by **Monica Miceli** | Recharger Magazine

# Ink 2000: A Quiet Company Enjoys Thunderous Success

Thoughtful. Introspective. Silent. Kelvin Yu, owner and lead scientist of Ink 2000, is a reserved man. Much of his success, however, comes as a result of his hushed nature — he listens very closely to what people in the industry are saying. Even when given the chance, Yu tends to shy away from the limelight. Yet when Yu does speak, he usually says something insightful and powerful.

Despite Yu's outwardly calm and contemplative nature, he has plenty to brag about. This former Kodak chemist with many patents to his credit is a six-time Productivity Enhancement Program Award winner for his work on inkjet ink formulations. He has worked as an ink scientist for a variety of manufacturers and remanufacturers, bringing him a full technological and business view of both the OEM and aftermarket arenas. His 27 years of valuable experience in ink technology has led him and his company to much success. In a way, it shouldn't be a surprise to anyone that Ink 2000, once a quiet little company, has roared onto the remanufacturing scene.

Since its beginnings in 1995, Ink 2000 has been selling inks for all popular HP, Lexmark, Canon and Epson printers and, as a result, has enjoyed thunderous success. The company offers several types of bulk inkjet inks including dye-based, pigment, archival, wide-format, fast-dry and indoor and outdoor UV inks, and sells an average of 200,000 gallons and 750,000 liters of ink, respectively, each year to wholesalers and distributors around the world.

**Kelvin Yu is the owner of Ink 2000 and a former Kodak chemist with many patents to his credit. His wife, Sisi, is vice president of Ink 2000.**

The company's biggest ink sellers are its pigment, dye-based and wide-format inks. According to Yu, "More than 50 percent of our revenue is driven by color ink sales, and it will only continue to grow as digital cameras become more popular. People want photo-lab quality prints from the convenience of their homes."

Yet with the clamor over color, Tina Pedrin, the company's office manager, cautioned that many remanufacturers aren't aware of the important differences among these inks or their uses. She explained that dye-based ink is comprised primarily of water. It flows better onto the paper and is the standard for most inkjet printers.

"The most obvious difference for a remanufacturer," she noted, "is in the ink's performance. A dye-based ink is not water resistant, so if you spill a cup of water onto your print, it is going to smear. But the good news is that if you're a customer doing a lot of photographs, you get a larger color gamut with the dye-based ink. The dye-based ink also tends to fade, but then we created a UV dye-based ink that prevents that from happening.

"Pigment ink is meant to be water and UV resistant," she continued. "If you have a pigment ink, you get deeper, richer colors and it is not going to smear — it's going to hold its spot on the paper. It doesn't bleed or fade, but it also costs a little more."

She noted that some of the newer cartridges are calling for a mix of the

dye-based colors and pigment black inks, which reduces black bleed and still allows for color vibrancy. Pedrin also said that assistance is available for customers who need help determining which inks are appropriate for their cartridge needs, and that inks can be switched within a cartridge if requested, though she typically doesn't recommend it.

Wide-format ink is a different story altogether. "Wide-format inks are very pure and must be very refined to be able to go through the wide-format print heads — about 10 times finer than regular desktop ink," said Joyce Tsang, the company's chemist.

Manufacturing wide-format ink is a completely different process than manufacturing all the other kinds of ink. It requires more refined raw materials, and the ingredients must pass through more filtration and breakdown processes.

"When a customer buys a desktop cartridge, it typically costs anywhere from $20 to $50. An OEM wide-format cartridge is close to $250, and then the customer has to buy the print heads separately. The print heads alone are a few hundred dollars. That's a lot of money, and that's why we make sure our ink is extremely pure," Tsang said.


**Nano Inkjet, Ink 2000's sister company in Dongguan, China, manufactures and sells inks to its local market.**

**Ink 2000 has approximately 250 inks available, keeping the popular ones readily in stock and making fresh batches for all others upon each order.**

But when ink flows, it can also get stopped up. A few years back, Yu listened to the industry's rumblings on finding a way to deal with the ink that accumulates in the bottom of inkjet cartridges, particularly in Lexmark cartridges.

"The particles used in making the Lexmark pigment ink — they harden like a rock," explained Keelo Chen, Ink 200's production manager. "A lot of pigment accumulates at the bottom of the cartridges, making them unusable. The rocks are horrible."

Many of the company's customers complained they "had piles and piles, maybe even rooms full, of unusable Lexmark cartridges because they couldn't get the hardened pigment particles out of the cartridge," Pedrin said.

Many tried to break up the pigment by using some of the cleaning solutions available on the market. They would clean the cartridge somewhat superficially, but they just weren't breaking

through the hardened particles. Customers were coming to Yu saying they had "tons of lost money in these cartridges and needed an answer fast."

Yu pondered the idea awhile. He recognized cartridges are both expensive and hard to come by and knew he had to find a way for remanufacturers to put these abandoned cartridges back into circulation. Resolute on finding a solution, Yu researched the items already on the market and observed their performance — and decided he could do better. Yu designed a cleaning solution that not only breaks up the rocks, but also breaks them down so "the particles will flow out of the cartridges like water," said Tsang.

The solution caught on with Ink 2000's distributors and wholesalers, and they found their customers started using it in many of their other cartridge models. "We have end users who found that because it worked so well with the Lexmark cartridges, they started using the solution in their other (cartridges), too. We're getting great feedback from that," Pedrin said. She explained that the solution's success in revitalizing what would otherwise be lost inventory makes the product a "very popular item."

Ink 2000's newest product causing a buzz in the aftermarket is its continuous inking system.

"Over the last couple of years at World Expo, we have seen more and more companies coming out with continuous inking systems," said Vice President Sisi Yu. "But nothing we ever saw was a finished product for the end user to be able to plug in and use."

Kelvin Yu saw the potential behind the concept and sought a practical way to make it work. Again, he decided he could come up with something better.

"We opened our sister company, Nano Inkjet, a manufacturing facility in China, in 2004. And because we had that resource, we had the ability to make our own mold," Kelvin Yu said.

**The Ink 2000 lab staff spends a great deal of energy making sure that it uses only the best ingredients in its formulations.**

"We had the luxury of designing and redesigning the system until we could make it just the way we wanted it — end-user friendly. We had the ability and the resources, and thought, why not?"

Ink 2000's customers lauded the new system. Though Sisi Yu understood the theory behind the system, she soon realized the company's continuous inking system really was a time- and money-saving product for people.

"These systems hold about 10 times the amount of ink a regular cartridge would, and the customers are getting 10 times more life out of the system. In what they pay for one or two cartridges, they're getting the equivalent of 10," said Kelvin Yu.

The system has six tanks, and each ink tank comes pre-filled with 120 milliliters per color of UV dye-based ink, approximately the amount of ink found in 10 cartridges. Customers can easily maintain the system by purchasing a refill kit and pouring the replacement ink into the top of the ink tank.

"We've noticed that people who want to buy this want a full, ready-to-operate and easy-to-maintain system," Pedrin said.

The system is particularly popular with photographers who do a lot of printing and require a full range of colors. "We find they especially like the UV ink. They want something that is going to give them an extra length of life to their work," she said. "It's been great. I've seen this product really take off over the last few years."

Ink 2000's systems, though primarily for popular Epson models, will be expanding to include HP and Canon systems as well. The company is planning to reveal the two new systems at World Expo 2005 and expects them to make a lot of noise within the industry. "Nothing makes a customer more loyal than when you save them money," she added.

Causing such reverberations isn't new for Ink 2000. Keeping up with the latest in changing OEM formulations, a struggle for many, has been relatively easy for Yu and the staff at Ink 2000.

"We've always been strong in the research and development area, and we

have always been good at staying on top of the every-changing market," Sisi Yu said. "Kelvin used to work for Kodak and other aftermarket companies getting inks formulated and getting patents for them. So he's very familiar with a lot of those patents and what goes into them. In having such a strong background with those large companies, he is absolutely certain of what goes into our inks and how to formulate them for optimal results."

Yu's personal knowledge of OEM inks has proven not only to be a legal failsafe, but a secret weapon that fuels his inventive nature. "Because people want exact OEM quality, we know how to do that without infringing on anything. Our standard of quality has always been to match OEM quality, but then we also have customers who want something better. They want the magentas brighter and the blacks darker, and we have those inks as well. We have our standard inks that match OEM quality, and we have inks that are superior," Sisi Yu said.

Another benefit of Kelvin Yu's extensive knowledge is it enables him and his company to develop new inks quickly.

"When a new cartridge comes out into the market, we immediately begin our testing and are often one of the first companies to have the new ink available," said Chen. "If there proves to be a big need, we can put out a new ink in about a week — we'll make sure we get it done. We work very quickly. Even when we aren't in a rush, new inks are out in less than a month."

Ink 2000 has approximately 250 inks available for a wide range of cartridge models. "We don't do an ink formulation for every single model or OEM out there, but we do the popular ones or what we think will be the popular models," Tsang said.

"We don't keep them all in stock, either, but we have the popular ones available all the time. There would be too much inventory to cope with, but more importantly, it means that we make fresh batches for our customers upon each order," Chen said.

Unsurprisingly, Ink 2000 is emphatic about the quality of its products. The quality-control team thoroughly tests each batch of incoming chemicals used in the production of its ink. "We spend a great deal of energy making sure that we begin with the best initial ingredients possible. When the bulk ingredients arrive, we test every single drum, not just a sample of the entire shipment," said Kelvin Yu. "We will find out any variation that occurs between the drums. We do that to make sure the consistency is really there.

"Having good chemicals and a strict production process," according to Sisi Yu, "is not enough to guarantee that an ink is made well. Having great water is an essential component in the preparation, cleaning and production processes."

The company built a water filtration and purification plant to get the purest and most refined salt-free water possible for the production of its inks. Sisi Yu explained that once the water's refinement has been achieved, "We add key ingredients that are weighed to exact measures, and they are then added in sequence while being mixed continuously. After mixing, we begin a filtration process. Our formula is then filtered through our submicron filtration system to ensure the easiest flowing ink possible."

The components and emerging inks are tested at various steps in the production process and again at the end. The quality control staff pulls a sample to ensure the quality of five key parameters of pH, viscosity, particle size, surface tension, optical density, conductivity, filtration efficiency and absorbency (color quality). Once the standards are met, the inks are filled into the appropriate containers and tested again. All of these measures guarantee Ink 2000 meets and maintains its ASTM standard. Ink 2000 follows its ASTM certification and pronouncement of quality seriously.

"We will never slash our quality just to come up with a lower price. We've always said up front that we're not going to be the cheapest, but we are not only going to give you consistency, we are going to give you quality," Pedrin said.

**Guadalupe Isarraras (seated), international sales representative, and Tina Pedrin, office manager, are readily available to fulfill orders and resolve customers' concerns quickly.**

The company also provides a certificate of analysis with every shipment as a guarantee that each batch meets its minimum specifications in each of the five areas.

All of Ink 2000's ink is manufactured at its Chatsworth, Calif., location. Nano Inkjet also produces inks, but in a role reversal to many other companies' operations. The China location does not ship its products around the world; instead it caters only to that region's needs.

"We have always done the majority of our manufacturing at the California location, but we've always had a large customer base in China, especially in the wide-format area," Sisi Yu said. "We were always sending large containers of ink over to China and decided to open a second plant to cater to that market. Why not service our customers right there? We decided it would free up (the California) location to focus on the rest of the world. We have customers in the U.S., Australia, Spain, Brazil and Canada — all of which are cared for by the California office.

"There are a lot of good and bad products that come out of China," Sisi Yu emphasized. "Some of the bad ones have nothing to offer but a good price. We don't want anyone to get the impression that we take part in any of that."

Perceptions are important to Sisi Yu. She is highly concerned about the company's reputation in the marketplace, particularly since many of Ink 2000's customers come by word of mouth. "We find that people who aren't willing to share information about their other vendors often refer us to their friends. We think that says a lot," she said.

She knows a good reputation can help a company and a bad one can be damaging. She also believes a company needs great service — not just great products — to ensure its good reputation remains strong.

"We really try to give great support. Our staff speaks English, Spanish and Chinese, and we can ship any of our products almost immediately. We can also help our customers determine which inks go in which cartridge models, if that is an issue," Pedrin said. "We can also offer specialized assistance in helping them to obtain a particular outcome or if they just need general help. We can talk anyone though just about anything."

Ink 2000 isn't just talk, though — the company strives to follow through on its promises. When asked to sum up the essence of his company, Kelvin Yu stated, "Quality is our life. Quality is our reputation." R

*Contact Ink 2000 at (800) 433-2786.*

## The Five Characteristics Affecting Ink Quality

by **Kelvin Yu** | Ink 2000

There are five major characteristics that are significantly affected by the chemicals used in the ink-production process and ultimately influence the quality of ink: color, pH, surface tension, viscosity and cleanliness.

**Color:** This is the most obvious characteristic of ink and is noticed when an image is printed on a substrate. In order to get color consistency from batch to batch, a spectrophotometer, which measures the amount of light energy reflected from the object, is needed. Since every color will reflect and absorb at specific wavelengths within the visible spectrum, absorbency is being measured as well.

**pH:** Acidity or alkalinity is expressed by a pH value. Anything within a pH value of 0 to 6 is considered acidic, and 7 is considered neutral. On the other hand, anything within a pH value of 8 to 14 is considered alkaline. Most inkjet inks should have a pH value of 7 to 9, because too acidic or too alkaline will damage the print heads.

**Surface Tension:** This is a measurement of the cohesive energy present at an interface. A precise measurement of surface tension by using a surface tensiometer is critically important because inaccurate surface tension will result in inappropriate ink droplet formation, and this will lead to poor print quality.

**Viscosity:** The flow rate, or viscosity, of ink is another factor that affects the quality of ink. Improper flow rate will result in nozzle clogging and poor print quality.

**Cleanliness:** Contaminants could potentially cause print failure. To ensure the best quality of inks, filtration must be used to get rid of the impurities in inks. Different types of filters should be used to affirm cleanliness. R