How is Distortion Compensation Calculated?

The first step is to calculate the distortion compensation that is necessary to ensure that the final image is printed without being stretched vertically or horizontally. It is important that distortion calculations are precise, because even a small error can create problems in the final printed image. In most cases, flexographers prefer that graphic designers not compensate for distortion in their artwork files. Instead, the distortion compensation is typically performed by the flexographer onsite, at the printing or tradeshop facility.

Most flexographers use a standard formula to determine distortion compensation percentages. This formula can be expressed as follows:

$$\text{Distortion Compensation \%} = \frac{K \times 100\%}{R}$$

where K = Constant, and R = Repeat Length

Determining the "K" Factor (Constant)

The distortion produced relative to the plate thickness is known as the "K" factor (K). It is possible to calculate the constant K factor using the following formula:

$K = 2\pi t$

where p = 3.142, and t = plate thickness (including polyester adhesive)

Example 1: Plate Thickness is 0.067", Polyester Adhesive (stickyback) is 0.005"

K= 2π (plate thickness + thickness of the polyester adhesive)

= 2 x 3.142 x (0.067" + 0.005")

= 2 x 3.142 x 0.072

= 0.452

Determining the Repeat Length (R)

The repeat length (R) is normally specified with the print job, however if repeat length is not known, it can be determined by measuring a printed sheet. (See Figure 53 for an illustration of Repeat Length.) If this is not possible, then it can be calculated by adding the radius of the printing cylinder, the thickness of the polyester adhesive, and the plate thickness, then inserting the results into the following equation:

$R = 2\pi x$

where π = 3.142, and x = (cylinder radius + adhesive + plate thickness)

Example 2 : Plate mounted on a 8" diameter cylinder (radius of 4"),

Polyester adhesive is 0.005", Plate Thickness is 0.067"

R= 2π(cylinder radius + adhesive + plate thickness)

= 2 x 3.142 x (4 + 0.005 + 0.067)

= 2 x 3.142 x 4.072

= 25.59"

Completing the Calculation

With the K and R values known, the distortion compensation percentage can be calculated using the original formula.

Distortion Compensation %= K/R x 100%

= 0.452/25.59 x 100%

= 0.0177 x 100%

= 1.77%

The entire calculation can be mathematically simplified to:

Distortion Compensation % = t / x X 100

Once the distortion compensation percentage is calculated, it subtracted from the original size (100%) to determine the actual output percentage.

= 100% - 1.77%

= 98.23% (Scale source image to this value). This final output value is entered in the **Scale** box of the output process plan.

How is Distortion Compensation Applied?

Once determined, distortion can be applied in Prinergy or Prinergy Evo using one of the methods described previously in this chapter. With correct compensation applied, layouts will print with their intended final dimensions.

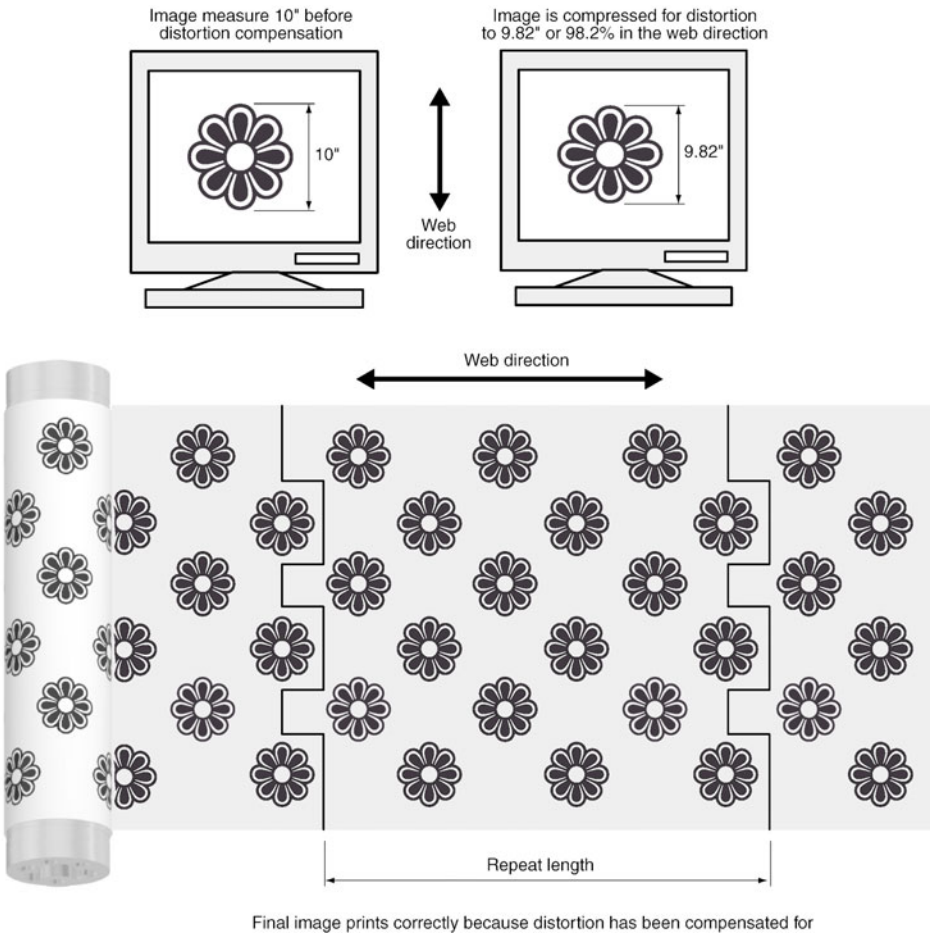

Figure 60: Applying Distortion Compensation