



Digital Printing Inks

At the center of any digital printing system is the ink, which consist of the carrier fluid as well as the colorant itself, a pigment or dye. The purpose of the ink is to deposit the pigment and bind it to a media's surface. To ensure print quality and minimize costs associated with printing, it is essential to optimize ink cleanliness through filtration. Introduction of particles into ink can occur at many points in the manufacturing and printing process, thus it is necessary to remove oversized pigments, agglomerates and other types of environmental contaminants in order to avoid plugging print heads and nozzles, minimize downtime, and optimize image quality.

Digital printing or inkjet inks are made of various formulations which use different carrier fluids to deliver the ink to the surface. As the ink is deposited on the surface, it must travel through a microtube and orifice making digital inks a filtration intensive process. The choice of filters will depend upon the carrier fluid, the source of color (pigment or dye based) as well as the color itself, as not all colors filter equally.

Pigment-Based Inks

The filtration of pigment-based inks, whether water-based or solvent based, would be considered a classifying application, requiring a filter capable of passing the pigments essential for the color while capturing agglomerates, gels and other contaminants. Since gels and pigment agglomerates are deformable, it is often necessary to utilize a depth type filter matrix between 0.45 and 1 micron to ensure capture. Melt blown depth filters are often used, but hybrid



pleated depth media provide the advantage of depth capture while providing significantly higher surface area which translates to improved capacity and flow rates and reduce operating pressures to further enhance capture.

Dye-Based Inks

Water is a low cost and relatively sustainable carrier fluid for the water-soluble dyes. The water must be dried, requiring energy input and increased production time (reduce press speeds). Filtration tends to be less challenging for dye-based inks since gels and agglomerates are not usually present, thus particle filtration down to 0.45 micron is typical. Membranes such as polyethersulfone (PES) are commonly used due to its high flow and capacity characteristics. For certain colors and dyes, glass filter media (0.45) is an



Stratum A Series melt blown depth filters deliver 99.9% efficiency at the stated micron. The multi-zone melt blown depth structure uses a graded pore structure for maximum dirt holding capacity.



The QXL is a hybrid pleated depth construction combines graded pore structure with high surface area for excellent gel and agglomerated particle retention.

ideal option, providing good mechanical filtration characteristics with enhanced removal due to the inherent positive charge of glass.

Solvent - Based Inks

While solvents are becoming less frequently used due to high VOC (volatile organic compounds) and other environmental issues, they still offer some critical advantages and therefore are found throughout the industry depending on the substrate and scale of the print (speed). Chemical compatibility is a key consideration and thus polypropylene media is most commonly utilized. Since these are pigment based, gels and agglomerate removal are central to the filtration process and thus depth media down to 1 micron is typical.

UV Curable Inks

The color components of the ink are cured and adhered to the media surface by UV photopolymerization, maximizing the speed and minimizing the levels of VOC's. Unlike the other ink types, there is no carrier liquid as this ink cures rather than dries. As this is a polymer based process, gels are a problematic, and similar to pigment based, depth media is essential for effective removal.

APPLICATION	RECOMMENDED TECHNOLOGY
Pigment-Based Inks	QXL 1, QXL 1.5*, Stratum
Dye-Based Inks	GFC 0.45, GFC 0.45D*, WaterTec 0.45, Stratum A (prefilter)
Solvent-Based Inks	QXL 1, QXL 1.5*
UV Curable Inks	QXL 1, QXL 1.5*

* Special formulation for digital print inks.