



**2009  
May**

**Screen Printing is an Efficient  
Manufacturing Process**

Nobody said running a business is easy for those who don't there is often envy and even resentment. For those who do or have run a business the emotion is diametrically opposite. Bravery is probably the most important characteristic. From start up through development to consolidation there a continuing flow of decisions and situations that need fortitude (a less trendy word than guts). An aspect of business that needs guts but pays handsome dividends is to examine carefully your processes and remove waste of all types because waste is the certain destroyer of profits. One of the main reasons why screen printing is under such pressure is that waste has become part of the culture. It is often accepted as inevitable. Set up time, the completely unacceptable term "overs," waste ink. I have seen oil barrels (159 litres) full of waste ink. Each barrel equivalent to £3000.00 in cash before they incur disposal charges. If the net profit for the company is 5% that waste is worth £60,000.00 in sales, yes sixty thousand pounds worth of turnover. If you don't agree ask your accountant.

Waste is the destroyer of profits. Waste is defined as rejects (On line and offline), unused materials, inefficient use of materials and consumables, wasted manpower, machine downtime for various reasons and excessive set up time etc. Any reduction in waste goes straight to profits.

This is where bravery comes into play. It is very easy to be conditioned to practices that are wasteful, challenging them and creating a culture of change can be difficult but very beneficial if you do it. Screen printing has always been and still is a production process that can provide good margins but optimising the process will make it really attractive.

Starting at the understanding of screen printing being a production process that is controllable, measurable and predictable you can move forward to greater profitability without having to drive up turnover. Also is the need for your company to capture the technical know how, refine it and distribute it as necessary throughout the company. The normal approach is for experienced members of staff to have the "knowledge" and only share it when they consider it necessary. The effect of this is that the process tends to stagnate and investments in equipment are not always as beneficial as they might be because traditional thinking is applied.

The philosophy you have to apply is to make sure that those involved in the process understand its operation and are able to avoid problems rather than constantly problem solving. Apply this understanding to a foundation of sound operating procedures and the practitioners can be looking at ways of improving the process performance rather just keeping it going. Experience tells us that improvements originating from the shop floor are often more likely to succeed than those imposed by management.

In the first instance you need to know where you are in relation to industrial best practice. The simplest measure is perceived rejects. That is the reject level you think you are creating if it above 2.5% it is very concerning, above 5% is potentially disastrous, above 10%, don't take orders give your customers money to take their work elsewhere. Your target is zero defects!



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You have to plan a complete review of the company. It will also take into account estimating, quotation and works order generation. Production planning and machine loading have a significant effect on efficiencies. You need to look at what degree of historical information is used in the creation of costing and determine the accuracy of the quote verses actual production cost equation. In time this will demonstrate what type of work is most profitable and you can determine your willingness to take on less or non-profitable work. The best change scenario being to improve the process to bring all jobs into an acceptable level of profitability. It maybe that already you have a Management Information System that provides all this information but the question still has to be is the data accurate. As the market is in recession this is even more important as getting additional volume is increasingly difficult but getting more from less is a challenging but attainable outcome.

This is a review needs to go from the shop floor up to senior management, recognising the relationships and structures both formal and informal that impact on the effective operation of the facility. If you don't have Standard Operating Procedures this is a very steep hill to climb but climb it you must if you wish to survive. Your SOP's have to be a clear description of how the processes are carried out. The need is for consistency of methods throughout the workforce. Work on the principle of there is sufficient information in the SOP's such that the operative can follow the instruction and complete the job without having to ask additional questions. This assumes that they know which buttons to press on the equipment and have the necessary Health and Safety awareness.

Your aim has to be to continuously improve their process from a firm foundation of best practice held on the SOP's. These are not written in stone but living documents that are updated as methods improve and develop.

A key aspect of achieving consistent results is the production of the stencil. This is an aspect of screen printing where some industrial screen printers have a great deal of experience in the development and operation of state of the art stencil production units specifically for biomedical sensors. The dimensional tolerance of stencil thickness and image size are very tight and the techniques applied in this application are relevant to all other high quality screen printing applications. The stencil is a precision engineered template for the image. If that is not your perception then be concerned.

Once you are satisfied that stencil production is under control and capable of producing consistent stencils then you move on to machine set up, ink preparation and print production. Drying and curing is a key aspect of most forms of screen printing. It is also an area where energy costs can get out of hand if the dryers are inefficient or incorrectly set. Cure levels determine the effectiveness of inter-coat adhesion particularly when using UV curing and reactive curing systems. Drying will affect registration and it is important to recognise where miss-registration is caused either during stencil production, printing or drying. Sometimes all areas will have an effect to a greater or lesser extent. The only way to manage these and other issues out of the process is with effective agreed Standard Operating Procedures, rigorously applied. The key word here is



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“agreed” for those working to the SOP’s must recognise the effectiveness of such procedures. In screen printing it is very easy to compromise the effectiveness of SOP’s with a small deviation from procedures that throws the process out of tolerance.

Standard Operating Procedures will enable you to continuously improve their process from a firm foundation of best practice.

Then you come onto lean manufacturing. This is where the principle is of getting the right things, to the right place, at the right time, in the right quantity to achieve perfect work flow while minimising waste and being flexible and able to change. This has to be the basis of what you are aiming for. To do this the need to reduce variables in the process is paramount. It may be that equipment is unsuitable due to maintenance deficiencies. A screen printing machine that is out of alignment is a reject production machine. You may have equipment that is unsuitable to maintain the consistency of result required to meet your objectives and requires capital investment. However this analysis is only possible if the potential variables are understood and how to rectify them are known. This is where the combination of expertise within the company and external resources can come together to create an optimum process.

The key to success is the recognition by senior management in your company of the need to reach these goals. Benchmarking production performance, adjusting SOP’s to suit, then embedding the improved practices in production and providing a platform and milestones for continuous process improvement.

Don’t expect this to be an overnight exercise and it is vital to explain to the workforce what you are trying to achieve. Removing cost does not mean redundancy it means higher profits and having a fit company ready for the opportunities as they arise. As mentioned before some of the best ideas for process improvements come from the people who are carrying out the tasks. Surprisingly sometimes a temporary worker who has no experience will say “Why do you do that?” The answer is often because that is the way it has always been. Times have changed and if your company doesn’t adapt and improve you may not be here to reap the rewards of the upturn.