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Trends to improve newspaper colour quality, flexibility and productivity

1) MEG's dedicated business is to produce high performance auxiliary press equipment for web offset presses and for over 30 years has been the technology leader in this area.

2) Trends in newspaper operations

Increase the quality and impact of colour and

Add value to ROP advertising, advertising supplements and magazine sections

Increase press utilisation and improve productivity to contain production costs

How can auxiliary equipment help meet these needs?

Considerable progress has been made to improve performance of commercial heatset equipment (from functional process analysis, high speed micro processors and the use of new materials). MEG is now able to transfer cost efficient technologies to newspaper applications

a) Improved paper handling, particularly to 4 colour press units

Provide optimum web tension variations to reduce waste, make ready and press downtime

Control longitudinal web register

Control lateral web register

b) Drying systems

To increase ink gloss, reduce marking, print on LWC and Super calendar papers.

These are the two areas I will focuss on today.

3) Optimum web tension is fundamental for colour quality and improved productivity

It impacts on waste and available press time and can cause

Web breaks, web flutter, loss of folder register and jams, loss of colour and back-up register, image slur

Variations come from (a) press line, (b) paper (c) press operation and maintenance

4) Web tension variations from press line include:

Type of paster and infeed, variation of tack of printing blankets, dryer and chill rolls, folder, maintenance and crew competence

Recent MEG research has confirmed that tension variations increase substantially with the number and weight (momentum) of web lead rollers, particularly during press acceleration and deceleration.

Now lets move on to the paper roll which is the major source of tension variation. The challenge is for equipment suppliers to produce equipment that minimises these variations and for printers to use and maintain the equipment, and to manage their paper handling. It is worthwhile to go back to the basics to identify the principle problems inherent within the paper roll and then review some techniques to address them.

5) **Paper factors most likely to cause web breaks**

Large variations in tension place stress on weak areas:

Pin holes, poor mill splices, mill splices near core, hair cuts, edge damage, out-of-round, poor cores

With an average of 830 signatures lost per web break (NAPL), plus additional slab off waste it is important to minimise damage by good roll handling.

6) **Paper manufacturing process creates tension variations on press**

A number of studies (VTT Sweden most recently at TAGA), confirm:

Major variation across the width of paper making machine, *ideally run rolls from same position across paper making machine width*

Significant variation from roll to roll

Significant variation between surface and core layers

Mill splices near cores are a major cause too

7) **10 ways to reduce paper problems (IFRA/NAPL)**

Only one of which requires investment in new equipment

New technologies for optimum paper tension

8) **Pasters with core drive and braking (4 quadrant drive)**

Provide a tension response up to 10 times faster than conventional methods

9) **Controlled infeeds v tension boosters**

A number of different techniques have been used on newspaper presses to control tension before the printing unit, none of them have been very satisfactory. However, commercial printers use controlled infeeds with highly satisfactory results. Until recently these have been very expensive and require considerable space. These problems have now been solved with low cost models integrated into the paster.

Controlled infeeds deliver significantly better tension management during splice, change of press speed and with bad rolls.

They provide best longitudinal register conditions for colour printing (direction of web).

10) **Lateral position of the web for optimum colour register**

Web guides have been rare on newspaper presses, again because of cost and space. However, New paster designs can incorporate chuck web steering to overcome these problems.

11) **Integrated paper handling systems**

At MEG we no longer focus just on pasters but rather integrated paper handling as a complete sub system to the press.

Tension control begins at the paster and continues with a controlled infeed when combined with chuck web steering this: Improves colour register, reduce paper waste in all operating conditions.

Automated roll handling will reduce paper damage and improve productivity

Let's now quickly move to another part of the press, between print units and the folder.

12) Drying systems

There is a strong trend in Europe to add dryers to newspaper presses:

To increase the impact of newspaper colour

To reduce marking

To improve ink gloss and allow printing on LWC and Super calendar papers, which allows

To add value to ROP colour advertising

Increase revenue from printing magazine sections and advertising supplements

Because drying is a new technique to many newspaper printers, it is appropriate to summarise the technologies available and their characteristics.

13) Ink and drying system characteristics (○ Poor, ◐ Moderate, ● Good)

Characteristics	Hot air	Hot air/IR	Infra red	Electron beam
Max. drying speed				
Newsprint	15 m/s	10 m/s	5-6 m/s	10 m/s
LWC & S/cal	15 m/s	10 m/s	3-4 m/s	10 m/s
Ink gloss	●	●	○	○
Paper moisture	○	◐	●	●
Running cost				
Ink	●	●	◐	○
Energy	●	●	○	●
Maintenance	●	●	○	●
Reliability/simplicity	●	○	●	◐
Safety	●	○	○	●
Space	○	○	●	●
Investment cost dryer	○	○	◐	○
Pollution control	○	○	◐	●
Chill rolls	○	○	○	●

COMMENTS: No system is perfect. Only hot air and infra red are in use today.

All are highly dependent on ink technologies and prices:

IR and EB inks are very expensive with poor gloss

Heatset colour inks are generally lower in price than coldset (Europe).

Only heatset inks allow unlimited speeds and high gloss on all papers. (It is important to note that Super calendar paper is not an upgraded newsprint and is more difficult to dry than LWC.)

MEG recently production tested a combination of hot air and infra red (HAIR). The relatively minor benefits were not adequate to compensate additional equipment complication, and the fire hazard of hot infra red lamps.

EB is a process not yet adapted to newspaper/commercial printing and currently has very expensive ink, poor gloss.

Hot air heatset offers the best all round performance today. It is an established technology with large installed base. Care is required for its correct selection and installation.

Dryers are part of a system which requires pollution control, chill rolls and air turn bars to eliminate marking.

14) Newspaper press with horizontal dryer

This press layout incorporates advanced paper handling. One important element are air turner bars to change the direction of the web without contact to eliminate marking.

15) Newspaper press with vertical dryer.

Vertical dryer installations will tend to become dominant with 4 high tower units.

16) Conclusion:

The selection of auxiliary equipment will have a major impact on overall press performance.

Selection of appropriate auxiliary paper handling and drying systems will increase colour production quality, productivity and flexibility of newspaper presses.