shadows accordingly. An example is given on the next page.



**Example**

In the highlight target (left) neutral grey lies in position "1-1-0". The same applies to midtone and shadow targets. The matrix needs to be filled out accordingly:

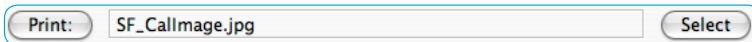
Highlight  -  -

Midtone  -  -

Shadow  -  -

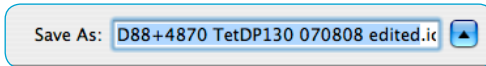
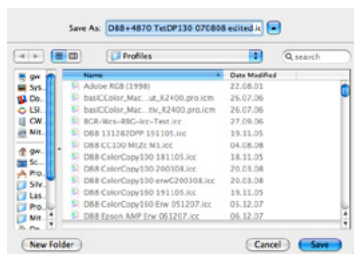


Using the "Print" button, the effect of the selected correction values can be tested directly as a test print, without previously having to save the profile!



If required, "Select" can be used to choose one's own test image (only JPEG files). Here, it is recommended to print a familiar image, for which the previous ICC profiles still show problems.

If the results are satisfactory, a new ICC profile can be calculated and saved. Clicking on "Done" opens the system's Save-dialogue using the path already set to the profile folder. It might be best to save the corrected profile using an appropriately changed file name.



Finished!



En  
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