

Computer-to-Plate with Polyester Printing Plates Exposure • Measurements • Printing

TECHKON APPLICATION NOTE 6

1 Plate Structure and Exposure

Polyester plates have like films a light-sensitive silver halide coating and can be exposed in image-setters. The advantage of polyester plates over films is that the plate can be created directly from the computer (Computer-to-Plate or CtP) which eliminates the intermediate film and the conventional plate copy.

Thus, polyester plates fit very well to the sphere of repro and DTP. But they demand a different setting of the imagesetter and another chemistry for processing.

These factors mean that polyester plates cannot be simply substituted for films and a permanent changing between films and polyester plates in one and the same imagesetter is not advisable.

Polyester plates are suitable where both the print run is short and the format is small. Fine screens can also be printed. With larger formats, the dimensional stability of the plates is somewhat limited, and could prove inadequate.

The appearance of polyester plates is similar to that of negative films. The light areas carry ink and print.

- The unexposed areas are light and print.
- The exposed areas appear dark and do not print.

In this respect, polyester plates differ from aluminium plates, both positives and negatives, where it is the dark areas which print.

2 The Importance of Measurements

The correct exposure of polyester plates is important in two respects:

- The exposure intensity must be adequate to achieve a good reproduction in the shadow tones

without a loss of detail in the light tones. Therefore the actual exposure intensity is to be determined by dots in the shadow and in the light.

- In order to achieve a print quality equivalent to that yielded by aluminium plates, the imagesetter may need to be linearised, its gradation may need to be adjusted. For this work, measurements with a reflection densitometer are required. These can be taken either on the polyester printing plate or on prints.

3 Measuring on Polyester Plates

For accurate results, the following requirements must be observed:

- reflection measurements shall be made with a densitometer without polarisation filters.
- a black-and-white densitometer is adequate as polyester plates are always gray, unlike aluminium plates which come in various colors.
- it must be possible to measure dot spread using either the Murray-Davies formula or the Yule-Nielsen formula.
- it must be possible to measure negative dot spread values.
- for simple operations, it should be possible to store the measured solid density once, and then measure the dot patches.

All these requirements are met by the TECHKON black-and-white densitometer RT 120. This model indicates in its R%NEG mode not only dot percentage values but also the density values, thus enabling the density differences between fully exposed and non-exposed areas to be determined. These values are required for both the correct calibration of the imagesetter and for the appropriate processing of the polyester plate.



The procedure for taking measurements is as follows:

- the RT 120 is calibrated to zero on the light unexposed area (R%NEG = 100 %).
- the solid density of the full exposed area, (R%NEG = 0 %) is measured, and the value is, if necessary, stored.
- the negative dot percentage values (R%NEG) of the patches of the step wedge or of the EPS control strip TECHKON TCS Digital are measured.

4 Why No Polarisation Filters for Polyester Plates

The polarisation filters in TECHKON R 410/e and SD 620 color reflection densitometers are always used for measurements on printed sheets, and are advantageous when measuring aluminium printing plates. They are, however, unsuitable when working with polyester plates.

The reason for this is that the silver-colored areas of polyester plates do not depolarise light unlike to prints and aluminium printing plates. The light reflected from the polyester plate during the zero-calibration of the densitometer remains polarised and cannot pass through the second polarised filter in front of the photodiodes. The result is that a densitometer with polarisation filters registers only a small difference in brightness between the light areas and the shadow tones of a polyester plate, thus resulting a low value for the density difference.

Do not use polarisation filters for polyester plates !

More information on this topic is given in TECHKON Application Note 1, entitled „The Use of Polarisation Filters“.

5 Adjustment of the Imagesetter and Measuring with Yule-Nielsen

Two processes can be used for correcting the imagesetter:

- dot measurements on the printing plate
- evaluation of the printing curve of the print

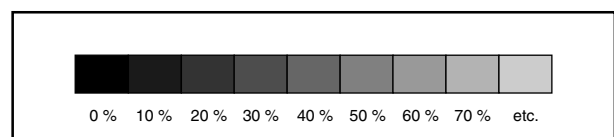
5.1 Measurement on the printing plate

On the contrary to printed sheets, it is important for polyester plates to measure the geometric dot spread, as only these areas take ink and transfer it to the printed sheet. The imagesetter is adjusted using the values of the geometric dot spread. Measurements are best taken on step wedges with 10 % or 5 % steps, which have been exposed onto the polyester plate. To obtain the geometric dot spread, the reading of the densitometer must be corrected using the appropriate Yule-Nielsen factor.

TECHKON Application Note 3, entitled „Dot Spread according to Yule-Nielsen“, contains details of this process.

Measurements on plates and adjustment of the imagesetter are made in the following steps:

1. A step wedge is exposed onto the polyester plate.



2. The density is measured on the dark 0 % patch with the RT 120. The instrument has been calibrated before on the light 100 % patch. The density

value should correspond to the instructions of the plate manufacturer or to a value based on experience e.g. $D = 0.70$. An important factor for this is that shadow and highlight dots remain visible on the plate.

The measured density and the reproduction of the fine dot structure enables the setting of the optimal intensity of the imagesetter.

3. With the RT 120 in R%-mode the positive dot percentage in the 50 % patch is measured. A deviation of 50 % in the display of the RT 120 is corrected in the instrument with the Yule-Nielsen factor. The setting of the Yule-Nielsen factor is described in the operator's manual of the RT 120.

4. The RT 120, now adjusted for Yule-Nielsen, is used in R%NEG-mode to measure all the patches in the step wedge on the polyester plate. Deviations from the nominal values of the patch should be used to correct the imagesetter.

5.2 Evaluation of the Printing Curve

This approach for correcting the imagesetter offers two advantages.

The printing curve of polyester plates is brought into line with that of aluminium plates.

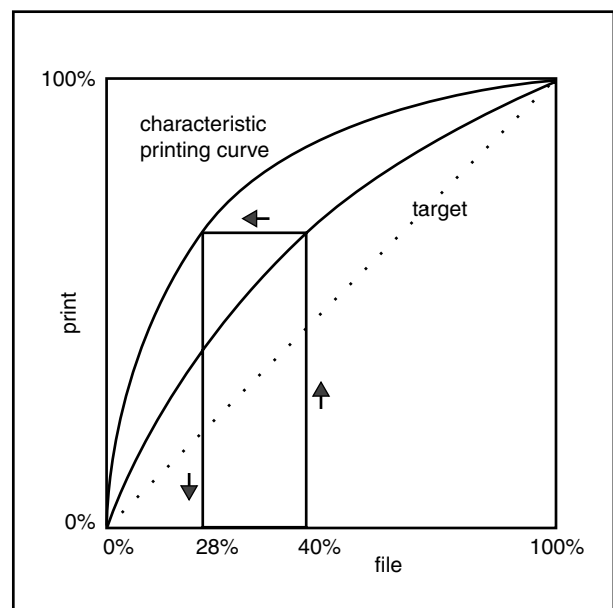
There is no need to take measurements on the polyester plates themselves and to use the Yule-Nielsen factor.

The measurements on the printed sheets are done with the TECHKON color reflection densitometer R 410, R 410e or SD 620 and the evaluation for the correction of the exposure values is done with the PC software TECHKON QS Pro.



The procedure is as follows:

1. A step wedge is exposed onto a polyester plate and printed.
2. All patches on the printed wedge are measured with the R 410, R 410e or SD 620 and transferred to the QS Pro software.
3. QS Pro compares the printing curve of the polyester plate with the target curve of an aluminium plate measured before.
4. QS Pro computes the corrected dot percentages for each patch of the wedge. The graph illustrates the way in which this is done using as example the value 40 % in the file of the plate setter. This must be corrected to 28 %.



Using this procedure, QS Pro produces a new gradation profile for the imagesetter. If it is set to correspond to this new curve, the imagesetter will image polyester plates which give the same results as aluminium plates.

The method just described is not only easy to carry out, but also particularly effective in practice, because it involves the finished printed sheet.

6 Tools for Checking Polyester Plates

- For measurements directly on polyester plates TECHKON offers the black/white reflection densitometer RT 120 with Yule-Nielsen formula.
- For checks on printed sheets TECHKON supplies EPS print control strips TCS Digital, which are designed to be exposed directly onto the polyester plate.
- For measuring the printing curve TECHKON offers the color reflection densitometers R 410, R 410e and SD 620 and the quality assurance program QS Pro for the evaluation and correction of the imagesetter gradation.

These products provide the complete means for quality control when using polyester printing plates.

All rights reserved.
Informations are subject to change without notice.

TECHKON®

TECHKON GmbH

Wiesbadener Str. 27 • D-61462 Königstein/Germany
Phone ++49 (0)6174-92 44 50 • Fax ++49 (0)6174-92 44 99
E-mail: info@techkon.com • <http://www.techkon.com>