

# Blanket Pressure Standardization Process for Sheet-Fed Offset Printing Presses

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## Abstract:

Blanket cylinder plays a crucial role in deciding print quality in sheet-fed offset printing presses. The pressure of the blanket needs to be standardized in the offset process otherwise it may cause dot gain, uneven print or other print problems. This paper throws light on the process adopted for blanket pressure standardization in sheet-fed offset printing presses to control the dot gain (Tonal Value Increase).

**Keywords:** Blanket, Pressure Standardization, Sheet-fed offset, Compressibility

## Introduction:

Blanket cylinder is an important part of offset lithography printing process which is used to transfer the ink from plate cylinder to the printing substrate. Blanket cylinder is a movable part of the sheetfed offset printing machine that can be brought in and out of contact with the plate cylinder and impression cylinder. The pressure of the of the blanket cylinder plays an important role to the quality of the final print in sheet fed offset printing press. So, the proper pressure between cylinder is an important adjustment. The pressure depends upon various things like gap between the cylinders, speed of the machine as well as the quality of the outer surface of the blanket cylinder.

## Research Objectives:

Objective of this research paper is to control the dot gain with reference to blanket cylinder squeeze and finding most suitable blanket type for modern sheet fed offset printing presses.

## Research Methodology:

The press room was standardized with standard temperature (22<sup>0</sup> C) and relative humidity 65%. Further the following things were standardized in sequential order:

- Pre-Press Dot Gain Standardization
- Dampening Standardization

- Packing Standardization
- Blanket pressure Standardization
- Plate Mounting Standardization
- Make Ready Operations

Further printing work with standard master having 0-100% tint patches was carried out by printing hundred sheets by placing three brands of blankets namely Phonix, Saphira, Navrania randomly. The printed sheets were analyzed using Techkon Densitometer to evaluate whether the dot gain is within tolerance limit or not.

#### Data Collection and analysis:

With the reference tint patches the dot gain (Corrected) for above mentioned three types of blankets are shown in the tables below.

**Table.1. Dot gain in case of Saphira blanket**

| Reference | C      | M      | Y      | K      |
|-----------|--------|--------|--------|--------|
| 100.0%    | 100.0% | 100.0% | 100.0% | 100.0% |
| 95.0%     | 96.1%  | 95.9%  | 96.0%  | 96.4%  |
| 90.0%     | 88.3%  | 90.7%  | 90.0%  | 90.3%  |
| 80.0%     | 76.5%  | 80.6%  | 80.0%  | 78.3%  |
| 70.0%     | 66.3%  | 69.2%  | 68.2%  | 65.3%  |
| 60.0%     | 57.2%  | 60.6%  | 58.6%  | 54.5%  |
| 50.0%     | 48.4%  | 51.6%  | 50.1%  | 45.5%  |
| 40.0%     | 40.4%  | 42.0%  | 41.0%  | 36.3%  |
| 30.0%     | 31.1%  | 32.6%  | 30.2%  | 26.9%  |
| 20.0%     | 19.4%  | 22.8%  | 18.2%  | 17.3%  |
| 10.0%     | 10.3%  | 13.1%  | 8.4%   | 8.0%   |
| 5.0%      | 5.4%   | 7.5%   | 4.1%   | 3.9%   |
| 0.0%      | 0.0%   | 0.0%   | 0.0%   | 0.0%   |

**Table.2. Dot gain in case of Phonix Blanket**

| Reference | C      | M      | Y     | K      |
|-----------|--------|--------|-------|--------|
| 100.0%    | 100.0% | 100.0% | 99.7% | 100.0% |
| 95.0%     | 92.9%  | 95.0%  | 90.8% | 94.0%  |
| 90.0%     | 85.6%  | 89.3%  | 85.9% | 86.5%  |
| 80.0%     | 71.8%  | 76.8%  | 73.6% | 72.0%  |
| 70.0%     | 63.3%  | 68.4%  | 66.5% | 62.1%  |
| 60.0%     | 54.0%  | 59.1%  | 57.8% | 52.1%  |
| 50.0%     | 45.2%  | 50.3%  | 47.2% | 42.8%  |
| 40.0%     | 37.3%  | 41.0%  | 39.1% | 32.7%  |
| 30.0%     | 27.1%  | 30.6%  | 30.7% | 23.2%  |
| 20.0%     | 16.6%  | 19.9%  | 19.3% | 15.1%  |
| 10.0%     | 8.7%   | 10.1%  | 8.1%  | 7.7%   |
| 5.0%      | 4.5%   | 5.1%   | 3.9%  | 3.9%   |
| 0.0%      | 0.0%   | 0.0%   | 0.0%  | 0.0%   |

**Table.3. Dot gain in case of Navrania Blanket**

| Reference | C      | M      | Y      | K      |
|-----------|--------|--------|--------|--------|
| 100.0%    | 100.0% | 100.0% | 100.0% | 100.0% |
| 95.0%     | 92.5%  | 93.6%  | 90.6%  | 95.0%  |
| 90.0%     | 85.2%  | 87.7%  | 83.2%  | 88.0%  |
| 80.0%     | 71.7%  | 73.9%  | 70.9%  | 73.1%  |
| 70.0%     | 60.5%  | 64.4%  | 61.9%  | 61.4%  |
| 60.0%     | 51.7%  | 56.2%  | 52.3%  | 50.6%  |
| 50.0%     | 43.8%  | 45.2%  | 43.4%  | 41.7%  |
| 40.0%     | 35.1%  | 37.2%  | 35.1%  | 33.5%  |
| 30.0%     | 25.9%  | 29.2%  | 25.5%  | 24.3%  |
| 20.0%     | 16.1%  | 19.9%  | 16.0%  | 15.2%  |
| 10.0%     | 7.2%   | 10.1%  | 7.9%   | 7.3%   |
| 5.0%      | 3.5%   | 5.1%   | 3.9%   | 3.6%   |
| 0.0%      | 0.0%   | 0.0%   | 0.0%   | 0.0%   |

**Result and Discussion:**

- **Dot gain analysis for different blanket types:**

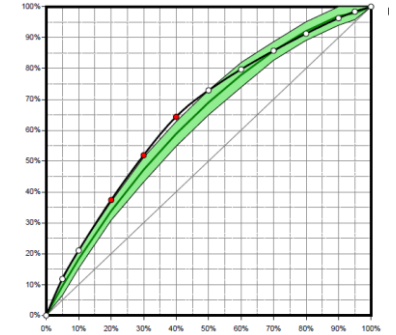
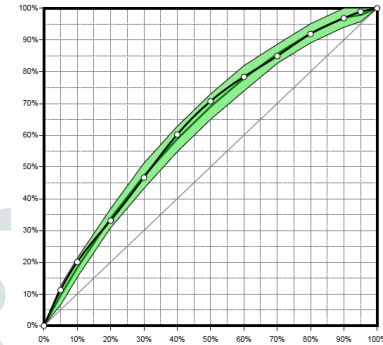
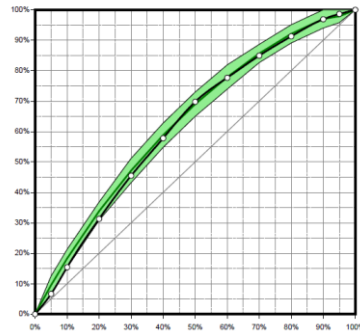
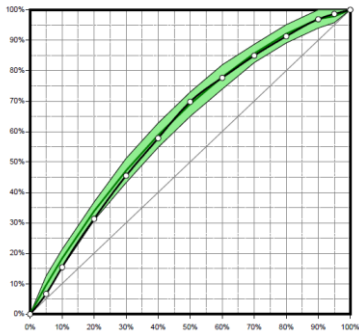
In the case of Saphira Blanket dot gain is found a bit less on middle tone to shadow areas. On the other hands on the highlight areas dot gain was a bit more. On an average, the dot gain for CMY&K the dot gain was within tolerance limit in case of Saphira blanket [Table 1, Appendix 1]

In the case of Phonix blanket and Navrania Blanket the dot loss found up to 10% specially on middle tone areas. On highlight to shadow areas the dot gain was out of tolerance limit. [Table 2-3, Appendix 1]

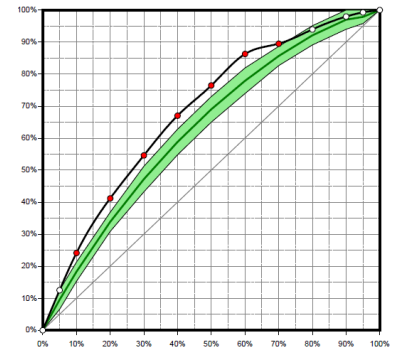
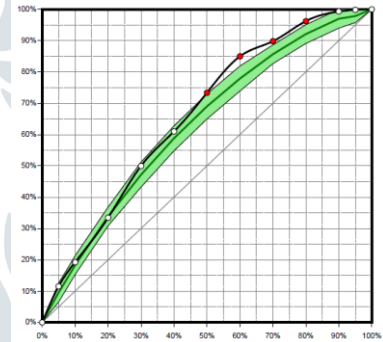
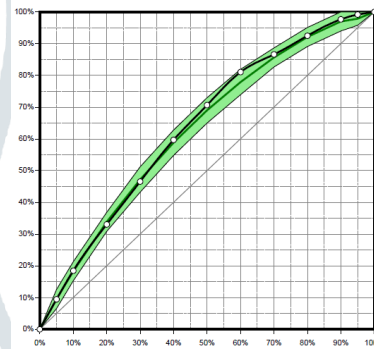
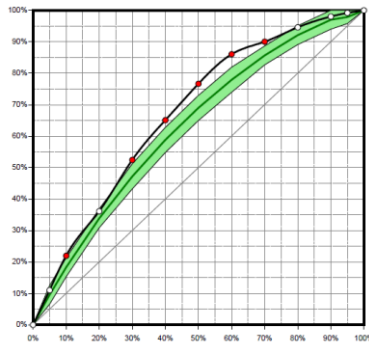
From table 1-3 it is quite evident that dot gain is within tolerance limit only in the case of Saphira Blanket. So, it is resulted that compressibility characteristics of Saphira blanket are most suitable for sheet fed offset printing presses.



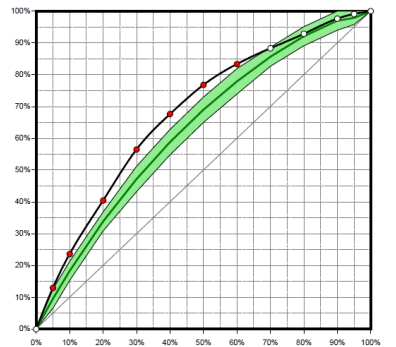
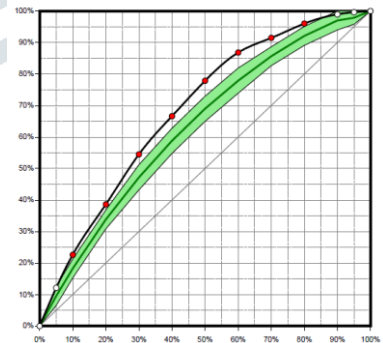
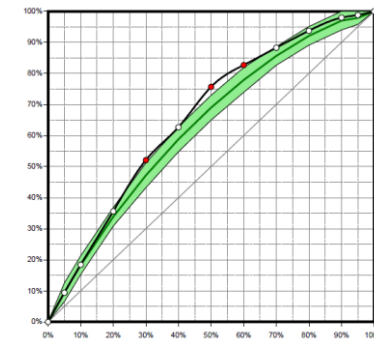
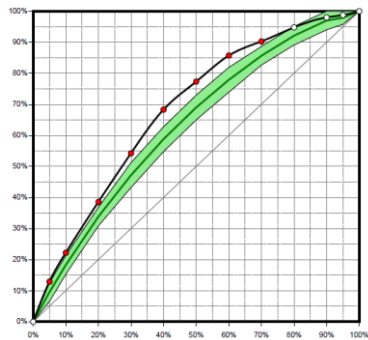
Saphira Blanket



Phonix Blanket



Navrania Blanket



C

M

Y

K