

PRINTING TODAY

KNOWING THE PRESS:

QUICK FACTS

Web presses are fed from rolls of paper as opposed to cut sheets. They are fast and tend to be best used for longer runs and/or short turnaround times. The best webs offer quality color reproduction comparable to sheetfed presses.

Color capabilities: Six to eight colors one or both sides of the sheet, depending on the press. Because signatures are cut from a continuous roll after printing, multiple passes and additional colors are not possible. Colors tend to be intense, with high ink gloss compared with sheetfed presses.

Typical run lengths: Webs are generally most economical in runs of 20,000 or more. Runs of 100,000 to a million or more impressions are common on full webs.

Speed: Very fast. The best web presses can print 40,000 of finished sheets per hour with no compromise in color reproduction.

Special attributes: Web presses can be equipped with inline folding and binding capabilities, saving time and cost of a separate binding operation.

Size: A six-color, full web press can be 160 feet or more in length and weigh about 100 tons.

Web Offset Printing: the Press and How it Works

Offset Printing is a fixed-image plate technology in which the image is transferred, or offset, to a printing blanket which accepts the image and transfers it to the printing substrate. Offset currently accounts for most of the commercial printing in the U.S.

Roll fed

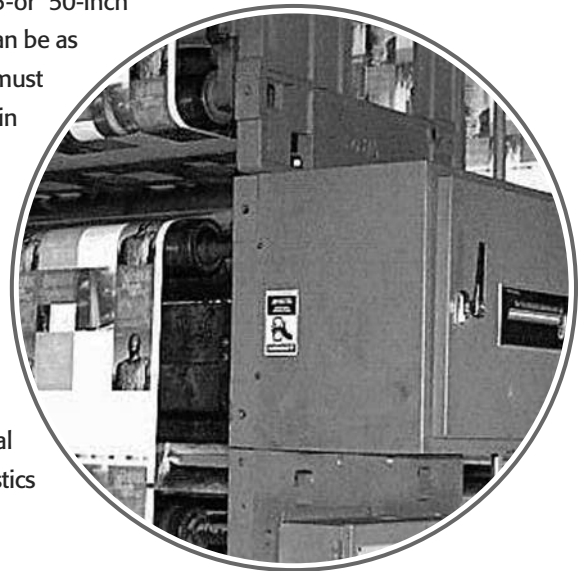
Web offset refers to the way the printing substrate is presented to the printing blanket. The substrate, most often paper, is fed into the press in a continuous ribbon from a roll. The web of paper is usually forty inches in diameter in the U.S., although faster presses handle 45-or 50-inch diameter rolls. The basis weight of paper can be as low as 20 lbs. or up to 170 lbs. The press must be able to accommodate these changes in caliper or thickness of the paper.

Heatset ink

Web offset is further characterized by inks that are set and dried in an oven at elevated temperatures. This is a continuous process that utilizes both evaporation and absorption as the physical phenomena responsible for the characteristics of the final product.

Offset ink process

Another unique feature of offset printing is the plates that are used to accept the ink and transfer it to a blanket. The plates are planer, which means that the image and non-image areas are on the same plane. The image area is oleophilic, or ink-loving, and the non-image area is hydrophilic, or waterloving. Ink and fountain solutions contact the plate and are attracted to either the image or the non-image area. This results in a duplication of the image on the plate, which is then transferred to a rubber blanket. There are several manufacturers of these plates who are making three kinds of plates. Although these are differentiated by composition and imaging technologies, they all result in a plate that selectively accepts ink and water. Ink and water are immiscible fluids, and so are oil and vinegar in salad dressings. They will emulsify under the right conditions, a process that is critical to offset printing. The image is transferred from the image area of the plate to a rubber blanket in a nip. Blankets are either compressible or hard. They are packed with thin sheets of paper to allow "squeeze" in the nips, which favors effective transfer of the ink dots from the plate to the paper.



Multiple processes

There are three process color inks: cyan, magenta, and yellow. Black is also a standard color. Most web presses have four separate printing units, one for each process color. Special color effects are achieved through the use of special inks, which closely match color hues created by Pantone and others. All inks consist of pigments, resins, and vehicles or solvents. The solvents are petroleum distillates that flash off in the oven at high temperatures. The paper web is often heated to over 300 degrees in this process.

After drying in the oven, the web is passed over chill rolls which set the tender ink film. Silicone is then applied to prevent marking of the ink on paper prior to folding the web and chopping it into signatures.

Additional in-line treatments include UV or aqueous coating, varnishing, perforating, and scoring before folding. Web presses vary in width and "cut-off" size or diameter of the printing cylinders. Narrow web presses or miniwebs run from 12 to 23 inches in width. Full-width presses handle webs up to 38 inches wide and some new presses are 55 inches wide. Web presses used to print books are wider – up to 60 inches. Presses run at different speeds. Some of the newest web presses will run up to 3,000 feet per minute with no loss of quality to the printed image.

