

Cork Tech Talk News

Manufacturers of Waterbase, UV+EB Curable Coatings, Varnishes and Adhesives

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INK JET COATINGS

Are *ink jet applied coatings* in our future?

WHERE DO COATINGS FIT?

Well, as you read on you'll see that ink jet technology has been developing at an accelerating pace for unique applications in all of the traditional graphic arts print markets. Coatings will become a factor in many of these applications as finish (gloss) and protection is sought, as it is today. Because we can ink jet, using dye and pigment based inks of a variety of types, water, solvent, UV, it follows that we can ink jet clear coatings as and where desired.

Most of us are familiar with ink jet printers in that these printers have saturated the home, and office desktop computer market.



Currently, the ink jet printing market is enjoying tremendous growth as the technology is moving to industrial applications. Wide format printing, 24 to 72 inches wide, for indoor and outdoor application is one such area receiving attention, as is digital photo printing. Both of these are forecast to see double-digit growth.

These new innovations cannot help but have a major impact on the print markets of the future.

One estimate places the present Global ink jet ink market at \$15 billion and growing, with most of this volume in the small office/home office market. Digital printing technology is forecast to grow into all areas of print. Some forecasts predict that digital technology can penetrate 10% of the current total print volume within 10 years.

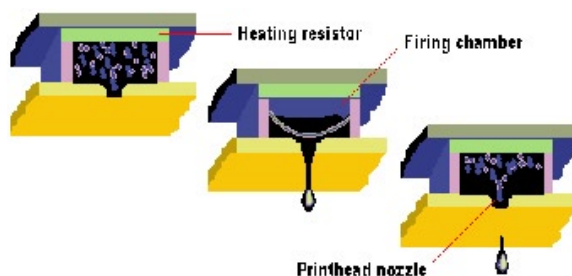
Because digital printing technology lends itself to short runs (demanded by today's customers), along with it's ability to print fully variable data, ink jet printing is the

print method that some think will dominate. Markets that have great potential are sampling, food, beverage, pharmaceutical and corrugated packaging, commercial printing, narrow web, labels and consumer products.

HOW DOES INK JET WORK?

Ink jet printers use a series of nozzles (in a print head) to spray droplets of ink onto a substrate, and are known as "Drop-on-demand type", defining the way in which ink is handled. They are either thermal bubble or piezoelectric in concept. The first bubble jet printers were shown in 1977, sold in the late 1980's and dominate the desktop market today.

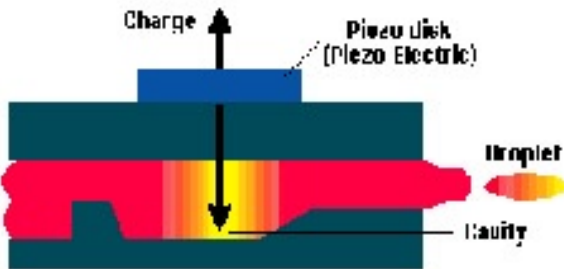
In bubble jet, ink is heated by an electrical impulse causing some ink to vaporize, forming a bubble. As the bubble expands, pressure forces ink from a nozzle. The bubble then cools, contracts (collapses), and creates a vacuum, which pulls more ink into the nozzle starting a new cycle. A typical print head has 300 to 600 tiny nozzles all of which can eject an ink droplet simultaneously.



In piezoelectric ink jet printers, ink droplets are produced by the effects of a transducer using piezo crystals at the back of the ink reservoir of each nozzle.

A small electrical charge triggers the crystal to vibrate. As the crystal vibrates inward, the motion forces a small amount of ink from the nozzle. When the crystal vibrates outward, the motion pulls additional ink into the reservoir replacing the droplet sprayed out.

OVER



The piezo method controls the shape and size of the droplet release better yielding perfectly round, smaller droplet size and higher nozzle density. Additionally, the ink does not have to be heated and cooled between each cycle as it does in thermal bubble ink jet technology.

Ink jet dots are very small usually between 50 and 60 microns in diameter. The diameter of a human hair is 70 microns. The dots are positioned with extreme precision and resolutions of 1440x720 dots per inch (dpi).

Color ink jet printers combine multiple colors to create fine imagery. Four-color (CMYK) printers have been common, with six-color models (adding lt. cyan & lt. magenta) now being directed to photographic quality printing.

Virtually all desktop, ink jet printers utilize water/solvent-based inks although some commercial/industrial inkjets use oil-based inks. Currently UV ink applications are growing.

Ink jet printing offers the potential for printing on almost any of the materials currently used by the printing industry given the advances in print head technology and the ability to use a wide range of ink chemistry. Further, ink jet is a non-impact printing technology, offering the ability to print on irregular substrates.

Piezo ink jet technology, because of its advantages, has become the technology of choice with tremendously robust print heads arriving from R & D. Considerations for faster printing speeds and ink drying issues have led to more and more interest in UV ink technology.

UV inks simply do not dry up in the nozzle. Print head reliability is high and maintenance is low. UV inks dry/cure instantly producing high print resolution. The forces driving UV ink jet technology are these properties, as well as low emissions, chemical resistance, and adhesion to a wide variety of substrates.

Markets spurred by UV ink jet properties are moving from just printing data to printing decoration, i.e., textiles, wood laminates, wall and floor coverings. Additional areas of application interest are signage, security, labeling, screen-printing, direct mail, smart cards, rigid plastics and aluminum products

WHAT FUTURE FOR INK JET?

The handwriting appears to be on the wall. Ink jet is here to stay with new developments bringing us new applications across the entire traditional graphic arts print industry.

Some of these applications will require an aesthetic look that is glossy, satin or matte, a look that is only available from coatings.

Aside from attention grabbing aesthetic appearance factors, liquid coatings can offer a range of desirable rub-scuff, water, chemical, packaged product and light (fade) resistances. Tougher products are those that are based on UV cross-linked chemistry where tight knit dry films are developed after the liquid coating is fully cured.

When pondering the protection of graphic arts products, consider the economic benefits of liquid coatings and varnishes, both aqueous and UV, especially UV when you're seeking higher gloss, scuff and chemical resistance.

LOOK TO CORK! for all of your aqueous, UV & EB coating, varnish and adhesive needs.

References

<http://www.pctechguide.com>

<http://www.industrialtechnology.co.uk>