

WHITE PAPER



The Promise of Plastics:
Adding Synthetic Substrates to Print Service Portfolios
Can Build Business with New and Existing Clients

Note: This is first of a four-part series covering printing on plastics. This first article will provide an overview of the medium, while the second part will explore how to develop new business opportunities with plastics. The third part will delve into testing and qualification as well as the importance of collaborating with your ink and substrate suppliers. The fourth and final article will highlight a case study of how print service providers have successfully diversified and grew their respective business by incorporating plastics into their portfolios.

Today's marketplace for commercial printers remains challenging, as the economic downturn has led to reductions in print jobs across all market segments.

As print service providers find themselves with excess capacity, many are looking for ways to diversify and expand into new markets and some have already done so by printing on plastics.

Once the domain of screen and narrow web presses, printing on plastics has become a viable option for sheetfed offset. While financial statements, books and magazines, and newspapers are offset staples, the applications and market segments plastics offer can help differentiate a printer.

In-store marketing applications for windows, floors, carpets, banners, and counter-tops to graphic advertising for busses, trains, taxi tops, and bumper stickers can add to the portfolio of offerings a printer can provide to their clients. Being able to provide unique, high-quality products on plastic substrates will help differentiate a printer from their competition and secure new business.



A promotion for The Scott's Miracle-Gro using FLEXmark® floor art™ yielded a 29% increase in product sales at Klem's, an eclectic department store located near FLEXcon's headquarters in Spencer, MA.

So What Do We Mean When We Say Plastics?

The term “plastics” is a generic term that encompasses a variety of synthetic and polymeric substrates. While substrates such as styrene, acetate, and PVC are the more commonly used, there are a number of other polymeric substrates that printers can use to diversify their product offering, once surfaces are primed. For example, polyester, polypropylene, polyethylene, polycarbonate, Tyvek®, and others are all now available to offset printers from quality substrate manufacturers. Furthermore plastic, self-adhesive substrates can provide glow-in-the-dark and prismatic effects as well as textured, metalized, and reflective properties before they are even printed, setting the stage for a host of application possibilities.

Although plastics offer numerous aesthetic options, they also offer many functional attributes. Characteristics such as tensile strength, chemical resistance, and flexibility, along with resistance to environmental conditions such as moisture exposure, UV light exposure, and temperature extremes, are all inherent properties of plastics, and in turn offer diverse application possibilities well beyond what paper can. That’s not to say that plastic is better than paper, it is just different, and it is the differences between the two printing mediums that make them complementary.

Challenges Associated with Printing on Plastics

With the consideration of incorporating plastics into one’s product offering; there are usually questions that need to be addressed. While some points may seem prohibitive at first, a closer look with a better understanding of them may reveal a long-term opportunity. For example, a sheet of plastic is more expensive than a sheet of paper. On the surface, the relatively high-cost of plastic substrates seems overwhelming; however, once it is realized that the profit margins on plastics are greater than paper, the price per sheet only adds to the overall profit margin. It is how the plastic substrates are used that drives the profit margins, and the end-uses are such that paper cannot fulfill the requirements of those applications.

Still considering the higher cost of plastic substrates, waste is a major concern. Material waste can be the “make or break” aspect of printing on plastics. When it comes to waste on press, there are two major contributors, inexperience with the substrate, and inferior substrates, both of which can be augmented by working with a substrate manufacturer. With respect to knowledge of the substrate, those that manufacture them are well-versed on their printability and processing on many different types of printing equipment. That knowledge and experience can be shared with new clients to help minimize waste when specifying and qualifying new substrates. Equally as important is the integrity of the substrate. To sell high-end products, high-end substrates need to be used, as they will generate less waste and minimize press downtime. Aspects such as lay-flat, printability, and consistency are all hallmarks of quality substrates. Spending less time “working through” cheaper substrates, increases the overall profitability of the job, and allows for greater productivity.

Another important topic when discussing printing on plastics is ink adhesion. Unlike paper, ink does not absorb into plastic substrates; therefore, ink adhesion can be challenging, and requires additional attention.

Most plastic’s printability is essentially dependant on its surface tension. If the surface tension of a plastic is too low, proper wet-out will not be achieved, and ink will not properly adhere to the substrate. While methods such as corona treatment and flame treatment do help to raise the surface tension of plastic substrates, their inconsistency and degradation over time make them unreliable and inconsistent options. A primer however, offers a uniform, consistent, and reproducible surface to print on, regardless of the press configuration. Coupled with the proper ink system, ink adhesion and quick ink dry-times on plastics are achievable on a consistent and reliable basis.

Primed Substrates

Much like priming the bare metal of a car before painting, plastic primers provide the necessary higher surface tension of the plastic than that of the ink for proper ink adhesion.

The benefit primed substrates offer, other than making the surface of plastics printable, is consistency. There are many different types, brands, and compositions of plastics, each requiring a special set-up and ink system to print on, which may not even work. A pre-primed substrate, however, provides the same surface to print on, time after time, regardless of the substrate. Whether printing on polyethylene, polypropylene, styrene, or any other plastic, if the same primer by a quality substrate manufacturer is used, the print surface is essentially the same.



Dock 86, a discount furniture store in Little Canada, MN, recently launched an in-store marketing campaign using FLEXcon films for alternative advertising on floors, walls, windows and countertops.

Primers for Conventional Inks

When printing with conventional inks on plastics, primers are almost always necessary. Primers provide the inks with a layer to “bite” into for proper ink adhesion. Even though the primer provides a layer to print on, the proper ink system must be used. Many ink manufacturers produce ink series designed for plastics, which speaks primarily to their ability to quickly oxidize. On plastics, there is no absorption to facilitate dry-times; therefore, the appropriate ink, coupled with the proper use of drying powders, fountain solution composition, lift size, and relative humidity are all necessary for quick drying. Primers, however, are the only reliable method of providing proper ink adhesion for conventional inks. Quality substrate manufacturers who provide primed substrates for conventional offset printing are often very familiar with the many conditions that effect dry-times; they can share their experiences with their clients to help them meet their delivery requirements.

Primers for UV Inks

Many may agree that primers are necessary for conventional printing, but what about those printing UV? The general misconception is that UV-curable inks can print on anything. Even though UV curable inks may cure quickly, ink adhesion is a separate issue. Proper surface tension is still necessary, regardless of the curing system. Furthermore, UV inks shrink during curing. The thicker the layer of the ink, the more volume there is to shrink. The shrinking of inks causes a loss in ink adhesion, which primers can assist with by providing a more stable surface at the time of printing.

UV curable inks also present an issue for ink adhesion if they are either under-cured, or over-cured. Inks that are not fully cured do not cross-link effectively, and result in poor ink adhesion, while over-cured UV curable inks can become brittle, and result in lower adhesion from being inflexible.

One Primer, Two Ink Systems

Whenever there is demand for something, a solution is most certainly to follow. The only problem, however, is that there may be many demands and just as many solutions. To be able to provide one primer for two ink systems is ideal, and that is exactly what FLEXcon set out to accomplish.

With the development of the single primer for both conventional and UV offset inks, FLEXcon set out to test and trial their product offering with the leading offset press and ink manufacturers. Working with Heidelberg, KBA, and manroland, FLEXcon tested and qualified numerous substrates on press to verify not only their printability, but also their processing. Aspects such as feeding, curl, static, and stretch were considered and then tweaked as necessary, to provide a product that runs on press without issue.

FLEXcon worked with ink manufacturers at the FLINT Group, INX, Megami, Sun Chemical, and TOYO to test ink adhesion on over 38 different substrates. The more than 5,500 individual data points that were gathered from concurrent testing at both FLEXcon's labs as well as each ink individual ink manufacturer's labs, confirmed that their multi-functional primer works to provide superior ink adhesion with both conventional and UV offset inks.



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Primed for Success

Plastic substrates can certainly provide new revenue streams within your existing clients and help you with new client opportunities. Adding plastics to your product offering can even help printing companies reinvent themselves as a more complete print services provider.

Moving forward, a printer is best served by collaborating with companies that can offer robust and comprehensive lines of off-the-shelf and custom products. The choice of supplier should focus on not only their technical know-how and product capabilities, but also their market knowledge of how and where to sell these new capabilities.

These aspects and more will be explored in the second part of this series, which is scheduled for release on April 30. In the meantime, if you have questions or comments, contact the Product Branding Business Team at (508) 885-8370.

**Tyvek is a registered trademark of DuPont.*



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About the Author

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About FLEXcon

FLEXcon is an ISO 9001:2008 worldwide manufacturer of pressure-sensitive films and adhesives for applications including indoor and outdoor advertising, bonding/mounting, and product identification, safety, hazard, bar-coded, and primary labels. The company's Value-Better-Supreme (VBS) product offering is the most extensive standard product offering in the pressure-sensitive film industry. FLEXcon is also a leader in developing custom solutions to meet unique converting or application needs. FLEXcon's mission is to provide its customers the highest quality products with exceptional service. The company is headquartered in Spencer, Massachusetts, and has operations throughout North America and Europe, with distribution worldwide. For more information on FLEXcon, visit www.FLEXcon.com.



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