

Thermal printer – The Technology

A **thermal printer** (or **direct thermal printer**) produces a printed image by selectively heating coated [thermochromic paper](#), or [thermal paper](#) as it is commonly known, when the paper passes over the thermal [print head](#). The coating turns [black](#) in the areas where it is heated, producing an image. Two-color direct thermal printers are capable of printing both black and an additional [color](#) (often [red](#)), by applying [heat](#) at two different [temperatures](#).

A thermal printer comprises these key components:

- Thermal head — generates heat; prints on paper
- Platen — a rubber roller that feeds paper
- Spring — applies pressure to the thermal head, causing it to contact the thermo-sensitive paper
- Controller boards — for controlling the mechanism

In order to print, one inserts thermo-sensitive paper between the thermal head and the platen. The printer sends an [electrical current](#) to the [heating resistor](#) of the thermal head, which in turn generates heat in a prescribed pattern. The heat activates the thermo-sensitive coloring layer of the thermo-sensitive paper, which manifests a pattern of color change in response. Such a printing mechanism is known as a **thermal system** or **direct system**.

Applications

Thermal printers print faster and quieter than [dot matrix printers](#). They are also more economical^[1] since their only consumable is the paper itself. Even though the paper is more expensive, printers can be rapidly refilled, leading to almost zero downtime. Commercial applications of thermal printers include [filling station](#) pumps, information [kiosks](#), [point of sale](#) systems, and voucher printers in [slot machines](#).