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Product Decoration

Working on the principle that the end of the world isn't nigh and we are not going to be left just with politicians, civil servants and the media to preach a doomsday sermon; printing will be involved in every aspect life. When most people think of printing, printed sheet of different materials is what first comes to mind. The reality is that there are countless applications are not just printed sheet. Sit in the car and look around, how many "unconventional" printing applications are there?"

The speedometer dials, the indicator arms, the air conditioning controls, the windscreen, most of the front facia, the side windows. Your mobile phone is beside you and one of the main production processes involved in that is screen printing. Of course your laptop has logos, a keyboard, the battery and circuitry that are all printed. Open the bonnet and dozens of printed sensors are there to send signals that keep you alive as the suspension senses mistimed braking on a corner. Should you be unfortunate enough to suffer from medical conditions that require regular testing of your chemical balance the sensors used are almost certainly screen printed. Being a little late home you purchased an expensive bottle of fragrance for your partner, notice there is no sticky label on this liquid gold but an elegant print onto a shapely bottle. Will it be enough? Only time will tell. So now you get a sense of those hidden printing applications. They fit into every environment and allow our technological miasma to operate.

The vast majority of these printing operations are analogue. Digital is starting to have an effect on other than simply graphic applications. However in digital printing ink formulation is critical. So much so that if the ink is not designed specifically for the particular model print head the digital printing revolution is no more than a spat during musical chairs at your child's birthday party. Whenever a print application is more than just for aesthetic purposes the chosen ink is likely to have physical and chemical characteristics that don't lend themselves to digital printing technology. Clearly this will change over time as the use of nanotechnology and other techniques in ink formulation create more digital friendly chemistries.

So what are the main analogue printing processes that are used in direct product decoration? Screen printing, pad printing and hot foil blocking. Laser etching/engraving and mechanical engraving both complement the analogue processes. Of course sublimation decoration using digitally printed transfers onto a polyester varnish or substrate serve a very useful purpose. Last month I mentioned direct digital printing onto textile at startling capital costs. This can also be achieved onto relatively flat none textile substrates for aesthetic purposes, the limitation being ink ranges available.

Adelco Universal Printer

When screen printing onto products the key is to be able to keep the stencil parallel to the surface to be printed right the way through the print cycle and maintain an even contact onto the surface by the stencil using the squeegee. For simple profiles this is relatively easy, flat, cylindrical, oval, conical, all pose no real challenges as long as you have the right equipment. This equipment will help position the object relative to the stencil and manipulate the object, stencil and squeegee to allow parallel contact between them to enable the ink to create the image. You may think this is a relatively slow process. It is if the machine is hand fed and offloaded, up to 1200 per hour.

Teca Print Semi Automatic Pad Printer

However if the volumes are sufficient and you wish to invest in the right equipment then it is possible to screen print a multi-colour image at 8000 per hour on bottles, DVD's, containers and other objects that can be automatically fed and offloaded. These will generally use UV inks or ceramic if printed onto glass. The advantage of screen printing is that with relatively simple equipment it is possible to print a huge range of products.

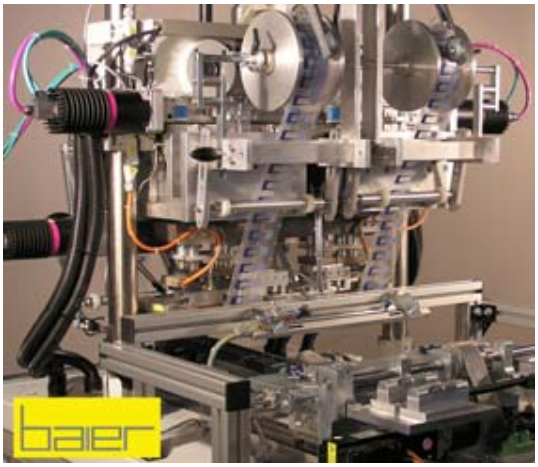
For objects with a flat surface to be printed the limitation is the size of stencil that can be sensibly produced and whether it is possible to dry/cure the ink after printing. A perfect example of this were sheets of titanium 2metres by 3 metres that had to be printed with an exotic ink and then subjected to massive pressures and temperatures to form a honeycomb of titanium that was immensely strong. Screen printing on a hand bench with a controlled pressure squeegee was the ideal solution. This was a nice combination of a simple printing technique with high tech wizardry. The only limitation for screen printing in product decoration is the printer's ingenuity and understanding what is not possible.

Pad Printing takes over where screen printing leaves off but even with this highly versatile process understanding its capabilities is also important to its success. Yes it will print on many different shapes and contours but it will not defy the laws of physics. Although pad printing will print larger items it is at its best printing up 350mm by 120mm print areas. I have printed bigger areas; large carving dishes in the potteries and gas tanks for Harley Davison but these are the exception. Most products that are pad printed come within the area mentioned. Another point to remember is that the process does not lend itself to thick films of ink. Typically the dried film thickness is 5 micron (0.005mm) This is compared with up to 300 micron with screen printing, the normal film thickness being 10 to 15 micron.

Numatic Henry

As with screen printing pad printing can be automated to a greater or lesser degree. With hand loading and offloading print rates of up to 1100 per hour are possible but this gives the operator very little time to check the print and handle the component. On this basis outputs can vary from 250 per hour to 800 per hour. The automation used can take the component from the operator move it through several print stations and return it to the operator. If the volumes are sufficient full automation can be justified. These are often very sophisticated special purpose machines with turning devices, pumped ink, pre-treatment and post-treatment etc. incorporated into the system. Whatever the level of equipment complexity, ensuring that ink conditions are stable and the ambient conditions are constant is crucial to effective pad printing.

Transfer Application Machine from GK Marketing



The Cinderella of product marking processes is considered to be Hot Foil Printing in its various forms. In reality it can produce effects that are impossible by other means. Starting with a carrier film that holds pigments, single or multicolour and metallic finishes, plain or holographic the equipment transfers what is on the carrier film to the substrate by the application of heat and pressure. The heating can be by means of a platen or roller and the application can be in single prints or continuous. The famous "Henry" vacuumfrom Numatic gains his personality from a heat applied transfer.

Like the other two processes hot foil printing is everywhere. Your credit cards have a holographic security logo as do all our bank notes. Often what appears to be a real wood grain finish is actually a hot foil print.

Allied to this are heat applied transfers in both cases the image is printed onto a carrier film either by screen printing or gravure printing and then applied to the substrate using pressure and heat.

Most of the suppliers of smaller format printing and decorating equipment provide a range of processes.

Laser etching/ablation is one that has its place in terms of providing a permanent mark onto surfaces and creating quite attractive results. The system can also be extended to cutting intricate patterns in leather, plastic, metal and wood. However even in its most basic form a laser system can be a significant investment but with all such techniques if the market is there go for it. Whether your bank will lend you the money is a completely different question. Maybe you should consider your own “Quantitative easing!” Funny how banks can do it but if you try you will end up in prison!

Kaye Dee Nautilus Laser Equipment