

PIA (Printing Industries of America) InterTech™ Technology Award for Xerox® Color 800i/1000i Press Metallic Dry Inks

Technology Description for Xerox® Color 800i/1000i Press Metallic Dry Inks

Xerox has created a new benchmark for metallic digital print effects with stunning, yet cost-effective, silver and gold metallic dry inks on the Xerox® Color 800i/1000i Presses. Using the digital press' fifth housing station, metallic dry inks can add a brilliant dimension and creative effects to static or variable communications. These unique dry inks are more than just digital simulations. They are real metallic inks with metallic flakes in the toner, carefully engineered to have some of the highest flop indexes in the industry, allowing any printer or enterprise operation to migrate more jobs to digital and service more high-value, high-impact customer needs.

With xerographic silver and gold metallic inks, printers can produce impressive metallic effects cost effectively using a streamlined, inline digital workflow with the fast turnaround time customers expect from digital devices. Metallic ink jobs run at rated press speed with no degradation at 80 or 100 pages per minute depending on the press model. This opens the door for new revenues or savings by migrating lucrative foil stamping or metallic ink offset applications, such as stationery, invitations, branded collaterals, premium direct marketing campaigns, certificates and business cards, to short-run, personalized, print-on-demand digital production.

These unique, low melt Emulsion Aggregate (EA) metallic inks can be applied to a wide variety of substrates including textured medias, polyesters, vinyls, magnets, and coated and uncoated stocks up to 350 gsm. The EA dry ink technology is environmentally friendly and uses no fuser oil, giving applications a smooth, offset-like finish. And because the change process from silver to gold is a clean and quick substitution of self-contained housings, with no maintenance or clean-up, customers have full flexibility to add sparkle or shine to almost any commercial or photo application.

Metallic dry inks can be integrated into the creative design in prepress or can be easily applied by following a few simple steps at the Digital Front End (DFE). Customers running the Xerox® EX-P 1000i Print Server can also use the Fiery® Smart Estimator tool to determine how a metallic dry ink may affect the cost of a project through area coverage analysis, allowing for accurate estimating. And of course, an expansive variety of mixed metallic effects are possible with tint overlays and textural enhancements using optional third-party software solutions like those offered by Color Logic, Inc. Advanced color management controls, the Xerox® exclusive Full Width Array and the latest in VCSEL ROS imaging, coupled with the new metallic dry inks, deliver high-value, high-profit innovation and incremental revenue opportunities to Xerox customers.



Section One

Market Price for the Technology (Standard List U.S. Pricing Quoted)

Several factors impact the market price for metallic dry inks, including whether the customer's press is a new installation or an upgrade to an existing color press, the type of digital front end selected and the number of colors desired.

If a customer has an existing Color 800/1000 Press with the fifth housing enabled, then an upgrade to the Color 800i/1000i Press can be as economical as \$14,750 for one metallic color and \$25,500 for both metallic colors. Silver and gold toners are \$660 per carton with a yield of approximately 55,000 prints. The rate of metallic area coverage can impact expected toner yields. Silver and gold developers are \$195 per carton with a yield of two million prints.

Pricing for a net new Color 800i/1000i Press will be impacted by the pricing plan the customer is qualified to receive and the type and configuration of the DFE selected. To enable the fifth housing for one metallic color, the price is \$30,000 and for two metallic colors the price is \$45,000. Toner and developer pricing remain as quoted above.

Section Two

First Year the Technology Was Commercially Available

Spring of 2015

Section Three

Technology Significance

Xerox® Metallic Dry Inks replace traditional foil stamping and offset metallic inks with a cost-effective, short-run, inline digital alternative. What has been conventionally achievable using offset printing can now be delivered through a single digital production press running up to 100 pages per minute. Eliminated is the time investment, custom dies, materials, waste and workflow steps that are cost prohibitive for short runs and variable data jobs. With Xerox® Metallic Dry Inks, streamlined digital workflows, fast turnaround time and impressive metallic effects can be achieved in a wide variety of static and variable applications. So, it's all about unlocking the new business profit potential for printers and the high-value impact on the audiences they and their customers are trying to reach.

To fully appreciate the significance of the technological impact of silver and gold metallic dry inks on the industry, it's important to highlight several key attributes that are enabling characteristics for success and how the Xerox® Color 1000i Press enables new revenues and profits.

Image Quality (IQ) Performance: The first threshold to meet or exceed is the IQ performance. If the flop index (a measure of the light reflectance or shine) of the metallic dry inks is not high enough, the resulting application's value will not meet the customer requirements and will not reach the acceptable level for bringing production in-house. At the same time, the metallic dry ink performance cannot negatively impact the CMYK image quality performance either. Ideally, the desired metallic image is attained in one pass as on the Color 1000i Press.

- **Ease of Use:** The system integration and operability must be capable of being successfully supported with standard operator skill sets, and not "press master" expertise, if early and widespread adoption of the metallic dry inks usage volume is to grow.
- **Productivity:** Adding metallic dry ink into a CMYK printing process has typically required a significant negative productivity impact. The Color 800i/1000i Press is capable of running metallic dry ink at full productivity for the media size and weight being run.
- **Economics:** To be commercially viable, relatively low capital costs and effective operating costs must be met, so the premium value results in solid operational profits.

Projected Metallic Dry Ink Print Costs



Wedding Invitation

- 2-up on 12" x 18" Duplex
- 14.5% area coverage of gold metallic dry ink
- Cost per 12" x 18" sheet with two invites = \$0.0534
- Cost per invitation for metallic dry ink = \$0.0267



Anniversary Card

- 2-up on 12" x 18" Duplex
- 5.79% area coverage of silver metallic dry ink
- Cost per 12" x 18" sheet with two cards = \$0.0214
- Cost per invitation for metallic dry ink = \$0.0107



Open House Invitation

- 2-up on 12" x 18" Duplex
- 15.1% of gold metallic dry ink
- Cost per 12" x 18" sheet with two invites = \$0.0557
- Cost per invitation for metallic dry ink = \$0.0278

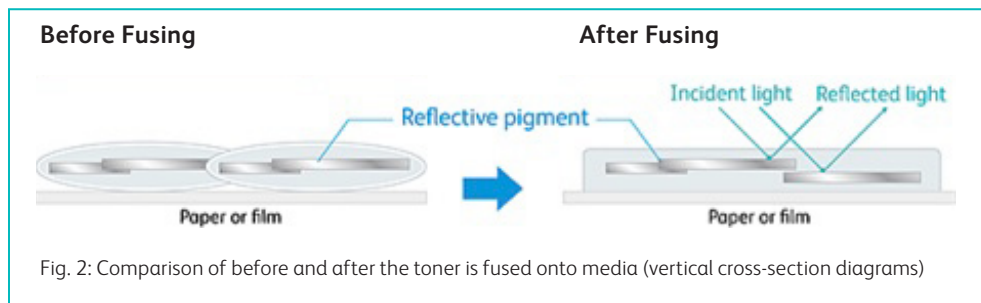
Printing companies and enterprise print operations can expand their businesses by applying silver or gold dry inks to company logos, brand collaterals, graphic images and photos, headlines, names or virtually any visual or text element. Popular applications include menus, invitations, key fobs, stickers, folders, business cards, lottery tickets, art posters, award/recognition certificates, letterhead/insignias, window clings, newsletters, direct marketing campaign pieces, greeting cards, photo books and photo gifting. Basically, printers using the metallic dry inks find that if a printed piece—with silver or gold—can be imagined, they can add value to that output with the Color Press metallic dry inks.

Section Four Technology Innovation

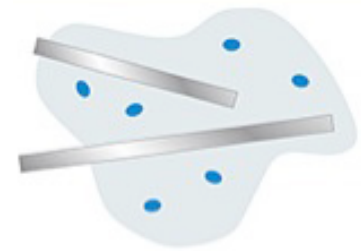
In recent years, metallic printing that can reflect light has been growing in popularity for its versatility and ability to create a dramatic impression. It is used for various application purposes in the printing industry such as greeting cards, book covers, labels and packages. Our Xerox venture partner, Fuji Xerox, made it possible to use a reflective pigment by adapting the emulsion aggregation (EA) method used to produce color press toner, thereby succeeding in developing silver and gold toner that is capable of the energy-efficient, low-temperature fusing achievable with EA-Eco toner while maintaining a high sheen.

With the conventional pulverization method, it was only possible to produce unevenly shaped toner particles whose reflective pigment particles were not oriented consistently. Also, the conventional toner particles had pigment particles that were not completely contained within the toner particles and protruded outside, resulting in image defects due to insufficient charging and transfer defects from electricity leakage caused by the protruding pigment. Therefore, it was difficult for this toner to be used with the xerographic system. To address this, Fuji Xerox utilized and adapted the EA method to orient the flat reflective pigment particles in the same direction, thereby developing ellipsoid-shaped toner particles that can fully contain the pigment particles. This new method allows the toner to meet both the basic performance requirements for toner as well as the performance requirements for metallic printing. In this way, this toner can be used with the Color 800i/1000i Press' xerographic system (Fig. 1).

By making the shape of each toner particle into a flatter ellipsoid shape, it is possible to align the orientation of the reflective pigment particles that are contained within the toner particle with the long direction of the toner particles. Hence, when toner is transferred onto media (paper or film), its pigment particles lay parallel to the media, allowing for higher reflection of light from the pigment after the image is fused onto the media to achieve a high sheen and create a metallic appearance (Fig. 2).



Conventional Pulverization Method



Utilizing the EA Method

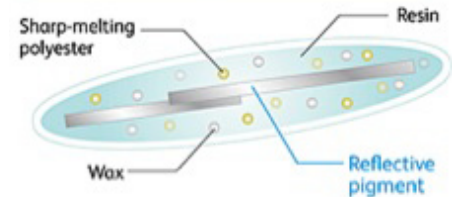


Fig. 1: Comparison of toner particles produced using the conventional method and the new method (vertical cross-section diagrams)

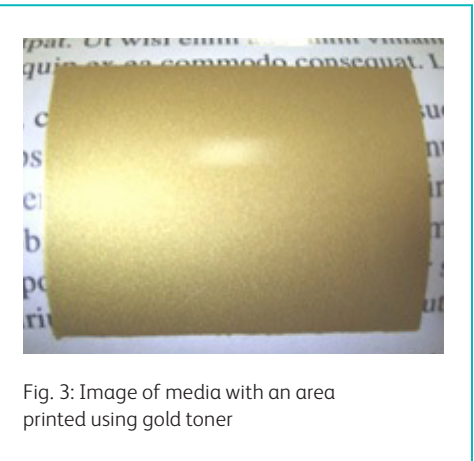


Fig. 3: Image of media with an area printed using gold toner

This reflective pigment does not allow light to pass through it, and therefore the color of the underlying media does not show through in areas where this toner is printed. This means that images with a highly metallic appearance can be printed not only onto plain white paper but also onto various other kinds of media, such as media that already has printed text, colored paper and transparent film (Fig. 3).

Section Five

Efficiencies or Return on Investment of the Technology

Managing the commercial print shop during the post-2008 economic recession has required commercial printers to drive significant cost containment to stay competitive and maintain business health. Xerox market research reveals significant pressures exist for commercial printers including increased price competition in local, regional and national markets. Demands continue to mount for faster turnaround times, resulting in shorter job run lengths (59% of print providers cite turnaround pressure and 75% of four-color jobs total less than 5,000 prints).

These ever-tightening market pressures require commercial printers to drive internal operational efficiencies and advancements. The printer needs to bring more jobs and pages into the shop to help run a more efficient business model. But where will that end? Standard four-color digital printing only, means a commercial printer is surrounded by fierce competition. Achieving profitable revenue growth during a business environment of intense competitive pressures requires something more: providing enhanced value! Printers must establish differentiating value as a competitive advantage. In short, this brings not only more jobs and pages but more high-value jobs into the shop.

Bringing Xerox® silver and gold metallic printing capability in-house enables printers to provide the required value to meet their customers' demands with new and different marketing applications, resulting in more high-value jobs and pages. Now the printer has options to offer: marketing collaterals and campaigns, direct mail and photo applications, all specifically designed with silver and gold metallic eye appeal to deliver stunning, high-impact jobs. This value, accompanied by relatively low capital costs and market pricing, results in a high return on investment (ROI). Now printers can provide their customers with stand-out print pages while obtaining a premium of 50–60% over CMYK-only applications, even using conservative estimates. For example, a Xerox customer previously sold 500 offset-printed metallic business cards for \$200.00 with a 40% gross profit margin. Today, for the same job using a Color 1000i Press instead, the printer sells the business cards for the same total dollar amount but nets a gross profit of 95%.

You can see that this can lead to the ability to pay for the capital technology costs approximately 35% faster (in terms of months to payback) as compared to CMYK-only market prices, even inclusive of the added \$25,500 capital costs for the silver and gold metallic dry ink options. The printer can drive an enhanced business model leveraging increased revenues, positive cash flow and profits, allowing for aggressive pay down of capital debts while expanding capacity and differentiation in targeted growth areas. These options provide a distinct competitive advantage.

Investment in Xerox® Metallic Dry Ink provides competitive differentiation, high-value job and page growth with substantial ROI and flexibility to thrive in a very competitive market, and enable a stronger business and a stronger future.

Source: InfoTrends/CAP Ventures, NAPL

