

COVERS
PHOTOSHOP
3.0

027

Photoshop Techniques

How to

PREPARE A PHOTO FOR THE PRINTED PAGE.

You've created a beautiful photo on the screen in Photoshop. You proudly place the file in your final page layout and send it off to be printed in your brochure. But when it comes back, your beautiful images are dark and muddy. What happened?

What happened is the printing process.

Ultimately, the art of producing a good halftone does not end until you have ink on the printed page. It doesn't matter how good a photo looks on your screen—if you can't get it to print right, what's the point?

Printing technology is currently going through a revolution. But for all the changes, the basics have not changed much in the last hundred years. This issue will walk you through the basic concepts you need to understand to get your creations successfully onto the final paper.

This issue is a companion piece for issue #025 "How to produce quick, clean desktop halftones." This issue provides background information for the step-by-step techniques covered there.





Example: 85 lpi; 45° Angle

Issue #1: Halftone Line Screen

A printing press does not print gray tones—just solid dots of ink.

Look closely at the photos in this newsletter. You will see that they are made up of row after row of tiny black dots. A photo reproduced in this fashion is called a *halftone*.

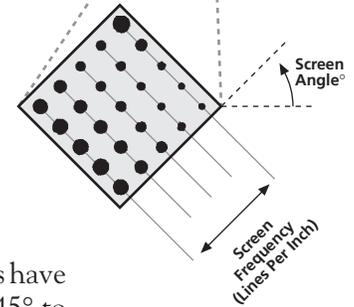
Examine the diagram at the right. You will notice that though the size of individual halftone dots vary, they are lined up in even rows.

Lines per inch (lpi): This is the measurement used to describe the coarseness of a halftone. It refers to the number of rows of halftone dots in each inch. (*This newsletter is printed at 85 lpi*)

Screen Angle: This is the angle that the rows of dots have been rotated. Halftone screens are usually rotated 45° to avoid visual patterning. (*Screen angle will not effect your work in Photoshop*)



(Magnified 5X)



Issue #2: Final Photo Resolution

Quality Factor Examples:



File size of a 4x5 grayscale photo.

Quality Factor	Quality: 2	565k
Equation	(85x2=170)	
Final Resolution	170 pixels per inch	

Resolution is a balance of quality and file size: Too low a resolution will result in a poor-quality image; Too high a resolution creates larger files than necessary and needlessly increases your processing time.

The most common approach to determining a target resolution is to multiply your printed line screen by a quality factor between 1 and 2.

$$\text{Lines Per Inch} \times \text{Quality Factor} = \text{Final Photo Resolution}$$

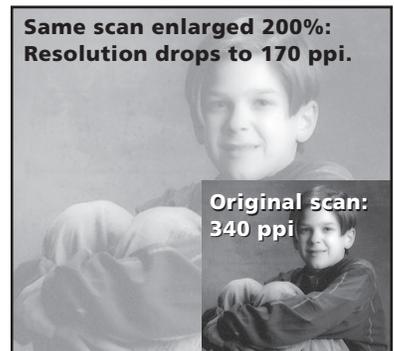
Use this equation to determine the target resolution of your final photo. At left is a chart showing four quality factors for a 85 lpi halftone.

Scanning Resolution:

Keep in mind that we are talking about your photo's *final resolution*. If you plan to resize your image, you need to take this into consideration when you scan.

Many scanners let you enter an enlargement factor in addition to the final resolution. If yours does not, multiply the final resolution by the percent you plan to enlarge the photo.

Note: Refer to the *Preflight Checklist* in issue #025.



Issue #3: Dot Gain



Simulated dot gain.



Highlights & Shadows

The fine details in extreme highlights and shadows shown here can be easily lost due to dot gain on the press.

When a printing press transfers ink to the final printed page, the ink will tend to spread. Likewise tiny specks of ink may not adhere completely to the paper. What this means to your photos is that the halftone dots will tend to spread or shrink when they are printed. This process is referred to as *dot gain*.

The results of dot gain are dark, unattractive images. Shadow areas tend to clog up, while subtle detail in the highlights can be blown away. We've broken the symptoms of dot gain into two parts that we will deal with separately.

Dot Gain Symptom #1: Highlight & Shadow Dots.

The most significant problem caused by dot gain is a loss of detail in the extreme highlights and shadows.

Focus on the lightest and darkest areas of the photo on left. Notice that the detail in these areas are carried by subtle differences in the dot sizes. It would not take much spreading or shrinking to completely lose the detail in these areas.

You can protect detail in these areas by adjusting your photo so that the darkest and lightest parts are within the range your press can comfortably reproduce. At the bottom of the page is a chart suggesting minimum and maximum tints to use for different type of printing.

Dot Gain Symptom #2: Gain in the Midtones.

Once you have adjusted your highlights and shadows, most of the critical work is done. Dot gain in the midtones will effect the overall tone of your halftone, but you do not risk losing as much detail.

As you gain experience creating halftones from your computer, you will get a feel for how your photos on the screen relate to the printed page. Generally photos will look darker when printed, so correct for that by making them slightly lighter on the screen.

Minimum and Maximum Tints:

Always talk to your press representative about what settings they would prefer. They will know more about their particular equipment than anyone else.

† *Photoshop in Black and White*, Jim Rich and Sandy Bozek

* Photocopiers are highly variable. Experiment.

** Because output from a laser printer is first generation, there is little if any problem with dot gain.

*** Docutech is a direct-from-disk, high speed copier. Output is first generation so no dot gain. (This newsletter is printed on a Docutech at 85 lpi)

Press	Paper	Line Screen	Min. Tint %	Max. Tint %
Offset Sheetfed [†]	Newsprint	85-120	3-5	85-90
	Uncoated	100-150	3-7	90-95
	Coated	133-200+	3-7	90-98
Offset Web [†]	Newsprint	65-100	1-3	75-90
	Uncoated	100-133	3-7	85-95
	Coated	133-200+	3-7	90-98
Quick-Print Shop	Uncoated	50-75	3-7	75-90
	Coated	80-133	3-7	90-98
Photocopier*	Standard Bond	50-60	5-10	75-90
	Laser paper	60-90	3-7	75-90
Laser Printer**	Standard Bond	50-60	2-5	97-98
	Laser paper	60-90	0-3	97-100
Xerox Docutech***	Standard Bond	85-106	0-2	98-100
	Laser paper	85-106	0-2	98-100

Issue #4: Output

When you print, the photo you see on your computer must be converted to halftone dots. This conversion is handled automatically by the Postscript printer. However, there are a few things you should take into consideration.

Laser printer or High-Resolution Imagesetter?

For most commercial printing, you will want to take your final page layout files to a *service bureau* to be output on a high-resolution imagesetter. Many printing companies now offer imagesetting output in addition to their other services.

For low-end print jobs that use a line screen below 65 lpi, you can get away with output from a desktop laser printer to create the final halftone.

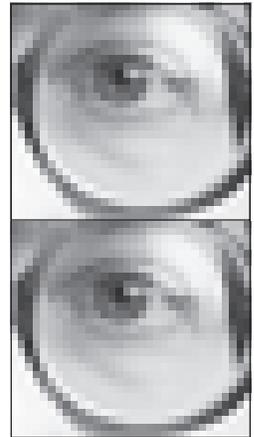
Paper or Film?

Your service bureau can output your images on either film or typesetting paper. You will get better quality from film output. Ask your press representative what they would prefer.

Direct from disk options...

Always ask if you can provide your press disks. Many devices on the market today allow you to print directly from your electronic files.

(This is printed on a Xerox Docutech, a direct-from-disk, high speed copier)



From pixels to dots...



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