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<th>Title</th>
<th>Printing processes in newspaper production.</th>
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Printing Processes In Newspaper Production
Session 7:

Printing processes in newspaper production

Characteristics of the various processes
Inking systems
Damping systems
Plates
Blankets
PRINTING PROCESSES IN NEWSPAPER PRODUCTION

OFFSET - CONVENTIONAL

FILM INKING

1. UNDERSHOT
2. OVERSHOT
3. PUMP INKING
   (INJECTION INKING)

DUCTOR INKING (Not used in newspaper printing)
Figure 1. Overshot fountain.

Figure 2. Undershot fountain.

Figure 3. Pump inking system or injector inking.
## DEMANDS ON NEWSINK

<table>
<thead>
<tr>
<th>UNDERSHOT</th>
<th>OVERSHOT</th>
<th>INKPUMPS</th>
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<tbody>
<tr>
<td>Viscous</td>
<td>Less viscous</td>
<td>Even less viscous</td>
</tr>
<tr>
<td>Short</td>
<td>Long</td>
<td>Long</td>
</tr>
<tr>
<td>High relative polarity for a high water take-up</td>
<td>Low relative polarity for a low water take-up</td>
<td>Even lower relative polarity to avoid excessive water take-up</td>
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IN PRACTICE

- Viscous and short inks create greater tendency to linting and rub-off
- If undershot inking is used > use newsprint with low linting and rub-off propensity (rough newsprint)
- Long and low viscous inks have tendency to ink misting and strike-through
- If overshot or pump inking is used, special additives in ink and newsprint with good opacity properties are needed
- High water take-up requires fountain solution with good wetting properties

> Ink, fountain solution, paper, inking unit and blanket properties are interrelated and must be dealt with as an entity
KEYLESS INKING

1. ANILOX LETTERPRESS

The hard letterpress plate has to be protected from the hard anilox-roller by means of soft ink forme rollers. A short inking unit with no disturbances of emulsification giving a very constant ink feed.

Oil based inks.

Anilox letterpress printing unit
2. ANILOX FLEXO

Because of the soft flexo plate, no ink forme rollers are needed > the shortest possible inking unit.

Water based inks.

Flexo printing unit
FLEXO AND LETTERPRESS PRINTING
A FEW ASPECTS

The loss of small dots (especially in flexo) deteriorates highlight details significantly.

New screening trends - higher screen rulings and frequency modulated screening - cannot be easily fulfilled in flexo or letterpress.

Whether computer-to-plate will be available for these printing processes is questionable.

However, it must be noted that the best **consistency** in print densities can be achieved with anilox letterpress.
3. ANILOX OFFSET

Issues to consider:
- short inking causes tendency to excessive water in ink
- ink water interactions are very essential
- temperature control to control viscosity
- wearing of anilox rollers
- wearing of ductor blades

To avoid **ghosting**, the forme roller is 1:1 in size to plate cylinder. Oil based
Louis Jean Chambon

var. pressure setting
Roller doctor blade
Ink pump
Compensating rollers
Kassel version

Neu-Isenburg
version

Anilox roller
Chamber doctor blade
Ink pump

Koenig & Bauer
B = blanket cylinder
P = plate cylinder
I = ink forme roller

Chamber doctor blade
Anilox roller
Ink pump

MAN Roland
Foam roller with doctor blade to remove residue ink

Metering blade
Pan roller var. driven
Ink pump

TKS
Rider roller

Adjustable

Scraper roller with doctor blade to remove residue ink

Orange skin rubber roller = film roller

Fountain roller, var. driven

Ink pump

Mitsubishi
Goss digital ink pump page- or column-wide

Ink distribution rail

Film inking roller, runs at the same speed as the ink fountain roller, is covered with an exchangeable PVC brush tape (affixed by a zip).

Scrap roller with special hard plastic covering

1/3 of the ghosting of conventional inking systems is eliminated

Doctor blade bar and worm shaft for ink return

Goss standard jet spray damping system

Bristle length: approx. 2.5 mm
Distance from distributor: 1.5 mm

Ink distribution roller rilsan-coated

Ink transfer roller conventional rubber-coated

Ink distribution roller hard plastic covering

Ink forme rollers conventional

Plate cylinder

Blanket cylinder
WIFAG OF 370 GTD
klassisches Spaltfarbwerk

WIFAG OF 570 GTD
«keyless», extrem Kurzfarbwerk

WIFAG OF 570 GTD, Farbkastenbereich
Keyless printing couples sold worldwide

Total: 3561 keyless printing couples = 100%
KBA Share: 1428 keyless printing couples = 40%
(retrofits not included)
App. 1. Solid tone density vs print length

Example of a small variation

Example of a large variation
Trend: Digitaler Druck
**ELECTRO-SENSITIVE PROCESSES**

**Principle of operation**

- Colour change in the reactive area
- Electrosensitive (electrochrome) layer
- Pin-electrode
- El. conductive layer
- Substrate

**Process variations**

- Electrolytic printer
  - Reference electrode
  - Recording electrode
  - Electrolyte
  - Paper

- Electro-erosion printer
  - Reference electrode
  - Recording electrode
  - Aluminium layer
  - Colour layer
  - Paper

**Special developments**

- Printer for «normal paper»
  - The electrolytic coating is carried out on a wet surface immediately before recording.

- Colour printer
  - Selective colour command
    - (Voltage excursion, length of impulse)
    - e.g. of a four-colour leuco dye mixture.
Digital job changes in Offset

The direct thermal transfer process

To erase the previous job and prepare them for further imaging the rotating forme cylinders are cleaned by means of a sprayed wash up solution and a cloth (1). The blanket also is cleaned.

The blank cylinder is imaged directly from the data set. Based on the out drum principle a polymer on a narrow support is imagewise transferred by laser-induced thermal transfer.

The laser imaging system with 64 channels has been especially developed for MAN Roland by CREO. Imaging time is about 5 minutes for an A3-size and a high resolution of 2400 dpi. The size of the imaging dot is 11 μm. Printing can begin without any chemical step immediately after fixing.
The two-step thermal transfer

By means of this less costly process a support layer is imaged while printing takes place (3). This layer is thermically transferred onto the cylinder when the job is changed (4).

Several jobs or complete sections can be imaged on a foil. Thermic transfer takes 25 seconds each time.
Principle of operation

Jet
Ink
Ink drops
Satellite drops

Driving principles

Continuous jet
High-pressure (pump)

Interrupted jet
(Drop On Demand = DOD)
Pressure impulses (e.g. piezoelement)
Draw impulses (e.g. counter-electrode)

Deflective principles
Dispersion electrodes

Oscillating jet
Mechanical

Drops collision
Electrostatical

Charging electrode (annular)
Drop catcher
Deflecting electrode (plate)

Deflecting electrodes
Electrode cylinder
Aperture
Electrode
Ion
Corotron

Ionic spray projection
Ferrofluid ink
Magnetic deflecting field

Special developments

Dry ink jet (Spark Jet)
Olivetti

Bubble Jet
Canon

Compound Jet
Hertz

Dry "ink"
High-tension
Jump spark
Small glass tubes

Reversible stema bubble
Heating element

Double jet
Pigmented ink

Satellite drops
(Microdot)