How Close to the Frame Can We Burn an Image?

We shoot ourselves in the foot because we are often forced to burn images just inches (a few centimeters) away from the inside edge of the frame. Other than replacing the frames with larger ones, what is else can we do? What is regarded as the safe distance an image could be burnt from the edge if there is one?

Answer: This particular question is frequently asked when I visit companies. At first, there is no one answer that takes care of the issue, per se, because it depends almost entirely on what type of tolerance and repeatable accuracy is sought, including the level of finish quality.
Primarily, from my experience, there are usually three reasons why screen makers expose images too close to the edge:

A. The frame is clearly undersized for the job at hand.
B. Too many images are ganged up to maximize impressions for a given sheet size.
C. The screen maker burns several single images on the same screen — one for each color for the same job or for entirely different jobs.

Scenario A speaks for itself. If the job undertaken is that demanding for its size, perhaps it is worth investing in a set of larger frames for that type of work. Every inch or centimeter increase in frame size is very much in favor of the printer.

In promoting better quality, there is no substitute for moving up to a larger frame size, except possibly reducing the amount of multiple images printed on the same sheet, as with Scenario B. The simple solution here is to reduce the quantity of multiples down to a number more controllable and manageable in production for the results required. The more crucial the job becomes — the fewer multiples (or total image area) can be printed successfully without hassle. Burning several smaller images on the same screen, as in Scenario C, tends to make sense with respect to housekeeping, but it could cost the company dearly in the long run. Besides other considerations, what happens if the screen pops? All images for that job or other jobs will be swiftly lost in a flash.

The problem observed when employing the practice of burning multiple images on the same screen is with an operation using 4-post sliding-table presses. As most images are positioned in one corner (taking advantage of the built-in side- and rear-edge guides for automatic take-off positioning), the second image is usually burnt in the diagonal corner ready for the next color. (Press operators simply rotate the screen 180°.) If the nature of work is that critical, simply position the image further away from the edge (towards the center of the table) and as necessary, use temporary, taped-down edge guides. Place only one image on a screen at a time or, at the very least, reduce the quantity applied but keep them away from the edges. The further the image is away from the edge — the easier it is to obtain superb results with less hassle.

Every press manufacturer has a printed format available illustrating the ideal substrate/image placement distance from the frame in relationship to the built-in registration guides in the table and take-off system. Many operators choose to ignore this format, but to do so is at their own peril! The image placement format is designed so that an image can be placed furthest away from the frame edge as possible (give or take a little) yet still able to print the maximum size sheet for the press (assuming maximum designated frame size is used).

Finally, printers specializing in complex and challenging jobs, particularly those that require extreme close-tolerance or three-dimensional demands (such as precise uniform coatings, clear tinting, phosphorus or conductivity criteria) might do well to consider using an in-house "image-to-frame" ratio matrix developed for this purpose. The ratio states the maximum suggested recommended size, as a percentage figure, that an image can safely be printed according to the total useable fabric area —taken as the square of the frame's inside dimension:

- For quality graphics, the total image area should not exceed 40 percent.
- For high-quality graphics and close tolerance, total image area should not exceed 30 percent.
- For printed circuits and other high-end electronic applications, total image area should not exceed 25 percent; nearer to 20 percent can make a dramatic difference.

Keep in mind that the above percentages are based on the image being placed in the center of the screen, and as proven by trial and error, end print results could improve further if the stated ratios were reduced. Many operations employing good quality techniques can increase or vary these percentages according to the type of work printed, thereby developing their own internal ratio matrix. The one given above is intended as a guide; there are so many influential variables involved in the process that no one formula can be everything to all printers for every job. Adapting and closely following a set of guidelines, such as the ratio matrix or something that approximates it, will foster greater hassle-free quality, because it will widen the envelope of opportunity in production achievements.

As images come in all shapes and sizes, common sense must prevail. A high-quality graphic image of only 20 percent in overall size, relative to the frame's useable fabric area, may sound great at first but it could spell danger if it were placed just 76.2 mm (3 inches) away from the frame. If a positive number is required for a safe distance to keep the image away from the edge—some practitioners state 152.4 mm (6 inches) while others say as much as 203.2 mm (8 inches).

-- The Print Guru, Mike Young, August 2004