

Density of Normal Inking in Offset Printing

TECHKON APPLICATION NOTE 2

1 Introduction

Normal inking is defined in DIN 16527 Part 3 as follows:

Normal inking is that inking in screen printing which gives the highest possible relative color saturation (for chromatic colors) or relative grayness (for achromatic colors) in the solids together with the best differentiation of the shadow tones in relation to the solid tone (maximum relative printing contrast).

Normal inking is a basic requirement for achieving high printing quality. The ink feeding of the printing units must be adjusted to the normal inking by means of the inking keys. The necessary setting will vary from job to job. Printing areas with strong inking need more ink in order to reach and maintain normal inking than areas with low inking.

The ink feeding is controlled in the solid patches of the print control strips by means of a color reflection densitometer. It is recommended that, for each color separately, all solid patches over the full width of the printed sheet have approximately the same density.

2 Determination of Normal Inking

2.1 Using color matching scales and target specimens

Appropriate color matching scales for process inks are available from Fogra and BVD. The color matching scales contain several grades of paper covering classes 1, 2 and 3.

Using color matching scales, target specimens are printed on the grade of paper and using the ink that will be used later for the production print. By means of both visual comparison and densitometer measurements, the specimen print is brought into line with the color matching scales. A visual check is

necessary because measurements from a densitometer can, due to differences in color tone between the process inks of different manufacturers, yield an incorrect result. The size of the printed target should be sufficiently large to enable a good visual check to be made; for this purpose the solid patches of print control strips are too small.

Once satisfactory, the density value of the target specimen forms the basis for the later production print. The production print is checked using a densitometer on the solid patches of the print control strips.

2.2 Using the printing contrast

This process is described both in DIN 16527 Part 3 and in literature. In a test print the ink feeding is increased gradually until the solid patch is well saturated and the highest possible contrast between the 80 % screen patch and the solid patch is achieved.

Solid density, screen density and the printing contrast are measured with a color reflection densitometer.

By means of this process, the density of normal inking can be determined for various printing carriers. In the subsequent production printing, this density of normal inking must be achieved and maintained in all solid patches of the print control strips.

Extract from DIN 16527 Part 3:

The recommended setting of normal inking for best results on a printing press provides information on the optimal saturation with maximum relative print contrast for a particular combination of ink, printing carrier, print form and printing conditions. When using European process inks, the saturation so indicated must be adjusted to the correct value for the paper being used.

3 Guidelines for Solid Density

The following guidelines apply to the use of densitometers fitted with polarization filters and having the spectral characteristics status E.

Paper class	C	Solid Density		
		M	Y	K
1	1.60	1.55	1.50	1.90
2	1.55	1.50	1.40	1.80
3	1.00-1.40	1.00-1.40	0.90-1.25	1.20-1.60

Specification of the Paper Classes

Paper class 1	all gloss-coated and half matt-coated papers with basis weights of 70 g/m ² or more*
Paper class 2	all coated papers below 70 g/m ² *
Paper class 3	all uncoated papers, including supercalendered and pigmented papers

* Matt-coated papers with basis weights of 70 g/m² or more are ranked as class 1 or class 2 depending on the printing process

For papers of classes 1 and 2, density tolerances of ± 0.10 (for chromatic colors) and ± 0.15 (for black) are commonly used. The solid density of uncoated papers is much dependent on the quality of the paper.

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