



**2007
November**

**Environmentally Sound Screen Printing
Carbon Neutral or Carbon Numb**

Guilt, fear, threat, are the tools that governments use to control their populace. In times past it was Mother Church with hell fire and damnation being the result of disobeying their teachings.

It is now Mother EU that increasingly subjugates us with a never ending stream of edicts, the contravention of which will not so much wreck religious wrath upon us more hit us where it really hurts in the P and L account. See the EU astride its Carbon Neutral chariot charging down on us SME's, come on fellas give us a break. Quite clearly we have to behave in an environmentally responsible way. Screen printing can adversely affect the environment. Not as much as moving the EU administration from Brussels to Strasbourg for political expediency however. Is it me or is that completely nuts? So working on the principle of not continuously bitching about our leaders, what can we do to reduce the torrent of waste and make ourselves more energy efficient. I refuse to argue either way on the Global Warming debate because both sides can be at times a stranger to the truth. What I want to discuss is the areas where we can help ourselves and the planet at the same time.

There is no better place to start than the " FESPA Planet Friendly Guide" available from the DSPA. This excellent guide was originally written by Michel Caza whose encyclopaedic knowledge of all things screen printing is unmatched. Added to this he is one of the best, if not the best, exponents of the process ever to have pulled a squeegee. Then Paul Machin the master of regulatory Environmental and Health and Safety affairs cast an editorial eye across the content. Paul was able to add his legal training and chemical know how to the contents. The resulting publication is simply the finest straightforward information source available to the industry. Of course much of it is applicable to digital and wide format printing.

Excerpts from the start of the guide explain the areas covered:

The guide deals with how screen printing plants can generate pollution, mainly in three areas:

- 1) Water Pollution
- 2) Production of industrial waste, both toxic and non-toxic.
- 3) Air pollution (malodorous smells, Volatile Organic Compounds (VOC))

Screen printing operations can be divided into 3 main steps:

- Step 1: Composition of the image and preparation of the screen: "prepress"
- Step 2: Printing on substrates or objects (paper, plastics, textiles, etc.)
- Step 3: Cleaning and de-coating of the screens

These three steps of screen printing do not generate the same level of pollutants in the environment.



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Atmospheric Pollution: the atmospheric discharges from a screen printing plant are mostly from solvents (usually the VOC coming from drying of inks, cleaning of screens, open cans or bottles of ink and impregnated clothing). These solvent emissions can also be the origin of olfactory pollution in the neighborhood when not properly channeled and treated.

Water Pollution: the run-off of polluted water coming from a screen printing plant is mostly due to cleaning operations (stencil making, screen reclaiming and de-coating, sometimes combined into one operation). Also, one must add to this list: fixers and developing fluid from photographic tanks.

The products used in screen printing (inks, solvents etc.) contain polluting elements which can be potentially toxic to humans, animal life and plant life, namely metallic elements and hydrocarbons. These chemicals upset the water table and therefore, disrupt the purifying process of drinking water. Some of these elements need specific treatment. They should not therefore, be discharged either, in the atmosphere nor the drainage system, and certainly not in household waste. They do need specific treatment.

Waste Production: there are three types of waste from screen printing as determined by the Hazardous Waste Directive 91/689/EEC, which must be separated with a view to their disposal. The non-hazardous waste: paper, board, etc) and clean packaging waste (mostly cardboard) that can be collected separately for re-cycling, the hazardous industrial waste for example waste ink and solvent, dirty packaging such as ink pots, solvent containers, dirty clothes, silver film contaminated wipes, fluorescent tubes etc.

Hazardous waste must not be mixed with other waste as it must be collected by specialised companies who handle hazardous waste. All hazardous waste must be described by its European Waste Catalogue (EWC) when it is to be disposed. The EWC number must be specified in the Safety Data Sheet for that ink, solvent etc.

Waste: screen printing plants engender 3 types of waste:

- 1) Hazardous waste that must be collected by specialised companies approved to handle hazardous waste.
- 2) The Clean Packaging Waste; to be re-used, re-cycled or sold.
- 3) The non-dangerous Waste collected by public local authority contractors.

From this you can see that the "FESPA Planet Friendly Guide" gets to the nub of the problem. Even more important is that it suggests solutions to everyday problems that face screen printers.



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Start from Scratch

For those who are able to start with a clean slate there is much that can be done to minimize the environmental impact of a company. The perfect example of this is Capital Print of Beckton in London.

The following low or zero carbon systems have been employed at Capital's new building,



- **Passive Stack Ventilation (PSV)** - the most effective natural ventilation strategy uses a combination of cross ventilation, buoyancy (warm air rising) and the venturi effect (wind around a high level opening creating suction). Passive stacks can comprise stairwells, atria or ductwork to take the warm air from within the building to exhaust outlets at high level. Because a stack can be located in the middle of the building, it can ventilate twice the depth of cross ventilation, and can also provide effective night cooling as the difference between internal and external temperatures at night tends to increase the buoyancy effect.
- **Photovoltaic (PV) technology** – to generate electricity from light the building has been fitted with PV (Solar) cells. When light shines on the solar cell the semi-conductor coating causes electricity to flow - the greater the intensity of the light, the greater the flow of electricity
- **Solar Water Heating** - Solar Thermal or Active Solar Heating is a well-established renewable energy system in many countries outside the UK and can be one of the most cost effective systems of renewable energy. Solar water heating systems provide the hot water services for the building, typically up 60%.



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- **Ground Source Heat Pumps** – the warehouse has been fitted with Ground Source Heating Recovery (GSHR) that extracts low-grade heat from the ground and converts it to higher temperatures for use as heating.
- **Rain Water Harvesting** - rainwater is collected into the building's on-site reservoir for use in the toilets, washrooms, dishwasher and garden.

The new building has a BREEAM assessment rating of 'Very Good' or better. BREEAM is the world's most widely used environmental assessment method for buildings. It assesses buildings against a set criteria and provides an overall score which will fall within a band providing either a; Pass, Good, Very Good or Excellent rating.

Yes there is an initial capital cost but this well set off over time with reduced energy usage and more suitable working conditions. Capital Print were fortunate to be precisely where the stadium for the 2012 London Olympics is to be sited, so they were able to use the compulsory purchase to ensure their new premises conformed to the latest environmental best practice. We are not all fortunate to be recipients of this Olympian golden egg but some of the techniques can be retro-fitted to existing facilities. If you are looking to build a new production unit think about these energy saving and creation systems.

It is easy to forget that simply working efficiently is something that every printer can do to reduce its environmental impact. Minimise downtime on the press, make rejects history, manage inks effectively, buy substrate that is the correct size, maintain dryers, produce top quality stencils, profile your presses, work consistently. All these are low or no cost options and will immediately improve your profitability. Stencil reclamation is a particular challenge to screen printers. Inks and solvents cannot go down the drain and some of the chemicals used to reclaim mesh are restricted. What some people do is hold all the waste in a storage sump and have it pumped out by a licensed disposal company, others store it in baulk and have it collected by the original supplier of the chemistry, which is the approach that Capital take. The use of environmentally friendlier materials helps a great deal but once mixed with inks and solvents they still cannot be put down the drain. You need to speak to your water company about what is acceptable. Of course I know the never ending stream of legislation is a pain in the butt but it can also be a spur to improved performance for your company and hence the environment.