



Today's chunky Xerox toner particles (microscopic view shown at left), manufactured through a mechanical pulverization process and fused during printing through a combination of oil and heat, will be replaced within the next few years by emulsion aggregation toner (right), composed of smaller, more uniform particles which require no oil and less heat. Smaller EA toner will print on paper with only slightly more thickness than conventional offset printing inks. Xerox says that EA will lower machine operating costs, improve imaging resolution and consistency, use less energy, and increase the life of the printer.

## Now you're cookin' with EA technology

Summertime is barbecue season—and among barbecue chefs there are your briquette lovers, and there are those who swear by conventional lump charcoal. And although either camp can make a good hot cookfire, outdoor cooks know that briquettes will burn hotter, longer, and more evenly.

What's this got to do with technology? one might ask. Well, twist this analogy around a bit and apply it to the science of manufacturing toner particles used in laser printers and digital presses. Up until now, conventional toner has been manufactured in relatively large chunks, employing cyan, magenta, yellow and black pigments in order to produce process colors for printing. These chunks of toner are then pulverized into small microscopic bits, which, just like lumps of charcoal, are different shapes and sizes, generally no smaller than about seven microns. The toner is then fused onto paper or another substrate using oils and heated rollers. However, it still lays down a much thicker layer on paper than the inks used in commercial printing. In addition, precise and predictable color management can be somewhat problematic when the tiny particles are not uniform.

But a new generation of toners will soon be hitting the market, based on a manufacturing process called “emulsion aggregation”, or EA, where toner particles are “grown” in a water-based environment from very small particles less than two microns in size into particles measuring three to fifteen microns. Emulsion aggregation not only consumes less energy in manufacturing but it also requires less heat to be fused to a substrate. It dispenses with the need for oil units since the EA process incorporates wax into the makeup of the toner particles; and printing with smaller, uniformly sized material results in less toner usage and more reliable color reproduction. EA also allows developers to customize particle shapes for specific purposes; they may be round or oval or even “potato-shaped”, depending on particular requirements.

Several companies are actively engaged in emulsion aggregation research and development, but the leader in this field—not surprisingly—is Xerox. And the scientific arm of Xerox which has spearheaded the company's EA technology development is none other than “PARC North”—the Xerox Research Centre of Canada, which is located in Mississauga, Ontario and headed up by Dr. Rafik Loutfy.

Dr. Loutfy and his associates unveiled their work on the emulsion aggregation process in a worldwide technology announcement made in July at XRCC. Xerox projects that EA could be integrated into output devices within the next twelve to twenty-four months; it even remains possible that it will drive Xerox's “FutureColor” digital printing products which are scheduled to be ready by next year.

So fire up your short run color and variable data jobs, folks, because we may see the print battle between traditional offset and high speed digital presses heat up considerably over the next two years. 🍷