

Ultra-fast spectrophotometer increases quality and efficiency

# Spectrophotometer Konica Minolta FD-9

**Using individual output profiles for every machine/paper-combination delivers better colour accuracy compared to a simple linearization. Next Generation technology means that you no longer have to trade accuracy for speed.**

Colour accuracy is an essential element of overall print quality, usually the difference between a print and a reference printing condition. The huge range of available media and pressures on short turnaround times mean that achieving colour accuracy is a significant challenge for modern print businesses.

## OFFSET IS OFTEN THE REFERENCE

FOGRA39 and the corresponding ICC-profile "ISO Coated V2" is established as de-facto reference standard in conventional as well as digital printing. To achieve this (or any other printing condition) the customers' data has to be converted to the output profile of the digital press. This output profile characterizes the printing system including all parameters which influence the final colour output. These include solid densities, dot gain ("linearisation"), screening and of course the paper.

In many print shops a so called "standard profile" is installed in the controller ("RIP"). For different papers only the corresponding standard profile for e.g. coated or uncoated is used. Unfortunately suboptimal colour is often the trade off for any time saving achieved.

## "STANDARD PROFILES" LIMIT THE QUALITY

As the print results on different papers even within one paper type can exhibit significant variation, print operators must try to compensate



**The automatic color measuring capability of the FD-9 can significantly reduce the time required for scanning, reduce operator errors and achieve improved accuracy in color measurement.**

for the differences with a "linearisation".

We conducted some experiments to investigate the impact of these factors. The resulting colour quality was evaluated using Fogra Process-Standard Digital Printing – PSD® using the Fogra Mediawedge V3 CMYK as the control wedge. The test compares the results when using standard profiles, standard profiles plus a linearisation and individual output profiles.

An output profile was created for a paper "Coated1" and the colour accuracy achieves PSD quality class A (Print 1).

When this profile was used for a second coated paper (Coated 2) the

print showed very high colour differences when compared to the reference. The print was completely out of tolerance.

Next a "linearisation" was done for this paper (Coated 2) but the output profile used was still based on the paper Coated 1. The colour accuracy improved (print no. 3) and the print fulfilled the criteria for PSD quality class C. However, the colour accuracy was still noticeably worse when compared to print no. 1.

After the creation of an individual output profile for the paper Coated 2 the test print once again achieved PSD quality class A (print no. 4).

Using one standard profile for all coated papers results in big loss of

Druck Nr.	Papier	Linearisierung	Ausgabeprofil	Mittlere Abweichung ΔE00	Maximale Abweichung ΔE00	Qualitätsklasse Fogra PSD®
1	Gestrichen 1	Gestrichen 1	Gestrichen 1	0,4	1,5	A
2	Gestrichen 2	Gestrichen 1	Gestrichen 1	5,1	8,9	außerhalb der Toleranz
3	Gestrichen 2	Gestrichen 2	Gestrichen 1	3,5	5,0	C
4	Gestrichen 2	Gestrichen 2	Gestrichen 2	0,5	1,8	A

**Summary of the print results on different papers.**

colour quality. Whilst linearisation can improve results using standard profiles, the use of a dedicated output profile for each paper gives the security to be able to deliver the desired quality to print buyers.

### INDIVIDUAL PROFILES ENABLE NEUTRAL GREY BALANCE

Linearisation only adjusts the dot gain curves of the CMYK primaries. Thus a simple linearisation fails in achieving the desired quality. The key to achieving accuracy and especially a neutral grey balance is a 4-dimensional adjustment (e.g. by ICC output profile) which also corrects the overprinting.

Advanced users may also attempt to optimize the accuracy using multiple measurements (so-called iterative adjustments). This in turn increases the number of colour patches to be measured compared to a "simple" profiling. Using handheld measurement instruments to manually scan this number of patches is time consuming and prone to errors.

### AUTOMATION AND NETWORK CONNECTIVITY – A NEW DIMENSION OF COLOUR MEASUREMENT

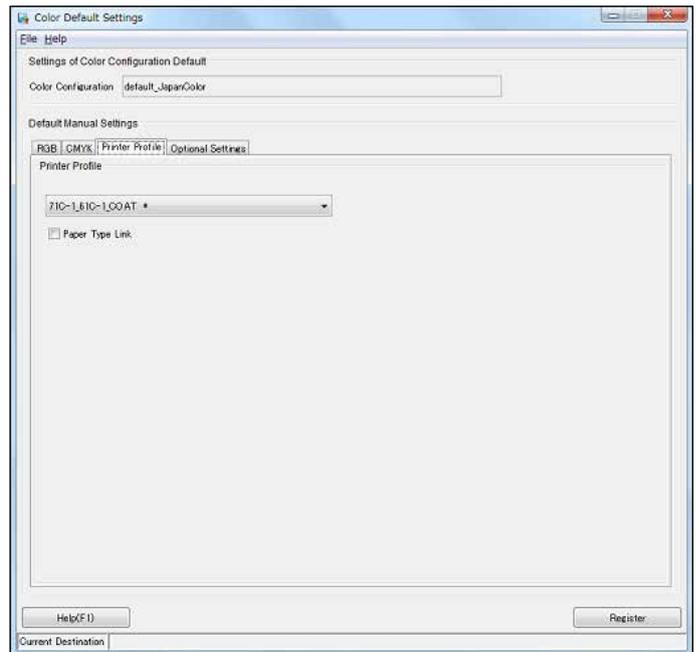
The solution is the use of an automated spectrophotometer that can measure typical profiling charts in minutes.

Konica Minolta recently launched the FD-9, an automated chart reader that measures a chart of 1500 patches in just 4 minutes, roughly twice the speed of conventional chart readers.

Chart readers often struggle when measuring very thin and/or thicker roll media, slowing the process down or compromising accuracy. In many cases a measurement is simply not possible or the chart is destroyed. The FD-9 was designed to measure an expanded range of compatible media, this means it is also a perfect tool for LFP printers.

The FD-9 can also measure typical control wedges (like the Fogra Mediawedge), which enables print shops to utilise the full potential of their presses and proof this to their customers. Charts and control elements do not need special layouts or even cutting from the actual print. The built-in image scanner in the FD-9

**Dialogue to choose an output profile in Konica Minolta IC-602 Controller. Here a standard profile for coated paper is selected.**



analyzes the complete print to detect measurement elements. The process is fully automated, user-friendly and efficient.

The FD-9 can be connected to a network via ethernet enabling multiple machines to benefit with minimal downtime, increasing the efficiency of colour management and control across the entire facility.

An intuitive and user friendly solution, the FD-9 enables print operators to focus on production by automating, simplifying and expediting colour management.

### FULL AUTOMATION

To further extend the utility of this next generation solution Konica Minolta developed the Auto-Sheet-Feeder. Up to 100 sheets can be pre loaded to the FD-9 for automated scanning and processing. This enables even extensive quality control measurements with minimal user input required.

### AN ACCURATE LONG TERM SOLUTION

Service and support for Konica Minolta products is available all around the globe to conduct the recommended annual calibration service and any necessary repairs. Users can also purchase a special set of ceramic tiles to allow them to monitor the absolute accuracy on a regular basis (optional accessory), a feature that is

completely unique for automated chart readers.

The FD-9 is available immediately and compatible with several software solutions.

### TECHNICAL DATA

**Measurement geometry:**  
45°a:0° (annular illumination / perpendicular detection)

**Measurement spot:**  
appr. ø 3 mm

**Smallest patch size:**  
6\*6 mm

**Light source:** LED

**Measurement conditions:**  
M0, M1, M2 according to ISO 13655

**In addition:**  
C, ID50, D65, ID65, F2, F6, F7, F8, F9, F10, F11, F12, User-Illuminant

**Compatible paper formats:**  
width: 45 - 330 mm  
length: 170 - 1500 mm

**Measurement speed:**  
• 500 Felder in appr. 4 minutes  
• 2500 Felder in appr. 7 minutes