



2007

JULY

INKS

Surprisingly people actually read these articles, which is flattering because I have been known to “go off on one” occasionally much to the trepidation of our esteemed Managing Editor. An issue that does occur is that suppliers can get a little miffed if I mention one of their competitors and not them. So this month whilst I am speaking of screen printing inks I thought I would include a list of all the manufacturers whom I am aware of having representation in this country along with their UK orientated websites. These are not necessarily all the manufacturers, representatives or agents just the ones I know. (Oh dear Peter I can see a full e-mail box looming. Ed)

Apollo Colours Ltd	www.apollocolours.co.uk
B&H Colourchange Limited	www.colourchange.com
Colegraf Inks	www.colenso.co.uk
Davison Chemographics Ltd	www.davisonchemographicsltd.com
Du Pont	www.dupont.com/MCM/en_US
Encres Dubuit	www.encresdubuit.net
FujiFilmSericol Ltd	www.sericol.co.uk
Gwent Electronic Materials	www.g-e-m.com
Kromex Limited	www.kromex.co.uk
Marabu Inks	www.marabu-inks.com
N V Unico	www.unico.be
Nazdar Inc	www.nazdar.com
Nor-Cote International Inc	www.norcote.com
Pacific Inks Limited	www.pacificinks.com
Proell Inks	www.proell.de
Printcolor Screen Limited	www.printcolor.com
Ruco Inks	www.ruco.de
Sabur Ink Systems Limited	www.sublimationinks.com
Sico Inks	www.sico-inks.com
Sirpi Inks	www.sirpi.it
Small Products Ltd.	www.smallproducts.co.uk
SunChemical Screen	www.coates.com/screen/scrnuk/home.html
Union Ink Co	www.unionink.co.uk
Wilflex	www.colenso.co.uk
Wolstenholm Limited	www.metal-fx.com

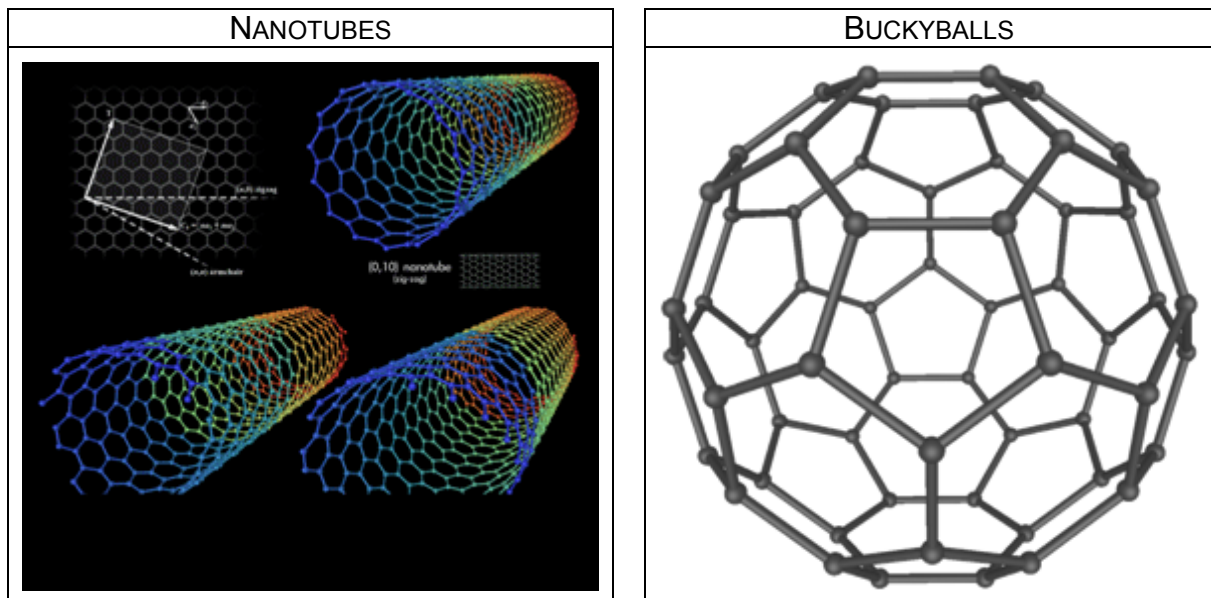
What I am not going to write about (somewhat reluctantly as there are arguments from both sides) is the justification for the price of digital printing inks as compared to screen printing inks because this column is about the pinnacle of print perfection that is screen printing.

From the ink makers perspective screen printing is an ink friendly process. Screen printing mesh meters ink through onto the substrate and as long as the pigment particulate size is less than one third of the mesh opening it will pass through the mesh without blocking. That is not the only characteristic that an ink formulation must have. The fluid or binder that carries the pigment has to enable it to remain in suspension with

an even dispersion. There are additives and solvents or diluents in the case of UV inks that enable them to flow and others that assist in wetting the substrate. A complex mix of chemicals that combine to produce the controlled ink film with the characteristics that we demand as printers. This is pretty fancy chemistry and now is the emergence of Nanotechnology is going to turn conventional thinking about inks on its head.

A nanometre is 1 Billionth of a Metre. $1/1,000,000,000$. In screen printing we normally work in Microns that are one thousandth of a millimetre. Therefore one nanometre is one thousandth of a Micron.

Nanotechnology is the use of structures sized between 1 – 100 nanometres. These structures are made up of atoms and can come in different forms; two typical structures are “Nanotubes” and “Buckyballs”



Using structures like these it is possible to create materials at an atomic level that can be attached to other materials to alter their characteristics or create completely new materials at a molecular level. So a pigment that is not conductive to electricity could be turned into a conductor or the electrical characteristics can be greatly improved. There are also Nanopigments that are produced by encapsulating organic dyes into clay particles to form a nano-dye/clay composite pigment. Nanotechnology can improve pigment dispersion and act as a barrier to UV radiation.

The new composite pigments appear to exhibit significantly improved light and thermal stability characteristics (weathering) when compared with organic dyes. The improved weathering makes the new composites particularly useful as colorants for materials destined for outdoor applications.



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Not only inks but substrates; paper for example is being re-engineered to have completely different properties in terms of reflectivity, water absorbency, mechanical strength etc.

Textiles that can relax you by altering your mood. Other woven materials that will filter out pollutants. Stain resistant clothing, woven materials that kill harmful bacteria. A student's dream; boxer shorts and knickers that they don't have to wash and make them "happy." This is not fantasy they exist in laboratories and some of these materials are in large-scale production. (Come on Peter get back to Inks. Ed)

It is considered that Nanotechnology will be for the 21st century what the Information Technology revolution was for the 20th century.

What this adds up to is that there is an increasing armoury of inks that the printer can use to generate business opportunities. It would be easy to think that with the frenzy there is about digital printing the development in screen printing inks would have stalled, however the major manufacturers and the specialists are still developing them. If you visited their stands at FESPA you would have seen the innovative approaches to the process.

One of the key issues is the aim to improve the business case for screen printing particularly when it comes to reducing the inventory of inks by developing a multi-substrate UV curing ink for multi-colour lines. Both Fujifilm Sericol and Sun Chemical Screen have recognised the need with the Sun UV U range and Sericol's Display Master XX it appears to be a matter of great minds thinking alike.

It is also noticeable how these masters of screen printing ink technology are addressing other prickly issues for the screen printer where Sericol recognises the need for the viscosity of UV ink to remain stable throughout the print run. This variation has been a constant problem particularly when adding new ink to a screen during a long run. One solution has been to warm inks prior to printing and before addition. The new ink formulations are much less affected by variations in temperature.

Another trade off has been that to get inks to stick to a substrate it has been necessary to include highly reactive chemistries in the mix. These chemistries attack the squeegee and cause it to swell. The aim is to be able to use a squeegee for extended periods before there is the need to rest and redress 24 hours later. The new formulations are less aggressive and allow a squeegee to be used throughout a shift without changing.

The message coming from the "Big Boys" in the market is that screen printing inks form the largest part of their product offering and they are still investing heavily in the process. Undoubtedly there is a move towards the industrial sector with inks for difficult substrates and inks for electronic applications.

As a very notable member of the "Ink Production Fraternity" so eloquently phrased it:



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“The notion that screen printing is a dead process is a pile of shite!”

(I leave the subbing to the Managing Editor.)

“Even though the perception is that Ink Jet Technology has taken over, screen printing ink is still our most important product.”

Amongst all the hype about our industry it is easy to forget the amount of real development and chemistry that goes into the manufacture of the inks that we use. The “inkies” of this world enable extremely sophisticated formulations to provide answers to the problems of overstressed printers. The ink technologists have to take account of the variables that users of their inks impose on their carefully researched compounds. It would be fair to say that 80% of users of their products do not read the technical data sheet. This is a mine of information that will enable the printer to avoid many of the problems that ignorance of the facts creates.

An area where developments in chemistries have had a significant impact is printing onto uncoated glass. Traditionally this was achieved with glass frit inks that were fired on to the glass through a lehr at temperatures approaching the melt temperature of the glass. Two component inks worked reasonably well but these came off almost immediately in the dishwasher. Marabu have developed their GL Two Component Ink that can withstand dishwashing up to 300 cycles and is now used extensively on glass bottles. To achieve this level of resistance it has to be dried at 140 °C for 30 minutes. This shows enormous energy savings over fired on ink systems. This ink also works on a wide range of metal and plated surfaces. There are currently no digital ink systems that will get anywhere near this level of resistance.

The ink guru behind many of the formulations used in the FESPA “Sensations” special effects portfolio is Dak Patel of Small Products Limited. He sees a tremendous growth in Special Effects printing where there is a synergy between digital and screen printing. The ability to print the special effects with screen printing provides significant added value to a printer and can give them a unique selling point when compared to a solely digital printer.

There are hundreds of companies throughout the UK making a good living out of printing onto a vast range of substrates with many different inks. It is very easy to be blinded by the undoubted down turn in large format POS screen printing. The big POS printers can only dream about the profit margins of these smaller specialist printers. What the specialists have learnt is that the “difficult” jobs are the ones they want because that is where they can set themselves apart from the “squeegee bashers” of old.

My advice is to see what inks are available in the market. Use their characteristics as selling tools; surprise your customer with your innovative approach to their needs. Please, always read the Technical Data Sheets they are a fund of information.