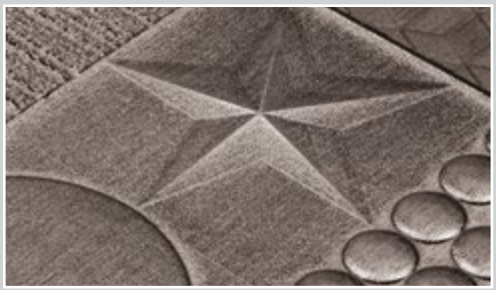
Cellaxy C500

DIRECT LASER FOR LINEWORK, CONTONE AND EMBOSSING



BASED ON INNOVATION.

HELL
Gravure Systems

Cellaxy is a versatile tool that uses intelligent software to adapt to the relevant requirements.

Cellaxy C500

Universal platform for investment security

Cellaxy defines the high-end in gravure. Cellaxy also meets the highest embossing and coating requirements. The Cellaxy laser system's universal design enables adjustments to be made based on intelligent algorithms without any mechanical changes. This ensures the high-power, high-quality laser beam can be utilized to optimum effect in any application.

One feature exclusive to Cellaxy is the use of up to two fiber lasers in the 600 W performance class, making it the most productive direct laser on the market. Thanks to its platform design, Cellaxy can optionally be equipped with any type of laser, meaning it is also prepared for future developments such as the high-performance classes of nano and pico lasers. The necessary preparations are in place for Cellaxy to engrave the HelioPearl* laser-engravable monolayer, too.

High-end HD Gravure

Cellaxy is the high-end output machine in premium packaging gravure and represents the benchmark for high-definition gravure (HD Gravure). Wherever top results are required for flexible packaging, labels, cigarettes, packaging for the cosmetic and pharmaceutical industry or decor printing applications, Cellaxy shows its strengths – because Cellaxy lasers with a resolution of up to 2000 l/cm (5080 dpi). The finer tonal gradations produce more nuanced, higher-contrast contone than in stylus engraving.

A superior concept

- High-end in HD Gravure for linework and contone
- High-performance, high-quality engraving for gravure and embossing
- Platform for investment security, regardless of laser source or surface
- HelioPearl* ready

** HelioPearl is a laser-engravable monolayer from K.Walter GmbH & Co. KG*

Superior across all applications

Sharper reproduction of text and linework, more nuanced contones and embossing with maximum accuracy in every detail

Linework and text

Cellaxy engraves with a laser spot size of 10 µm and a resolution of up to 2000 l/cm (5080 dpi) for contour definition in etching quality. In addition the special algorithm for optimizing edge cells produces smooth, closed contours in print.

When engraving with Cellaxy, the screen and screen angle have no effect on the speed of the laser. This means Cellaxy can make the most of its superior performance regardless of job structure, imaging a gravure cylinder up to three times faster than an 8 kHz standard engraving machine.

Cellaxy engraves linework and text in etching quality.

Cellaxy produces contones that are even more nuanced and show even higher contrast.

Contone

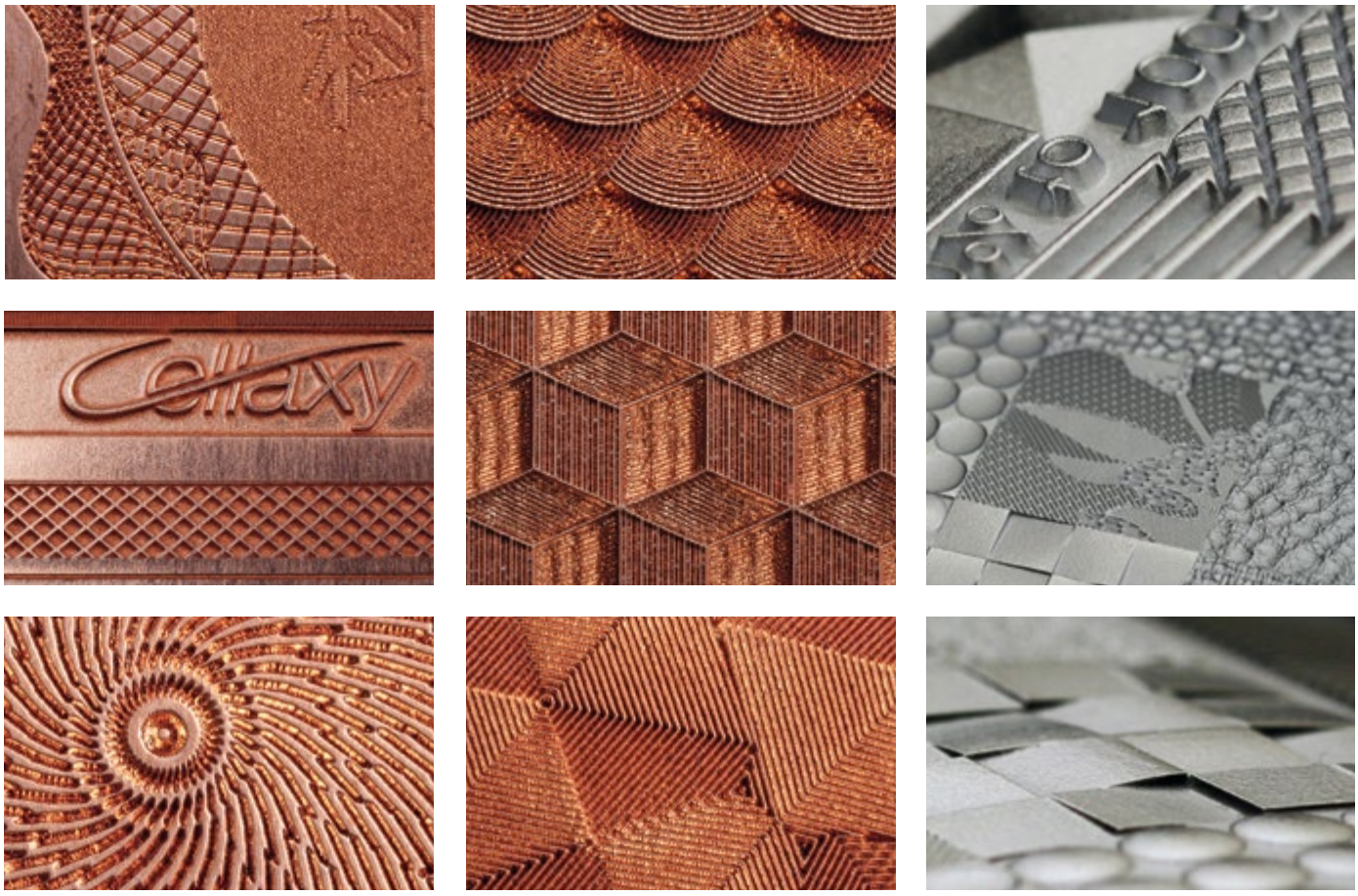
As a result of finer tonal gradations, Cellaxy produces contones that are even more nuanced and show even higher contrast than in stylus engraving. Either a diamond screen or a hexagonal screen can be used for contone reproduction. Helio-compatible calculation of contone screens ensures cylinders engraved conventionally and lasered with Cellaxy can always be used together for printing.

Cellaxy works in tandem with CellCreator. This unique software makes it possible to adapt contone screens to specific printing conditions, which also creates smooth vignettes on aluminum and perfect smoothness with metallized inks.

Embossing

There is a clear trend toward products with increasingly elaborate finishing. The demands relating to fineness and detail are particularly high for embossing techniques. As a universal laser for the direct structuring of metal surfaces that is capable of engraving virtually any geometrical shape on a cylinder surface, Cellaxy is ideal for many of these applications, producing precise embossing forms with exceptional cost-efficiency.

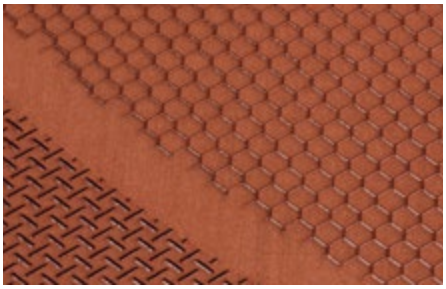
Cellaxy performs fully automated multipass engraving with an engraving depth of up to 4000 µm. It does so on a variety of materials, including copper, zinc, steel and aluminum. Both 2D and 3D embossing forms are produced in the highest possible stepless and seamless quality. The results achieved with Cellaxy embossing processes are highly impressive thanks to long-lasting tactile qualities and high attention to detail. This applies equally to micro-embossing over large areas and background textures.



Cellaxy engraves stepless and seamless 2D and 3D embossing cylinders e.g. in copper (illustrations on the left) and steel (illustrations on the right).

Coating

Cellaxy can also be used for coating applications, e.g. in the engraving of transfer rollers, with high-quality, high-performance and low cost. Coating application systems are implemented as inline solutions or as stand-alone coating systems. The corresponding transfer rollers for primers, lacquers and adhesives are screened with Cellaxy in hexagonal form or with line structures (hashes).



Superior equipment concept

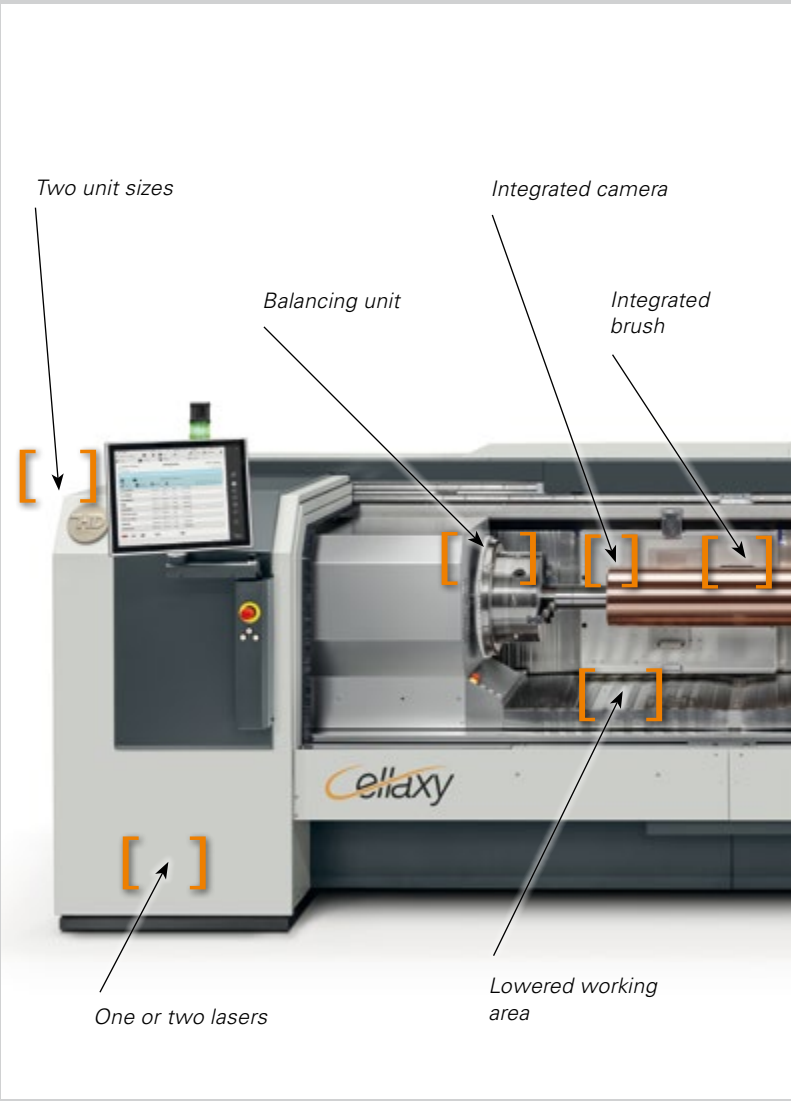
High-performance, high-quality, versatility and investment security

Separate lowered working area
A shutter separates the machine's user-friendly lowered working area from the laser head. The extraction, lubrication system and the wet chamber have all been optimized based on the latest developments.

Integrated brush
The integrated brush head is engaged as required to optimize surface cleaning – during multipass processes, for instance.

Temperature-controlled bearing blocks
The cylinder temperature needs to be kept constant throughout to ensure high-precision lasering, so Cellaxy regulates the temperature of its laser chamber and bearing blocks.

Two machine sizes
Cellaxy is available in two different sizes geared to customer requirements.

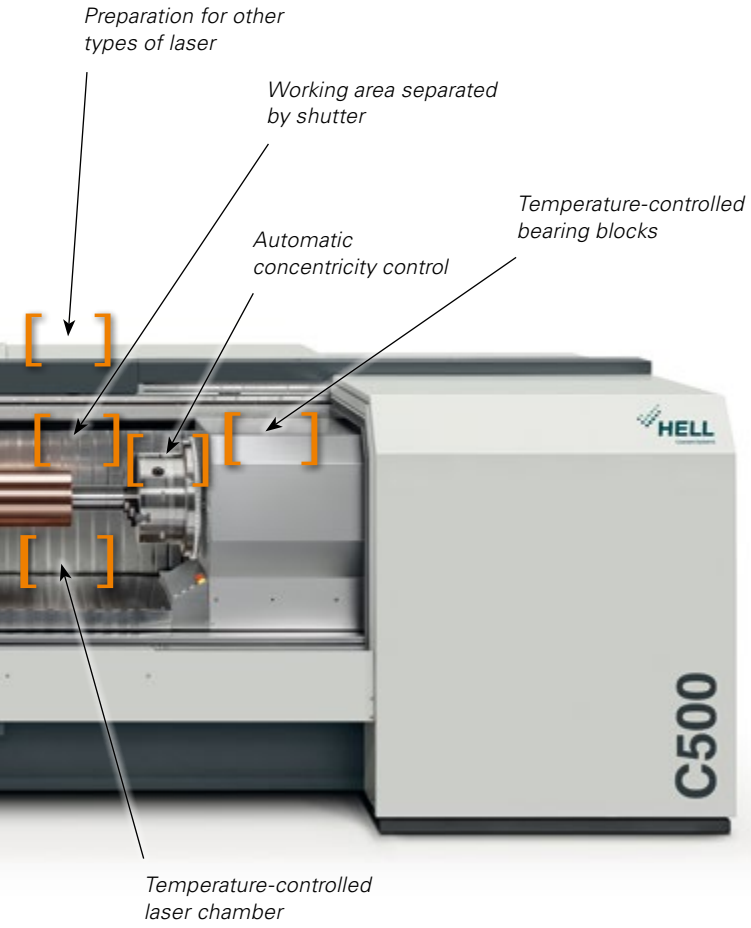


Three laser modes
The Cellaxy fiber laser can produce a steady, uninterrupted laser beam and also allows users to pulse the beam. On this basis, HELL has created three different operating modes for Cellaxy:

Pulse
In this mode, the output-modulated laser beam is pulsed on and off for excellent removal characteristics. Areas of use include printing applications and high-precision embossing.

Interleave
Utilized in conjunction with pulse mode, this mode switches the output-modulated laser beam back and forth between two alternate tracks. In addition to boosting performance, it also ensures good removal characteristics and is used, for example, in standard embossing applications.

Continuous
In this mode, the laser output is continuously modulated between 0 and 100%. Practical applications include decorative gravure and LAMS etching masks.



One or two lasers

One feature exclusive to Cellaxy is the use of up to two fiber lasers in the 600 W performance class, making it by far the most productive direct laser on the market.

Ready for new laser developments

Cellaxy can be equipped with any type of laser, meaning it is also geared up for the latest developments such as the high-performance classes of nano and pico lasers.

HelioPearl ready

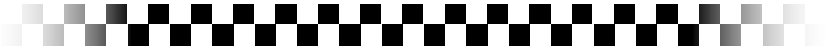
Cellaxy has all the necessary preparations to engrave the HelioPearl laser-engravable monolayer. For this pupose, it can be retrofitted in the field with an alternative shortpulse laser.

HelioPearl is developed by K.Walter to produce a polymer monolayer for eco-friendly, cost-efficient and time-saving cylinder coating.

Cellaxy laser modes:

Pulse

Interleave



Continuous

Application-specific software algorithms

Optimum engraving results through practical adaptions

First-class laser beam quality and intelligent algorithms

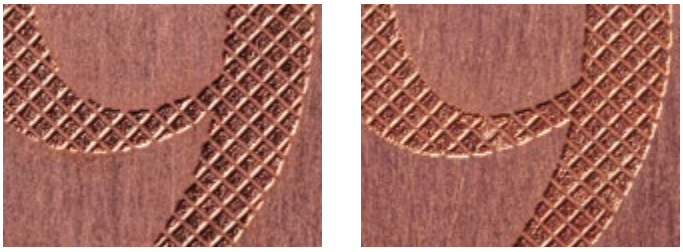
Cellaxy is a universal laser tool for the direct engraving of metal cylinders. A variety of integrated software-based functions enable it to adapt to the relevant application. This means Cellaxy meets all kinds of requirements relating to applications such as the packaging, tobacco and automotive industries, wood decors and technical cylinders.

Cylinder compensation

Cellaxy compensates for suboptimal cylinder properties as far as possible. For example, it is equipped with an integrated system for balancing. Cellaxy is also fitted with a series of sensors to check the properties of the cylinder to be lasered and interrupt cylinder run-up in the case of inadequate concentricity or balancing quality. The cylinder's conicity is checked using geometrical cylinder measurement and the focus can be adjusted during engraving if necessary.

Edge cells

Due to the process, a gravure cylinder must also be screened in full tone in order to provide the doctor blade of the printing unit with sufficient contact surface. On inclined contours, this often creates small cells that do not print out and make the contour appear less smooth. Merging nonprinting cells with neighboring ones improves the printing behavior and makes the contour look smooth again.



Left: Contour with conventionally lasered edge cells.
Right: Merging edge cells for an improved printout.

SuperCell

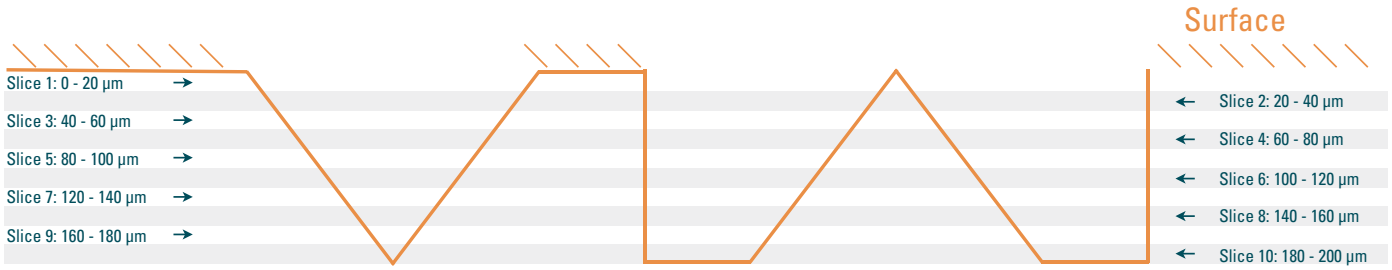
SuperCell is an algorithm that creates smooth contone transitions in direct laser engraving. Based on dithering technology in CellCreator, it ensures perfect, smooth vignettes.

Multipass

The maximum engraving depth of each laser pass depends on the material and application. For example, it is approximately 11 µm in the case of steel and around 30 µm in the case of copper. Comprising several engraving passes, the multipass process is used to achieve larger engraving depths. The special feature of this process is that the cylinder's feed direction is reversed between each engraving pass. The focus position is automatically adjusted to suit the relevant engraving depth. The multipass process can be used for engraving depths of up to 4000 µm.

Stepless embossing

Cellaxy is controlled by 8-bit grayscale TIFF data. The engraving depth follows the grayscales in the image signal with exceptional precision. In the multipass process, the original 8-bit grayscale TIFF file produces an n-fold number of new 8-bit grayscale TIFF data. Each individual file is used to control one slice. In each slice, the engraving depth follows the grayscales in the image signal. The transition from one slice to the next is calculated using complex algorithms to ensure a stepless result. This means Cellaxy can produce stepless 3D engravings with ultrafine resolution up to a maximum engraving depth of 4000 µm.



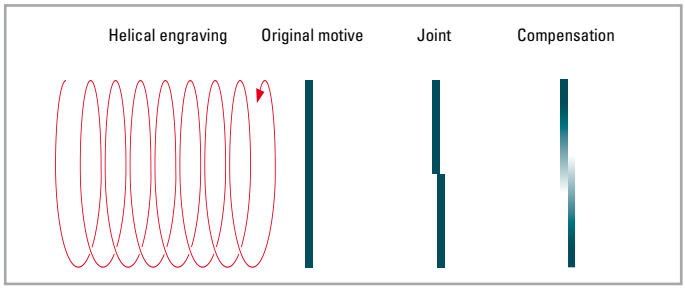
Example of a true 3D engraving with a depth of 200 µm. Ten 8-bit grayscale TIFF files were automatically calculated for this purpose, each generating one slice. The rotation is reversed in circumferential direction between each engraving pass.

Sequence combiner

In order to laser several embossing jobs onto a cylinder as efficiently as possible in one pass, Cellaxy is equipped with the sequence combiner. Under a graphical user interface, the sequence combiner merges several small embossing jobs into one superordinate one. This is a method of operation that can be very useful, for example, for multiple engraving of a test job with different production parameters.

Seamless finish

For seamless engraving of printing and embossing forms, Cellaxy benefits from algorithms that adjust vertical motive structures to the continuous feed's helical gradient on the fly. It has several algorithms, depending on the application, with the result that joints are no longer visible.



Without compensation, helical engraving causes a joint on a seamless circumferential motive structure.

CellCreator

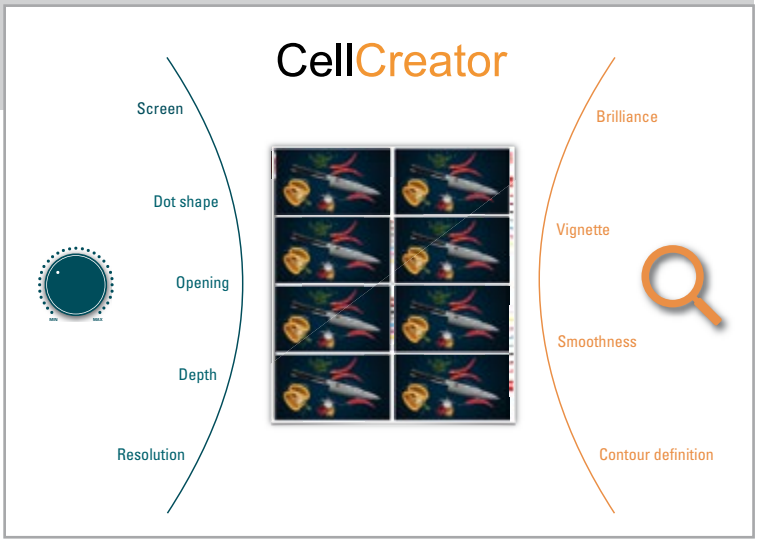
The key to perfect reproduction in direct laser engraving

HELL provides its Cellaxy customers with a set of tried-and-tested Helio-compatible screens as standard. This enables users to immediately image linework and contone cylinders that can easily be combined with electromechanically engraved cylinders.

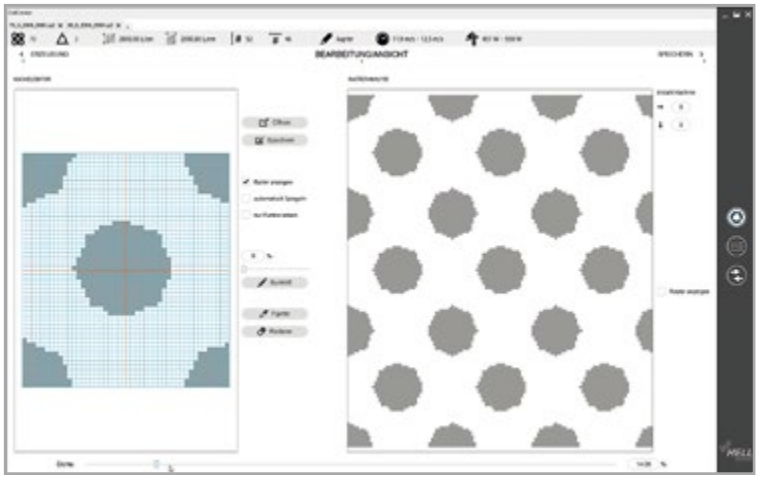
Moreover, CellCreator makes it possible for users to edit pre-defined screens or develop their own screens. This includes various cell geometries (e.g. hexagon or diamond) plus a screen structure that can be varied in terms of either depth or area as required (e.g. semi-autotypical, conventional, or autotypical). The possibility to define a separate cell description for each density value is unique.

CellCreator enables users to adapt gravure cylinders very specifically to customer requirements and fully utilize the potential of direct laser engraving. This results in perfect contone reproduction and a linework resolution of up to 2000 l/cm (5080 dpi).

No comparable tool exists!



CellCreator transparently maps the Cellaxy production parameters onto the print result.



CellCreator generates the spatial description for the cell of a given density value.

Optimum in gravure and embossing

Compatibility and high-performance

High-performance gravure

Comparison of the average engraving time for a sample cylinder set: 0.7 m², 6 colors, screen 70, screen angle 0,0,2,2,3,4, helical engraving, 25% fast crossfeed, Twain efficiency factor 1.5, no preparation time.

Stylus engraving

8 kHz	8 kHz Twain	12 kHz	12 kHz Twain
60 mins	41 mins	37 mins	25 mins

Direct laser engraving

1-beam	1-beam interleave	2-beam	2-beam interleave
82 mins	42 mins	42 mins	21 mins

High-performance embossing

Comparison for engraving an embossing cylinder: 0.7 m², 500 µm depth, no fast crossfeed, no preparation time.
Copper: 25 × 20 µm slices, steel: 42 × 12 µm slices.

Copper

1-beam	1-beam interleave	2-beam	2-beam interleave
40 h	21 h	21 h	11 h

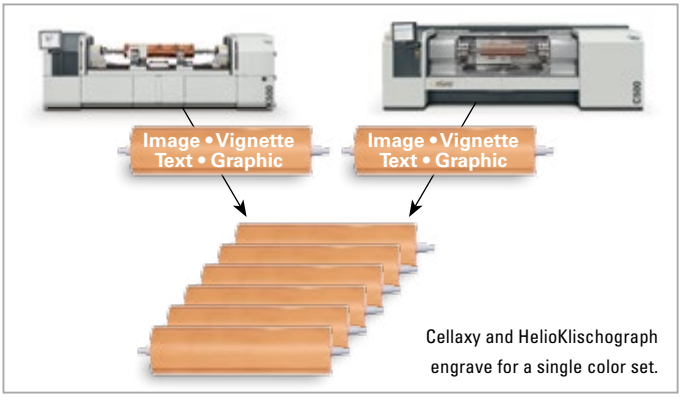
Steel

1-beam	1-beam interleave	2-beam	2-beam interleave
57 h	29 h	29 h	16 h

Mixed operation

Helio-compatible contone reproduction is always ensured with Cellaxy, meaning that cylinders engraved conventionally and lasered using Cellaxy can be used together for printing.

Furthermore, there is no difference between the requirements relating to the copper surface of conventionally engraved and lasered cylinders.



Cellaxy and HelioKlischograph engrave for a single color set.

Based on Innovation. HELL

HELL solutions satisfy the toughest demands in terms of print quality, cylinder service life and printing speeds. Printing forms engraved using HELL equipment benefit from simplified color matching, minimal start-up waste and optimum engraving results with high print densities, soft vignettes, brilliant contone and razor-sharp lines.

Your local HELL representative will be happy to provide further information and personal advice on our products and services at any time. For contact addresses and additional product information, see our website www.hell-gravure-systems.com.

Subject to design modifications. Errors excepted.

Technical and functional details

All the benefits at a glance

Basic data	Cellaxy C500	Cellaxy C500 XL
Basic unit (L x H x W)	4700 x 1694 x 2089 mm	6300 x 1734 x 2089 mm
Space required incl. access area (L x W)	7300 x 4089 mm	8900 x 4089 mm
Weight	Approx. 10,000 kg	Approx. 13,500 kg
Hollow cylinder		
Face width	400 - 1850 mm	400 - 3300 mm
Circumference	300 - 1600 mm	
Cylinder weight	Max. 500 kg	
Cylinder mounting	Pivots in three-jaw chuck	
Shaft cylinder		
Face width	400 - 1950 mm	400 - 3400 mm
Incl. shafts	800 - 2350 mm	800 - 3800 mm
Circumference	300 - 1600 mm	
Cylinder weight	Max. 1500 kg	Max. 2000 kg
Cylinder mounting	Three-jaw chuck	
All cylinders		
Balance quality	G<2.5	
Concentricity	< +- 35 µm	
Laser		
Principle	CW fiber laser	
Power	Up to 2 x 600 W	
Wavelength	1064 nm	
Optical system	Closed	
Write resolution	500 - 2000 l/cm = 1270 - 5080 dpi	
Spot size	10 - 20 µm	
Engraving depth	Depends on material, e.g. Cu: 30 µm	
Max. engraving depth	4000 µm	

Subject to design modifications. Errors excepted.

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