

China: The Source for Low Cost, High Quality Ink Jet Supplies

*Ray A. Work, III
Work Associates, Inc.
Hockessin, Delaware, USA*

*Guangbin Zhou
RBT Associates, Inc.
Edina, Minnesota, USA*

Abstract

Many inkjet ink and ink jet media technologies have become mature. Both the technologies and the raw materials to produce these products have become available from numerous sources worldwide. As a result first world, third party suppliers have come to market with lower cost, satisfactory alternatives to those supplies provided initially only by the printer manufacturer. Now, as a result of this state of development, the next step in the maturation of these products has begun. The migration from high tech, first world manufacturing to the developing world is underway. This paper describes the state of this migration with some specific examples of products that have undergone this movement and the resulting effect in the marketplace. A prediction of future trends will be presented as well.

A new dynamic will be described where the maturation process is being short-circuited by taking new technologies directly from the high tech, first world to the developing world resulting in lower cost, high performance products for this marketplace much sooner. This is resulting in significant benefits for the industry and the consumer.

Introduction

This paper will focus on consumables for wide format ink jet printing generally applied to the graphics markets. The principles and trends in other ink jet markets are following the same path to third world manufacturing.

Ink Jet Inks

With the development of industrial ink jet print heads and their adaptation to wide and grand format printers replacing air brush actuators, solvent based ink jet inks were developed in the US and in Europe to provide high quality, reliable performance. Initially these inks were only available from ink manufacturers specified by the printer manufacturers. Purchasers of this expensive equipment and the warranties and service agreements provided by the manufacturer precluded the printer owner from

searching for alternative sources of lower cost inks. As the market has matured and warranties have run out many printer owners searched for lower cost alternative ink solutions. Initially those inks came from first world, third party manufacturers. This competition provided by these new ink sources resulted in lower prices from both the printer authorized ink suppliers and from the third party suppliers. Even these prices were too high for many printer owners especially those in third world countries. In China over a relatively short period the market shifted from imported authorized inks supplied by the printer manufacturer to third party imported inks then to domestic ink manufacturers. The retail price for output produced in China through this period decreased very rapidly as shown in Chart 1.

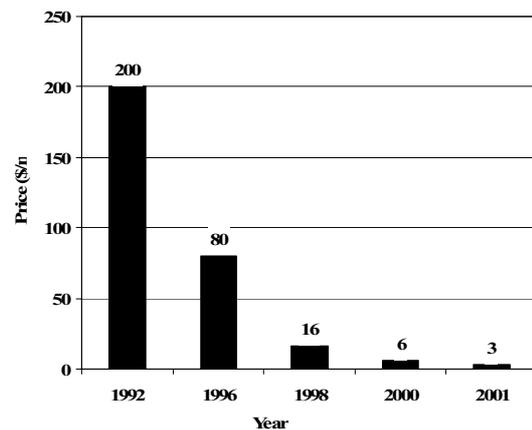


Chart 1. Retail Sales Price in China for Solvent Inkjet Printed Scrim Vinyl [Price (\$/sq. meter) vs. Year]¹

Although these domestically consumed inks would not meet the quality needs of the markets in the US and Europe these ink manufacturers are working to produce inks which will meet first world needs. With help from first world scientists acceptable inks are now being produced and are beginning to find their way to the US and European markets. With much lower profit margin

expectations and lower labor and material costs Chinese companies will make these inks available to the world market driving the prices of solvent ink jet inks down by as much as 50%.

Wide Format Ink Jet Media

Fast drying, microporous, ink jet coatings applied to plastic films like cast vinyl, fabric reinforced vinyl and oriented polypropylene were introduced shortly after pigmented water based inkjet inks became available in the mid-1990s. The technology has now matured and these products are now produced in China, Korea and Taiwan and sold at very low prices throughout the world. Most producers produce these products with low cost raw materials on substrates which are variable in quality and selected for their low cost. In developing countries these products are selling well but in the US and Western Europe most service providers reject them for their poor quality. The same forces are in play here as with the solvent based inks discussed above.

Seeing the opportunity, one US manufacturer has formed a joint venture in China to produce product on equipment capable of producing world class coatings. Incorporating high quality raw materials and substrates and using first world quality principles this joint venture is producing high quality products for distribution to both private label and printer manufacturers in the US and Europe. The low cost of materials, inexpensive manufacturing facilities and labor have enabled the joint venture to offer these world class products at a fraction of the cost of US and European manufacturers. This has led to substantial cost reduction all the way down the supply chain to the service provider.

One specific example is water resistant microporous 15 oz. scrim vinyl used for making short term outdoor banners. In 2001 the street price was about \$1.25 per square foot, today high quality product produced in China can be purchased in the US for about \$0.65 per square foot. Two factors allow this price reduction without a reduction in quality. First the vinyl substrate is produced in China as are most of the materials used to produce the coating. Second the supply chain is made more efficient through direct sales to the service provider eliminating the two step distribution so common in the US. With this drop in price point there continues a rapid swing in buying patterns. Even printer manufacturers and US coating companies have started purchasing this Chinese manufactured product branding it as their own.

The Next Step – New Technology

With the capabilities now in place the next step is to take new technology directly to China for manufacturing without waiting for the technology to mature. An example is a new water resistant block out, opaque scrim vinyl for water based inks. This product incorporates never before

used technology to improve physical durability and adhesion of the coating to vinyl. In addition it achieves a level of whiteness far beyond that ever made available to the market for this class of product. In Table 1 a whiteness comparison of several products currently offered are compared to the new product.

Table 1²

Products Name	Whiteness	L*	a*	b*
Kodak WR Reinforced Flex Banner	99	92	0.5	-4
LexJet Thrifty Banner	99	92	0.8	-4
HP Scrim Banner	74	94	-0.4	-2.6
New WR Blockout Scrim Vinyl w/ Prelume [®]	134	92	4	-11

Conclusion

The above examples show the sequence of events in the maturation process for ink jet printing consumables. In the past it took a number of years to progress from innovation to commoditization. Today this process is beginning to be short circuited with the introduction of new technology directly to third world manufacturing. The quality and cost of products produced in China have now reached the tipping point. Printer companies and large private label suppliers are embracing these Chinese products which provide them higher margins and the customer a better value. It must be mentioned that products being offered by some Chinese manufacturers are designed for the low cost, low quality marketplace which exists there. For most first world customers these products do not meet their needs. .

References

1. Guangbin Zhou, ICISH '2004, September 15-19, 2004, XI'AN, P. R. China.
2. Private communication Shandong Limei Digital Technology Materials Co., LTD.

Biography

Ray A. Work, III received his B.S. degree in Chemistry from Auburn University in 1966 and a Ph.D. in Physical Inorganic Chemistry from the University of New Orleans in 1971. Following a one year post-doctoral research fellowship at the University of Hawaii he joined DuPont as a Research Chemist at the Experimental Station in Wilmington, DE. At DuPont he initiated and lead the development of DuPont's inkjet ink business. Upon his retirement from DuPont in 2001 he formed Work Associates a consulting, advising and brokerage firm for products from the P. R. China. For more information check www.workassoc.com.