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<th>New plate-making technologies.</th>
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New Plate-Making Technologies

By

F Van de Velde
I am greatly pleased to be elected to hold an introductory lecture here as an expert on new printing technology. However, in some respect I must disappoint you, because as managing director of a regional newspaper publishing firm having responsibility for production, thus being interested in modern techniques - and also taking my age into consideration - I shouldn't be passed off as an expert. I'll try to give you a short picture of my back-ground.

Holland is a small country on the North-Sea with a population of over 14.5 million. There is a good variety of newspapers, distributed both throughout the country and regional. In 1987 79 daily papers per household were sold, and when we include passing on of a paper - to neighbours and relatives for instance - we come to a figure of 93. The 4.5 million copies a day are published by 23 newspaper companies, spread over 45 titles with an independent editorial policy. A great part of the titles, and nearly 60 per cent of the total sale comes to the credit of the regional papers.

The techniques applied are owing to strong competition to be high-speed, thus fairly up-to-date. Transfer of editorial items from and to news agencies takes place by means of a fast transmission network, using the data package switching technology. Many reporters avail themselves of practicable portable computers and transmit their articles by telephone to their central editorial office. Two daily newspapers have extended their text processing system by a layout system, or complete electronic page make-up. The national newspapers are in the final stage of switching to offset printing. The smaller regional newspapers differ in opinion between them, and have converted or are being converted for approximately 50 per cent. Full colour printing is being practised on a small scale, both on editorial and advertising pages.

The newspaper PZC, for the production techniques of which I am responsible, ranks with a circulation of 63,000 copies and an average number of pages of 22 broadsheet to the regional newspapers, and is convinced that the national newspapers are going to rule the standard of quality and the need for good full colour products. Consequently and on account of concentration of production, of a sister company and, resulting from a co-operation, the graphic production department from 1981 onwards underwent a substantial process of transformation. In 1983 a four unit Goss Metroliner offsetpress, erected in new premises, was put into operation, and at this moment the remainder of the building is nearing completion, so that from September next all newspaper operations will be concentrated on one location.

A simple, modulair Mycro-Tek text processing system has gradually grown into an integrated system with 46 terminals. Output takes place with two Linotype CRT typesetters, Linotron 202, which will be replaced by 70 pica wide laser imagesetters, Linotronic 300, later this year.
All these changes have off and on made me make remarks which obviously were not forgotten by some people in the newspaper industry. Thus a big mouth can lead to a trip to Trivandrum.

I shall approach the subject "New Plate-Making Technologies" from the aspect of the process of electronic typesetting towards offset printing. Though letterpress and flexo printing techniques are not unfamiliar to me, an optimum linking-up to the present computer revolution is achieved. Besides, the quality of printing is still by far the best and modifications on conventional methods - anilox-offset presses are already in operation - result in lower cost.

This is the right moment to introduce a trio. They came all the way from Holland to accompany us on our little journey along the platemaking technologies. They have typical Dutch names: Jan, he looks a bit like a paste-up; Piet, he is the negative type and Mien: she has the shining image of an offset plate.

Let us depart from the paste-up. We see some possibilities to produce an offset printing-plate thereby.

The most simple is the way from the paste-up to the negative and to the plate namely a negative offset plate. Not a positive plate: lower speed and higher cost make this method less suitable for newspaper production.

* The paste-up is laid against fixed feed gauches on the copy board of a reproduction camera, and exposure of the image takes place on a sheet of film which is manually fed in, also by means of feed gauches.

* Processing takes place either manually, or mechanically, and the final result is an illegible negative film, by which the printing plate can be exposed.

* This takes place on a exposure unit, a vacuum pump ensuring optimum contact between film and plate, whereafter illumination with UV-light takes place. - Jan is not very happy - . Dosage is critical: a too short time of exposure yields a weak contact of the imaging surface to the aluminium; a too long exposure yields widening of the pointsize, resulting in image deformation on the rotary press. A photo meter ensures an optimum exposure time.

* Processing of the plate can be done manually. However, a processor operates more efficiently. The plate is developed and provided with a protective gum coating, and dried.

* Finishing of the plate is done by means of a punch- and bend-unit, required to clamp the plate on the plate cylinder of the press. Besides manual processing there is automatic equipment for this purpose, working very accurately.

It is a simple system, but of course there is always a snake in the grass. In this case the register problem, requiring attention. In case of monochrome printing it is important indeed that on each page the printing image shall appear on the same place of the paper. And with spot colour, Mien would like her case to fit.
A good register can be achieved by positioning the negative in the preparatory stage of exposure on a transparant foil of the size of a printing-plate. In case of more films with one plate this method is the only right one. Spot colour is always combined with the black film and exposed immediately in succession.

From a technical point of view easy and faster, in case 1 plate per film is made, is a system whereby optical characters on the paste-up lead to manual punching of the film. A similar punching of the not exposed plate produces a reasonable register, also for spot colour. This method we use at PZC.

In a more advanced register system various stages in the process are inter-adjusted. The paste-up is punched, applied in all further mechanical operations, so: copyboard of the camera, punching of the not exposed film (a rollfilmcamera seems essential to me) and of the not exposed printing-plate. Finally the punch/bend-unit should be provided with this system. The advantage of this system is, that - once provided - all operations can be executed with a great extent of experience, so fast and efficient.

A technique becoming very popular in Europa of the late years, is the direct filmless platemaking system. Especially in the case of newspapers having a limited circulation, the cost of film per page is relatively high, mainly when the same newspaper has to present more editions, and various pages are exchanged. How does such an electrostatic system work? Well, in the first place we know that Piet doesn't exist.

A filmless platemaking system consists of five sections:

- A copyboard, provided with pins, needed for the register. When the paste-up is in its place the board is re-positioned in the camera, ready for the exposure stage. A good illumination of the paste-up is necessary for a transfer of the image without any marks from cut edges.
- The second is the plate storage and exposure section. An electrostatic plate moves into position against register pins. Once the vacuum on the exposure board has been activated, a charging corona passes over the plate, imparting a static charge to the photoconductive coating. After charging, the exposure platter is pivoted into the correct position for exposure. The light reflected from the copy strikes the plate surface and dissipates the charge in the non-image areas. Where no light reflection takes place, namely the image areas of the paste up, the charge remains.
- The third is the toning section. The plate is transported into the toning module where - in most systems - the liquid toner develops the latent image, created at the exposure stage.
- Once the image has been developed it is made permanent in the fusing section by passing through a radiant heating section which fuses the toner to form the tough printing image.
- The last section is comparable with a stand-alone developing unit. The coating in the non-image areas of the plate is removed, the plate is rinsed with water, gummed and dried and ready for bending. It can be treated as a conventional grained and anodised plate requiring no specialised pressroom chemicals or founts.
Some systems have the possibility for a visual check before removing the coating. It should not be necessary.

Various alternatives on the systems diverging in detail are available.

1. Backlight on the copyboard is required for processing positive films, especially of importance for full colour reproduction. Experiences of a couple of newspapers in The Netherlands as to this method are positive.

2. In connection thereof clients have applied for punching-equipment precluding tolerances as to positioning of the plate during the exposure stage. Prepunching of the stored plates doesn’t work, so we see a punch device in the exposure section.

3. Naturally a complete punch and bend unit can be supplemented to the equipment described, and if such should be the case from a supplier wanted by the client. The manufacturers prefer doing business with a regular trading partner, and in this case give a guarantee.

4. In my opinion a jolly good idea for big printing houses with more presses is a unit enabling a barcode to be attached on the edge of the plate, informing the pressmen of the position of the plate on the press. Even applying a plate-scanner for registration of density values is very practicable.

Let us line up the advantages of the filmless platemaking.

* Speed is substantially higher on account of the absence of a complete photographic stage with exposure and development of material. The first plate of a page will be ready within 4 minutes, in case of straight run the second plate will follow after about 2 minutes. The plate output per hour varies from 30 to 120.

* The cost of material is lower on account of film saving.

* The cost of labour is lower too: unless the equipment should be in full operation for hours at a stretch 1 operator can manage full production and attend to feeding in time.

* When adequately maintained the quality of reproduction is more easily controled. Photographic processes are - as I mentioned before - critical: light output of the lamps diminishes proportional to the duration of life; temperature of developer effects the speed etc. etc. These factors are now confined to one big processor.

It is however obvious that these equipments are considerably more expensive, compared to seperate components of the manual type. However, also the structure of production may present some disadvantages.

- For instance many regional newspapers have a high degree of editions, whereby a number of pages is only partially re-edited. Just think of a front page where often only the edition indication is adjusted. The cost of material is low, but should a plate got lost, for instance owing to severe fracture of newsprint caused by a web break on the rotary press, and the original page has been reconstructed for a great part, we have a problem.
Back-up is a special matter. It is a fact that the equipment is apt to function not properly when production is at its highest peak. For regional newspapers an automatic street will have sufficient capacity to operate satisfactorily under full peak load, and supplementing second equipment will not be payable. Back-up equipment in the form of conventional units seems essential to me, for a breakdown of a more serious nature than a plate pulled out of alignment may not be remedied by own staff.

Some specialist say that for the reproduction of full colour separations the only right method is to expose the plate directly from the separations on film. Processing by way of a direct method in this case does not meet the requirements as to quality. I must honestly say that experiences in The Netherlands make me doubt of such a judgement. Good full colour printing is effected by many other powers, and thus the reproduction and the register of the direct equipment come up to the requirements of the plate wanted by the average newspaper printer.

The conclusion of the paralell should be that the pressure of investment for a direct plate making system is fairly high and is consequently highly dependent on the output quantity and the structure thereof.

Therefore it goes without saying that the market has asked for an escape, eliminating the draw backs of manual operation - despite very fast double exposure units too labour-wasting for production peaks -, but adhering to the production method by film. The manufacturers an suppliers combined the stand-alone units to half and full automatic platemaking streets. The most speedy ones are the double type models, exposing two plates at a time, achieving a production of 300 plates an hour.

These systems are of equal construction compared with those for the high demand of production of newspapers in letterpress, based on photopolymer, backed by more than 15 years of process of development.

There is a category I have not yet been talking about and which will effect the further development of plate-making technology. Leading newspapers, both abroad and at home, tend to decentralization of printing-plants: instead of the expensive transport of printed newspapers, pages are transmitted with the aid of facsimile techniques by telephone, and even by satelite, to remote printing houses. Standarisation of the printing proces and the necessity for printing-industries to make their expensive printing presses pay as much as possible, has already caused a Dutch national newspaper partially to be printed by a competitor. Already long time ago the India newspaper "The Hindu", also distributed here in Kerala, started to make use of transmission techniques.
Logically techniques evolve towards laser technology and the receiving unit of the system does not produce a reproduction on paper, not a film, but a direct offsetplate. Apart from data compression, restricting the time of transmission of the page, such equipment consists of two scanners: a reader-unit scanning the paste-up and a recording-unit transferring the same image line by line on the plate. The camera unit of the filmless systems is perfectly suitable for this purpose if the optical system is replaced by laser exposure.

Chemco installed News-Scan facsimile network systems for at least 3 publishers in India; I don’t know what output devices have been installed, but Chemco has the direct laser technology in its selling program.

The Wall Street Journal, using a satellite network, is already a step ahead. In its US plant in Orlando the computer-to-plate technology proves to work very well. Triple-I workstation (manufactured by Information International) produce the computer pages, including screened halftones and graphics. Laser platemakers, manufactured by the parent company Dow Jones, realize exposure of the plate within one minute.

This technique has great possibilities, but is only reserved for organizations having dito quantities of production. Especially for the reproduction of illustrations – photo’s, info-graphics, logo’s – but also for complete furnished advertising material, expensive scanners and processing terminals are required, not to speak of enormous electronic data storage, essential for a broadsheet page. I am personally convinced that a period of 10 years is no exaggeration before computer-to-plate technology will be payable for a medium-sized newspaper. Minor papers may sooner opt for the PC-oriented systems, a subject which will be extensively discussed during the forthcoming days. I won’t go further into this matter now. Nevertheless it is important that the technique is already available and parallel with computer revolution becomes faster and cheaper.

So far the contemplative side of my dissertation. Back to the hard facts in a – unfortunately not complete – survey of the existing platemaking systems and associating indication of investment. The marketing strategy of a manufacturer diverging greatly in various parts of the world, and import duties differing very much, I cannot but give you indications according to prices prevailing in Europe.

1. The conventional stand-alone units

There is a wide variety of single and separate components, there is an enormous number of manufacturers. Two names for exposure units are Delta Electronics (Delta-Turn) and Sack (model 33): fliptop models (meaning a double copy board on two sides) with a capacity of 80 plates/hour. The investment is about $ 12,500.-. A faster unit, 120 plates/hour, has a price of $ 37,500.- and an automatic unit, 200 plates/hour, has a price of $ 70,000.-.
A good plate processor, with a capacity up to 200 plates/hour, will cost $16,500.-.
Plate punch units are delivered by Billows (manual), $15,000,-; by Barenschee, Berth, Nela in a half-automatic version, $22,000.-. Full automatic, up to 400 plates/hour, prices come to $65,000.-.
Plate bend units will cost $8,000.- for a manual system, $25,000.- for a half-automatic and $65,000.- for a full automatic system.

2. Combinations: systems from negative to plate.
Suppliers and manufacturers are Howson Algraphy, Hoechst, Polychrome, Western Lithotech, Horsell, Misomex, Staub, Sixt, Krause-Biagosch etc.
A manual operated system will cost $52,000.-; a half automatic system varies from $150 to 200,000,- and the automatic systems start at $200,000.-.
Of the last category I mention some:
- Horsell with the High Speed Gemini Plate Street, producing an impressive output of 300 plates an hour. Also new is the Mercury 850 plate processing machine, that can be installed as a stand-alone device or integrated into a processing line;
- A very fast german system, installed in England, by Krause-Biagosch, claiming a normal production of 300 plates per hour;
- Western Lithotech, taken over by Mitsubishi Chemical Industries, with the Lith-X-Pozer V;
- New is the Hoechst system, Ozasol ZL 300, that features a performance of also 300 plates/h.

To this category belong the comparable streets for polymere letterpress plates:
- NAPP produces the Titan lines of exposure, processing and plate bending, capacity 120 plates an hour;
- BASF is the biggest German supplier of letterpress plate systems.
- Recent information about the present Letterflex systems, delivered by Grace, was not available in time for me.
- I also don’t have product information of APR, also known as Hercules, a Japanese system, as far as the letterpress plates are concerned.

3. What about the filmless, electrostatic systems?
- The Elfasol system (Hoechst in Germany is manufacturer and has an agency in Bombay) was the leader of this technology and still uses a dry toner concept; there are 3 types: the EA 692, broadsheet capacity in multiple production approx. 55 plates per hour, the 693 approx. 76 per hour and the new 695 has a maximum capacity of 120 plates an hour. I was not allowed to mention the European prices, but to compare them I can give the rates of 1, 1.5 and 2.4.
- The PowerPlate Pioneer is a Chemco development, also delivered by Howson Algraphy with the name ElectroLith 105. A good answer to the Elfasol and based on the use of liquid toner. It can handle doublewidth plates and therefore the capacity is not high: a maximum of 30 plates/hour. The European price is about $125,000.-.

- Also from Chemco is the NewsPlater, a full automatic system and also delivered by Howson (type 2500). A capacity of 120 plates/hour is claimed, 80 will be possible; the price is $190,000.-

- Polychrome builds a high capacity machine, the OPC 2000, capacity 120 plates/hour. Price indication reads $240,000.-

- Agfa Gevaert Belgium presented last year a polyester plate, which is exposed straight from a paste-up. It can be exposed by any type of camera, argon lasers or automatic plate processing units. I have no detailed information about it.

Remains to me to mention a few technical aspects. In the first place I hardly said anything about the printing plates. That’s why the quality of presensitized and electrostatic offsetplates is being watched over to such a degree that selection on purely technical grounds is not possible. Prices don’t diverge very much either. Only a combination of factors can make you decide what plate you want.

- For Mien can’t handle bad weather -. In a free and not exhaustive sequence I point out to you the printing circumstances, among other things determined by the quality and stability of:
  - the newsprint
  - the ink
  - the blankets
  - the acidity of the dampening solution
  - the temperature and air density in the pressroom

and of course the way you are advised in this matter by your supplier. Continuity of supply is self-evident.

One more quality remark. Though nearly all offsetplates are guaranteed for printing 100,000 copies and more, a plate is apt to loose its image round about 50,000 copies. Reckon with a failure either in the exposure of the plate (the UV light lost its power), or in adjustment of the press: there is something wrong with one of the factors mentioned.

Finally some words on flexo printing and its platemaking. The main problems in this interesting evolution for newspaper printing lies in the balance between ink, the printing plate and the newsprint. During the last two years intense consultation has been taking place between the manufacturers of these raw materials. Consequently all main suppliers of letterpress are turning to flexo, which may yield improvement again for letterpress. Last year water development of relief plates was a major theme. Water spray washout can mean a greater relief depth, so the problem of linting can be delayed. It will also reduce the environmental problems with polymer. That brings me to a remark about the offset plate making: all the reviewed systems are harmless to the environment.
Reflecting to the subject I can only come to the conclusion that no conclusion can be drawn. The choice for a platemaking system depends on a scale of factors you will know better from your own experience than I do. In your selection procedure make sure you don't opt for equipment, for a name, or a day's price of material, but that you are investing in a shackle of the production process to fit in the chain of the entire production process. A neighbour regional newspaper of PZC has finished far reaching automation and employs a Harris 8300 full page make-up system for editorial as well as advertising pages. It works perfectly, and we are mutually convinced that our chains are fitting in with our own gear wheels, but don't try to interchange them!

Our trio Jan, Piet and Mien departs for Holland again, I will stay here for the discussion. I hope we succeeded in furnishing you with some understanding on the shackle platemaking. I want to thank you cordially for your attention.