

Non-Process and Chemical-Free Offset Printing Plate

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The first indicator of non-process, non-chemical offset print plates was Drupa 2004 international print fair, which is held quadrennially in Dusseldorf, Germany. After successful studies and many comprehensive test programs, this new product gained acceptance mainly in Europe, Asia and Africa markets in a short time. Sensitivity of light of this plate is between 800–850 nm (IR laser, ideally 830 nm) wavelength and it can be imaged by all commonly available thermal CTP systems. The main point is when the plate is exposed; CTP system does not need any additional attachment.



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Up to the present, in plate preparation processes for press machines, development machine and related chemicals has been needed in order to get result throughout traditional method. Recently the new, non-process, non-chemical plate technique of the sector has provided great facility for applications in presses. Thus, the exposed plate is installed directly to the press and development machine, development and using and supplying of post development chemistry and technical service costs were shortened.



Thus, there is no need to purchase any device except CTP machine to switch to preparation plate with CTP exposure system. Related to this, logistics and storing requirements for electricity and waste water facility were eliminated. Non-process plate does not require a separate washing and gumming station for particular situations or other processing steps. Eventually, these considerations have many greater advantages than reducing the expenses in case of purchasing development machine for plant. Thanks to using non-process plate, the physical space covered by development machine, setup, installing, energy and water expenses will be reduced.

If a product is expected to function properly in practice, that product should be well-grounded. Traditional electrochemical surface, anodized aluminum plate is a sample of this kind of product. Non-process plate is similar to other modern offset printing plates in respect to bearer material (aluminum) and the layer that holds up the moisturizer material (emulsion). On aluminum bearer there is a very thin, particular made of polymer layer comparing with other plates.

Non-process plates, like all other thermal plates, are installed in CTP system manually, semi and full automatically. These plates run negatively. It means that thermo laser exposure head operates the printing image onto the plate

and a thermal polymerization occurs. During this process, in exposed areas of the plate, dissolution or separation of any particle is not observed.

As they have a lower light sensitivity in comparison with conventional plates, imaging speeds of these plates are lower. Nevertheless, a remarkable efficiency in producing is achieved in digital plate preparation. For instance, with (Magnus 400 Quantum) CTP plate exposure machine V speed version with 740x660 nm plate format and 2400-dpi resolution delivers up to 28 plates per hour.

It has a proper resolution compatible with expectations for high quality commercial operations. At 80 screening frequency it carries all screening dots from 1% to 98%. Additionally, the plate can screen 10 or 20 μm with Staccato screening technology in accordance with FM screening and with SQUAREspot imaging technology, photo-realistic printing results are achieved.

Addition to this, the two following characteristics helps by preventing the problem occurrence related to plate making and print press without need to take precaution. Firstly, the non-exposed new plate or exposed plate can be handled for up to four hours in yellow light and one hour in white hour. Secondly, the latent image on surfaced of exposed plate maintains during two weeks on condition that it is stored in a lightless environment.

After imaging process, there is no need for traditional plate preparation process (such development for plate setting and gumming. As plate is formed of a stable dispersion of a particular polymer substrate on aluminum surface, a thermal polymerization is occurred during imaging process. In this process substrate particles do not dissolve. Exposed plate goes directly to plate drum. Although a poorer picture (image) contrast is monitored in comparison with other CTP plates, it helps position of exposed plate onto print drum properly.

By function of develop on press, plate takes final working position after press starts to run. When the print press starts to run, pre-moisturizing starts to blister the polymer substrate in non-image areas of plate. In the beginning, it might be considered that water filter should be replaced or non-exposed plate substrate must be cleaned often. Whereas, after plate-contacted ink rolls run, printing ink transfers dissolved polymer substrate with its tackness to the press deliver by transferring first paper sheets over it. After a few sheet prints, plate surface provides proper surface characteristics. That is to say, as the press works, a good quality print is achieved after 9–15 standard sheet printing.



Non-process plate complies with non-stop workflow requirements. It has a well-suited structure with various print inks, print chemicals and moisturizers. Additionally, this characteristic structure of thermal plate makes possible using standard CTP plates or conventional offset plates instead of chemistry-free plates for a continuous producing.

Printing resistance is confirmed as 100.000 prints by manufacturer company (depending on printing parameters of that time). With this printing resistance extensive range of daily commercial operations can be easily accomplished.

Non-chemical plate is compatible with all small and mid sized of printing operations. Its high-resolution characteristic allows for high quality printing jobs. It is planned to produce plate for another interesting field, small-sized web offset.

In any case, non-process, non-chemical plate users shorten all expenses related to conventional plate preparation methods. At the same time by reducing plate preparation steps, possible print failures and errors which can occur in conventional plate preparation processes (installation, imaging, and development) are eliminated.

Environment-Friendly

In every plate making method, waste water and residual liquids are observed. Neutralization or old developments methods of pre-running process steps are old technologies. Thermal direct plate eliminates all problems related to development and treatment.

Plates are especially compatible with strict environment and treatment regulations. In our country legal regulations are not sufficient as much as in developed countries. If available print houses are analyzed it is clearly seen that conventional plate users give harm to environment and pollute water sources seriously. Plate developing machines have a nearly 35–40 lt. water capacity. Every plate manufacturer recommends different development chemistry, water solution and this ratio is generally 1/3, 1/4, 1/5, 1/8, 1/9. For instance, a manufacturer using 2500 plate in size of 70x100 cm per month has to refresh chemicals at every 500–600 plates. In this plant, 180–200 lt. chemical waste water per month and 2500 m³ year pollute environment. Every liter chemical pollutes 10 liters fresh water. When all printing houses are considered forbidding figures come out.

In plants using CTP system similar environmental problems are met. In thermal or violet plate preparation process, after imaging process, chemical process must be applied in CTP device. When preparing print plate by this system, various amount of chemistry is used varying from manufacturer to manufacturer. For example, A manufacturer can set 8 m² plate with 1 kg chemistry but B manufacturer can use a different amount. The only issue remaining unchanged is both methods use chemicals in plate preparation process.

Conclusion

The damage to the environment by conventional printing plate preparation methods can only be prevented by using chemical free plates. Giving no harm to workers' health can be considered an additional advantage.

Technical Specifications

Plate	Negative-working, thermal digital plate; develop on press
Application	Short-/medium-run sheetfed applications
Plate colour	Pale blue/grey
Image contrast	Medium blue/grey—for visual identification only, not suitable for densitometer measurements. 12-point type is readable for determining press cylinder placement.
Latent image stability	Under dark storage conditions, the imaged plate may be kept up to 2 weeks prior to going on press.
Gauge	0.14mm, 0.20mm, and 0.30mm
Maximum short grain width	1050mm
Spectral sensitivity	800–850nm
Platesetter compatibility	Recommended: Kodak Trendsetter, Kodak Lotem, and Kodak Magnus platesetters Other accredited platesetters: Screen PT-R platesetter range, Heidelberg Topsetter and Suprasetter platesetter range, and Luscher Xpose! platesetter range
Laser energy required	325 mJ/cm ²
Resolution	1%–98%, 200 lpi
FM capability	25 micron stochastic
Run length	100,000 impressions
Shelf life	18 months