DOT GAIN AND INK FILM THICKNESS

INK TRANSFER TECHNOLOGY
DOT GAIN AND INK FILM THICKNESS

Innovating print performance since 1972.
**THE ISSUES RELATED TO APPLYING UNCONTROLLED INK**

In the world of Flexography printing, customers are demanding higher profiled printing while utilizing (4) color process, (7) color HD or expanded color gamut and line work bringing breathtaking life to many packages.

Whether it’s the most complicated process printing job or the simplest line work, controlling the Ink Film Thickness is very critical when it comes to providing a highly repeatable print job.

As a customer, separator or printer, do you find yourself at the supermarket picking up packages and easily identifying dirty print or dot gain issues that are commonly known issues which most printers struggle with?

**DOT GAIN** is a phenomenon that causes printed material to look darker than what’s intended. This happens because the diameter of the halftone dots increases in size during the printing process.

Between the plate properties and Ink Film Thickness, you start to see a tonal shift in the highlights first causing the dots to get fuzzy and appear much bigger.

These issues contribute to many losses for converters such as customer rejections, short stops for cleaning plates, press downtime for remounting plates, wasted time, motion and materials that all impact the bottom line. So, now that you can relate to these challenges it’s important to ask the question....why?

**Your problem could be due to Dot Gain or variation within the Ink Film Thickness**

Once this phenomenon occurs, it’s more critical than ever to control the amount of ink transfer from anilox to plate and plate to substrate to prevent off color material and customer rejections that lead to high dollar claims.
The doctor blade tip must be matched to the specific anilox line screen in order to maintain the correct ink film thickness.

As a general rule, the smaller the tip thickness (contact area), the cleaner the wipe (less ink film thickness).

As you can see below, the blade tip thickness gets smaller as the anilox line screen gets higher.

If a large tip (say 200 microns) is used on a line screen of 1000, the contact area of the 200 micron tip will be too large; therefore allowing the actual wiping pressure of the tip to be spread out over a broader area.

This results in less actual wiping force and allows a thicker film of ink to transfer to the plate. As a direct result, this thicker film floods the plate dots and other print areas making the overall appearance to look dirty.

### ANILOX LINE SCREEN

<table>
<thead>
<tr>
<th>Blade Tip Thickness</th>
<th>400 ls</th>
<th>600 ls</th>
<th>800 ls</th>
<th>1000 ls</th>
<th>1200 ls</th>
</tr>
</thead>
<tbody>
<tr>
<td>.075 Microns</td>
<td></td>
<td></td>
<td></td>
<td>✔️</td>
<td></td>
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<tr>
<td>.095 Microns</td>
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<td>.125 Microns</td>
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</tbody>
</table>

Ink and the anilox must work together as a team to transfer the correct amount of ink to the plate.
On a CI press, the doctor blade chambers can be controlled by either manual or pneumatic adjustments to increase or decrease blade pressure depending on the circumstance.

Too much pressure on the doctor blade tip causes more contact area on the anilox roll, allowing more ink to transfer onto the plate or screened areas making it difficult to control the optimal ink film thickness.

Often when a new set of doctor blades are installed, the printer forgets or doesn’t understand the importance to back the chamber out to the home position. If he does not do this, it causes the blade to start in a stressed/over-pressured position which results in a larger contact and consequently a poor wipe – on a new set of blades. This can also lead to premature doctor blade wear, anilox wear, ink contamination and anilox scoring.

While much of the above can certainly contribute to too much blade pressure, other factors that need to be considered are uncalibrated chambers, worn or broken adjustments and lack of doctor blade training.

The top picture is showing blade wear from too much pressure compared to the bottom picture which shows correct pressure on the blade.
It is commonly known that anilox cell volume drives the color achieved and a different cell size will change the physical ink film thickness transferred to either darken or lighten the color. So, if the ratio of your plate to anilox LPI aren’t taken into careful consideration (i.e. anilox/plate 6:1), the anilox cell could be too deep for the dot size and an excessive amount of ink transfers to the plate causing dot bridging and visual dirty print.

Today many companies are spending high dollars on state-of-the-art printing presses, anilox rolls, plate material and inks, often not taking into consideration how much of an impact the doctor blade has and the game changer it provides to improve quality, service and costs. Why trip over dollars to pick up nickels when it comes to smart investments that more than pay for themselves when it comes to high dollars print quality rejections, loss of productivity stopping to clean plates, wasted material going over impressions and stopping to change inexpensive doctor blades. Much like ink and anilox technology, doctor blade tips are used to provide the cleanest wipe on the metering roll and provide the thinnest ink film thickness to match the signed off predicted proof when the press is set up to those standard conditions every time.

Ask yourself if you are doing the following tasks to providing press side repeatability day after day:

► Fingerprinting your press twice a year
► Anilox auditing and cleaning schedule
► Operator training
► Calibrating press chambers and impression rolls
► PM and auditing viscosity controllers

If so, using the correct doctor blade and tip configuration is another piece to the puzzle. Precise tips require precise settings. Our goal as a blade supplier is to help you achieve ALL that is required – which includes training, set up assistance, tracking assistance and the right blade choice for the process. Without completing that circle, the optimum results cannot be achieved.
Thin doctor blade tips are necessary to achieve the cleanest wipe on high line anilox rollers. To insure this thin tip gets the longest life possible, a protective coating is often used to insure its durability.

With higher speed presses utilizing quick changeovers, the mileage on a doctor blade is more than two to three times greater than with older, slower presses during that same time frame.

As the doctor blade tips wears, consistency is critical in maintaining the same ink film thickness throughout the blade life. It’s a fine line between getting the blade life, achieving the optimum cleanest wipe without wearing out the anilox. That’s where our new blade technology comes in.

You asked and we listened! Our concept for the new GAMUTSTAR was designed by all the feedback received from our customers and their challenges. The blade design and multilayered coating allows optimal conditions for ink metering and blade longevity lasting a week plus.

While every printer’s worst nightmare is replacing score lines in their anilox’s, the outer layer on the GAMUTSTAR is coated with our “soft” – “lower friction” material that has been used for many years eradicating anilox score lines.

So, despite the challenges and imperfections of high line anilox engravings, the GAMUTSTAR will provide those results that both the printer and customer is thriving to achieve.

With over 40 years of superior expertise in the printing industry, Daetwyler continues to make innovative doctor blades that customers require for exceptional print performance.
ADVANTAGES

» Extended blade life due to durable base coating

» Extremely High service life for long runs and multiple jobs

» Ideal for Expanded Gamut Printing

» Very gentle on anilox thanks to additional soft coating

» Cleanest possible wipe over the entire blade life means no changes in tonal values

APPLICATION

Flexo Printing

AVAILABLE CONFIGURATIONS

Lamella

Flexolife

CONFIGURATION

WIDTHS

1.00” – 1.563”

THICKNESSES

0.006” (0.150mm)

0.008” (0.200mm)

0.01” (0.250mm)
Brian Wolf is Daetwyler’s Regional Technical Manager for the Upper Midwest Region. Prior to working with Daetwyler, Brian worked for Bemis for 24 years, holding positions as Press Operator and Ink Blender. He also held management positions in the pressroom and was Process Lead being certified in Lean Six Sigma and WCOM – World Class Operations Manufacturing.

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