

Published by
 GRAPHIC ARTS TECHNICAL FOUNDATION
 4615 Forbes Avenue, Pittsburgh, Pa. 15213
 ©Graphic Arts Technical Foundation, Inc., 1965
 Number 69, November, 1965
 Printed in U.S.A.
 Edited by ROBERT F. REED

THE GATF DOT GAIN SCALE

To fill this need, GATF has developed a dot gain scale that can be stripped into negative or positive flats and printed along with the work on the press sheets. It shows at a glance any dot gain or loss, whether this occurs in the contact printing of negatives or positives, in platemaking, in proofing, or in printing.

The principle on which the GATF Dot Gain Scale works is that fine screen tints are much more sensitive to dot gain than are coarse screens. They show a given dot gain as a greater percentage increase in density than does a coarse screen tint. And the finer the screen, the more sensitive it is to dot gain. This is why very fine screen work is so much more difficult to keep open on the press than coarse screen work.

The Baker Signal strip is based on this principle. It provides guide sections that indicate dot loss, gain and slur. But the indications are qualitative and give no actual measure of degree of these conditions.⁶

The GATF Dot Gain Scale is so designed that it gives numerical values to any sharpening or dot gain that may be taking place. It is made up of ten steps of 200-line screen tints which are graduated in density from step to step. These steps are in the form of numbers from 0 to 9 on a background of a 65-line tint of uniform strength. Their density gradation is such that, in original negative or positive of the scale, Step 2 has the same density as the background and is therefore invisible to the naked eye at ordinary reading distances.

When reproduced along with halftone copy in any stage of the reproduction process, some of the numbers will appear darker than the background, and some lighter. And since their density differences are not great, there will usually be one number about as dense as the background. This number therefore will be invisible to the naked eye, and will indicate the relative amount of dot gain or loss that has taken place. Sometimes, however, there may be no invisible number. One number may be slightly darker than the background and the next number slightly lighter. In such cases it can be assumed that the invisible number is halfway between.

THE GATF SLUR GAUGE

Dot gain can be caused by simple enlargement of dots due to improper contact printing of negatives or positives, improper exposure or development in platemaking, or improper printing conditions such as excessive cylinder pressures, soft inks, or running too much ink on the press. Such enlargement is in all directions. However, what seems to be dot gain may either be dot slur or doubling, which is directional. It is therefore important to distinguish between ordinary dot gain and slur, since these may result from different causes and require different remedies. Since the dot gain scale reacts to slur the same way it reacts to ordinary dot gain, GATF designed the Slur Gauge which is shown greatly enlarged in Figure 3.

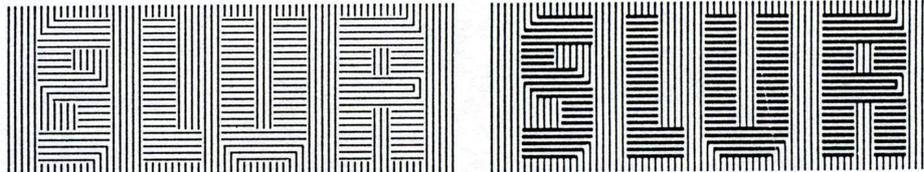


Figure 3. Enlarged Slur Gauge.

The horizontal line tint forms the word "SLUR." The vertical line tint forms the background. Since these tints have the same value, the word "SLUR" is invisible when all lines are printed with equal thickness. But if slur occurs, the horizontal or vertical lines thicken, and the word "SLUR" shows up darker or lighter than the background.

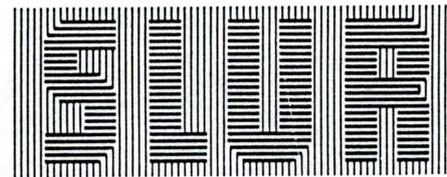
Dot doubling, due to double impressions on the press sheet, can also cause the word "SLUR" to appear. Dot doubling can be distinguished from slur by examining the image with a magnifier and looking for double dots. However, it is simpler to add a GATF Star Target alongside the Dot Gain Scale. The Star Target will readily distinguish between doubling and slurring without the need for a magnifier. Doubling will cause a large figure "8" to appear in the center of the star,⁷ while slurring will appear as an oval with the elongation at right angles to the direction of travel.



Figure 2. GATF Dot Gain Scales showing increasing amounts of dot gain.

To provide the greatest help to the off-set printer in diagnosing and remedying dot gain, GATF has combined its Dot Gain Scale and Slur Gauge in a single strip approximately 1/4 x 2 inches. This is small enough so that it can generally be stripped into negative or positive flats and printed along with the work on press sheets.

Sometimes even this small space is not available on the press sheets. In such cases the image of the Dot Gain Scale can be trimmed by opaquing or staging. The trimmed Dot Gain Scale shown in Figure 4 measures only 1 1/16 x 1/8 inch. It is not as easy to evaluate as the full-sized Dot Gain Scale, but it contains the same information; and with some practice the trimmed figures can be easily located.



Both negative and positive forms of the scale are provided. Figure 5 shows how the printed image of the new Dot Gain Scale shows dot gain and enables the pressman to detect it and to distinguish at a glance between ordinary dot gain and slur.



Figure 4. Dot Gain Scale reduced in size to fit small space on sheet.

HOW TO USE DOT GAIN SCALES

In Contact Printing Originally, the GATF Dot Gain Scale was intended to be basically a press guide to help the pressman control the halftone dots on the press. Very soon it was discovered that the scale also shows dot area changes in contact printing and platemaking. Some shops which tested the scale reported that for them the most important use of the Dot Gain Scale is in control of contact printing.

Figure 5. Printed images of the Dot Gain Scale showing the different effects of ordinary dot gain and slur. Actual size. The top scale is sharp, second scale shows dot gain without slur, and bottom scale shows dot gain caused by slur.