

Color Reflection Densitometer for Control of Aluminum Printing Plates

TECHKON APPLICATION NOTE 7

1 Type of device and measurement readings

You can use color reflection densitometers not only for quality assurance on the printing machine but also for readings on printing plates.

Color reflection densitometers are used for measurement of aluminum printing plates because these devices automatically choose the color channel (C, M, Y or B) for measurement which, in terms of inking of the printing plate, will deliver the highest measurement reading and thus the best possible resolution.

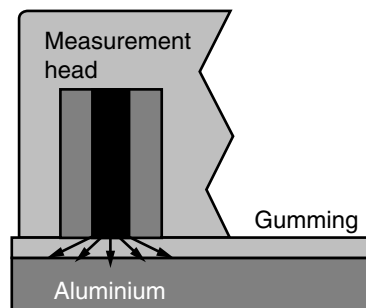
In measuring on aluminum printing plates, only screen percentages are considered. To get correct and repeatable measurement readings, pay attention to a number of special factors described as follows.



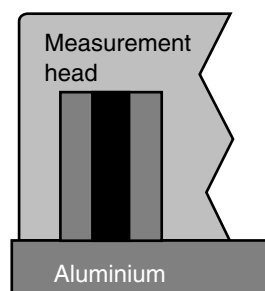
Color reflection densitometer R 410 / R410e

2 Preparing for measurement

- Wash off the protective layer (gumming) before measuring on the printing plate. This protective layer tends to be applied unevenly and, apart from scattering light, thus falsifies measurement readings. Don't wash off the protective layer if measurements are to be made before gumming.

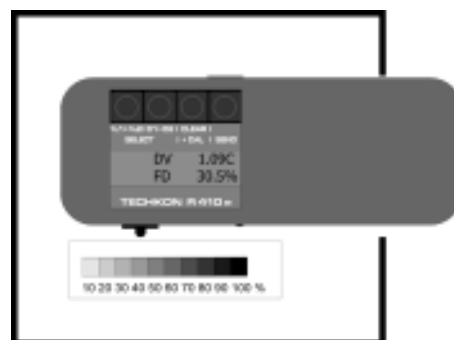


Wrong: Printing plate with gumming / scattered light



Right: Printing plate without gumming

- The printing plate must be absolutely level on an even surface. To prevent the measurement device from wiggling, make sure all four feet rest on the printing plate during measurement. Otherwise you may obtain inexact measurements. If the size of the printing plate does not permit this, you need to compensate height with equally strong material.

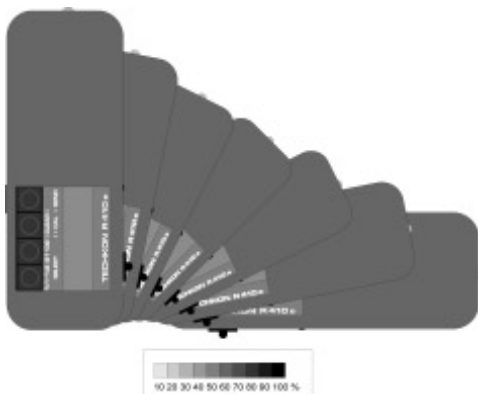


Wrong: Danger of false measurements; the device does not rest fully on the plate

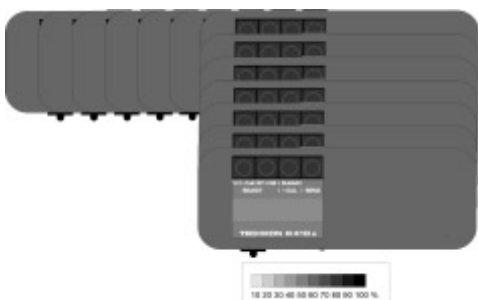


Right: The device does not wiggle

- Don't turn the plate, resp. the device during measurements. Always work in the same direction of movement during measurements. Otherwise the roller direction of the aluminum and the plate's crystalline surface structure could adulterate measurement readings.



Wrong: Don't turn the device



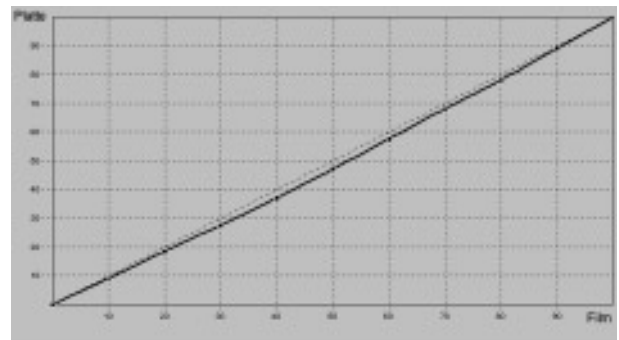
Right: Always work at the same angle to the edge of the plate

3 Application areas

There are two basic applications when measuring on the printing plate. The most common is conventional plate exposure, i.e. copying the film onto the

plate via an exposer. The second method, which is growing in popularity, is direct exposure of the printing plate (Computer-to-Plate) in a specially designed exposer.

With the traditional method, the printing plate is measured to check whether the set exposure time was selected properly. In this case the user checks known standard values and uses the readings to record a characteristic copy line. In practice, e.g., this results in a reading of app. 36-37 % for the 40 % screen patch on a positive plate. The reading confirms so-called copy losses when the film was copied onto the plate. Caused by the copy light emitting excess radiation onto the film's screen dots, these losses compensate for dot gain in print.



Characteristic line for a conventionally exposed positive printing plate

Just as in film exposure, direct exposure of printing plates requires linearization of the exposer. In this case only the inked, geometric dot size is evaluated, not the optical share of dot area as in measurement on paper. The geometric share of dot area is calculated with the Yule-Nielsen formula. The optical share of dot area is compensated with the so-called n-factor.

Barring certain limitations, this calculation permits evaluation of screen percentages on a plate according to the geometric size of dots. To apply the Yule-Nielsen formula, the previously mentioned n-factor needs to be set, resp. calculated for the measurement device.

For exact information, refer to TECHKON Application Note 4 „Measurement of Trapping“.

Although linearization using the Yule-Nielsen formula generally works, in practice correcting the exposur on the basis of print output (characteristic printing line) achieves better results since this method considers other parameters which affect the printing process.

We therefore recommend exposing and arranging control elements (step wedges in grades of 10% ; 100, 90, 80, ..., 20, 10%) onto the printing plate and printing machine. Using the densitometer, then obtain the screen percentages. By comparing this information to standard values (see *TECHKON Application Note 5 „Dot Spread, Dot Gain and Contrast in Color Printing“*), you can easily correct exposure settings. The program TECHKON QS Pro automatically makes corrective calculations for exposure settings.

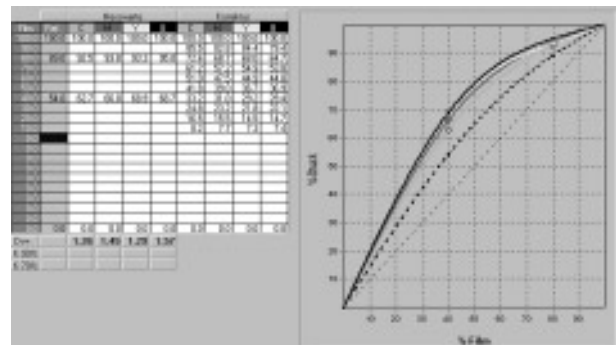


100 % 90 % 80 % 70 % 60 % 50 % 40 % 30 % etc.

Step wedge for recording characteristic printing lines

The printing plate which has been exposed with the corrected settings now serves as a reference. The screen percentages for the control patches measured on the plate are recorded and checked for conformity for future exposures.

If you change the plate type, you may need to re-check and adjust the exposure settings. You also should check the stability of the exposur from time to time.



Automatic corrective calculations with the TECHKON QS Pro program

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