

Technik im Detail

HelioSprint 2 – One for All

New engraving system now covers all application areas

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With HelioSprint 2, improvements made over many years have resulted in a new universal broadband engraving system: One-for-All. HelioSprint 2 now covers all requirements of the application areas from security, stamps, packaging and decorative printing to varnish and coating rollers.

HelioSprint 2 is the result of many years of continuous development and improvement of the engraving system. At the beginning of this development, there was still a multitude of individual specialized systems in the form of the A (technical cylinders), B (decor), C (packaging), D (securities) engraving system. With HelioSprint 2, all application areas are now covered by a single universal system. How did this become possible?

As banal as it may sound at first, an engraving system is supposed to engrave. In concrete terms, this means that 30 million cells must be cut into the surface of a medium-sized gravure cylinder. And each cell (from light to medium to dark tone) must be depth-controlled to within 1 µm! This performance must also be fast, constant and reliable. The requirement: an engraving cylinder must be 100% reproducible at all times.

The standard engraving system worldwide is HelioSprint with over 5000 units. It engraves at an average rate of 7500 cells per second!

From „rough“ to „fine“

The areas of application for gravure printing are diverse. They range from application and coating rollers, through packaging and decorative printing, to security and securities printing. Accordingly, engravings are required in screen rulings from 32 l/cm to 200 l/cm, and in security printing even higher. Now, it is in the nature of electro-mechanical engraving that the screen ruling and the maximum engraving depth are linked via the angle of the engraving diamond. Typically, engraving diamonds with 120° and 130° are used. This results in required engraving depths of up to 78 µm.

Highest engraving quality

High-quality engraving is characterized by the fact that it fully reproduces the repro data on the cylinder and that there are no engraving-related disturbances in the subsequent print image. These disturbances are effects such as ringing and dragging. Furthermore, insufficient dynamics or temperature-related drifting of the engraving can lead to reduced engraving quality. The outstanding requirements that an engraving system must meet are summarized: Consistency, reliability, productivity, sufficient engraving depths and all this with high engraving quality.

Development of the engraving system

As the inventor of electromechanical engraving, HELL has built up a unique and very comprehensive know-how in the production of engraving systems over more than 60 years. Despite a multitude of attempts, only the manufacturer OHIO Gravure Technologies has succeeded in gaining a foothold in this field alongside HELL. Due to the very high requirements, it was obvious at the beginning of the development to focus only on a part of the application areas. The HelioSprint C engraving system was therefore primarily aimed at publication printers, since the angle of the engraving stylus used here only required a smaller engraving depth. However, this system also covered wide areas of packaging printing. The following HelioSprint B engraving system was then aimed entirely at packaging and decorative printers. The table „HelioSprint Chronology“ gives an impression of the history of engraving system development.

With XtremeEngraving, a new engraving process was introduced in 2003. This created a new degree of freedom in engraving: the choice of writing resolution could now be made independently of the requi-

red screen. This meant that engraving now worked almost like an imagesetter. As a result, very large cell volumes could now be realized on the one hand, but also the highest contour sharpness on the other. However, this freedom also came at the expense of productivity, which in turn was partly compensated for by the increased engraving frequency of 12 kHz. Today, Xtreme-Engraving is mostly used when special requirements are involved.



Modern engraving systems do a fantastic job of precision work. One engraving system cuts over 100 billion cells in 2 years! This corresponds to a gravure line length of over 42.000 km. Each cell is cut with an accuracy of 1 µm

Tightest manufacturing tolerances

Since 2018, the new MultiTune alignment process has improved engraving quality without affecting productivity. MultiTune provides a much more meaningful fingerprint of the engraving system than was previously possible. As a result, the behavior of the engraving system can be adapted more precisely to the respective screen and screen angle. In engraving, this results in sharper contours and less dragging and ringing. MultiTune is a standard feature of current Helio-Klischograph engraving machines.

The continuous further development of the engraving systems is based, on the one hand, on the continuous optimization of components and materials and the minimization of manufacturing tolerances. On the other hand, the software for compensating for mechanical deviations has been improved again and again. Along with this, the process for creating the engraving system-specific fingerprint

has also been continuously refined. And finally, the engraving systems also benefited from advances in power electronics, which provide the necessary drive energy for the engraving system.

42.000 km line length

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In order to maintain the required accuracy from the first to the last cell, the system must be treated with care. HELL has set up the Rheady maintenance program to ensure that the engraving system can continue to perform its work with precision even beyond this point.



The Rheady maintenance program ensures consistently high engraving quality even after years of intensive use

HelioSprint 2 is the new universal broadband engraving system that covers all applications



	HelioSprint C	HelioSprint B	HelioXtreme 22	HelioSprint D	HelioSprint BC	HelioSprint III	HelioXtreme 32	HelioSprint BC+	HelioSprint 2
Introduction	1998	2001	2003	2004	2008	2008	2010	2016	2022
Screen	60 - 100	54 - 80	14 - 118	100 - 148	54 - 100	60 - 100	14 - 118	54 - 100	40 - 148
Frequence	7,5 kHz	6 / 7,5 kHz	7,5 / 7,5* kHz	7,5 kHz	7,5 kHz	12 kHz	7,5 / 12* kHz	7,5 / 9 kHz	5/6/7,5/9/12* kHz
Depth	60 µm	70 µm	70 / 110* µm	60 µm	70 µm	65 µm	70 / 110* µm	70 µm	78 µm
Xtreme*	-	-	•	-	-	-	•	-	•
MultiTune (seit 2018)	-	-	-	-	-	•	•	•	•
Application	Publication Packaging	Packaging Decorative	Security Stamps Packaging Decorative Tech. Cylinder*	Stamps	Packaging Decorative	Packaging Decorative	Security Stamps Packaging Decorative Tech. Cylinder*	Packaging Decorative	Security Stamps Packaging Decorative Tech. Cylinder

The history of engraving system development. With HelioSprint 2, one engraving system is available today for all applications