

PAD PRINTING IN 2007

PDS International – Peter Kiddell

Anybody who says screen printing and pad printing are dead processes should have visited FESPA in Berlin. There were three halls dealing with the topic. FESPA represented the largest Screen and Pad Printing exhibition for many a year, maybe ever.

Although UK visitors were up on previous exhibitions the number was not a true representation of the size of our industry. In broad terms less than 10% of the companies in the UK who use Screen and Pad Printing sent visitors to the show. That was certainly not for lack of promotion FESPA was in every publication for months ahead. UK manufacturers were well represented as exhibitors and many did startling amounts of business. Sadly most printers sat at home putting and increasing reliance on the Internet for their information. More enlightened amongst them read this journal. If you are one of the 90% of companies who failed to attend then you missed a tremendous opportunity for inspiration, innovation, and encouragement. Don't miss it next time!

Talking with the main suppliers to the Pad Printing industry in the UK it is clear that the headlong dash to China is over as reality has hit home to the UK market. It might be cheap but if you can't have reliable deliveries and consistent quality your business plan starts to look like last night's takeaway.

This resurgence in the UK market has first been seen by sub-contract printers, many of whom are working to capacity. Second hand machines are no longer freely available. Some that were in mothball are being re-commissioned.

In spite of the slowdown in the industry in Western Europe manufacturers have not lain dormant. Clearly the Chinese and Far Eastern machinery manufacturers have wanted to penetrate the Western markets with some degree of success offering very low cost equipment. A downside to this is the cost of sale that is the same no matter what the sales price of the machine is. Therefore companies working on reduced margins find it a challenge to deliver the backup that established suppliers can provide.

It is interesting to see how the competition from the Far East has stimulated the production of low cost entry-level models from the European manufacturers. Kaye Dee Marking solutions are offering their single colour TPE 100 from Teca Print for £1,950. This looks very much like the TC 70 of old with more sophisticated electronics and a 100 mm by 100 mm plate. With this price and the backup of a long established company it has to be ideal as a startup machine.

TECA PRINT TPE 100



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MI MICRO FROM TAMPOGRAPHIC



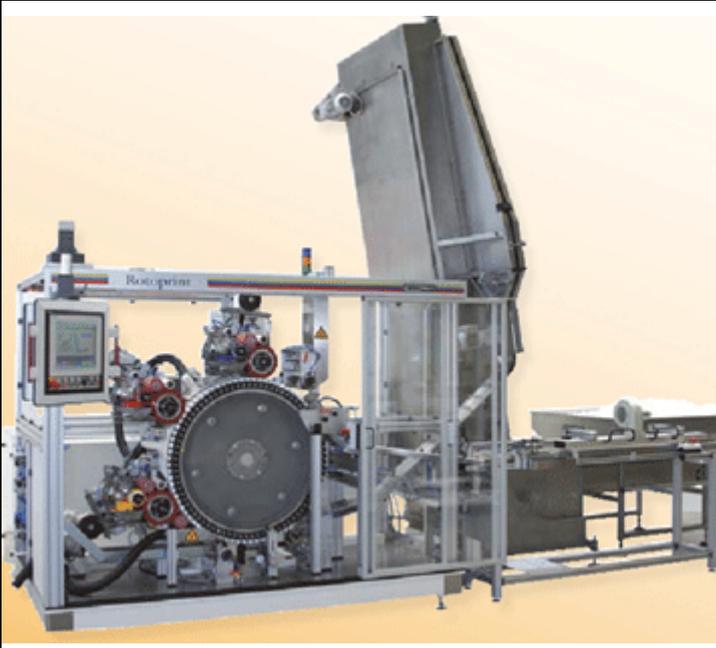
Tampographic Services address this market with their Mi Micro range of fully electric machines starting at £3000, available for a few years now they can be used as a bench mounted machine and are often built into fully automated systems where the machine has to run continuously. Speeds of 3500 up to 5000 cycles per hour are attainable with these machines.

TAMPOGRAPHIC (TOSH) ROTARY TABLE



Even Tampoprint, for years the doyen of pad printing machinery manufacturers has available their Sealed Ink Cup 60/90 machine that is an evolution of the Hermetic closed cup machine that for some time was the fastest pad printer available, capable of print speeds of 5400 per hour. The Sealed Ink Cup 60/90 reaches 3500 provides a high quality print within its 90 mm closed cup.

TAMPOPRINT CLOSURE PRINTER



PRINTED CLOSURES



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Increasingly now in our markets Pad Printing is being incorporated into fully automatic systems. The only way we can compete against the low and virtually no wage economies is to keep our labour levels to a minimum.

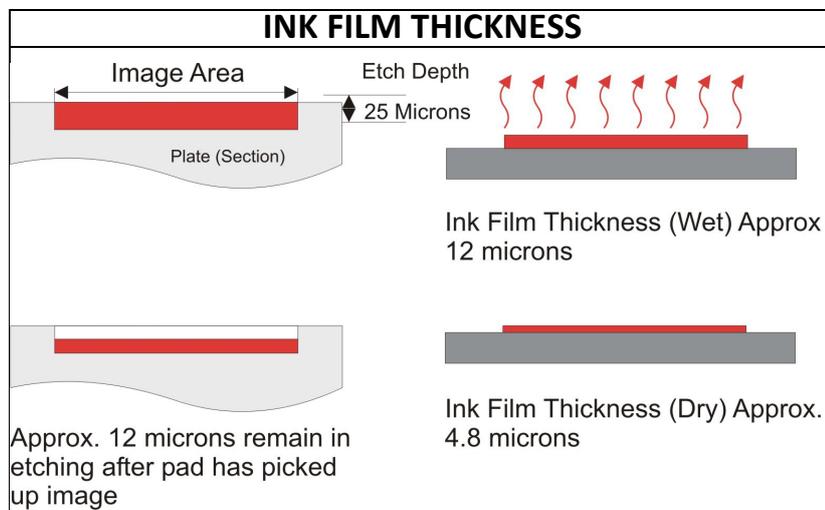
Of course we cannot match the all too often non-existent environmental and health and safety policies of the third (but soon to be first world) economies. Tell me is it just me or is it not wrong to deliberately expose people to hazardous materials? What is the moral difference between buying the product of slave labour in the 18th century and buying furniture sprayed by hand in a room without extraction or any protection for the employees in the 21st? We in the developed world who invest the capital in such practices claim to care for our fellow man, oh really!

So where did that come from? Probably from the many conversations I have with businessmen trying to make a living in manufacturing in this country. Don't worry our grand children will get jobs as guides and character merchandisers in the national theme park called the United Kingdom. Hi ho, Hi Ho, it's off to the future we go.

Back to the special purpose systems and automation. Innovative adapting of the Pad Printing process enables very complex shapes and materials to be printed.

The first question to be considered is the substrate and the working conditions in which the ink has to operate. With this information it can be established what drying and/or curing is necessary; that in turn affects machine configuration. Compared to screen printing inks pad printing Inks are more expensive. This is a mixed blessing the advantage being that ink manufacturers are more likely to have inks that are for specialist applications and may be willing to formulate ink specifically for your requirement.

Pad Printing Inks differ from screen printing inks in two ways. Pad inks tend to have a higher percentage of pigment and the solvents used are much faster evaporating. The speed of evaporation being a key mechanism in the Pad Printing process. The reason for the higher concentration of pigment is the characteristic thin film of ink laid down by the process.

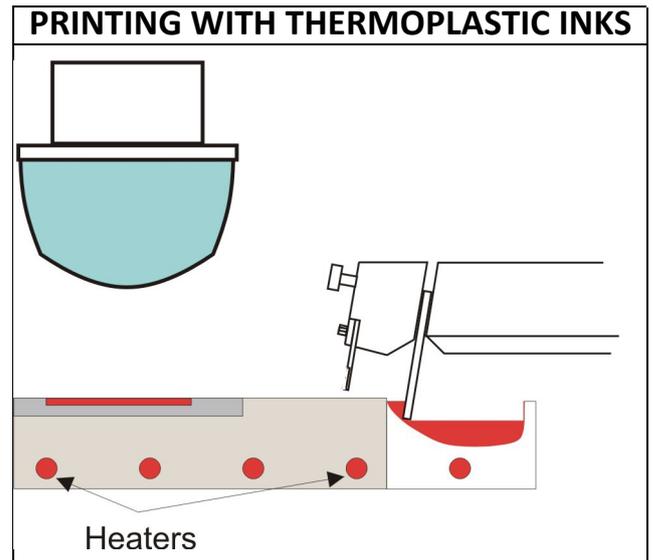


Here again the thin ink film can be an advantage when printing 4-colour process but if the need is to print a very opaque colour a double print is often required. This applies in automated systems just as it does on stand-alone machines.

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It is possible to pick up thicker films of ink and this is achieved when printing Thermoplastic Ceramic inks. With these inks the transfer mechanism of the ink from the etched plate to the pad and from the pad to the substrate is caused by using ink that is solid (like candle wax) in ambient conditions and must be heated to 80°C become liquid. This heating takes place in the ink reservoir and the printing plate. Unlike conventional pad printing inks, pad wetting does not occur due to solvent evaporation, but by the cooling effect of the pad when it comes into contact with the ink in the etching of the plate. Similarly the ink transfers from the pad to the substrate because the outer ink surface becomes tacky when exposed to the air, making it tackier than the ink on the surface of the pad. The cooling effect of the glass or ceramic substrate enables a complete transfer.



Film thicknesses as great as 50+ microns are possible with this method. Of course this is normally used with ceramic colour that is fired at approximately 580°C for glass and 1200°C for ceramic. The automatic systems will often accept mouldings or components in bulk orientate them and place them on a feed mechanism that enables any pre-treatment to take place. This can take the form of corona discharge or flaming to increase the surface energy of certain plastics.

Cold plasma pre-treatment is becoming increasingly popular it can remove oils on the surface of metals. When printing onto plastics cold plasma removes release agents, slip modifiers, plasticizers and other contaminants. Also it modifies the surface to make it more attractive to the inks. It can raise the surface energy to a level that virtually any inks system will adhere. Cold plasma also removes dust and the static electricity that attracts it in the first place. Plasmatreat (UK) Ltd provide equipment for this process.

Once prepared for printing the object or objects are located and then if necessary rotated or inflated at the print station. The machine may print many colours on the flat, curved or rotationally.

Then comes the drying. Most conventional pad printing inks dry fairly quickly because of their fast evaporating solvents. Accelerated drying can be achieved with flaming, infrared emitters or hot air. There are some inks that have UV resins incorporated in the formulation. In which case UV emitters are used for curing. Sometimes drying is applied between colours so that there is no pick up of ink off the object by subsequent printing pads.

In very sophisticated systems image recognition is used to check print quality or simply read printed barcodes.

A point that is often ignored by component producers is that as soon as you want to print on an object. Dimensional tolerances, surface finish and cleanliness become critical factors. A client will be uncompromising about a logo colour or the fine tonal work demanded.

If the system is inadequate it is possible to create rejects faster than the original component can be produced. It is moments like these when you wish you were on a slow boat to China returning the equipment to its source. No don't do that; stay here and queue for a job in the Theme Park!