

**-Pressure personalized zonal divided doctor blades-
A developmental suggestion for the keyless newspaper printing technology.**



By:

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1-Introduction

Just few years ago KBA, the great German sheet fed & newspaper web offset printing machines builder & developer , has innovated the keyless shortened train inking unit technology with adapted flexographic anilox roller & doctor blade.

Since that many models, even digital ones, of keyless litho or waterless offset machines had been launched in markets, carrying not only the trademark of KBA, but also sometimes its competitors.

Dozens of scientific features have been released tackling with the advantages and benefits of the keyless technology. Getting rid of the ink fountain-metering keys and also most of the multi different functions alternately rubber and stainless inking cylinders, both are the main of these advantages.

According to the final prints quality parameters, the keyless technology had proved its efficiency. It already gives appropriate standard tolerances ranges of ink film thicknesses on the plate zones, blanket zones and finally on the printed material surface. That what is called a correct ink metering. Hence we receive similar standardization of densities, colors values, gloss and brightness profiles & all other optical properties on the end prints

That's apart from the dramatic short cut of the keyless machine make ready times between the subsequent jobs, reaching the O.K sheet with correct acquired color values. Short make readies are the most critical competitive factor in the era of day after day shrinking print runs.

2- What's the keyless shortened train inking technology?

Regarding the halftone printing original theory, the halftone dot size and the ink film thickness are the only two detectors of the printed colors strengths and all other optical profiles values on the prints.

The exposed halftone dot size factor is metered over the printing plate through an integrated Color Management System / CMS, that's happening during the pre-press phase. Whereas the ink film thicknesses are metered at the press phase on the machine inking units, definitely by their fountain keys ((screws)). These keys move forward and backward pressing on the fountain blade determining the ink film thicknesses, and also according to the instructions of the Job Definition Files / JDFs, which are loaded on the machine control unit as the heart of the CMSs.

In the keyless technology, the inks fountains' keys and also the inks too long cylinders train are both have been substituted with what we can call "A modified felxographic inking unit ". Here KBA kept the anilox ink metering ceramic roller with it's doctor blade ((ink scraper)), but integrated it with a very shortened ink cylinders train. In the keyless technology, the stainless or polymer doctor blade is still wiping and collecting the surface excess ink on the anilox cells shoulders. The micro width of the gap between the blade edge and the shoulders surface "theoretical equals zero" is changeable regarding the vertical pressure force directed across the blade. And so consequently, the wider this gap is, the higher the whole ink volume transferred from the anilox roller to the printing plate.

As a differentiation from the conventional anilox roller, here the elimination of the ink fountain-keys compelled KBA to compensate their absence by using a thermal zoned anilox roller. Every ex-zone on the ink fountain is represented thermally with its same width and parallel location on the anilox. That's what is considered the ((New)) of the keyless technology.

Depending on the opposite relationship between the ink heat temperature and it's viscosity profiles, the anilox roller achieves a precious **spot thermal metering** of the ink film thicknesses. The higher the anilox zone cells heat temperature degree, the lower their carried ink viscosity and the thicker it's thickness on the printed material. Thus a stronger required density means more heat ((more energy)) on its equivalent on the ceramic anilox roller.

3- And what's my developmental suggestion?

I suggest the addition of another metering parameter of the ink film thicknesses on the keyless lithoffset and waterless machines. I suggest a parameter which also works under the control of the JDFs loaded on the machines-control units. It will stand beside the thermal personalized anilox zones, or may be their alternative. Too simply, I suggest: **dividing the doctor blade into zones!!!** .

The depth, screening & volume of the anilox cells are all fixed ((static)) engraved unchangeable parameters, and impossible to be zonal personalized from job to another one. So the only rest changeable parameter, could be metered, on the keyless inking unit is the doctor blade pressure force. Virtually, to be more precious, my suggested new ink metering parameter is the **too narrow width gap between the doctor blade-edge and the cells' shoulders**.

I suggest dividing the doctor blade into zones, also with one width identical to their thermal equivalents on the anilox roller. KBA has already personalized the heat temperature of every anilox roller-zone, and I call also to personalize the pressure force on every similar zone of the divided doctor blade.

My revolutionary theory here bases on the opposite relationship between pressure force on every zone of a divided doctor blade in one hand , and the width of the micro gap between it and the cells shoulders underneath and the ink transferred volume in the other hand.

To obtain ((thick)) ink film for ((high)) color strength on a printed zone, we apply a relative ((weak)) force on its equivalent doctor blade zone, and vice versa. In other words, according to my suggested theory, the blank "white" print zones will have zero micro blade-anilox gaps, whereas the solid ones will acquire the widest possible gap.

4- The result

The thermal/ pressure dual personalization of every printing zone on the anilox roller, and a divided doctor blade respectively, sure will demonstrate more optimum ink film thicknesses metering on the keyless lithoffset and waterless conventional or digital printing machines. Now, on those machines the strongest printed colors zones are not having only the highest heat temperature degrees on the anilox cells!!, but also the lowest pressure force on the doctor blade.

All the preflight adjustments of these two ink metering parameters, are automatically achieved via the JDFs during the make ready period prior to actual print. Any required re-adjustments during the run, are just fingers touches on the keyless machine-control panel.

I invite KBA and all keyless technology developer to study, examine and test the applicability of this theoretical developmental suggestion.

5- Future imagination

I dream of a day when we speak about a doctor blade **divided into micro zones** !!! . Every zone is in equal width of the anilox cell size!, and so can be immersed into it's depth wiping whatever of its ink volume!!!. I dream of -one to one- ink volume personalized anilox-cells!

Am I too optimistic? Or I'm realistic? We shall leave the answer to the future.