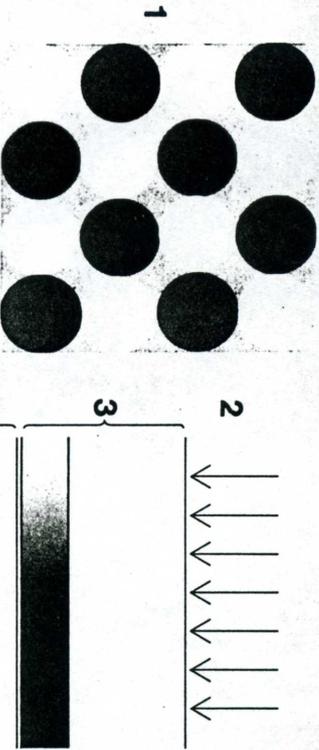


THE HALFTONE DOT

Some colour scanners now use laser light and electronic dot generation (the two do not necessarily go together) to expose the output separations. Others, however, do not, and rely on contact screens to create the halftone image.

The halftone screen, viewed in cross section, has a continuously varying density pattern as shown in the diagram. In use the contact screen is placed in contact with the film emulsion during exposure. A continuous tone image projected through the contact screen (which is effectively what happens on the scanner) is broken up into dots because a very high contrast film is used. A high contrast film is one which essentially records either black or white with no intermediate tones. The result is dots of varying size. It is important to appreciate, however, that these dots do have a low density fringe around the edge and are known as soft dots. Separations with soft dots should not really be used for platemaking since small changes in exposure will cause the effective size of the dot to alter. You should always try and use hard dot separations made either by using electronic dot generation scanners or by duplicating soft dot positives onto another film.



Build-up of the halftone dot with the aid of a contact screen

1. Detail of a contact screen (available as a grey or magenta contact screen)
2. Exposure light
3. Continuous tone negative
4. Section of contact screen
5. Section of photographic film
6. Film dots seen from above

The contact screen is, during exposure, in direct contact with the light sensitive material, emulsion to emulsion.

In a scanner, each point in the original is illuminated by a fine point of white light and the reflected or transmitted light is measured through red, green, and blue filters. The resulting electronic signals are organised by the scanner's computer to control another light source that exposes the colour separations – four films, one each for yellow, magenta, cyan and black. On these films the tones in the original are represented by solid dots of different sizes. These dots are either created electronically by the scanner or a contact screen is used.

FACTORS AFFECTING A HALFTONE DOT

The main characteristics of a dot such as its shape and size are determined by the tonal value required and picture detail present at that point and the type of halftone screen being used. Some of the factors that then influence the reproduction of the dot are:

- How well the separations have been made, and in particular, whether they have hard or soft dots
- The plate characteristics
- The plate exposure conditions – accuracy and evenness of exposure, good contact, cleanliness
- Plate development conditions
- Press settings such as ink/water balance and impression pressure
- General press condition – inking rollers, blanket, condition of gears and bearings
- Substrate characteristics, particularly smoothness

During the subsequent processes of reproduction these dots change in size (resulting in a net increase), and the chief aim of this kit is to show how, by controlling this dot gain, we can control the quality of the final product.

Controlling dots

What is the significance of all this? The significance is that scanners are programmable. That means that the size of the dots can be controlled precisely. So if we know what we want, the scanner operator can produce it for us. For example, if we know that a 50% dot on the film positive grows to 69% when printed, this provides a basis for programming the scanner. In such a case, if we actually require a 69% dot in the final print then we should produce a 50% dot on the film positive.