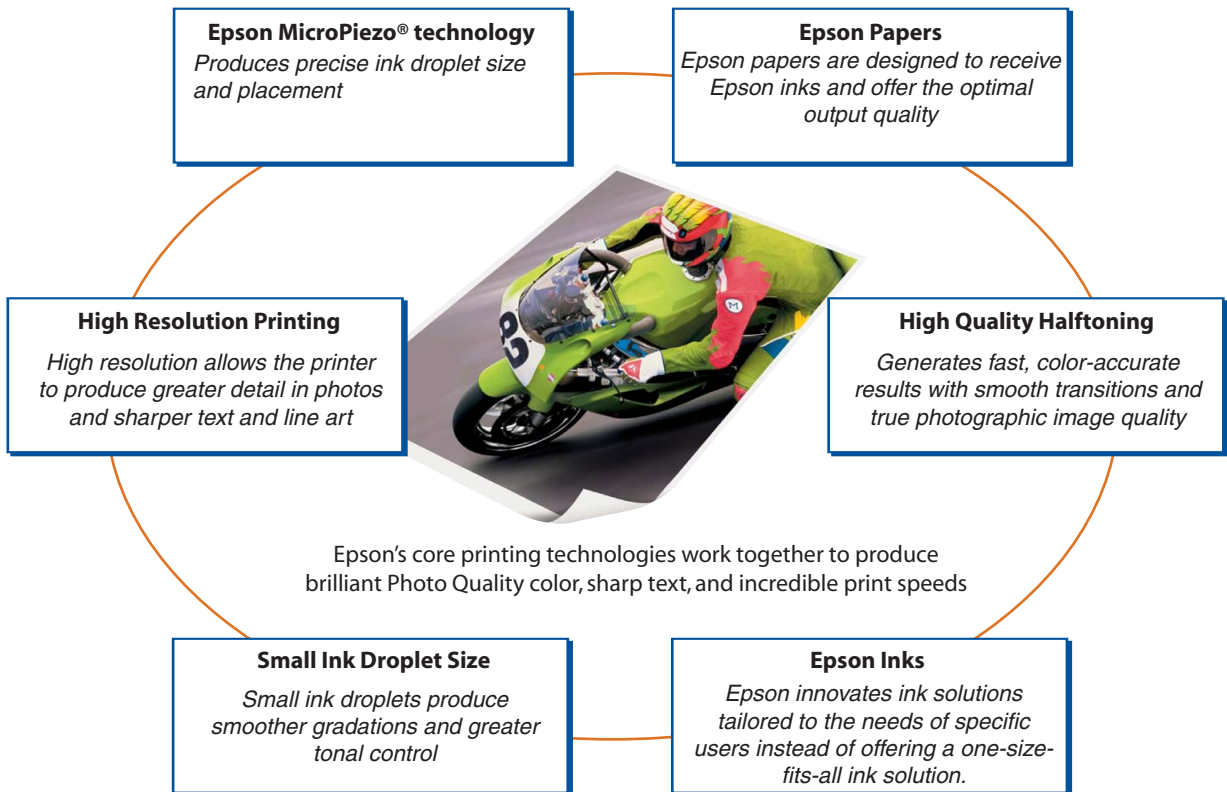




This technical brief provides detailed information on the core technologies used in Epson printers and all-in-one printers.

## Print Quality—Core Printing Technologies

The core technologies used in Epson ink jet printers work together to produce award-winning print quality, and each component is equally important in delivering exceptional print quality.



Detailed information on each of these core printing technologies is on the following pages.

This combination of core technologies used in Epson ink jet printers produces:



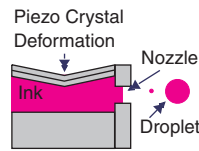


- Epson MicroPiezo Technology:** Epson Micro Piezo print heads use high-precision mechanical pumps to produce ink droplets, and no heat is involved in printing. Here's how it compares to thermal ink jet technology, used in other ink jet printers:

**Epson MicroPiezo Technology**

*Mechanical method:*

Precise electrical pulses cause the ink reservoir wall to deflect inward, projecting ink through the nozzle.

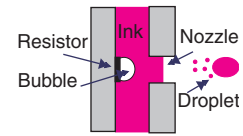


Epson's MicroPiezo technology results in consistent ink droplets without satellites (unwanted ink spray) or misting.

**Thermal technologies**

*Heat method:*

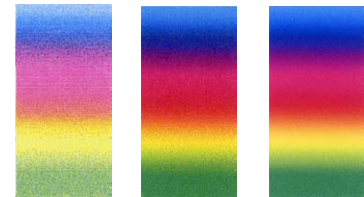
Heat produces a vapor bubble in the ink reservoir which expands and is ejected through the nozzle.



Some thermal printers produce more inconsistent droplets with satellites and misting.

- High Print Resolution:** Resolution, which is generally measured in dots per inch (DPI) is an important factor in achieving print quality. Epson printers are unique in combining very small, variable-size ink droplet sizes with high resolutions to precisely print crisp details in photos and laser sharp text. Also, Epson's variable ink droplet sizes and high resolutions combine to improve color ranges and accuracy because Epson printers can use halftone algorithms with more color combinations and smoother color gradations.
- Small ink droplet size:** Most Epson printers produce ink droplets so small you cannot see them with the naked eye. A smaller ink droplet allows the printer to produce a greater number of different colored "printed dots" because a wider range of tiny droplets can be combined to create a larger color palette. Additionally, smaller ink droplets produce less visible printed dots, especially apparent in the lightest areas of a photograph.

Effect of Print Resolution and Small, Variable-Size Ink Droplets



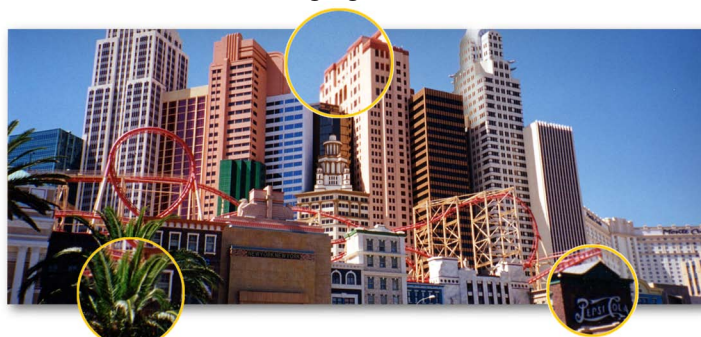
*Gradations and blends become smoother as resolution and droplet control are increased*

Epson printers use Variable Size Droplet Technology, where the printers can produce a number of different ink droplet sizes. The size and number of droplets varies by model, but offers these benefits:

- Different ink droplet sizes can be combined to achieve more tone representations
- The smallest ink droplets can be used in the low-density or highlight areas, reducing the visibility of printed "dots"
- Large ink droplets are used in dense coverage areas to improve print speed

With this technique, Epson printers can produce high print quality without sacrificing print speed and without having to increase the number of nozzles on the print head.

Smallest ink droplets produce smooth photos, especially beneficial for highlights and detailed areas



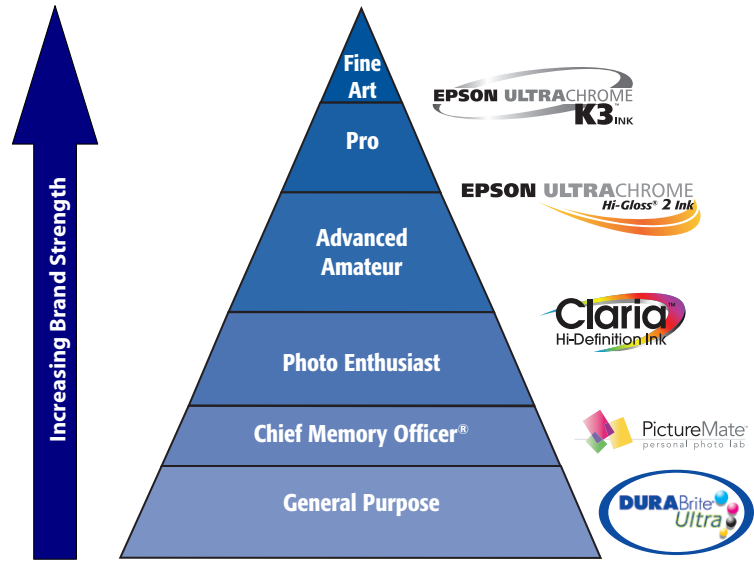
Variable sizes combine to achieve more tone representations for smoother gradations

Large droplets are used in dense coverage areas allowing Epson to have fast print speeds without increasing the number of print head nozzles



4. **Ink System:** Epson offers a variety of ink systems to meet every printing need. Whether the customer is most interested in the everyday printing of documents and the occasional photo, is an amateur photographer looking to primarily print photos with stellar image quality and durability, or is a professional photographer staking his reputation on breathtaking large format prints, Epson has the right ink for the job.

Additionally, unlike competitive printers that require special or optional inks, with Epson printers there are no added costs for optional cartridges, and you never have to swap an ink cartridge to get sharp black text, superb photo quality photos, or both on the same page.



You can find detailed information, comparisons, and FAQs on the Epson ink sets in the Ink Solutions document.

5. **Epson Papers:** In general, Epson printers will deliver their best output quality when used with Epson papers. Epson papers are designed in conjunction with Epson printers and genuine Epson inks so when all three elements are present and used, the best possibly print quality is achieved.
- The Epson printer driver optimizes ink density based on the resolution and type of media selected
  - Epson printers are designed to produce their optimal print quality using genuine Epson inks on Epson papers
  - Epson ink jet papers are specifically designed to receive Epson inks.



6. **High Quality Halftoning:** Every ink jet printer uses a method referred to as halftoning, that places ink droplets to create printed “dots” in various patterns so you see continuous tone color. Epson printers use a halftoning module that produces fast, high-quality, color-accurate output. The Epson printer drivers use an advanced error diffusion technology to determine the most efficient pattern for applying ink droplets to the page, based on the content, selected output quality, and paper type.

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