

The half-tone letterpress was widely used in commercial publication in the first half of the 20th century until it was replaced by offset lithography. The process of printing using a half-tone letterpress involves progressively printing colored dots to form an optical illusion. Using cyan, yellow, magenta, and a key tone, also known as CYMK, the colors are printed overtop one another. Using theories of subtractive color allows the optical illusion to simulate a full spectrum of color. The half-tone adds additional depth across the printed sheet. In order to create a fully-formed image, the colors, ink density, and paper alignment must all work together to form that cohesive final image.

The process starts with etched copper plates that provide a relief of the desired image. One plate is made for each of the four colors in CYMK, cyan, yellow, magenta, and key. While the “key” in CYMK is often black, it can be a variety of colors depending on need. However, in the modern age, desktop publishing applications typically expect K to always be black. These copper plates are etched with tiny dots measured in lines per inch or LPI. The higher the LPI, the higher the sharpness and detail visible in the final product.

To begin printing, one copper plate is placed and aligned in the letterpress, using an adhesive to ensure it is secure for printing. Next, the ink train and rollers need to be attached, aligned, and calibrated. Ink is applied to the inkwell and the rollers transfer the ink across various rollers helping to heat the pigment and distribute it evenly. Experts can judge the volume of ink needed based on the sound as the rollers run and apply the ink. Additionally, the pressure of the press needs to be adjusted to get a full, exacting image. Doing a quick print on a spot sheet allows the printer to have a guide for positioning the paper stock when the final printing begins.

Next, the paper feed board and delivery area need to be prepared. Coated paper stocks are ideal for halftone printing, to allow for a crisp dot gain and a sharp image. Using more typical uncoated cotton stock results in much more ink spreading and loses definition and quality. Various tools for alignment are adjusted to ensure the letterpress mechanisms can run the paper stock through the press accurately and consistently. Several test sheets are made to allow for adjustments before proceeding. A printer might adjust ink levels and distribution on the rollers, or alignment of the copper plate or paper feeding mechanisms. Once all adjustments are made, the printer can proceed with the stock and run through the

remaining sheets of the color and plate being printed. Once the run has been successful, the letterpress needs to be cleaned and prepared for the next color.

The process is then repeated for the remaining colors. Alignment becomes even more critical for each future plate because even a small amount of misalignment can cause the image to appear blurry. Small marks outside the dimensions of the final image are used to help ensure this alignment is as desired. When printing each pass, small lines in both vertical and horizontal directions help to make adjustments until they are perfectly aligned. The combination of cyan, yellow, and magenta produce a result that has colors, tones, shadows, and highlights. Adding the key color allows for more depth and contrast, but black can be easily overpowering, so ink volume and printing should be handled with care. The prints would then be trimmed to their final size, as well as to remove any extraneous marks from printing, such as those printing marks that help with alignment.

Together four colors, printed in dots create an amazing-colored image that deceive the eye into seeing a full spectrum of color in a robust and clean image. Cyan, yellow, magenta, and black dots work together to create layers of depth in a cohesive final image. The artistry of the half-tone letterpress comes in many layers, from understanding subtractive color theory, to the meticulous alignment required to produce the optical illusion. The machinery used in printing must be exacting and precise in order to deliver ideal results, but it's more than just the letterpress itself. Knowing what paper to use and how to adjust the ink and its distribution within the machine are all important to producing that perfect final image.