

MultiDot: a silent revolution that came from Poland

How a Polish printing house can save €200,000 annually – and print more beautifully in the process?

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In the world of offset, nothing particularly revolutionary has happened for decades. Screens were what they were. Everyone knew how they worked, everyone got used to them, and no one specifically asked if it could be better. And then three gentlemen from Heidelberg Polska decided **to find the answer to an unasked question** – and the result was MultiDot: a patented screening technology that changes the rules of the game in offset printing.

Printing is a great deception. And that's a good thing.

Before we answer the question "what the MultiDot is", it is worth understanding what the "art of printing" consists of. Andrzej Kunstetter, an expert at Heidelberg Polska with nearly 30 years of experience, puts it bluntly:

"Printing is one big deception – and there's no hiding it. We see a full range of colors, while on the printout we have only a fraction of it. But that poor recipients must be convinced that they see exactly the same thing they saw in nature."

The secret lies in the screen – a grid of microscopic dots from which every printed image is built. The human eye combines them into half-tones and colors. This same phenomenon makes a television screen "pretend" to be yellow using a set of red and green pixels. Magic? No – optics.

The problem is that for decades, nothing particularly new appeared in the field of screening. There were attempts, but – as A. Kunstetter says – "they appear and disappear." Until the team from Heidelberg Polska decided to change that.

How is innovation born? In the Polish branch of a global giant!

Heidelberg Polska is a company involved in the sale, distribution, and service of printing machines – not an R&D center. And yet, it was right here that MultiDot was created.

Andrzej Kunstetter, Tomasz Jasiński, Marek Chmielewski – prepress and digital solutions experts with several decades of experience at Heidelberg – decided to check if imperfect screens could be replaced with something better. And since the idea seemed to make sense, then... why ask the headquarters for an opinion?

"We did it ourselves – basically without asking anyone for an opinion. We arranged the money, we arranged the people, we launched the project. – Tomasz Jasiński"

The project received funding from NCBiR (National Centre for Research and Development) and lasted over 3 years. The Warsaw University of Technology and several printing houses open to novelties were invited to cooperate, agreeing to test the technology in production conditions.

The result? The MultiDot grant project was rated as **the best project among all those funded by NCBiR** in a given intake, and the technology obtained patents in many countries.

What is MultiDot?

MultiDot is a patented offset screening technology developed by the Heidelberg Polska team in cooperation with the Warsaw University of Technology. It operates within the Prinect system and requires a license. The technology affects the way halftone dots are built, which translates into a better image, lower ink consumption, and higher stability of the printing process.

Three offset problems that MultiDot solves at once

1. Quality: an image that says more

The simplest demonstration of the difference: a bottle with a label is visible on an offset printout. On a traditional screen, the text on the bottle is unreadable. On MultiDot – it can be read. Not under a magnifying glass – with the naked eye.

Why such an effect? The quite complex structure of the MultiDot halftone dot causes individual pixels to represent not only tonal values but also the content of the image. In addition, an increased color gamut... Every halftone dot casts a shadow – the more ink, the larger the shadow. This phenomenon of controlled optical dot gain in MultiDot technology changes the geometry of the dots so that there are more shadows, but each one is smaller – thanks to which there are many times more color combinations and the color gamut expands.

One of the customers of a printing house using MultiDot asked to... return to the old screen. The reason? His packaging stood out **too much, although "in-plus", on the store shelf**, and competing printing houses were unable to achieve such quality.

2. Savings: 15% less ink, 200,000 euro in the pocket Less ink on the sheet is not just the cost of purchase. It is a whole chain of effects:

- **Shorter drying** – less ink dries faster (applies to conventional printing).
- **Less powder** – supporting drying between sheets.
- **Less water and energy** – needed for drying.

- **Shorter make-ready** – less waste paper during color matching at the beginning of the run.
- **Greater machine efficiency** – more jobs can be performed during one shift.

One customer from Japan, printing with UV inks (where saving on drying does not occur), saved over 200,000 euro in a year solely on ink.

3. Stability: the first and the ten-thousandth print – identical

This is one of the most difficult problems in offset: maintaining color from the first to the last sheet. MultiDot paradoxically improves stability because, despite the complex structure of halftone dots, it uses a lower screen ruling:

"An image made with MultiDot at a lower screen ruling is simply smoother. The lower the screen ruling, the more stable the process. – Andrzej Kunstetter"

Traditional offset, to obtain a sharp, detailed image without a visible screen structure, requires high screen rulings (e.g., 70 lpcm = 175 lpi or higher). MultiDot achieves better quality at just 60 lpcm = 150 lpi. And a lower screen ruling understandably means lower sensitivity of the printing process to fluctuations in environmental conditions (temperature, humidity, pressure), ink viscosity, or the degree of wear of the printing form.

Numbers that make an impression

Indicator	Traditional offset	MultiDot
Screen ruling (at the same quality)	70 lpcm / 175 lpi	60 lpcm / 150 lpi
Ink consumption	100%	approximately 85–90%
Drying time	standard	shorter
Color gamut	standard	expanded
Color stability in the run	good	very good
Global installations	–	79+ (including 19 in Japan)

Implementation: is it difficult?

Short answer: no. Longer answer – it depends on the mindset.

On the technical side, the conditions are simple: a printing press in good condition, the Prinect system, and a MultiDot license. Nothing changes on the press itself – except that printing is faster and better.

The real barrier is in people. Operators who have been perfecting their workflows in a certain way for years do not necessarily want to learn something new. Tomasz Jasiński puts it aptly in one sentence:

"Good is the enemy of better. If it has been great so far, why should I change it?"

The answer is obvious: "because 200,000 euro a year is a good argument." But the change must start with the owner's decision – not from the operator.

79 installations and still growing

MultiDot is currently implemented in 79 printing houses worldwide. Apart from Poland, Japan turned out to be a breakthrough – 19 installations – where printing houses are intensively seeking both savings and quality. This technology also works in the UK, USA, China, South Africa, Sweden, India, and the Middle East.

In Poland, the first printing houses implemented this technology as part of pilot projects. Now they have been using it in production for several years – and – as Mirosław Pawliński, the host of the podcast, says – only superlatives are heard in conversations.

Summary

- **MultiDot is a patented Polish screening** technology developed by the Heidelberg Polska team in cooperation with the Warsaw University of Technology.
- **Better quality:** higher sharpness, wider color gamut, clearer details.
- **Real savings:** statistically approx. 15% less ink, less powder, water, and energy, shorter make-ready, less waste paper.
- **Higher run stability:** lower screen ruling = less variability in printing.
- **79 installations worldwide**, including Japan, USA, UK, South Africa.
- **Requires:** Prinect system, good technical condition of the machine and – above all – an open mind.
- Side effect: possibility of hiding security information in the screen structure (MultiDot Secure – subject of a separate article).

Do you want to know MultiDot from the technical or economic side? Contact Andrzej Kunstetter or Tomasz Jasiński from Heidelberg Polska directly – contact details are available in the description of the 'Niezbędnik Poligrafia' podcast.