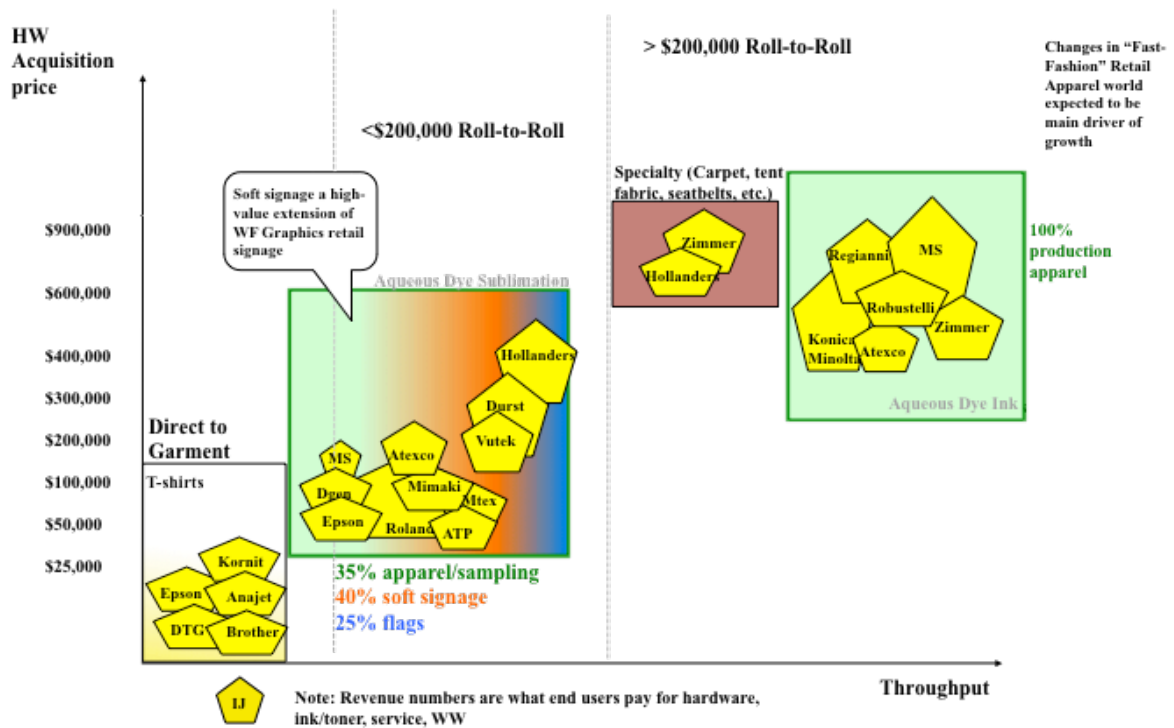


Ink Jet Textile Printing Forecast 2014

The textile ink jet market is one of the most dynamic ink jet printing markets in the world. After ink jet technology's decade and a half sputtering entry of focused on printing textile sample books and high-value soft signage, breakthroughs in ink jet productivity plus the creation of the "Fast Fashion" business model by apparel retailers has opened up a new chapter for production ink jet technology in textile printing.

The ink jet textile print market can be segmented into three segments: Direct-to-Garment (T-shirt printing), Roll-to-Roll < \$200,000 printers (mostly soft signage), and Roll-to-Roll > \$200,000 printers (apparel printers).

Figure 1 Textile Ink Jet Printer Market Segmentation

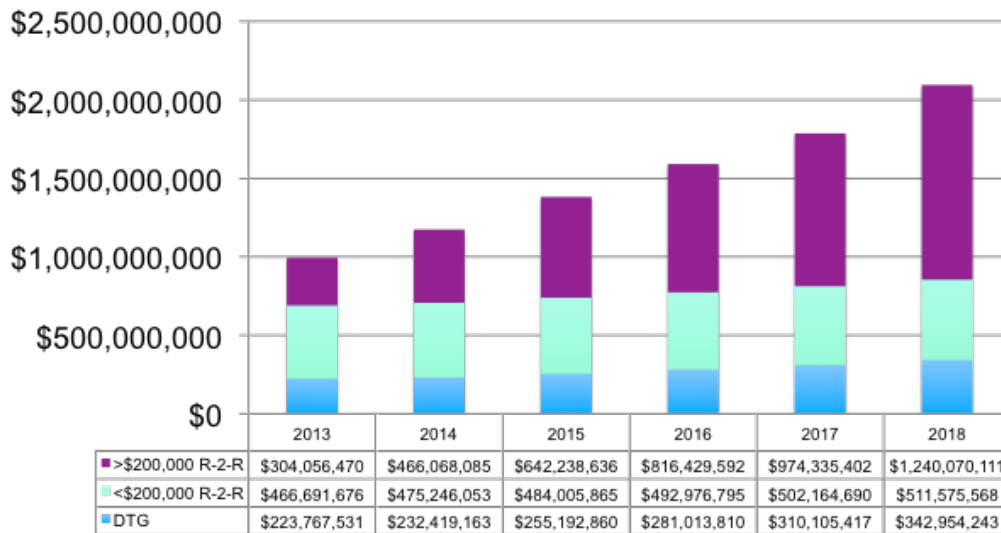


Source: I.T. Strategies, Inc.

The ink jet textile market is projected to reach equal revenue to production ink jet document printing markets by 2018, with a completely separate set of manufacturers, different distribution channels, and different customers. Even within the textile ink jet market each of the three market sectors have different manufacturers, distribution channels, and customers.

Figure 2 Projected Ink Jet Textile Printer Hardware and Ink Revenues, 2013-2018, WW

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Direct-to-Garment (DTG)

After 15 years of existence, the ink jet direct to garment market has matured. There are two segments within the DTG market: low-end (<\$15,000 printers) and high-end (>\$15,000 printers). In the low-end sector, historically nearly all printers sold were based on Epson 17" wide format graphics printers, Epson printers that were bought on the open market and modified without Epson's consent. Third-party manufacturers converted the Epson printers so that they were able to print on platens where a blank T-shirt was stretched underneath the printheads. Nearly all models printed with specialized aqueous pigmented inks, inks that were fixed to the T-shirt through a heat press. Over 20,000 of these units are still active today, mostly in use by local screen shops and small-scale entrepreneurs.

The ability to print a single T-shirt economically (as no screens needed to be created) created the high-end DTG market by opening up the market for web-to-print providers. In the US in particular there are at least three web-to-print providers each printing well over 1 million ink jet T-shirts annually. Those providers needed more productive printers and often purchased high-end bespoke DTG printers from Kornit, Brother, and Anajet that used non-Epson piezo print heads. This market is expected to continue to grow independently from the low-end DTG market. The low-end DTG market is in radical transformation.

After years of implicitly condoning the use of its printer technology, Epson launched at the beginning of 2014 its own dedicated DTG printer. This printer (F-2000) features Epson's newest thin-film printhead technology and Epson's own textile ink jet inks. The print quality and hardware durability benefits from a printer designed from the ground up plus Epson's marketing and distribution infrastructure resources have left a shrinking opportunity for third-party manufacturers that modified Epson printers. Many of them have in fact stopped manufacturing printers and have become Epson resellers.

While Epson's resources are likely to expand the demand for DTG printers once sales are fully underway in 2015, its products are also projected to be more durable. This projected durability reduces the demand for printer units as not only will the units last longer, but also up time is projected to be improved. The net result is strong growth for DTG output, but moderate growth for hardware placements.

<\$200,000 Dye Sublimation Roll-to-Roll Ink Jet Textile Printers

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The first roll-to-roll ink jet printers were introduced in the mid-1990s. Initially products were used for the creation of sample books, books that had swatches of printed fabric that are shown to fashion buyers to help the apparel manufacturers hone in on what designs to create for the next fashion season. Following were soft signage and flag printing. The latter two accounts for about 70-80% of the print volume produced on these printers today.

Demand for these products is growing moderately, at an estimated 4% compounded annually from 2013 to 2018. It could grow faster, contingent upon two factors not included in our projection assumptions:

- 1) A dramatic reduction in retail cost/print for soft signage, making it competitive with vinyl printed signage (soft signage is 2-3X more expensive than vinyl signage today)
- 2) Faster than expected adoption of these <\$200,000 devices (at the expense of >\$200,000 devices) for apparel production in emerging countries within 24-hour driving distance of developed economies

It is unlikely a dramatic reduction in the retail price of soft signage will occur during the forecast period. Due to the higher cost (and value) of soft signage compared to vinyl signage soft signage works best economically where it can be hung 2-3X longer than vinyl point-of-purchase signage. This cost premium effectively eliminates for now a large portion of point-of-purchase signage, the largest application in the wide format graphics signage market.

Regionally the majority of these printers are sold in Asia, as this is where the majority of sampling printing and apparel production occurs. Chinese player Atexco – who rarely sells outside of Asia– occupies a large share of the market.

The majority of these products print using dye sublimation inks. Using a transfer process is most common, rather than printing directly. Dye sublimation inks work well on polyester that is common to both soft signage and apparel – especially sporting wear apparel whose function has extended well beyond sporting activities into daily wear clothing. With improvements of the look and feel, no longer is polyester considered an inferior material for clothing.

>\$200,000 Roll-to-Roll Ink Jet Textile Printers

The >\$200,000 roll-to-roll ink jet textile printer market, also sometimes referred to as the production apparel ink jet market, is a market that has crossed the “Chasm” and is in the beginning phase of its inflection point upward. Fast fashion retailers like Inditex (Zara), H&M, C&A, Forever21, Uniqlo, and others dramatically altered the business model of the fashion industry during the last five years. Instead of only competing on the lowest price, they have discovered that competing on the latest fashion (and turning that fashion more frequently) has enabled them to dramatically reduce the industry standard discounts (typically in excess of 30%) at retail. As a result those fast fashion retailers have become more profitable than the industry average – and spurred on by their success – are continually looking to speed up the time to market. For those fast fashion retailers production is starting to shift out of Asia (and corresponding time on the slow boat to market) to other emerging market economies closer to the point of retail (Turkey, Mexico, etc.).

Ink jet printing of textiles is further enabling the fast fashion retailers to compress the turnaround time from design concept to retail rack. Due to the volumes required, the <\$200,000 ink jet roll-to-roll printers are often not productive enough. This, coupled with dramatic increases in ink jet productivity through wide array serial printing and now

turnaround time from design concept to retail rack. Due to the volumes required, the <\$200,000 ink jet roll-to-roll printers are often not productive enough. This, coupled with dramatic increases in ink jet productivity through wide array serial printing and now even single-pass ink jet printing, is causing the >\$200,000 to grow upwards of 20% compounded annually from 2013-2018.

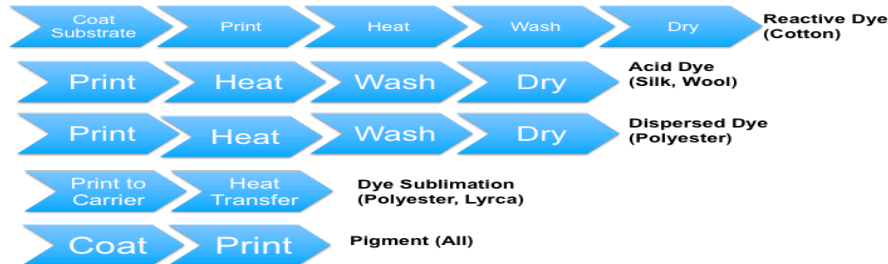
Regionally nearly 50% of units are installed in the European Economic Community (incl. Turkey). Other Asian countries outside of China also play a large role (Vietnam, Bangladesh, Philippines, etc). The majority of these models use reactive and disperse dye ink as much of the output is focused on higher value cotton products. Dye sublimation inks are also used in this product category.

Of note is that MS was sold to Dover Corporation in early 2014 and that Robustelli is closely tied to Seiko Epson Corporation. Reggiani is the last remaining large independent manufacturer left in this >\$200,000 ink jet textile printer market.

Textile ink types by application usage

There are many different types of aqueous ink jet inks used in textile printing. The difference is dictated by type of fabric and number of post-processing steps required. Ultimately there is a desire to print with fewer steps, favoring aqueous pigmented ink. However, the performance of pigments inks for vibrancy and washability are not yet at the level required by users of natural fabrics.

Figure 3 Textile Ink Jet Ink Types by Common Substrate



Source: I.T. Strategies, Inc.

The Bottom Line

Ink jet textile printing is a dynamic market poised for fast growth. Demand is driven mainly by the technologies' ability to compress turnaround cycles in fast fashion, the ability to add-value to display signage through more luxurious and lighter to transport substrates, and the ability to print micro-runs as low as one piece (DTG). There is little overlap between ink jet textile and other ink jet applications in terms of substrate and distribution channels, and even within the three textile segments there is great difference between these. This fragmentation has kept the market in the hands of smaller, fast moving printer manufacturers. With the scale and growth rates of this market now in view of larger ink jet players, we expect upcoming participation from larger ink jet players as well as consolidation/acquisition of existing manufacturers to continue.

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