PRINT FOR PROFIT
#14

INK MANAGEMENT

What is sticky smelly and expensive? Truffle flavoured chewing gum. No, ink. It is sometimes difficult to recognise the chemical sophistication of screen printing ink when you see the way it is abused in use. The state of some ink stores has to be seen to be believed. Dirty, disorganised, dangerous and a drain on profitability.

Ink chemists spend years of research and vast amounts of money providing printing mediums for our industry. The increasing burden of environmental and health and safety legislation tests them constantly. That legislation is for the greater good but the impact is to put an upward pressure on prices whilst the industry is trying to cut back on costs. Although highly sophisticated screen printing inks are only small beer when compared to the paint industry and cosmetics. Therefore we are dependent on the direction these industries are taking when it comes to significant changes. An example is the mirror finish effects that are now available. The largest volume is used in nail varnish. Pearlescent effects in automotive paints. In spite of these constraints ink suppliers to our industry are remarkably innovative and we are fortunate to have based in the UK some major players in the industry worldwide. This is not a brown nosing exercise towards ink manufacturers but their efforts are crucial in the continuation of a dynamic screen printing industry.

Back to the drain on profitability. Effective management of ink is not about spending a lot of money. It is about good housekeeping and organisation. Screen printers can be divided into groups. (a) Small user, standard colours. (b) Small user wide range of colours (c) Medium to large user wide range of colours and standard range. (d) Large user. Large volume of standard colours and numerous special colours.

No matter what category you fall into there are certain rules that apply to all.

1) Know what inks and additives you have in stock.
2) Know the age of those materials.
3) Have technical data sheets readily available on all materials.
4) Have Material Safety Data Sheets on all materials and ensure that all users know what are the stated recommendations.
5) Provide the correct personal protective equipment for all staff.
6) Provide suitable eye wash facilities
7) Use adequate extraction or removal of volatile organic compounds VOC's where necessary.
8) Wipe up any spills of ink promptly.
9) Ensure that any spills of ink or solvent cannot get into the external drainage system
10) Have an approved contractor for disposing of waste inks and solvents.
11) Keep the usage of solvent to a minimum.
12) All inks and additives to be stored in sealed containers within the recommended temperature range.

13) Only ever mix inks by weight and keep a record of those mixes.
14) Never return mixed or used inks into unused inks.
15) Do not store squeegee material in the ink store or mixing area.

It would be ideal if you met all these points however the ones that are mandatory are those to do with Health and Safety and Environmental issues. Contravene these and you open yourself to prosecution. All these points are common sense and the foundation of efficient ink management.

The heart of any system is the primary measurement device, weighing scales. These should be Electronic and suitable for the mix weights of ink.

Weigh Scales Courtesy of Sericol Ltd

You can either buy in colour-matched inks or mix your own colours. You will need scales whichever route you take. All press ready inks have recipes, either for colour matching and addition of solvents and additives or simply the addition of solvents and additives. I say press ready because allowing inks to be modified at the press without careful measurement and recording is a sure way to destroy profits.

The term ink kitchen is often used for the ink mixing area. It is particularly apt as it should be as clean a well-managed kitchen. The term recipe also fits this analogy. Recipes are an accurate record that allows others to produce the same result. In the ink kitchen those recipes are tied into the production control system that also state what amounts are required for a given print run. If a job is new calculating the amount of ink required starts with the minimum amount to prime the machine and then the usage. Determining the usage requires a combination of experience and calculation. Estimating the print area and applying the coverage specified on the Technical Data sheets will give you a pretty close estimate. It is possible to get a more accurate figure for coverage from some origination software.

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Arriving at the correct colour can be as simple as taking it from the tin and mixing in the solvents or in the case of UV systems just take it straight from the tin, to a fully automatic dispensing system with feedback from precise colour measuring instrumentation. From £50 to £50,000.

Ink management in its simplest form is where you are mixing your own colour using a stock list of base colours direct from the manufacturer, detailing use by date ink type colour and amount. Each one has an index card. A record of usage will give you stock levels. When you mix a colour to a specific recipe produce an index card detailing the recipe, volume, location and print a patch on the card and a label for the container using the correct mesh and print conditions. File the index cards by colour. If the inks are UV the date is critical all UV inks should come with a use by date. If you have mixed a colour take the earliest use by date and work to that as far as the total mix is concerned. Certain pre-catalysed solvent-based systems will have a short shelf life so beware. As a rule solvent based systems will keep for years but some UV curing systems can have a shelf life of as low as six months.

Ideally you want one person responsible for mixing and managing inks. If it is a multi-person task consistency is essential. One disorganised operator can throw any system into chaos.

The next level is to use a computer to store the information and have the weigh scales linked to it. This will keep recipes, stock levels records of special colours that can be used as part of other mixes. Be careful of metamerism occurring. That is when a match is correct in one lighting condition and wrong in others. That is why a Viewing Cabinet with is essential. Here you can check colour matches under different standard lighting conditions. Unfortunately all too often they are used as storage for ink samples or sandwiches.

Taking computer technology step further is to incorporate a spectrophotometer into the system so you can measure the colour you wish to reproduce determine the recipe and then check the printed result.

One of the reasons for rooms full of a vast range of partially filled tins of ink is that when colours are mixed for a job the fear is you will run out before the end of a run. Therefore a little extra is produced. Over time this can add up to a great deal of money tens of thousands of pounds is not unusual. In one case I was aware of a hoard shown to be valued at £75,000.00 when in fact it was worthless as it was categorised incorrectly, now that is serious money.

Careful management takes care of issues like this. The final step on the road to optimum ink management are ink dispensing systems. Of those companies who I know to have adopted these systems none have regretted it. So how does it work.

Ink Formulator Courtesy of Coates Inks Ltd

A standard range of intermixable colours are stored in bulk, and the system can dispense a specific amount of ink to a particular recipe consistently simply by inputting a colour code. The system will draw standard colours from bulk storage to the necessary ratio at the required weights to provide the specified amount. It will store hundreds of recipes, maintain records of stock levels of both bulk storage and mixed colours that are returned to stock. It will utilise mixed colours in other mixes. Location information can be held, ink usage for particular jobs, effectively every statistic and record that is required to optimise ink usage.

The frequency of mixed colours being returned to stock is dramatically reduced as it is possible to supply precise quantities to the shop floor and if there is an unexpected ink shortage at the end of a print run a very small quantity can be mixed to complete the run. The only excess is the volume required to prime the machine. Returning this priming quantity to stock will be determined by its condition. If it is solvent based the solvent loss may make it impractical to hold in stock, this also applies to water based UV. Conventional UV may lend itself to returning to stock. You have to make a judgement as to whether it is worth it.

Typical functions available in these ink-dispensing systems are shown in the graphic above. What they add up to is increased process control and real savings in ink usage. The most noticeable effect is the virtual elimination of cans of mismatches and overproduced colours in the ink store. Any that do occur are utilised in future matches. It is likely that you could recover the cost of the installation in a year. It is not just the cost of the ink you have to take into account. It is the reduction in print rejects, machine down time and waste ink disposal. A sure way to increase profitability.

This what can happen if you dispense too much brown ink for the cadburys campaign.

Courtesy of PDS Health and Safety Department