

There is a section of the printing industry that is beavering away in small factory units throughout the UK whose return on capital and pre-tax profits are but a dream to the wide format giants of the point of sale industry.

These companies are normally owner managed, employ up to 10 people and currently stacked out with work. They will use screen printing, pad printing, hot foil printing and possibly small format flat bed digital printing. These are the “Product Decorators.” Many of them have been in the business for more than twenty years. They are the self sufficient innovators, who operate below the radar of the general printing industry. Their greatest assets are their practical abilities and experience in their area of activity. Whereas the conventional printing industry will deal with at the most five different substrates, mainly paper, board, PVC and polypropylene; these guys will be faced with dozens of different materials in a whole range of shapes and sizes. Typically the image size will not exceed 350 mm and generally be less than 100 mm. Look at your watch, your mobile phone, your promotional pen; the key board of your computer, the dishwasher in the canteen, your memory stick, even your bottle of aftershave/perfume or the heavy metal T-shirt you secretly treasure. If the image is not a label but directly printed onto the item, one of these companies could well have printed it.

It could almost be called a cottage industry but that would demean the skills and expertise of such companies. It is certainly a resurgent industry. In a world where any volume product is manufactured in the orient personalisation can be challenging to say the least. You can have whatever you like printed on the product as long as you want 10,000 and you can wait 15 weeks. In a world where inventory control is crucial to a company, holding vast stocks are a thing of the past. Even the leviathan supermarkets aim to keep all their stock either on the shelf or moving to the shelves shifting the stock, and hence the cost, down the supply chain.

There are metal shipping containers full of cardboard boxes which are themselves full of anonymous products whose final destination is uncharted. With the best will in the world 250,000 white T- shirts cannot have their identity created when first produced. The thousands of pens that will be used to promote the 10 Kilometre Road Race or your local Hospice will not gather their logos and promotional message until they reach these shores. We are still a long way from photo reactive polymers that will accept a projected image, or Organic Light Emitting Diodes incorporated into every viewable surface. You may scoff at this conjecture but as was stated by a renowned futurologist, actually, a professor quantum physics. “In ten years we know it will be different but we don’t know how different.” So watch out for those surface changing spectacles!

These surface decoration specialists have to know what they are being asked to print onto. That is not always so easy, as the moulding was originally produced in Guangdong Province. The plastic used was no longer a pure bred polymer but a mongrel mix of molecules whose surface is unrecognisable from the original specification. Why, you may say, is this important? Quite simply if you have to print on a surface the quality control of the materials used to create the surface has to be much more precise than if it were a non printed surface. Flow additives, material turbulence in the mould tool can all

affect the printability of a material. The moulding conditions for the components are way out of the printers' control. They are not going to be able to speak to the machine setter in Guangdong to ask if he has used mould release which will ruin the printability of a plastic.

The printer has to manage this situation because his client will not accept a beautifully printed pen whose advertising message will come off as soon as he picks it up. In many cases it is necessary to wipe the surface with a cleaning agent or pre-treat it with flame, corona or plasma. Most product printers resort to the first two methods, sometimes corona discharge is used and very occasionally plasma pre-treatment. Plasma has been discussed in previous articles. The equipment is challengingly expensive but can sometimes be the only solution. As you are aware the substrate has to be wettable by the ink and all these methods are aimed at making it so. If it is not wettable then the ink won't stick! Screen printing, pad printing and digital printing all require the ink to wet the surface to stand a chance of forming a bond. With hot foil printing the temperature of the die will assist the adhesion by melting the surface to be printed, but even then pre-treatment may sometimes be necessary.

Because of the variability of substrates the most popular ink systems are two-component that means they have a catalyst added to enable polymerisation to take place. The resulting cured ink film is a thermoset plastic that adheres very well to a wide range of substrates and is extremely resistant to abrasion and chemical attack. You would be surprised how aggressive sweat can be on ink, so products that are handled have to be resistant. Some of the more aggressive materials we come into contact with are natural oils, plant extracts, perfumes and after-shaves. These will attack many ink systems.



Be very wary about digital printing machinery suppliers who say their ink will “stick to anything.” People such as this are sometimes strangers to the truth. Small format flat

bed digital printers can be lovely pieces of kit, particularly those like the Kornit supplied by Adelco Limited for printing onto textiles. Digital printing inks are designed for particular applications, increasingly now textiles. Sublimation inks are well developed but many of the digital inks do not give you the range of adhesion and resistance characteristics you expect from screen and pad printing inks or the hot foils with their protective layers. Digital printing is excellent for short run attractive graphics where survival of the print in difficult working environments is not crucial to their success. Times are changing and the inks are improving but the need for the ink to suit the jetting mechanism can compromise its long term operational resistance. For the specialist product printer digital is a useful add-on but is unlikely to become their core production process, unlike point of sale.

The other aspect of product printing that is often ignored by their clients is the packing and unpacking element of the work. Cardboard boxes strapped to pallets are the first barrier. These have been bound in adhesive tape and enthusiastically shrink wrapped. Once the packaging has been broken into, the individual items are often boxed and tissue wrapped. Cutting open and unwrapping is a fine means of creating dust and a static charge both of which are an anathema to efficient print production. Having printed and dried the items then have to be repacked. This unpacking and repacking can be the majority of the cost in a print job. Typically a production unit will have to devote 50% of its working space to product storage and handling which very quickly takes it from a “cottage” industry to an “industrial unit or two” industry.

It appears that mathematics is not the strongest point of the masses in Guangdong. Boxes often contain more product than is specified on the delivery note, which, when you take into account samples and set ups is a useful fault. Not so pleasant are the multi footed species that can inhabit the packaging. An enthusiastic entomologist could have an enjoyable sojourn in the goods inwards department. At times shipping containers have to be carefully opened and aired well before entering to retrieve boxes from the other side of the world.

Product printers have to be able to print on many different shapes. Selecting the printing process is normally determined by the shape and the equipment the printer has available.

If it is possible for the squeegee to stay in contact with the surface to be printed then screen printing is possible. If the surface is uneven or difficult to get at then pad printing is more suitable. Pad printing does not give the same ink deposit as screen printing but pad printing is better at fine detail and multi-colours. Batch quantities and the type of equipment available can swing it one way or another.



Hot foil printing can apply metallics, wood grains, pearlescent, all types of effects as long as there is a foil to suit. For larger quantities multi-coloured transfers can be applied. If you are sad like me you will be looking at print all the time, wondering how it was produced and admiring the print specialist that did the work. In this age of digital displays on phones and games print is everywhere. Without printing techniques these hi-tech devices would not exist.