

# PRINTING INDUSTRY: Static Control Applications

## Structure and Terms

### Printing Technologies: Background

- 1) Letterpress      The oldest technology, with individual lead letters that are put together onto a forme. This is what Gutenberg invented in the 1400s. Think Fleet Street 1980.  
Still used now for specialist applications, but the lettering is made up electronically.
  
- 2) Offset / Litho      Most books, brochures, magazines are made by this process. It is “offset” because the image is put onto a plate then onto a rubber blanket and then transferred onto the paper. In letterpress it is direct printing; in offset it is indirect.  
  
There is sheetfed presses and web presses. Sheetfed do smaller jobs or thicker paper. Web presses do long runs of newspapers, magazines etc
  
- 3) Flexo      Relief printing, usually onto plastic for packaging applications.
  
- 4) Gravure      Specialist printing process using combustible inks. The image is contained in holes in a cylinder which hold the ink. The ink is pulled out of the holes electrostatically onto the paper or film.
  
- 5) Screen      Twenty years ago Screenprinting was a growing technology, now largely replaced by digital. It used a screen/mesh which held the image. The ink is pushed through the mesh by a squeegee onto the paper.
  
- 6) Inkjet      Coding and marking
  
- 7) Print Finishing      Paper folders.
  
- 8) Pad Printing      Printing onto 3-dimensional products, often mouldings.
  
- 9) Label Printing      Wide variety of processes and application methods.
  
- 10) Digital      This has been the technology of the past decade and an area where we have a lot of knowledge and experience. It is a rapidly changing technology where everyone is still learning. It has two main divisions: graphic printing onto signs, displays etc where it has largely replaced screen printing; and document printing e.g. bills, letters, customised publications, but increasingly small runs of books and brochures as its speed and quality increases.

# PRINTING INDUSTRY: Static Control Applications

## 2) Offset / Litho

Traditional printing on paper is usually done on offset / litho machines. They can be sheet fed presses for short runs or web offset for longer runs for large magazines, newspapers etc. Most books, brochures, magazines are made by this process. It is "offset" because the image is put onto a plate then onto a rubber blanket and then transferred onto the paper.



A Komori Sheetfed Offset Press

Big names in this area are Heidelberg, MANRoland, K&B (all D) Komori, Mitsubishi (all JP)

Normal problems are:

Double sheet feeding - separate the sheets with ionised air - Model 5000/ 4400  
- use a 1250-S Bar at from edge of stack  
- when printing light plastic sheets this problem can be severe

Delivery bad stacking - use a 1250-S Bar in the swan neck to neutralise the sheet

See: Application sketch " Printing Offset Sheetfed"



Commercial Web Offset

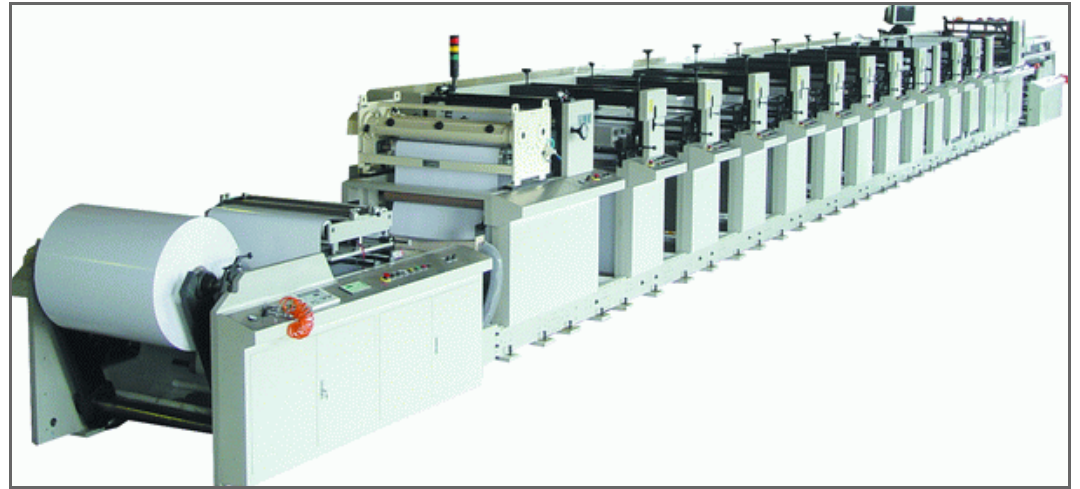
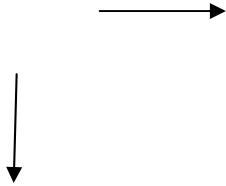


Web Offset Newspaper Press

### 3) Flexo

A bit like letterpress - direct printing from a rubber plate which has a relief image. Generally for printing onto packaging materials e.g. carrier bags or labels. Not very high quality, but cheap and quick. Sometimes use solvent based inks so possible customer for EX equipment. Nearly always rotary - web presses.

Conventional Flexo Web Press  
with individual print units (8  
colour in this photo)



BHS Flexo VLF Press



Common Impression (CI) Flexo  
Press, with 6 print units around  
a big central drum.

Most use water based inks, some use solvent based inks - so EX could be an issue.

#### Problems:

Usually on winders - normal long range solutions - see Winders Sketches.

Sometimes the web may need neutralisation before the CI unit.

#### 4) Gravure Printing Machines

Gravure is for high speed, long run, high quality printing, often on plastic, nearly always with solvent-based inks.

The image is etched into a cylinder. Ink is applied to the cylinder and the image is transferred onto the medium (often with electrostatic assistance - though this is not our area).

Used for high quality, long run applications.: high volume magazines, Christmas wrapping paper etc.

Use EX equipment. Big names are Cerutti (I) Omet (I) DCM (F) W&H (D), Fischer & Krecke (D).



Cerutti Gravure Press

Problems:

The main static problems with combustible solvent-based inks are to reduce the static charge in the web below the fire risk level.

See "EX Applications" sketch.

On the winder of gravure and printers there can be considerable static build up. See application sketches "Winders".

Coating and laminating applications are similar to gravure and flexo presses, when they use solvent-based coatings.

#### 5) Screen Printing

Screen printing has been replaced by graphical digital printing in many areas, such as posters, signs and displays. It is used for higher quality printing on flat sheets as well as three dimensional objects.

Rotary screen print machines are used for high quality labels.

The static problems can be

- dust on the product
- bad feeding on automatic machines
- at the screen
- at the delivery

See two application sketches "Screen Printing " for further details.



A small hand operated screen printer

#### 6) Label Printing

Large and varied industry using various printing techniques and application methods.

See application sketch "Label Printing and Converting"

## 7) Inkjet Coding and Marking

Wherever there is coding or marking onto plastic products, or products wrapped in plastic film the static charge in the product can distort the image area and even destroy the electronics in the print head.

As inkjet coding is used throughout the world in many industries this is a major problem.

It has a simple solution -

-see application sheet "Inkjet Coding and Marking"



Simple Inkjet Coder

## 8) Print Finishing

There are a lot of print finishing operations - turning the printed page into a book, display, magazine - such as guillotining, binding, drilling, stapling, coating, welding etc but the most common is folding.

This is done online on web presses and is not usually a problem, but paper sheet folding is an important area for static eliminators

See application sheet "Print Finishing"



MBO Folding Machine

## 9) Pad Printing (Tampon Printing)

Pad Printing on plastic products can have two static problems:

- dust on the product
- printing problems - ink fly / feathering

See application sketch "Pad Printing"



## 10) Digital Printing

Important and growing market where Fraser has become a specialist in the static control problems which this industry faces.

There are two separate sides of Digital Printing:

- 1) Documents
- 2) Graphical

Document digital printing is used for customising letters, bills, mailers.

Often part of an integrated mailing system with folders, bursters and envelope systems. These printers can print in colour as well as black and white.

The static problem can be throughout the processes.



Digital "Document" Press

see application sketch "Digital Document Printing"

Graphical digital printing is for larger format colour printing of posters, displays and similar. It can be on rigid sheets or flexible material.

The main static problems are on flatbed machines printing with UV inks onto rigid plastic sheets. These have dust as well as printing problems.



Flatbed UV Digital Printer

See application sketch "Graphical Digital Print"



Solvent Based Printer for Flexible Materials