

Image-to-Print

Printing Technology & Innovation Days

**Innovations & Challenges
in Rotogravure**

Rudi Weis-Schiff
Janoschka

I  (like) Flexo...

I 
GRAVURE

The Market Situation for Flexible Packaging in Europe...



- Strong price pressure
- Budget restrictions
- Volumes move to low-cost countries
- Smaller / shorter print-runs
- Overcapacities
- Competition between Gravure and Flexo
- **Volume moving from Gravure to Flexo !**
- **Is this true...?**

Gravur ⇔ Flexo: Market Study in 2006 by GfK

“Mr. Gravure, a reliable person with a strong personality”

but also:

reliable

serious

personality

elegant

cautious

slow, unflexible

“Someone who knows what he is talking about, someone that you can trust”



Source: ERA

Gravur ⇔ Flexo: Market Study in 2006 by GfK

“Mr. Flexo, less reliable and less attractive”

“Mr. Flexo”



faster

flexible

unreliable

less sociable

less elegant

rather capricious

“Watch out,
You will most probably
not get what has been
promised”....



Source: ERA

Market Study in 2014 by Gfk



The Magic “0” – who is more beautiful ?



What is better: Gravur ⇔ Flexo ???



Convince !



Seduce...



Objective !

21 questions for an objective answer !



Flexo ⇌ Gravur ...

Flexo

Gravure

Investment of the printing-press:

- Considered as being lower

- Considered as a rather high investment



Investment of the tool-production: (plates or sleeves):

- Often financed (or pre-financed) by the supplier

- Rather high investment



Tooling
(plates / cylinders)

Flexo ⇌ Gravur ...

Flexo

Gravure

Costs:
(Plates / cylinders)

- Considered as being lower

1

- Considered as a rather high

Material Costs:
(for plate / cylinder production)

- relatively high Polymer-plate costs
- Manufacturing costs
- Mounting cost
- Tape and other materials
- Anilox Rollers

- Low material cost for copper: 420 my (thickness) = 2,36 Kg per m²
- Other Material - low
- KWh - low
- Relatively* high production costs

1

*depending on installation and location

Tooling
(plates / cylinders)

Flexo ⇌ Gravur ...

	Flexo	Gravure
Automatization level:	<ul style="list-style-type: none"> ▪ Very limited 	<ul style="list-style-type: none"> ▪ Totally possible
Repro process and Color Management:	<ul style="list-style-type: none"> ▪ limited 	<ul style="list-style-type: none"> ▪ Fully implemented
Delivery Times:	<ul style="list-style-type: none"> ▪ Short and Flexible 	<ul style="list-style-type: none"> ▪ Rather long



SET-UP

Flexo ⇌ Gravur ...

Flexo

Gravure

Set-up time of machine:
(average per job)

- Relatively quick

- Considered as being longer

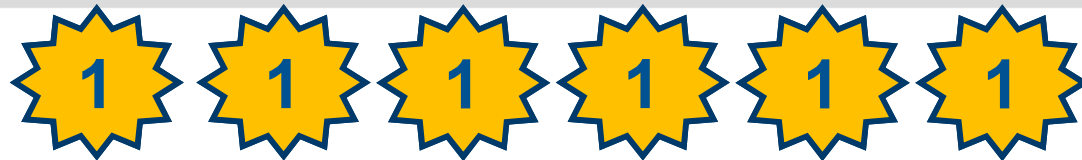
Material Waste:

- Central impression-roll
- Less material in the machine
- Faster on register

- Relatively high, especially on small- and medium size print-runs



Flexo ⇌ Gravur ...



Flexo ⇌ Gravur ...

	Flexo	Gravure
Printing speed:	<ul style="list-style-type: none">High printing speed	<ul style="list-style-type: none">High printing speed
Consistency during the print-run:	<ul style="list-style-type: none">Some issues	<ul style="list-style-type: none">Very consistent
repeatability:	<ul style="list-style-type: none">Some issues	<ul style="list-style-type: none">Very good repeatability

Flexo ⇌ Gravur ...

	Flexo	Gravure
Production cost small-run:	<ul style="list-style-type: none"> ▪ Considerable 	<ul style="list-style-type: none"> ▪ High
Production cost mid-size run:	<ul style="list-style-type: none"> ▪ Considerable 	<ul style="list-style-type: none"> ▪ Relatively high
Production cost long-run:	<ul style="list-style-type: none"> ▪ Considerable 	<ul style="list-style-type: none"> ▪ Low

Printing Quality

Flexo ⇌ Gravur ...

	Flexo	Gravure
Printing quality in general:	<ul style="list-style-type: none"> Much improved 	<ul style="list-style-type: none"> Superior
Fine type, text and elements:	<ul style="list-style-type: none"> Limited 	<ul style="list-style-type: none"> High definition
Image quality, vignettes:	<ul style="list-style-type: none"> HD 	<ul style="list-style-type: none"> High-definition is standard



Printing Quality

Flexo ⇌ Gravur ...

Flexo

**High densities,
intense colors,
metallic inks,
varnishes and
lacquers:**

- Limited

Gravure

- No issue
- Excellent color
brilliance
- Excellent ink-coverage

1

Other

Flexo ⇌ Gravur ...

	Flexo	Gravure
Energy Consumption:	<ul style="list-style-type: none"> Reduced 	<ul style="list-style-type: none"> Reduced
Innovation:	<ul style="list-style-type: none"> seen as having improved its quality level considerably 	<ul style="list-style-type: none"> not seen as an innovative technology

Flexo ⇌ Gravur ...

Flexo



Score
12

Gravure

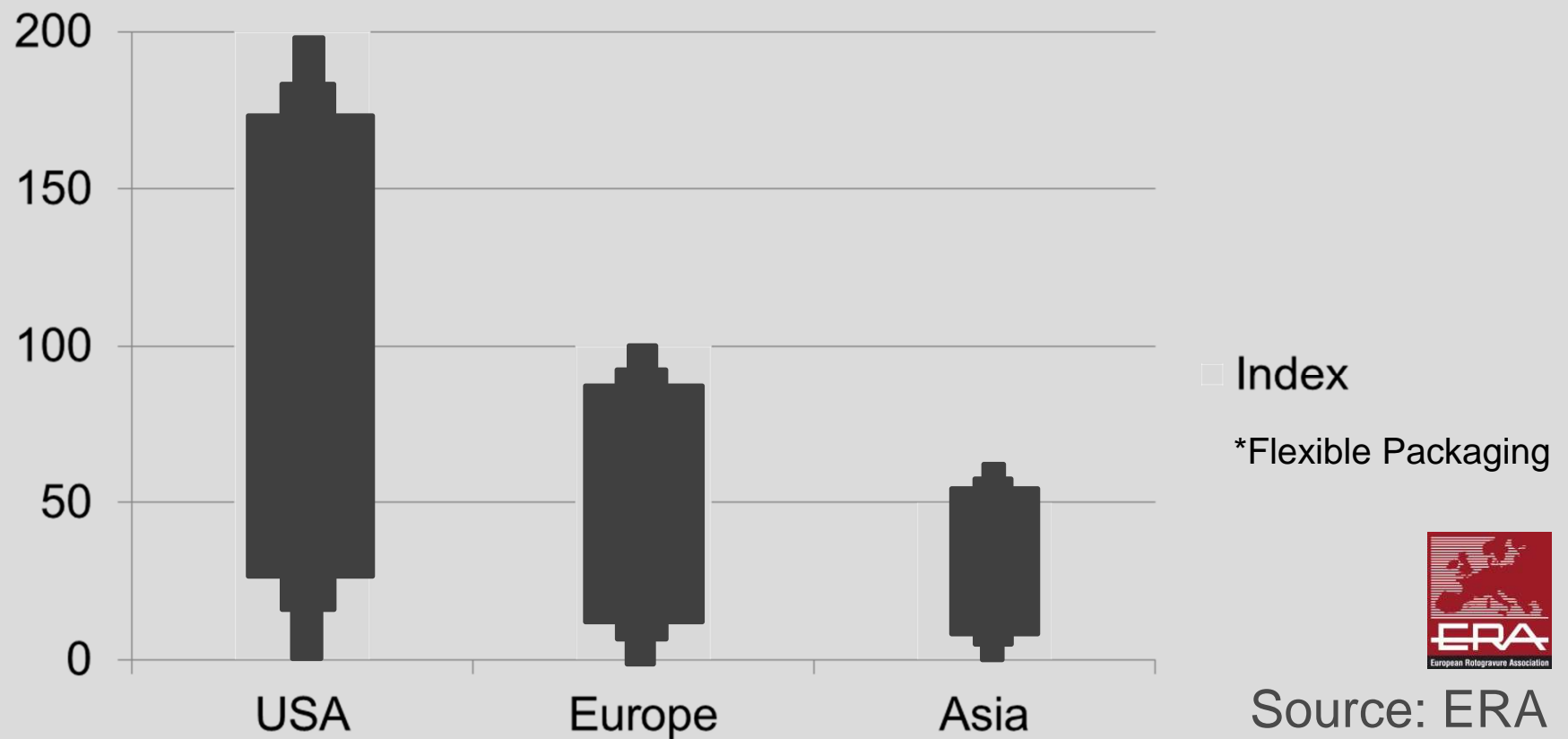


Score
12

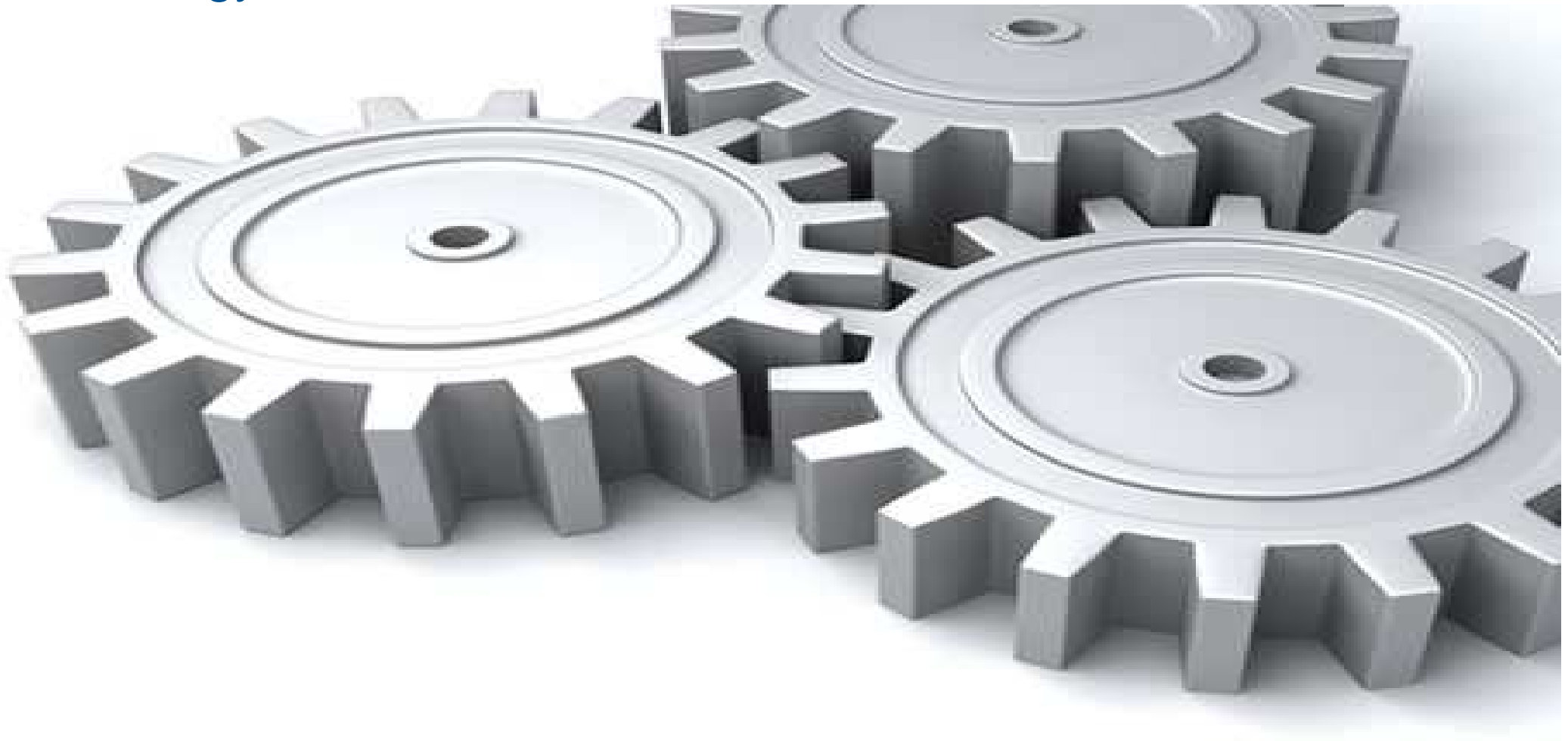
Market share: Gravur \Leftrightarrow Flexo



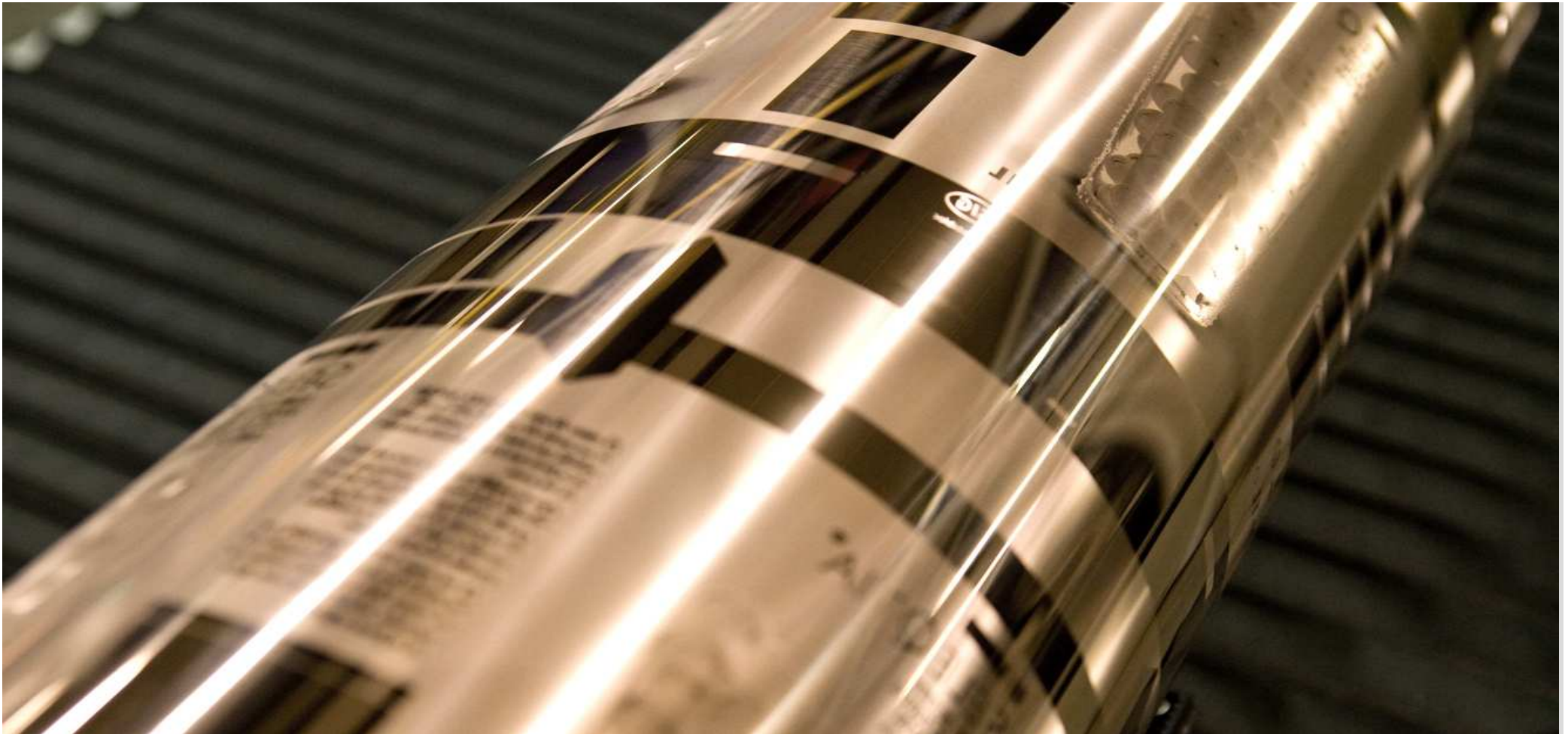
Cylinder prices* around the world...



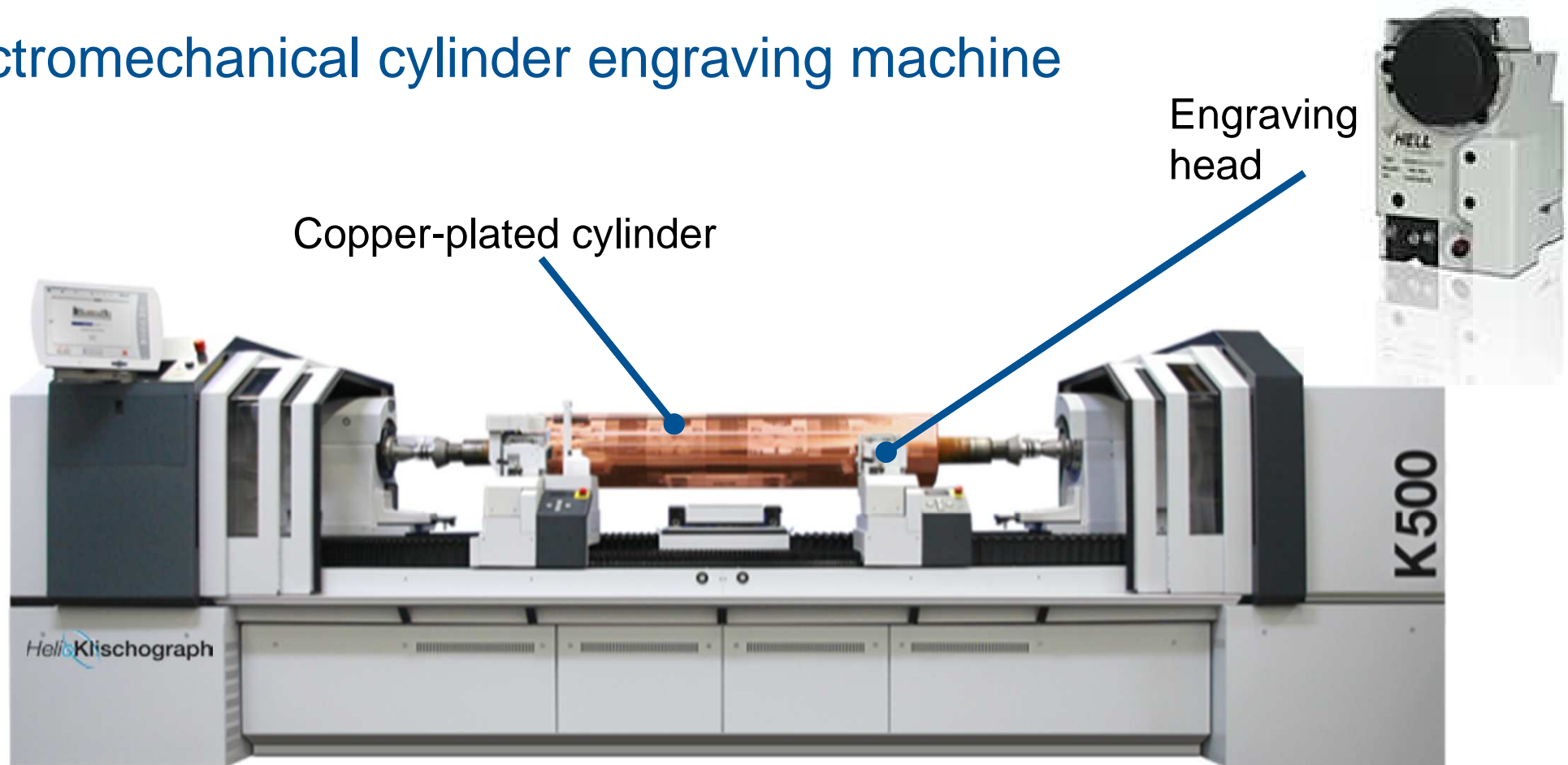
Technology



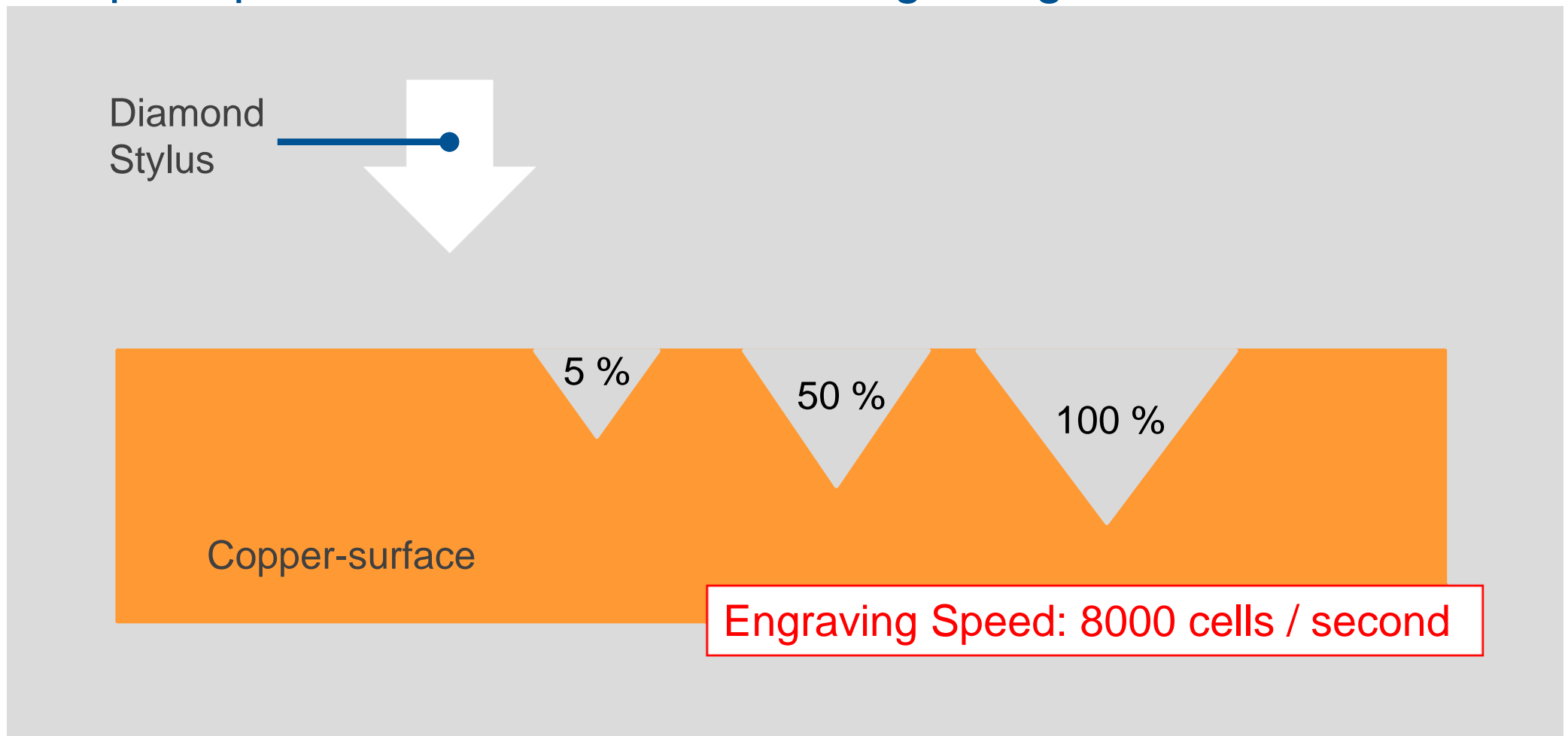
The principles of electromechanical cylinder engraving



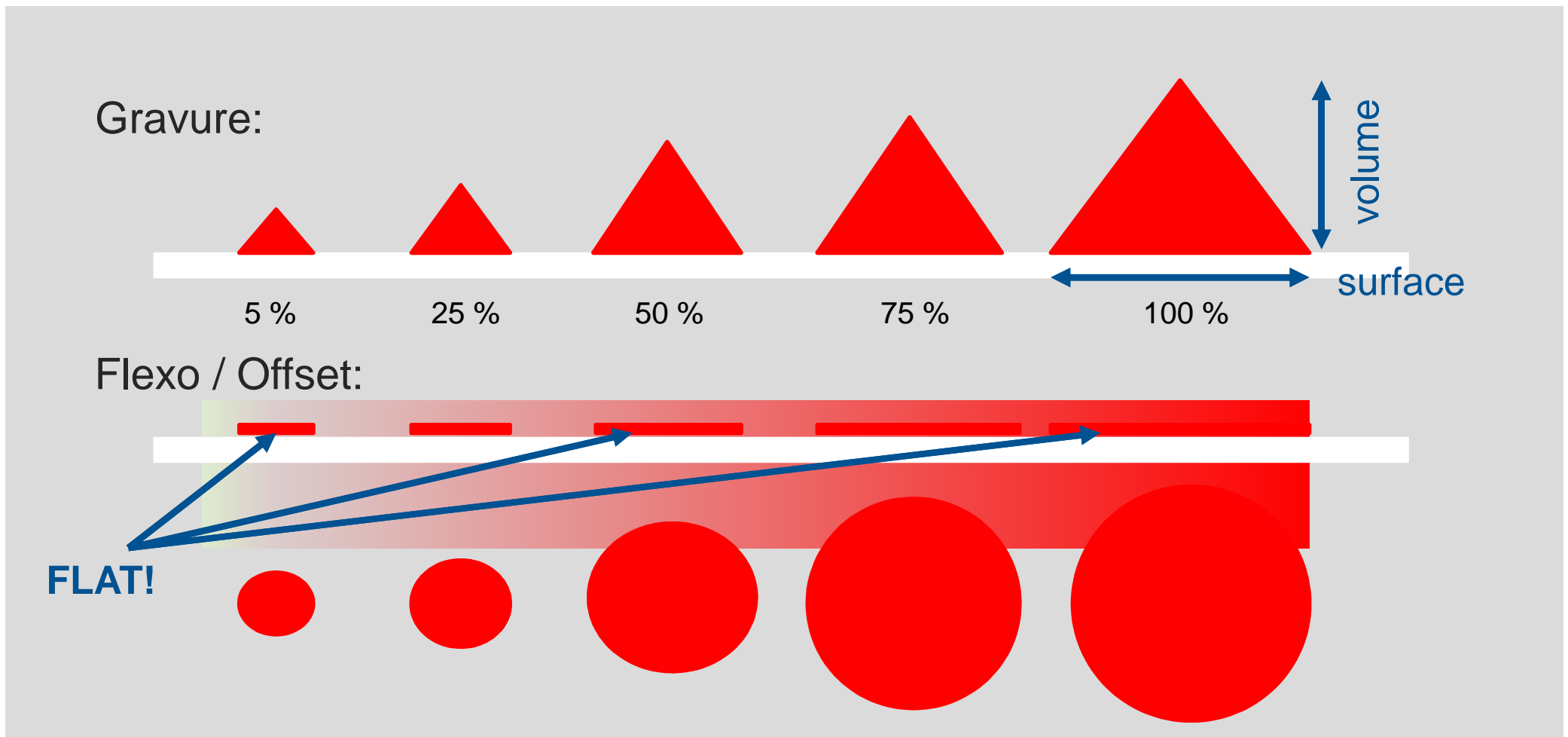
Electromechanical cylinder engraving machine



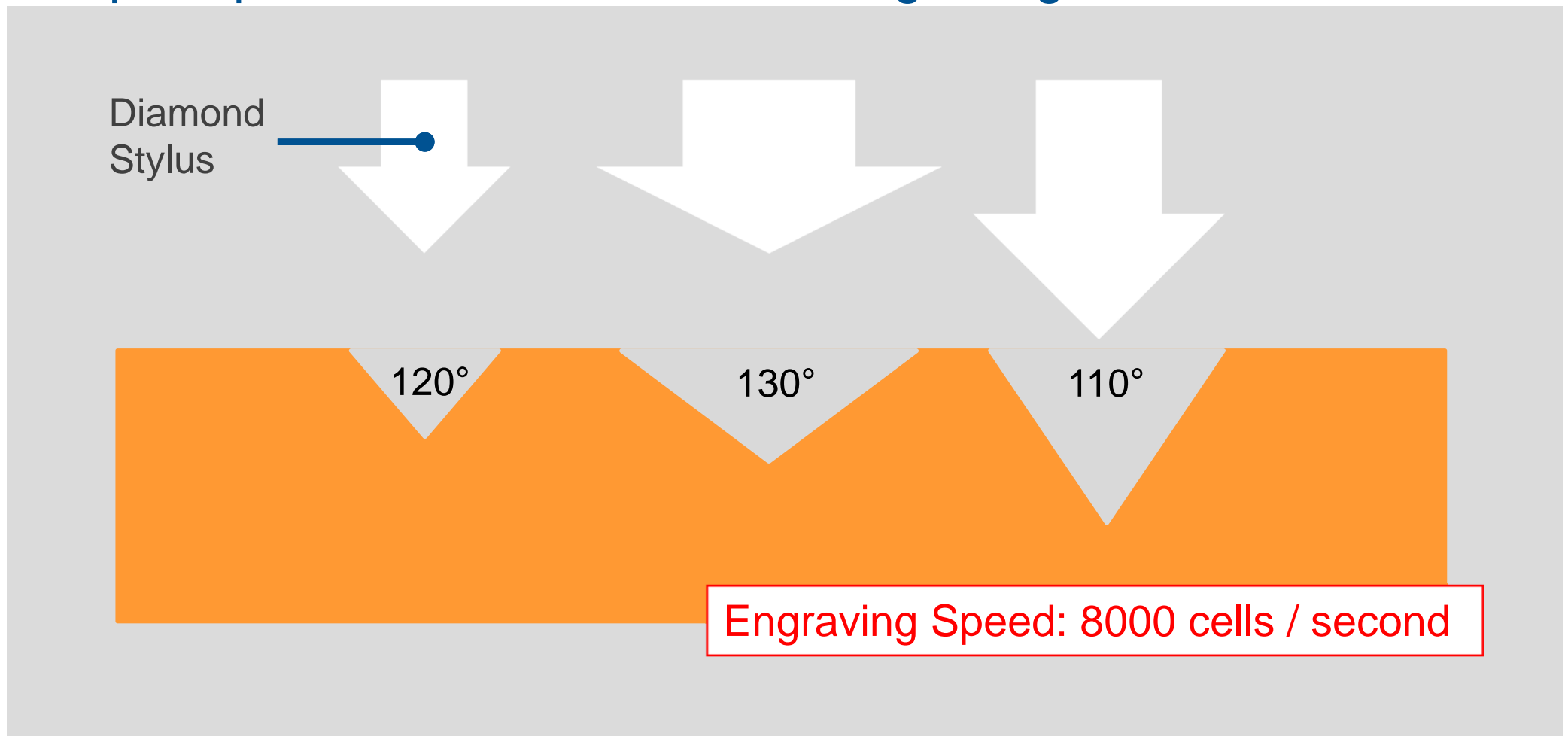
The principles of electromechanical engraving



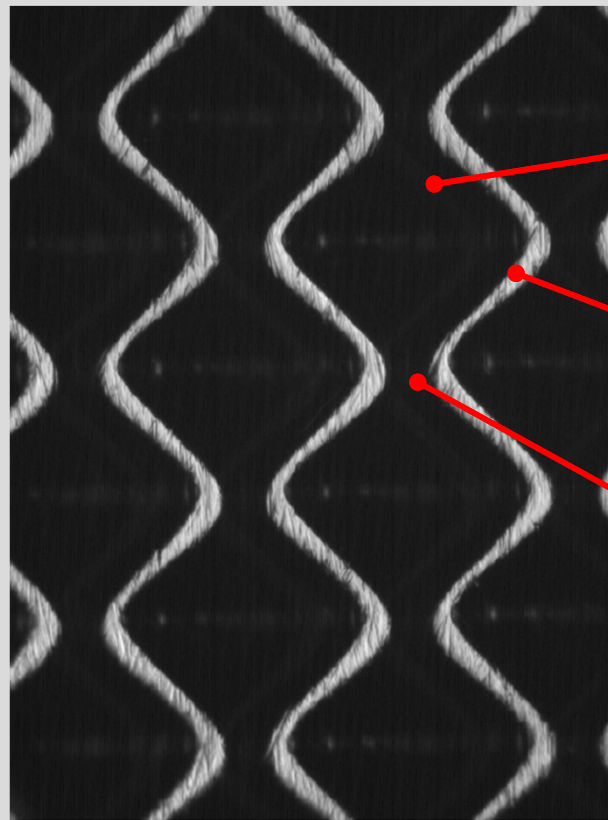
The principles of electromechanical engraving



The principles of electromechanical engraving



Engraving-Cells and Parameter

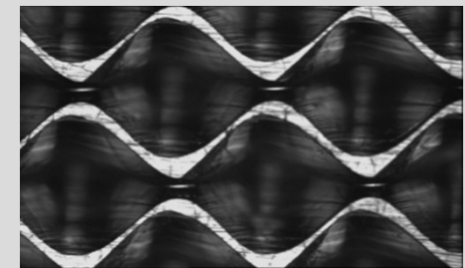


cell

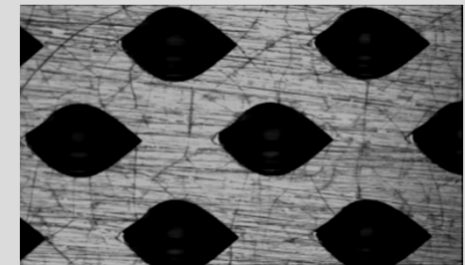
Cell-wall

Channel

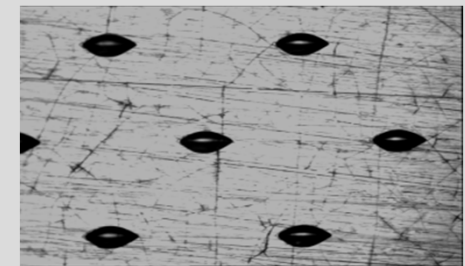
100%



50%

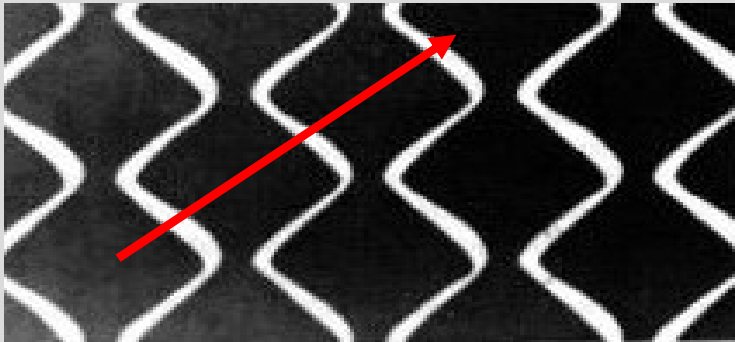


5%

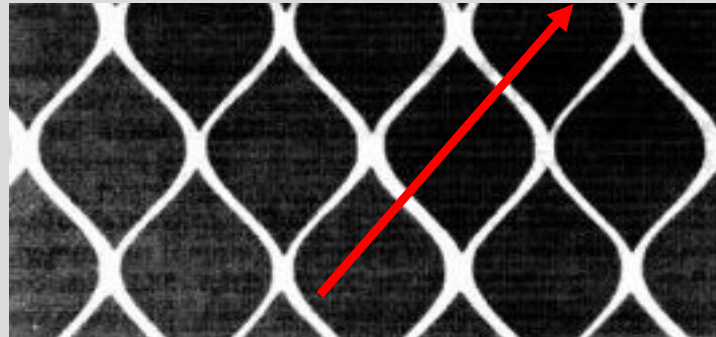


Gravure angles

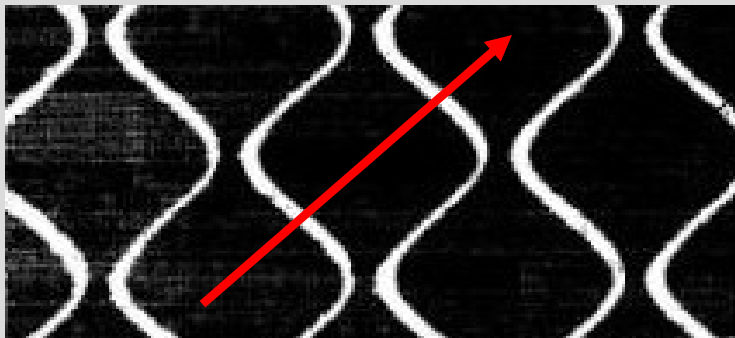
< 0 - cyan



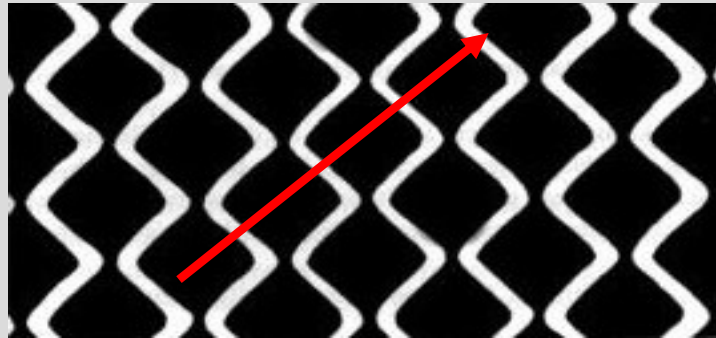
< 2 - magenta



< 3 - yellow



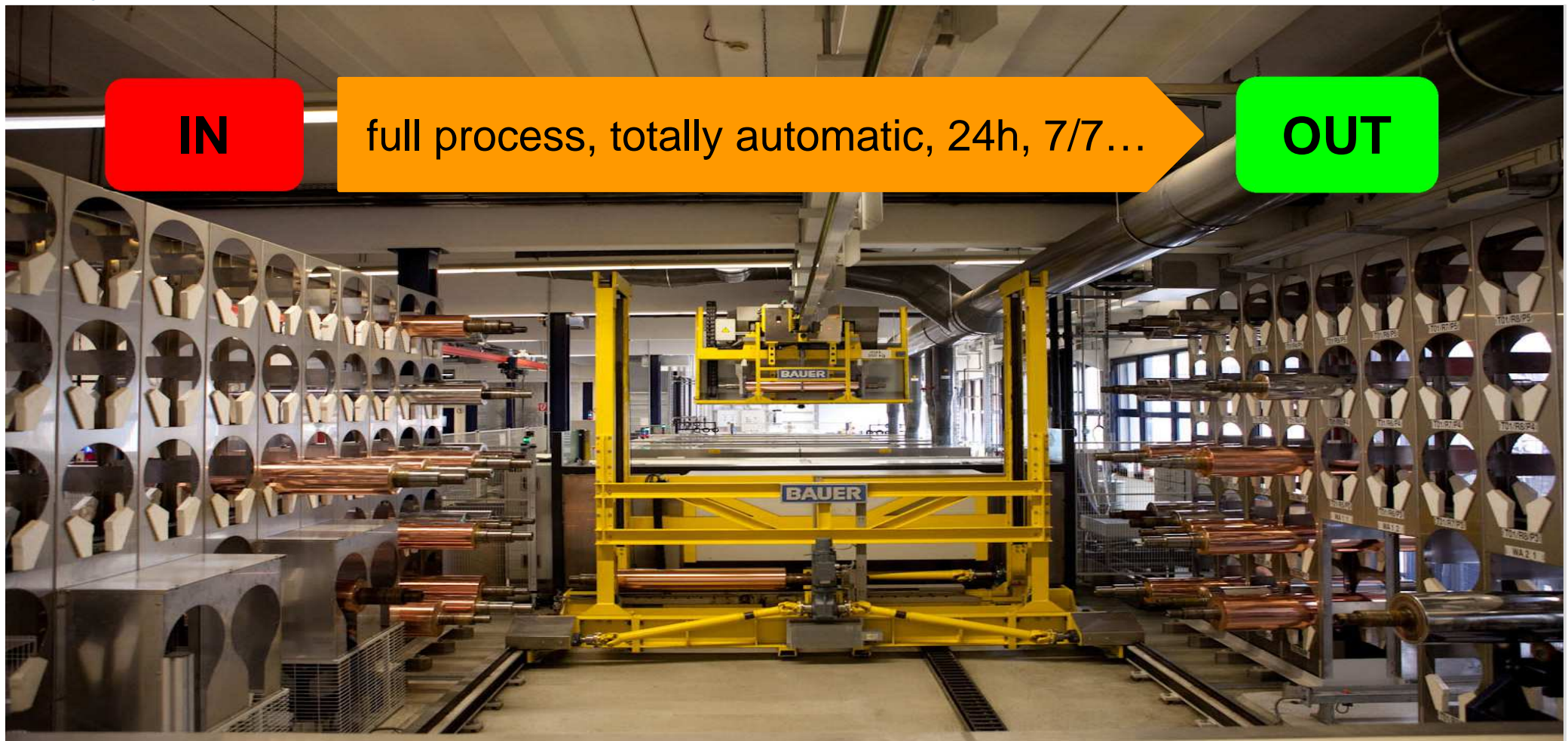
< 4 - black



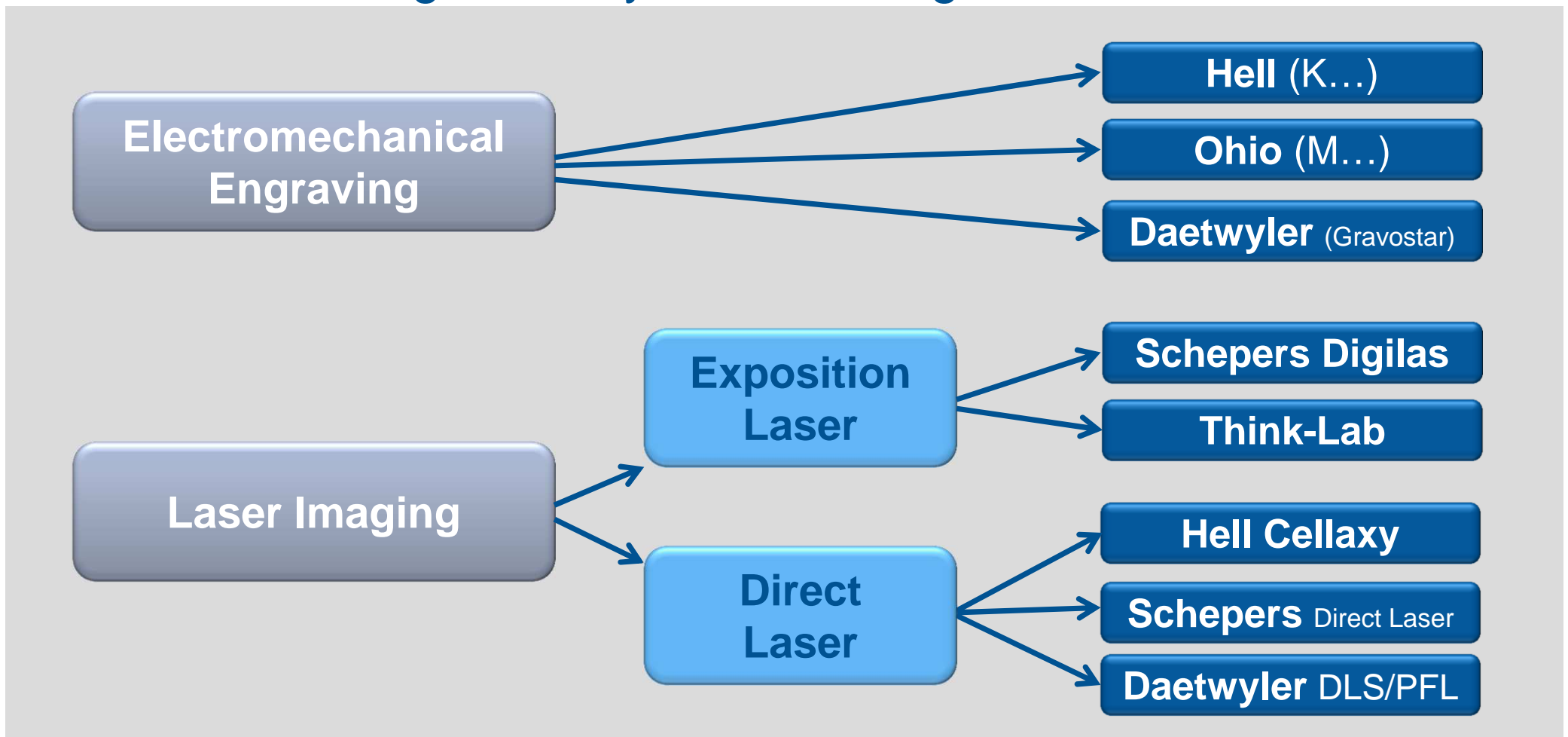
Fully automatic production lines



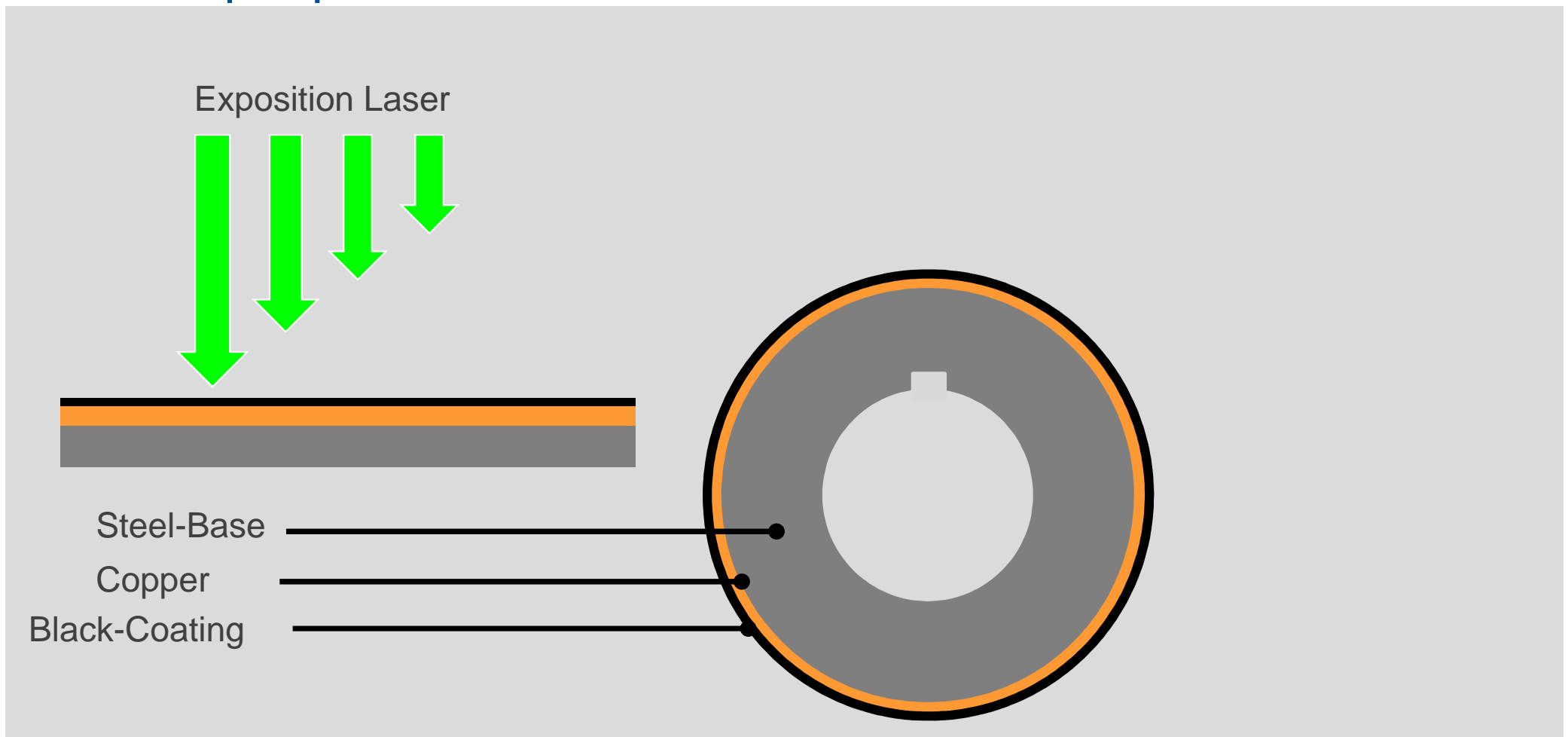
Fully automatic production lines



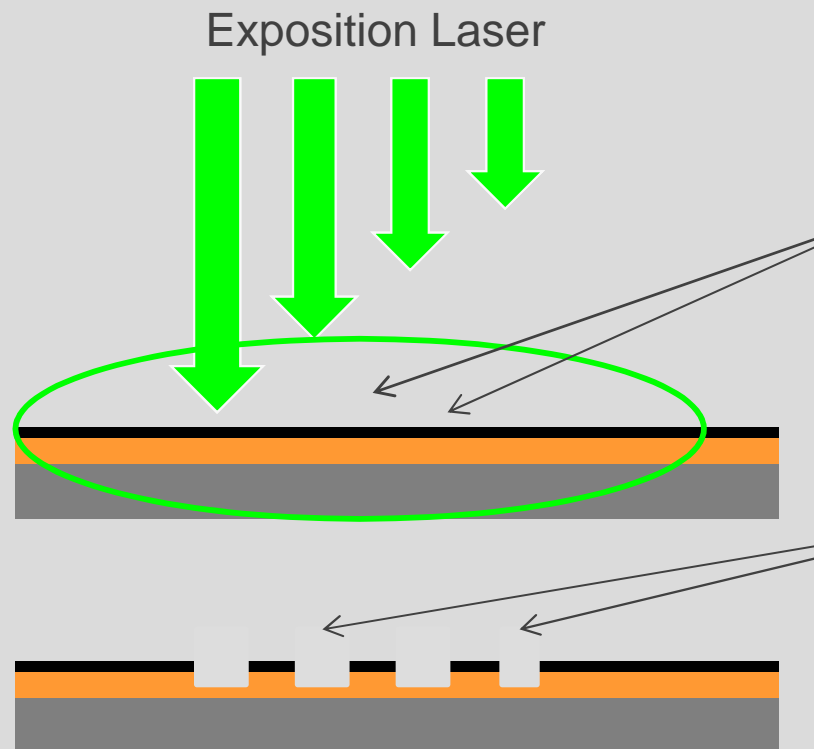
Different technologies for cylinder making



DIGILAS | Exposition Laser



DIGILAS | Exposition Laser

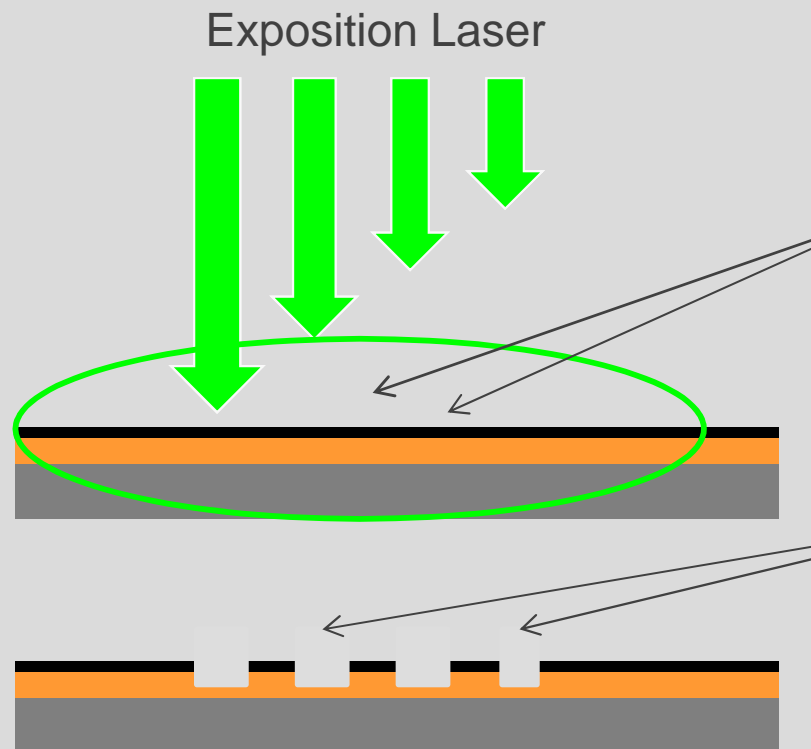


The Laser burns the cell openings into the black coating.

The cells are then chemically etched

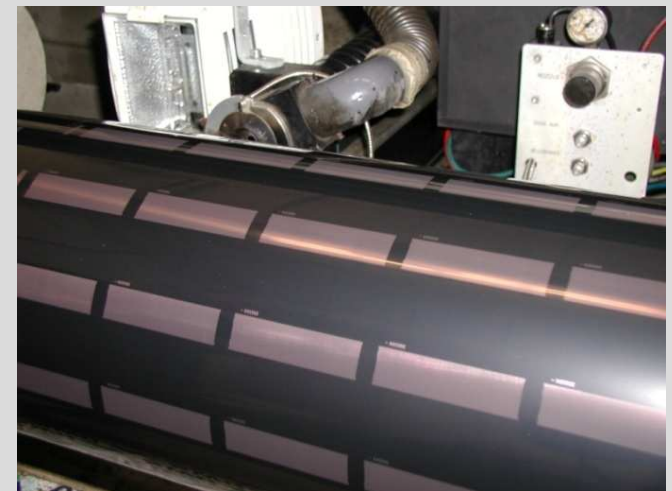


DIGILAS | Exposition Laser

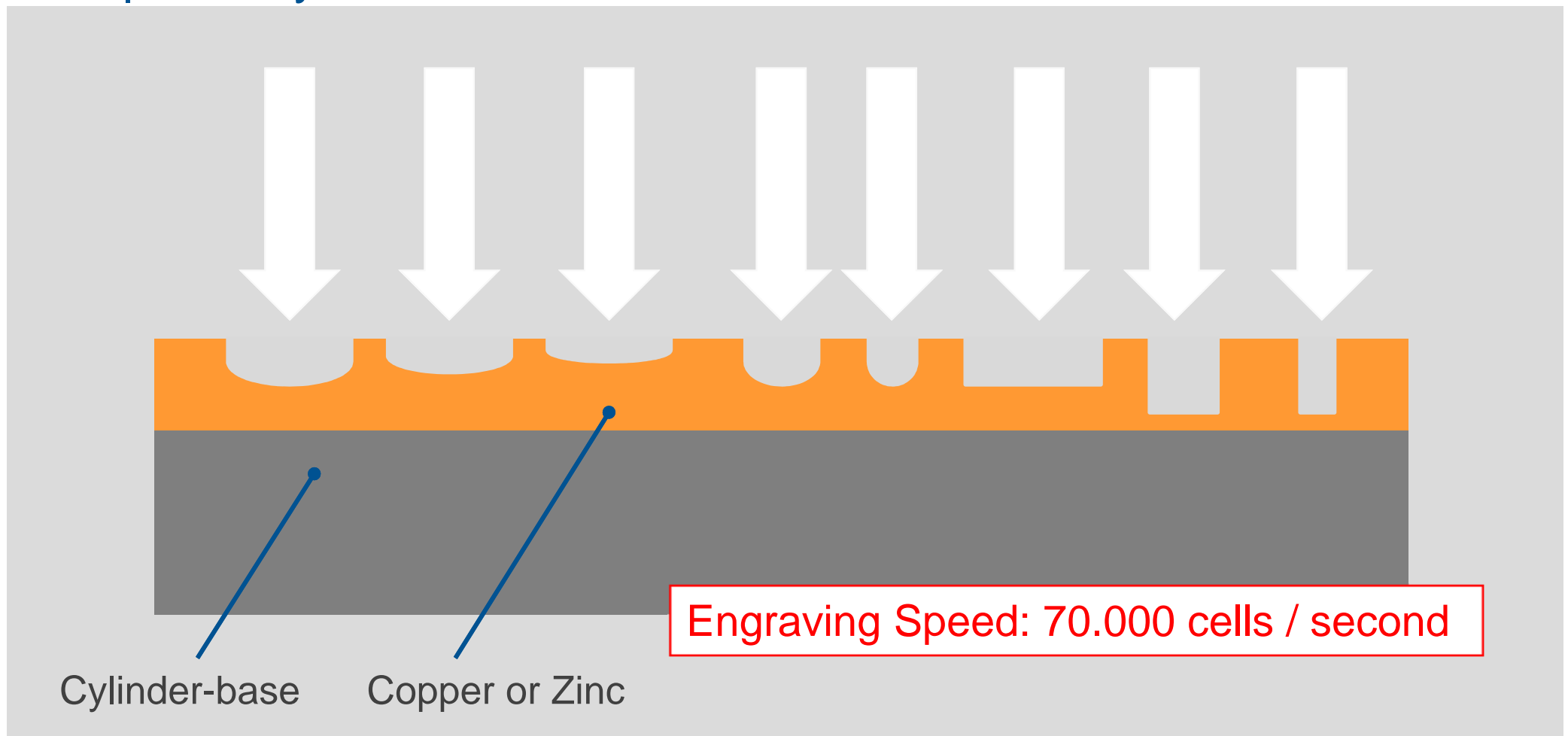


The Laser burns the cell openings into the black coating.

The cells are then chemically etched and the black coating will be removed...



DLS | Cellaxy - Direct Laser



No limit in cell-depth

no limit in size
and depth...



Laser Imaging I another dimension...

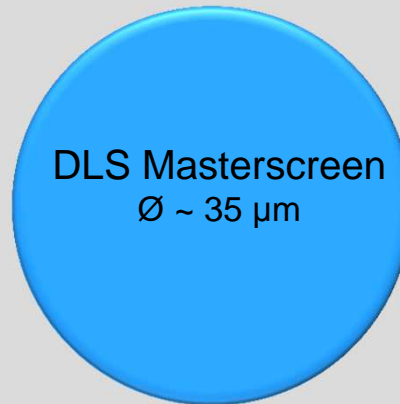
Exposition Laser
Think-Lab
 $\varnothing \sim 2 \mu\text{m}$



Laser direct
 $\varnothing \sim 10 \mu\text{m}$



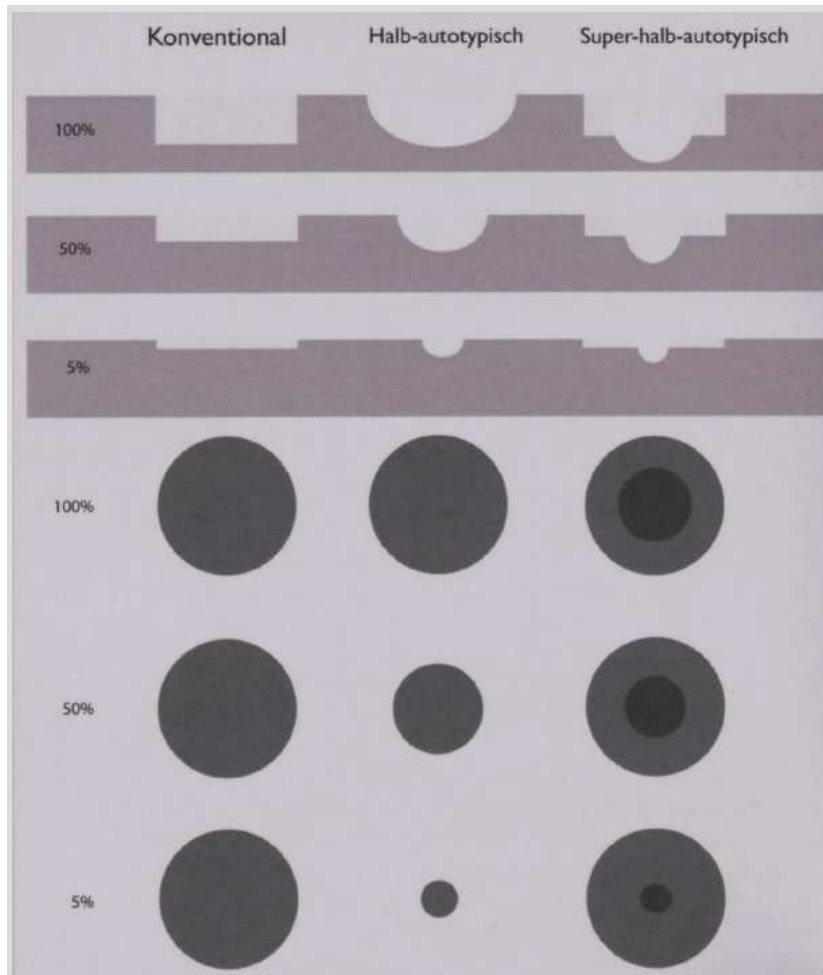
DLS Masterscreen
 $\varnothing \sim 35 \mu\text{m}$



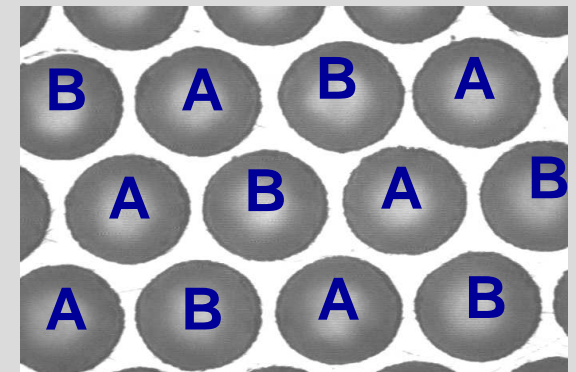
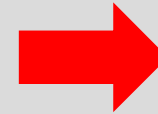
Human Hair
 $\varnothing \sim 100 \mu\text{m}$



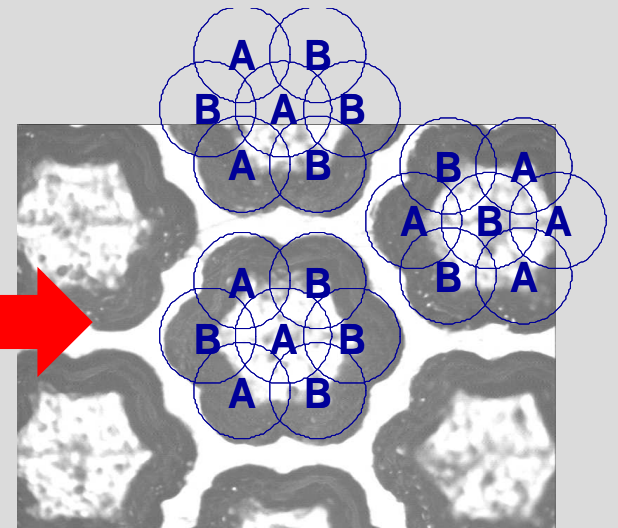
Different Cell Geometries with DLS



Single
Shots
Laser A,B



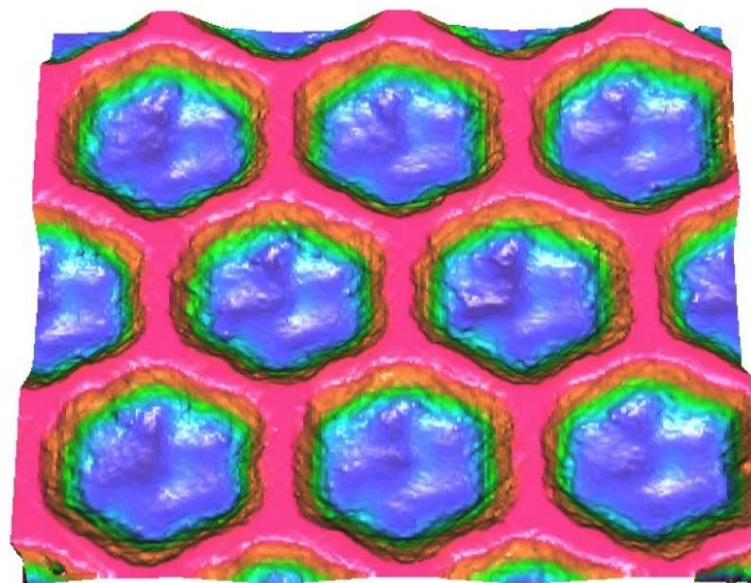
Masterscreen
(1 single cell
is created out
of 7 shots)



Laser System – Daetwyler DLS



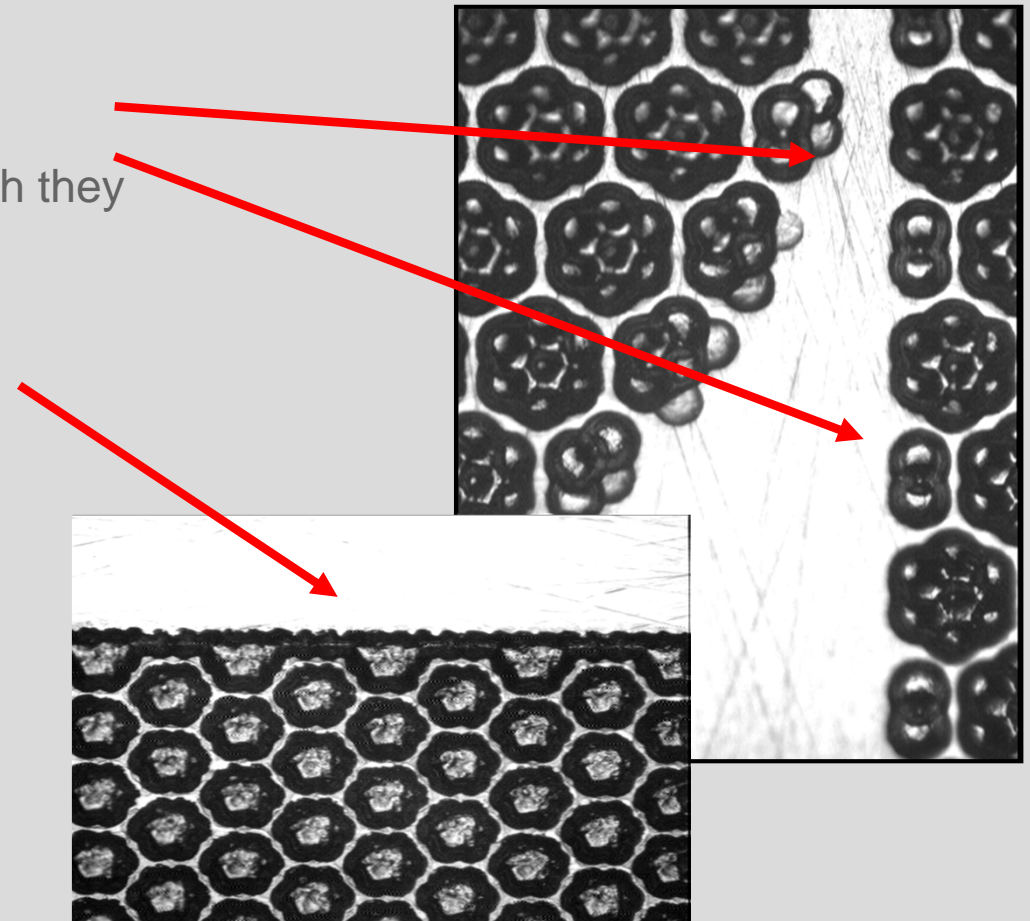
Single Shot



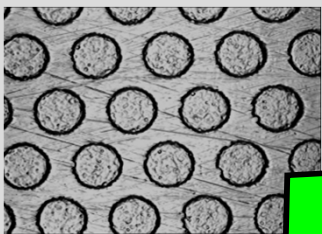
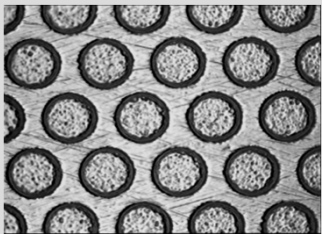
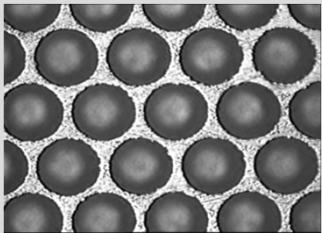
Master Screen

Advantages of Cell Shapes

- ➔ Text, forms and designs can be reproduced without limits and will print in excellent quality.
- ➔ „Outlines“ can be produced as well, although they are not really needed...
- ➔ Offset-Quality with **Gravure Density**...



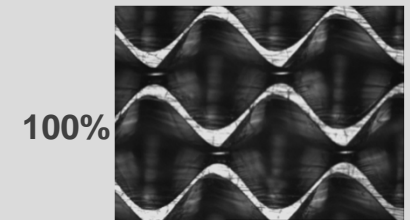
Direct Laser System | the benefits



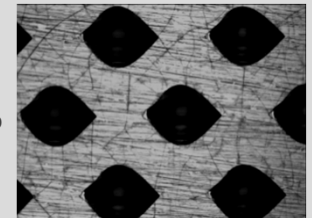
Laser Conv.

→ Excellent printing results for half-tones and vignettes

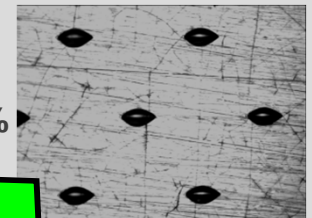
→ Especially for substrates which are difficult to print



100%



50%



5%

Gravure

Direct Laser System | the benefits line-work and half-tones combined

Ingredients:

Flavor, Butter, Eggs, Yeast, Fruit Extracts,
Vitamin A, Vitamin B, Vitamin C.

**Produced by Janoschka
for our customers.**

Fine negative text
in the vignette

Vignette

Positive text

Direct Laser System | the benefits and imaging with chinese characters...

主料：

香料，黃油，雞蛋，酵母，水果提取物，
維生素A，維生素B，維生素C。

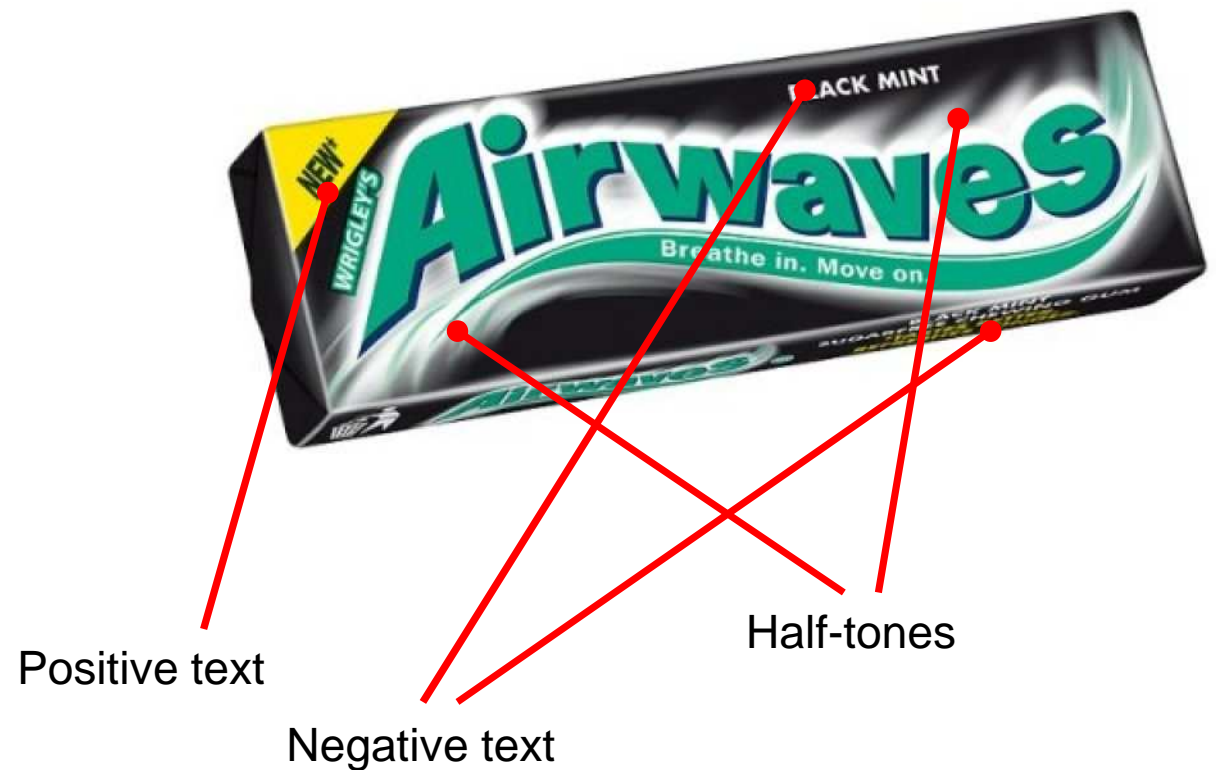
生產雅諾施卡為我們的客戶。

Fine negative text
in the vignette

Vignette

Positive text

Direct Laser System | the benefits combination of line-work and half-tones...

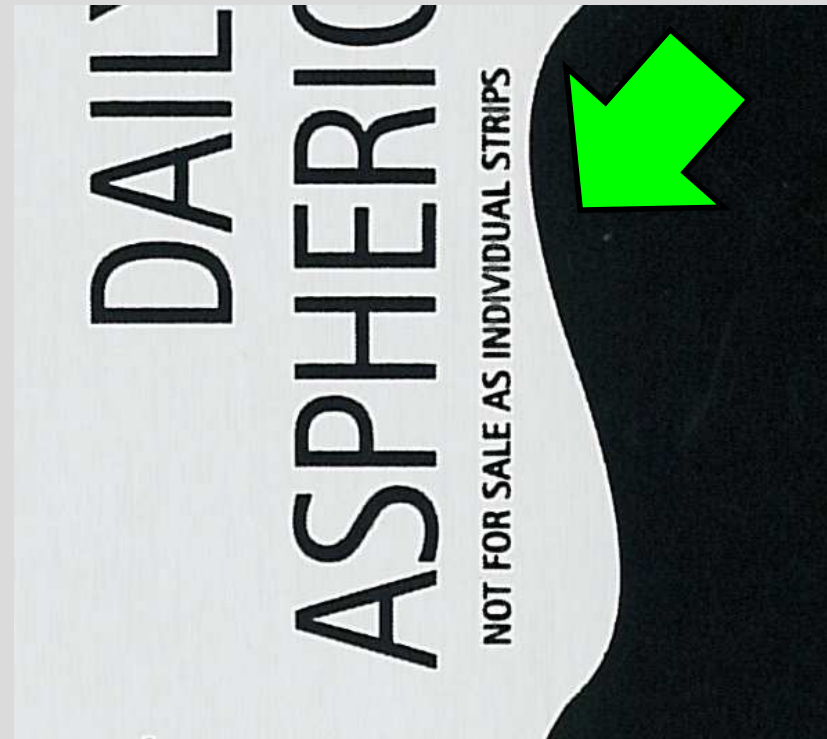


Laser Technology | the benefits | saw tooth effect

electromechanically engraved



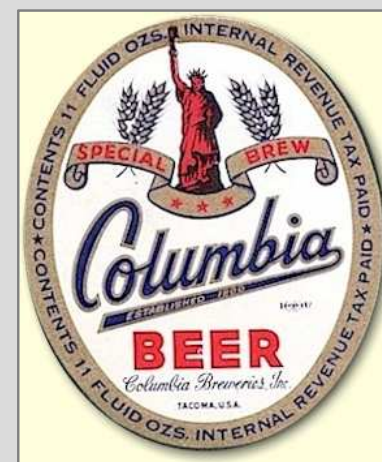
Laser Technology



Fields of Applications | Labels



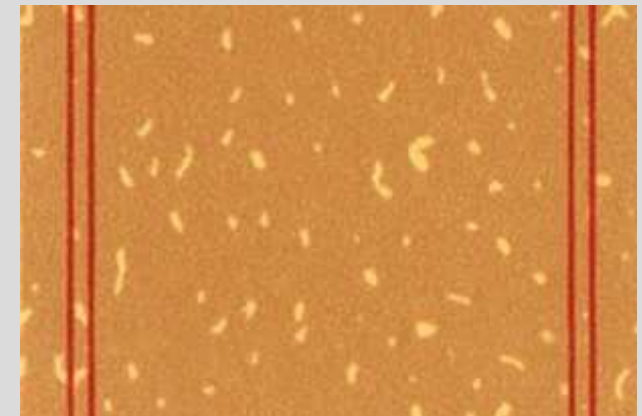
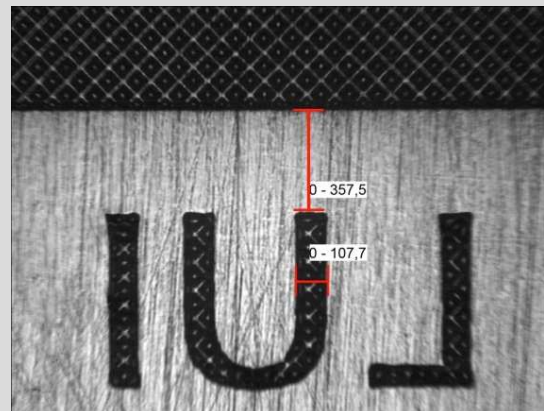
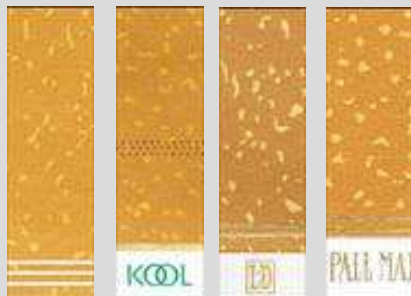
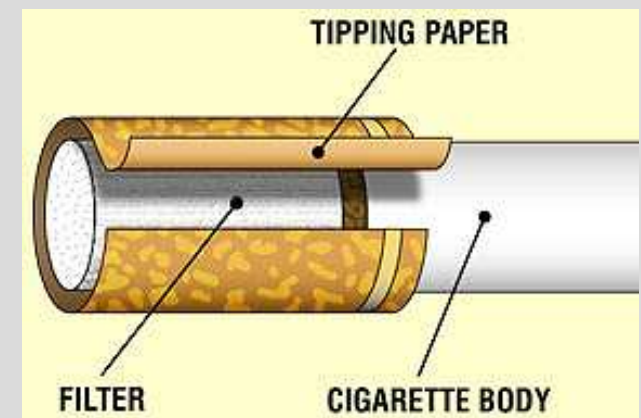
Fields of Applications I Labels



- Intense colors, fine lines, text and logos

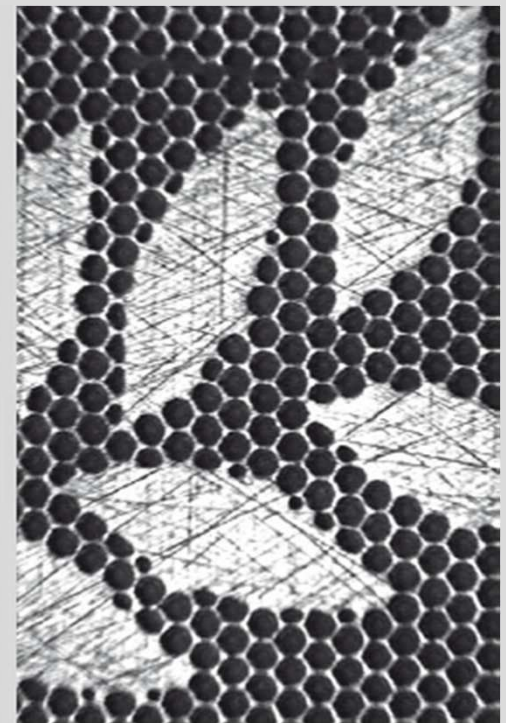
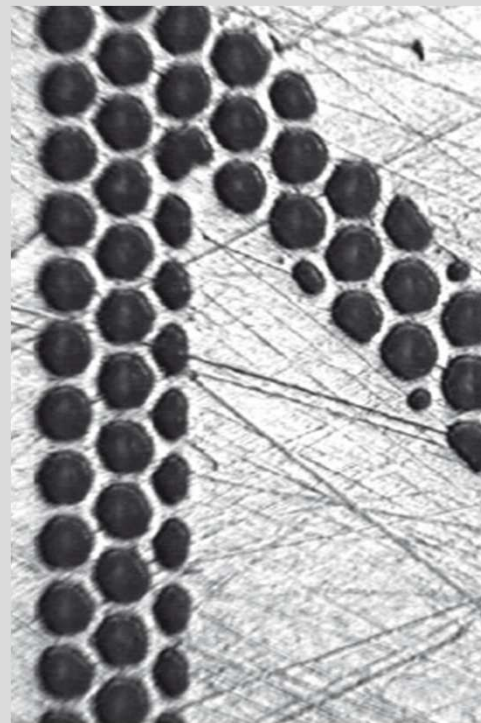
Tipping I Cigarette Filters

- 1 or 2 colors “cork design” (line-work)
- Fine lines and logos
- Laser technology recommended !

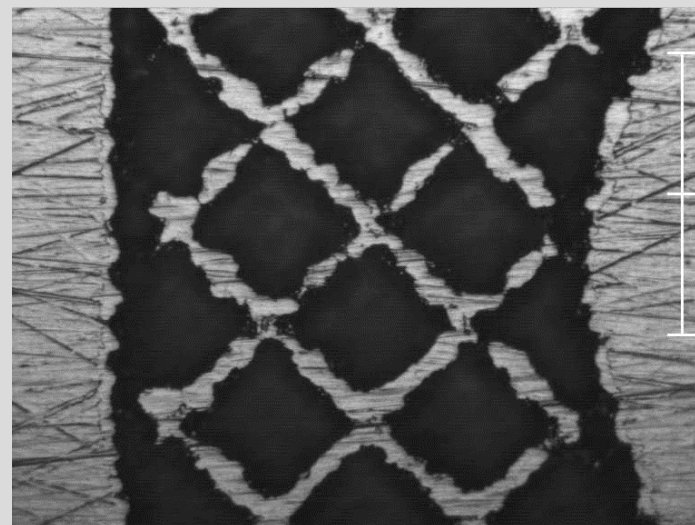


Laser Technology | Excellent for fine type and elements

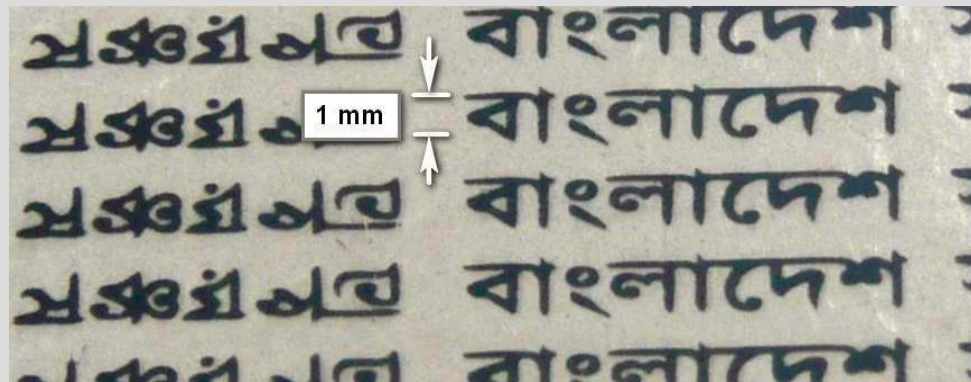
- Positive / negative text elements
- Strong background-colors



Laser Technology | Excellent for fine type and elements

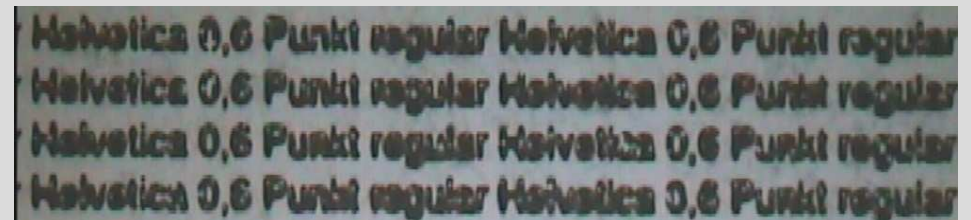
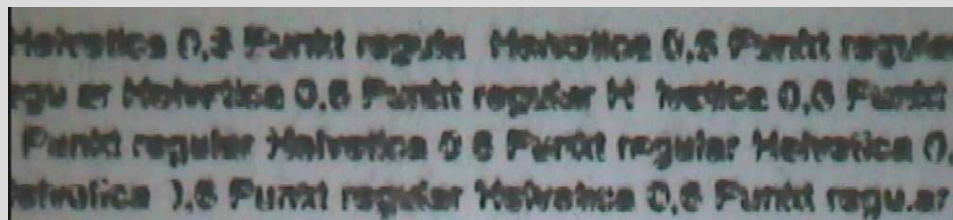
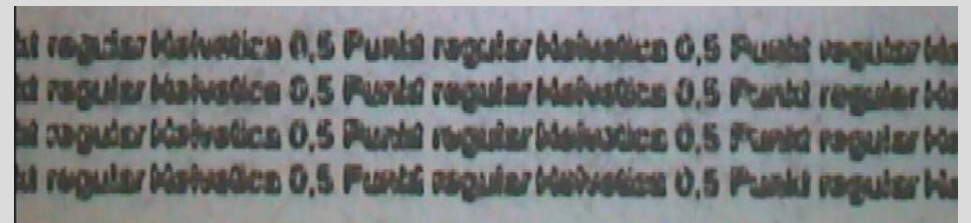
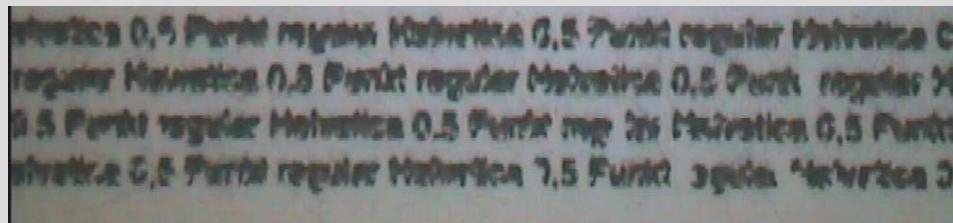


Micro-Text

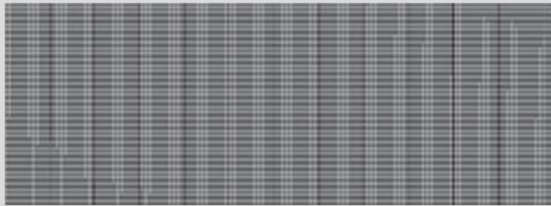


Security Elements | Micro-Text

Seen through the microscope: 0,5 - 0,6 point type



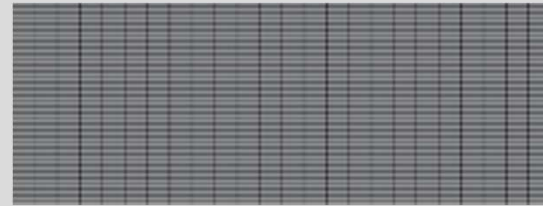
Micro-Text | Nano-Text



Mikro text with 0,15 mm font size

Janoschka Janoschka
Janoschka Janoschka
Janoschka Janoschka
Janoschka Janoschka

Ratio x100



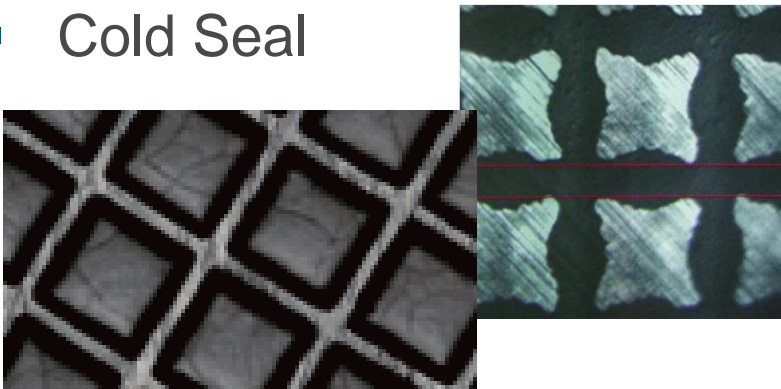
Nano text with 0,015 mm font size

Janoschka Janoschka Janoschka Janoschka
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Janoschka Janoschka Janoschka Janoschka

Ratio x100

“Heavy Volume” | Special Applications

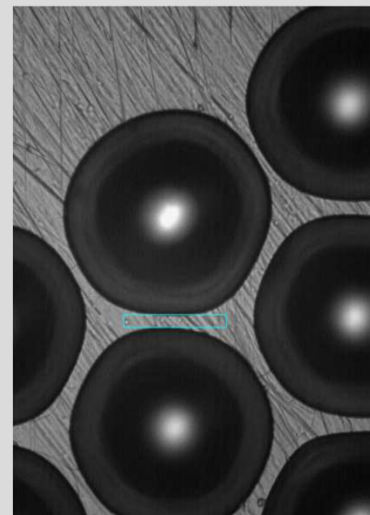
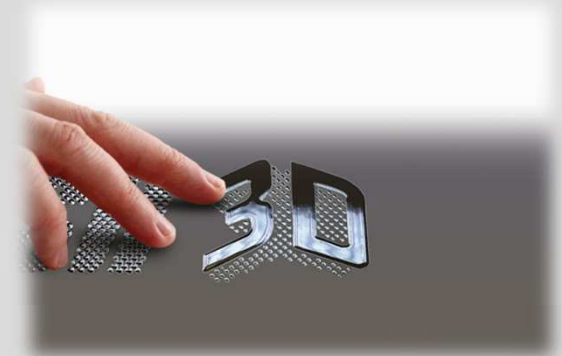
- Lacquers and Varnishes
- Metallic Inks
- Primer
example: medical packaging
- Hotmelt / Wax
- Cold Seal



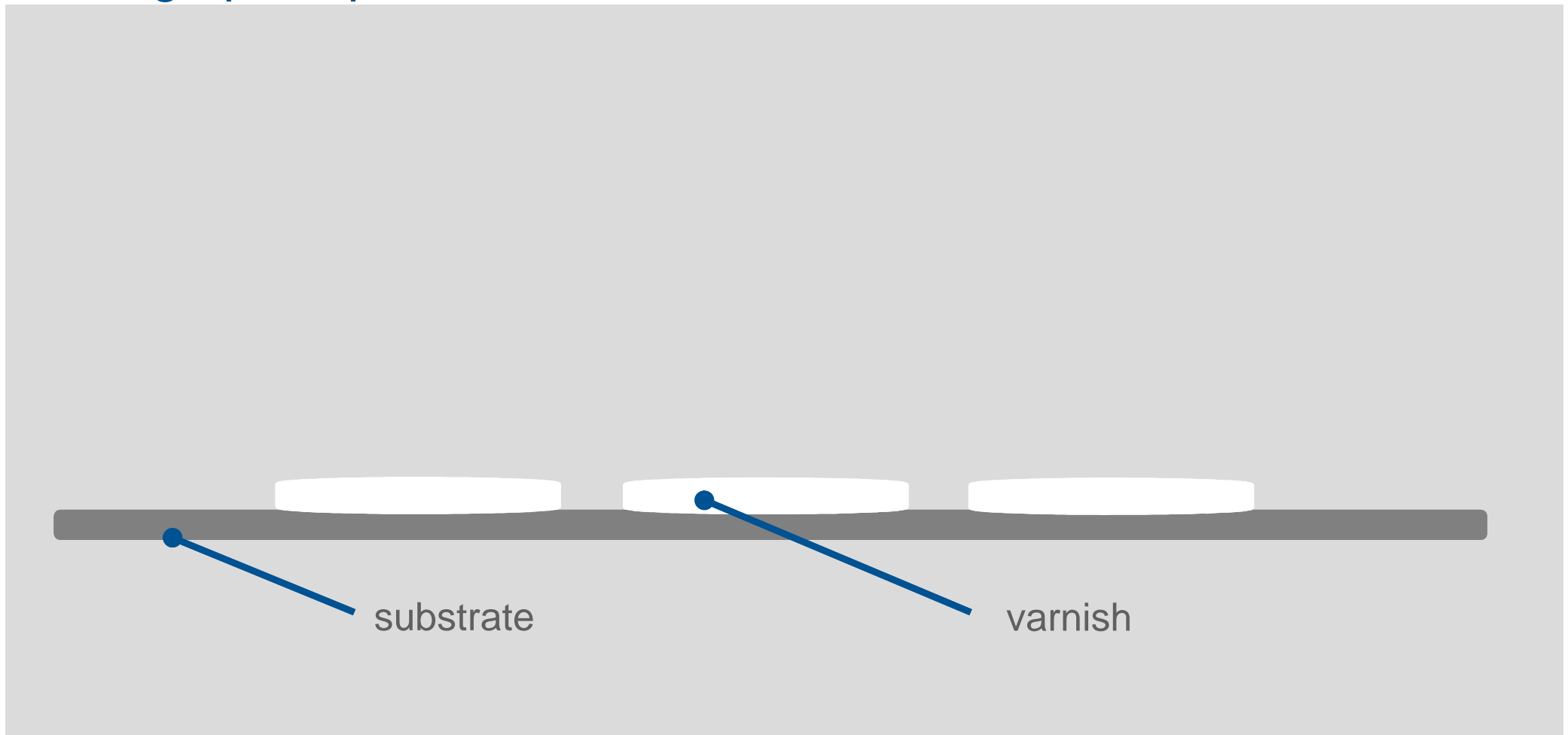
Haptic Effects

Created with UV or water based varnishes to generate a visible and 3D structure like lines, text or logos.

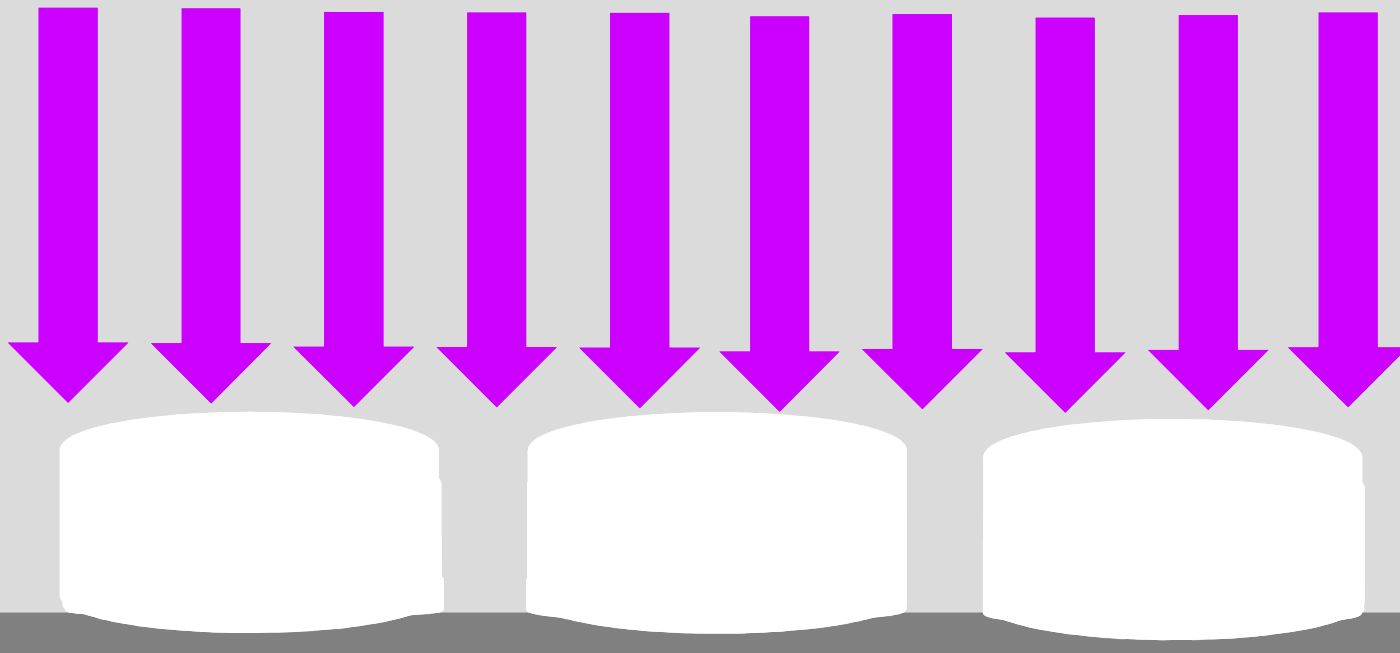
Haptic effect requires mostly Laser technology due to the huge ink transfer. In addition with etching there is no cell size limitation they can be adapted to the design for an optimized balance between sharpness and volume (usually app 80 μm).



Printing I principles



UV curing



UV light installed in the printing unit will make the UV lacquer expand after printing and give it a 3D shape

The principles



LOGO

1. Printing of a gold background color
2. Overprint of the Logo color



LOGO

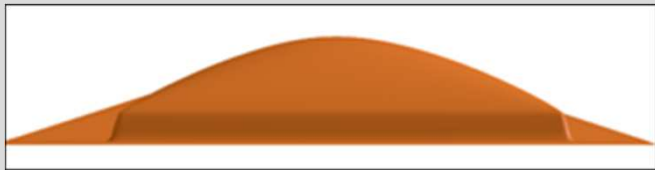
1. Printing of a gold background color
2. Overprint of the Logo color
3. Overprint of the 3D Lacquer
4. UV curing of the lacquer after printing creates 3D effect

3D Embossing

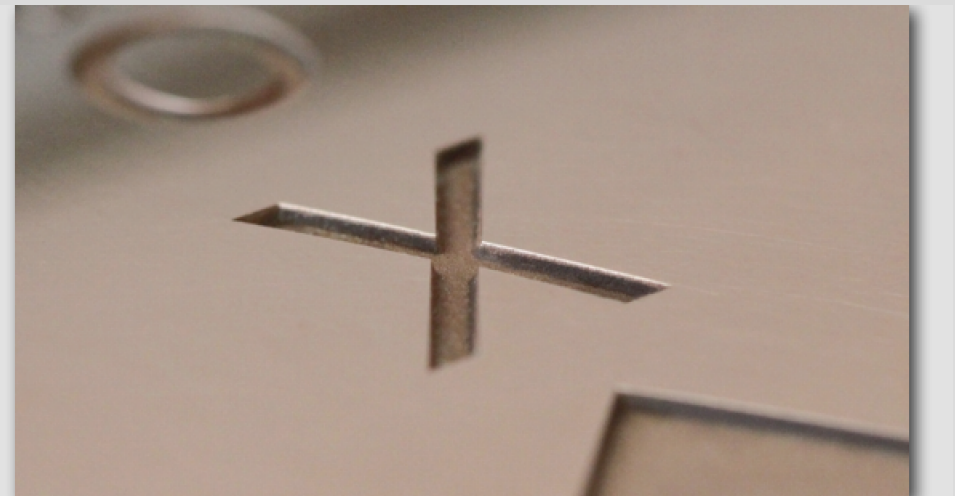
CNC technology



Laser technology



Laser Technology | give it the touch...



3D Embossing



Micro-Embossing with Laser Technology



Images | 3D Structures



Now who said the gravure is not innovative...?



Thank you for your attention !



Wer interessieren will, muss provozieren.
(Salvador Dali)

gutezitate.com