

Recently I have been involved extensively in digital printing technology and I am concerned with what I see. Potential users do not understand their options and consequently can make uneducated buying decisions. Once installed machines become prey to a push button culture where the electronics will "sort it out." Substrate management, regular maintenance, the operation of the RIP, colour control and many other issues that are taken for granted create problems for all involved. Regular basic maintenance is being missed on the grounds of "we don't have time." Calibration for different substrates is eschewed in favour of an "it will do" culture. The signs of decay that pervaded some less than professional screen printing shops in the past and unfortunately in some cases the present are now creeping into digital printing.

Historically the biggest problem with the successful use of screen printing has been the lack of understanding of the key issues by users of the process. The acceptance of poor quality, high levels of rejects and corrosive down time has been the norm. Particularly when screen printing companies have been faced with unreasonable delivery demands from their clients. This in turn has created unnecessary problems for suppliers to the industry. Suppliers have had to devote considerable resources in resolving problems caused by this lack of understanding not just with the printers but also within their own ranks.

Printing is a manufacturing business where understanding and controlling costs are crucial to success. So often the estimate prior to quotation bears very little relationship to manufacturing costs. Once the order gets to the production floor it becomes a disorder!

The adoption of digital printing by screen printers has given them an insight into what is possible when it comes to process measurement and control; that is Digital Workflow. Because of the relatively slow pace of digital printing and scary ink costs justifying its use has to be quantified. Firstly in Return on Investment calculations but then continuing and refining the business model once digital printing is in production. There is no reason why screen printers should not use the same techniques. Their Achilles Heel is often stencil production particularly generating the image on the stencil. Producing, using and storing photopositives is an increasing problem. The total costs of using them can be unreasonable particularly in large format or applications where dozens of stencils are produced in a day. It is even worse if you are printing the same image on different substrates when you will need to apply different profiles to colour separations to deal with the dot gain variations. £1,200.00 is not unusual for a set of photopositives so very quickly annual costs of £100,000.00 have to be swallowed.

There is an alternative and that is Computer to Screen. The options opening to the technique are increasing as the technology used particularly in wide format flatbed digital printers is incorporated into imaging stencils. These options have come in several forms. Initially a screen coated with emulsion had an image printed onto it with either ink or wax using a piezo digital printing head. Luscher are the best-known manufacturers of this equipment and have hundreds of units worldwide. The Luscher JetScreen use wax that it fires through piezo heads and is able to produce a dot as small as 60 microns. These techniques have proved very successful, particularly in large format printing.

Adoption of this technique immediately removed the need for expensive photopositives and meant that there was no undercutting when the imaged screen was exposed. With traditional exposure this often occurred if the emulsion on the photopositive and the photosensitive emulsion of the coated screen was not in intimate contact due to poor vacuum or a dirty blanket. Exposure of a direct imaged screen is also faster as there is no need for the glass of the exposure unit that would have been in between the UV source and the emulsion that has to be cured.

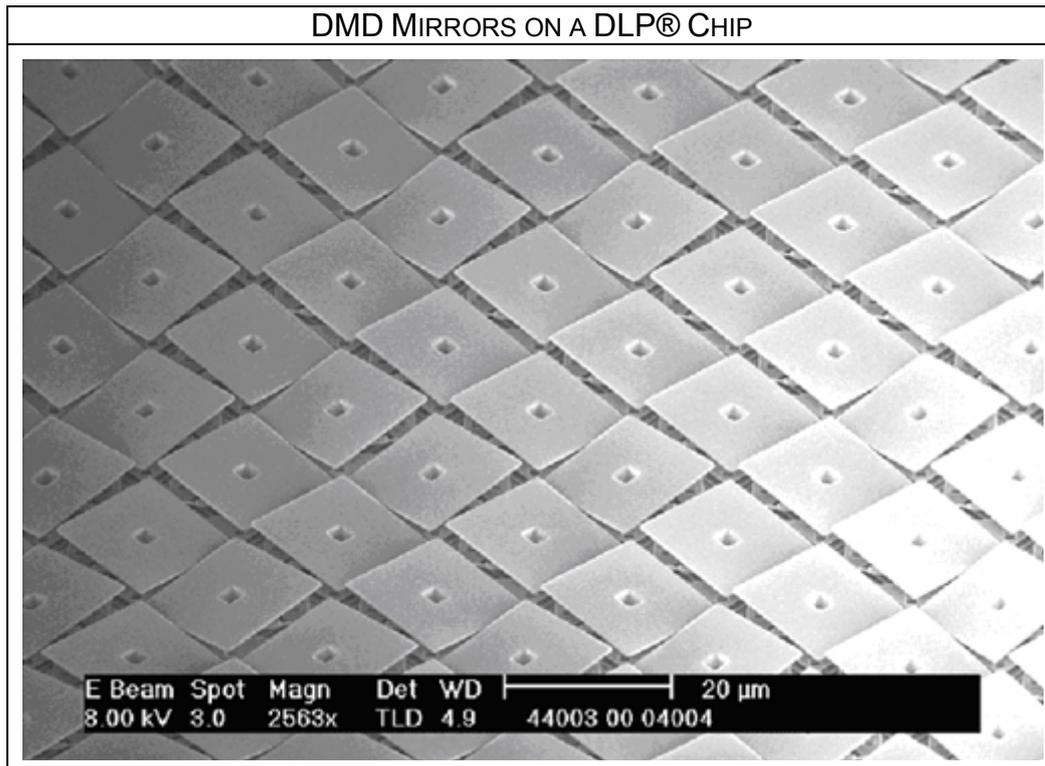
Even in the best organised facilities there are errors or last minute changes in the required image that can quickly be adjusted in the Computer to Screen system without the time lost and ensuing costs of remaking the photopositives. Suitable for many applications the savings in the production of photopositives gave a fast return on capital. When creating the image directly on the coated screen the resolution of the piezo heads used meant that line rulings above 85 lines per inch were to say the least ambitious. The limitation in resolution of the image printed onto the coated screen meant that the finest applications were beyond its scope. In large format Point of Sale, printers preferred to work around the 50 lines per inch region. However it was possible to have a wide tonal range from 2% to 98%. This is quite acceptable at viewing distances of 2 metres. For images that were viewed at arms length or closer it was not acceptable. Why some clients insist on high resolution images on bus sides is beyond me but if that is what they want that is what they have to have. People do not understand that lower resolution prints have a thicker ink film, which in turn gives a more vibrant print. What is needed on a large format poster is impact not the nose hairs of Jade Goody. The inability to exceed 85 lines per inch satisfactorily ruled out the creation of high resolution images (100/120 or even 150 lines per inch) used for example in printing CD's or high quality ceramics. In spite of this printing direct onto the coated mesh with wax or ink has and is proving a very efficient cost effective method of creating the image digitally.

Direct exposure using focussed Ultra Violet light was a further improvement and is highly likely to take over from digital printing onto a coated mesh where its slower speed and higher capital cost can be tolerated. This technology is accelerating in screen printing with equipment from KIWO, Signtronic, CST and soon Luscher whose thermal wax based direct to screen system has held sway in large format stencil applications for several years.

The co-operation between Signtronic AG Switzerland and Proditec GmbH & Co. KG is particularly interesting. Proditec have the long established PROKA range of Direct Projection cameras. The Signtronic system will sit nicely in the Proditec automation system. The Signtronic focussed UV overcomes the need to use white mesh and special fast acting emulsions. Also 60 l/cm 150 l.p.i. line rulings are attainable. The Signtronic system will not yet reach the production speeds of 18 large format frames per hour of the direct projection cameras but the 28 m² per hour still gives a reasonable throughput for high resolution stencils.

The heart of the direct exposure systems is a Digital Micromirror Device or DLP® chip. This is a remarkable component developed by Texas Instruments™ The DLP® Digital

Light Processing™ technology chip is probably the world's most sophisticated light switch. It contains a rectangular array of up to 2 million hinge-mounted microscopic mirrors; each of these micromirrors measures less than one-fifth the width of a human hair. Used extensively in High Definition Television and Projection systems. The use as a means of focussing Ultra Violet Light exposing a stencil is one of many of the adaptations of this technology. The reliability of the system is proven since its invention in 1987.

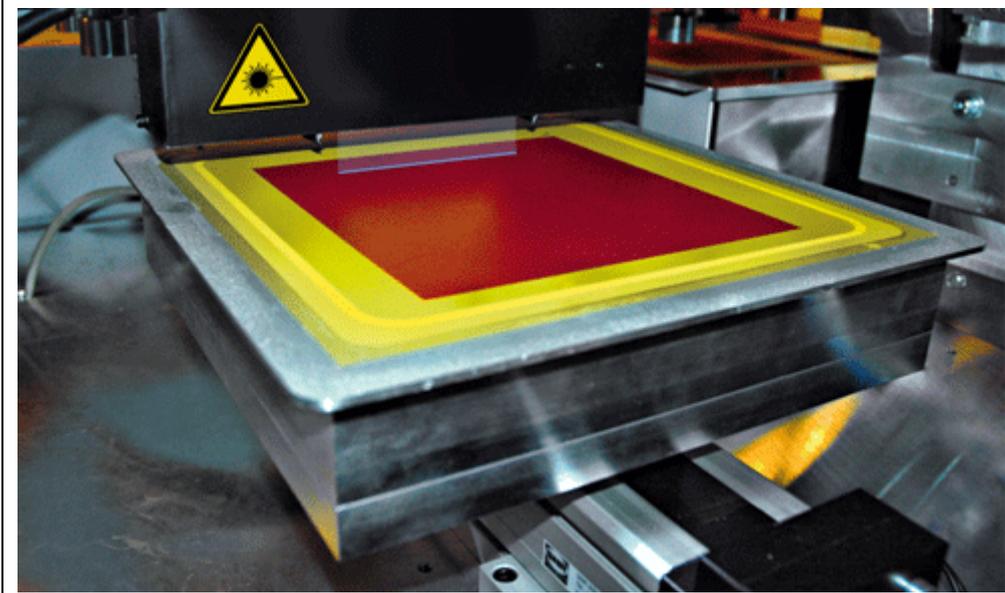


For very fine exposures the systems that use a laser to expose the coated screen are now becoming available. Surprisingly SEFAR have brought out a piece of equipment known as the SEFAR LDS **L**aser **D**irect exposure **S**ystems (Computer to Screen Systems) for high quality stencils. The system is targeted at printers of optical discs and similar small-format applications such as printing onto labels and solid objects. This can also be used with SEFAR pre-coated mesh to reduce still further the potential anomalies in stencil production. Another interesting factor is that SEFAR are now working with Signtronic in selling their JetScreen large format systems to augment their LDS system.

SEFAR LDS



LDS LASER



These examples of co-operation between major suppliers to the industry have to demonstrate to printers the way forward. Companies like SEFAR have a very clear picture of what is happening to the industry through their sales of mesh. Who would have imagined 10 years ago that a mesh manufacturer of their standing would be selling digital equipment, both CTS and digital printing on to containers. Times are changing fast.

Embracing digital technology in all aspects of screen printing is essential. Ranging from managed workflow to Computer to Screen and digital instrumentation for measuring all



the key elements of the process. In the digital workplace the same system can deliver data to CTS, flatbed digital, roll fed digital and provide management data to verify costings. What is the point of running a business if you don't know where or even if you are making a profit?

Remarkably many screen printers who print four colour process may own but do not use a densitometer. Why bother they haven't finger-printed their presses. They use the same separations on paper as they do on PVC. The same separations on a flatbed press as on a cylinder press. Isn't it about time they stepped into the real world? No wonder print buyers don't want screen printing, they have probably never seen a decent example. In a conversation with an engineer who uses graphics screen printing as a production method it was described to me as process from a land that time had forgot. When it was explained to him the real capabilities of the process his enthusiasm was rekindled. Let it be the same for the screen printing industry.