

Engraving vs. Printing

Since the beginning of history, there have been many materials and methods used for recording ideas. Chiseled stones, cuneiform clay tablets, and Egyptian papyrus scrolls are some early examples. Now in the twenty-first century, a personal computer with an inkjet printer can produce high-quality text and graphics. Vibrant ink colors are available, as well as many choices of paper.

A basic printing process consists of applying black ink to white paper, producing a high-contrast, readable result. The ink color or the paper color may be changed, as long as the choices produce a good contrast. For example, yellow text on white paper is difficult to read. Black text on purple paper is also challenging. Some websites look great on the monitor, but are difficult to read once they are printed.

While printing adds one material (such as ink) to a base material (such as paper), engraving physically removes material from the base material itself. If the material is a single color, proper lighting is needed to ensure good contrast between the surface and the engraved area. Engraving deeper into the material also helps, by producing stronger shadows in the engraved area.

Engraving may be performed manually, as in the stone and clay examples mentioned above. More often, a computer-controlled engraving machine is the method of choice. This system offers the same advantages as desktop publishing, and produces a “hardcopy” that is much more durable than paper.

Two-Tone Plastic Engraving Material

Two-tone plastic engraving material consists of a thick layer of plastic that is coated with a thin layer of plastic. Each layer has a distinct color, producing a two-tone effect when the thin layer is removed. This feature solves the contrast issue associated with monochromatic material. The total thickness is typically one-sixteenth of an inch. The thin layer is typically only three thousandths of an inch deep. With such a small amount of material to remove, two-tone plastic can be engraved quickly and easily.

Since the thin layer is the one that is engraved, its color is usually specified first in the description of the material, followed by the color of the thick layer.

Front-Surface (Obverse) Engraving

In front-surface engraving, the thin layer is on the front of the material, but is considered the background color. Engraving this layer reveals the thick layer underneath, which is considered the foreground color. This difference in nomenclature can be confusing. Black/White engraving material produces white characters on a black background.

Back-Surface (Reverse) Engraving

In back-surface or reverse engraving, the thin layer is on the back of the material, and is considered the background color. Engraving this layer reveals the thick layer, which is clear. When viewed from the front, one sees through the clear layer and the engraved area. Once again the nomenclature can be confusing. Black/Clear engraving material produces clear characters on a black background. The engraved area may be filled with paint to produce different color characters. Otherwise, the clear characters will take on the color behind the engraving material.

Normal versus Mirrored Text

In front-surface engraving, text is engraved in the same manner as it would be written. In reverse engraving, the text needs to be mirrored so that it is readable when the text is viewed from the front. Fortunately, most engraving software can mirror text when needed. There are other uses for mirrored text. At a loading dock, a truck driver would be able to read a sign reflected in the rear-view mirror.

Indoor and Outdoor Use

There are many industrial, commercial, and office uses for engraved signs. A wide variety of styles are now available, including basic colors, pastels, stone faces, wood grains, and metallics. The market for indoor material is greater, so some styles are rated for indoor use only. Engraving material rated for outdoor use has protection against ultra-violet light, which can degrade the plastic and fade the colors.

There may be slight color variations between different suppliers, based on their recipe for producing the colors. Therefore, BFS uses plastic engraving material from only one manufacturer, [Innovative Plastics Inc.](#)

Rotary Engraving Machine

A rotary engraving machine is similar to an industrial milling machine, in that both remove material from the work piece. A single rotary cutter is positioned over a two-dimensional work area. When the cutter moves down into the item, material is removed to a specific depth. On a milling machine, this depth is usually adjustable over a wide range. On a rotary engraving machine, the rotary cutter has two vertical positions: up and down. The up position allows free movement over the material, while the down position removes material.

BFS uses a [Newing-Hall Model 300](#) rotary engraving machine.

The rotary cutter mechanism has a nose piece just above the tip of the rotary cutter. In the down position, the nose piece rests on the material, and the tip cuts into the material. This design allows precise adjustment of the cutting depth, which is only a few thousandths of an inch.

As plastic chips are cut away, they need to be cleared from the surface to allow continued cutting. Also, these chips could scratch the thin layer as the nosepiece moves over the material. With a hose attached to the side of the nosepiece, the chips are vacuumed away as they are cut from the engraving material.

The rotary cutter is specifically designed for the type of material and the desired effect. BFS uses [Antares](#) cutters with micrograin carbide tips.

While good hardware is essential for producing engraved products, good software makes the process faster. The ability to edit and save engraving information brings office automation to the engraving machine. Word processors process more than just words, and engraving software can now manipulate images as well as text.