CANON SOLUTIONS AMERICA

RADIANT FUSING TECHNOLOGY

Helping workgroups become green environments with quality, reliability, and energy efficiency.

Radiant Fusing technology excels in environments where users require reliability, energy efficiency, low heat and noise output, instant-on capabilities, very high image quality, and low ozone emissions. It helps your office remain productive and environmentally friendly.

Radiant Fusing technology was purpose-built for intermittent technical document printing. Instead of starting with a conventional design and trying to improve it, we started from scratch and focused on just one thing: finding the most efficient way to fix toner onto the paper. The result was this unique patented design.

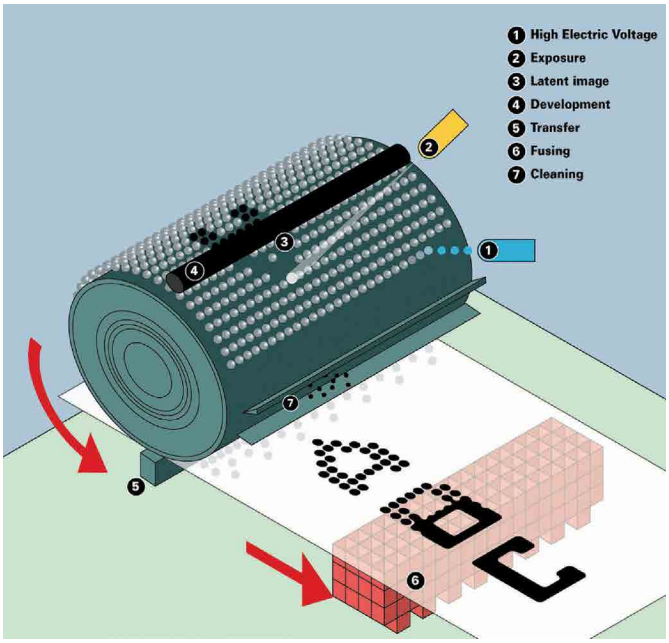
Radiant Fusing technology is an eco-friendly fusing method, providing instant-on printer availability with no warm-up time. It consumes less energy and emits less noise and ozone compared to conventional fusing methods. In addition to the environmental benefits, it also provides incredible, consistent quality. During the Radiant Fusing process, the toner melts and fuses to the media via heat uniquely distributed through a wire grid, without distorting the image.

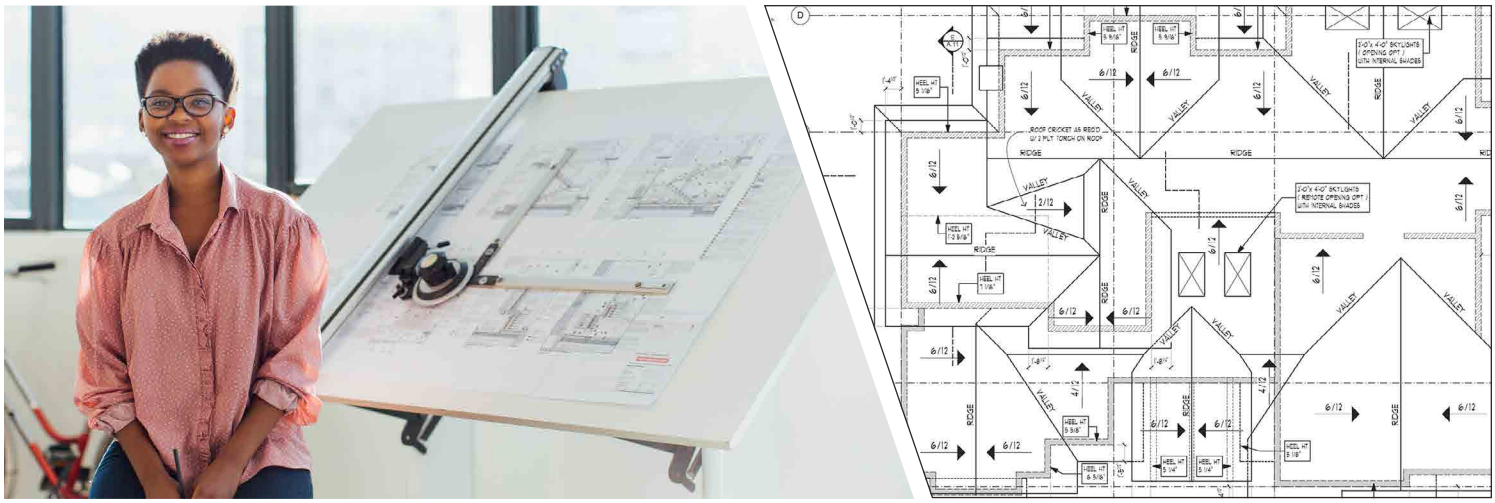
Why a patented technology?

In low- and mid-volume large format environments, technical document printers often remain idle for a large part of the day. In these environments, most printing occurs in considerably less than 15% of a full eight-hour work day—and often even less. Especially with typical low volume users, large format drawings are mostly printed for immediate and short term use, in small quantities at a time. For the daily user, the speed at which the first print is delivered becomes critical for instant document availability, even more than the engine speed. This can be referred to as FPOT or First Print Output Time. To achieve a rapid FPOT with conventional LED technology based systems, it is necessary to supply power to maintain the fusing unit temperature at a constant and high enough level to avoid lengthy warm-up time (ready mode). This generates unnecessary heat, energy consumption, and noise, even when the equipment is not in use; factors to consider when placing the device in a workgroup environment. And alternate technologies that were not developed specifically for the low volume decentralized user, such as single pass inkjet, may also require lengthy first-print-out times due to time required for uncapping of print heads as well as print head cleaning and maintenance routines. Radiant Fusing technology was developed to deliver instant printing on demand while conserving energy.

The basic principle of Radiant Fusing technology is to enable the most time and energy efficient way to fix toner onto the paper. The main process steps are the following:

1. **High Electric Voltage** — The light-sensitive drum gets a negative electric charge.
2. **Exposure** — The drum is then exposed to light from the LED (light emitting diode) array.
3. **Latent Image** — Where light from the image hits the surface of the drum, the negative charge disappears, leaving a latent image.
4. **Development** — The drum comes in contact with the toner. The negatively charged toner is attracted to the area of the drum where the points of light have caused the original negative charge to disappear. The image on the drum becomes visible as a layer of toner covers the discharged parts.
5. **Transfer** — A positive charge is applied through the media as it moves past the drum. The positive charge attracts the toner and causes it to move from the drum to the media.
6. **Fusing** — The toner is heated and fixed permanently (fused) onto the media. In Canon equipment containing Radiant Fusing technology, this is done via an array of heated lamellae, or plates. The heat rises up through the media, allowing the toner to literally melt down into the media. This minimizes any distortion of the image, which may be created by systems using heated pressure fuser rollers.
7. **Cleaning** — Toner particles left on the drum are removed and the drum is cleaned prior to printing the next image.





The basic principle of Radiant Fusing technology is to find the most efficient way to fix toner onto the paper. For that purpose, the paper with its toner deposit is transported through the fusing unit, emitting the optimum amount of heat in the shortest time possible. The fusing unit is built around a series of thin metallic tiles that can heat up and cool down instantly. These tiles are made to quickly and efficiently radiate the required amount of heat:

- Thin to increase their heat conduction rate
- Wavy shape to increase their radiating surface
- Made of metallic alloy to lower their specific heat capacity
- Coated to preserve them over the long run

Why is Radiant Fusing technology better than conventional technologies?

While the thin metallic tiles used in the Radiant Fusing technology are able to heat up and cool down instantly, conventional technologies are using large and thick fusing rollers with much higher specific heat capacity. This means that the amount of energy required to reach the optimum fusing temperature is also much higher. So to avoid lengthy warm-up time, those devices are maintained at a certain temperature most of the day.

Conventional technologies generate in ready mode (standby):

- Higher energy consumption to maintain the temperature
- Higher noise levels; due to necessary ventilation fans and moving parts
- Larger footprint; due to possible overheating of the equipment, it has to be installed at a safe distance from the wall
- Delayed FPOT (First Print Output Time) from sleep mode, up to six minutes for some printers

What are the key benefits of Radiant Fusing technology?

Because the fusing unit instantly reaches the required temperature, the system virtually stops and waits for the next print job while in ready mode (standby). This results in:

- **No warm-up time**
  Enables quick printer availability even from sleep mode.
- **Fastest FPOT (First Print Output Time)**
  Users get output quickly even when the system is turned on from a cold start or activated from sleep mode. Features the fastest FPOT (First Print Output Time) from sleep mode in its class: 40 seconds for an A1 or D-size plot.

- **Lower power consumption**
  Reduces energy usage with EPA ENERGY STAR® approved Radiant Fusing technology. The metallic tiles are heated instantly, limiting the amount of power required in ready mode (standby) and sleep mode.

  At least 50% less energy usage than comparable systems during a typical work day (eight hours), based on a yearly average volume of 55,000 ft², entering sleep mode after 15 minutes of idle state. That is why all Radiant Fusing printers have earned the U.S. Department of Energy, Energy Star® designation. When compared to competitive printers, Radiant Fusing systems consume significantly less electricity. Over the course of a year the reduction in electrical consumption can add up to substantial energy savings.
- **Less noise and heat**
  Minimizes distractions, so the system can be placed close to the working environment. With no pressure rollers, a lower temperature is maintained with Radiant Fusing technology. Because the system heats and cools instantly, there is no need for noisy fans and the system runs quietly in ready mode (standby) and sleep mode. The system returns to silent right after printing and can be placed close to workgroups. Because there is no risk of overheating, the system can be placed close to a wall or in a corner.
- **Sharper output**
  Prevents resolution loss, dot size degradation, and line fuzziness, since the toner melts exactly where it is placed on the media.
- **Greater long-term reliability**
  Generates less internal heat and uses fewer consumable parts (no fuse-rollers or fuse oil). The reduction in heat exposure preserves all parts of the machine, enabling a longer life.

These characteristics make Radiant Fusing technology perfect for workgroup printing. It is embedded in Canon's portfolio of PlotWave series systems. A real-world tested and proven technology, with over 170,000 technical document printers driven by Radiant Fusing technology in use worldwide.

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