

Image-to-Print

Rotogravure Technology & Innovation Days

Laser Technology for cylinder making

Liong Yew Wei

Janoschka | 4 April 2013 | Ho Chi Minh City



The Future is Laser

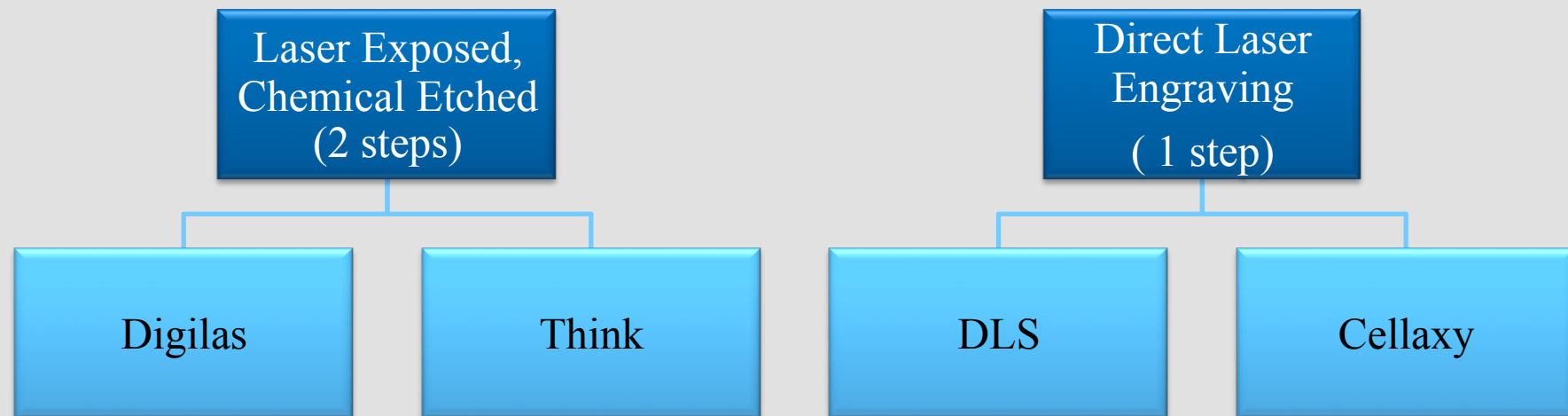
The Future is Laser

In general, there are 4 Laser technologies available nowadays:

- Daetwyler DLS (Swiss)
- Hell Cellaxy (German)
- Digilas (German)
- Think Lab (Japanese)



Laser Technologies at Janoschka



Janoschka is the only service-house equipped with ALL 4 types and having experience with all existing Laser Technologies.

Cell geometries

Etching



Variable area

Stylus



Variable area and
variable depth
(not flexible)

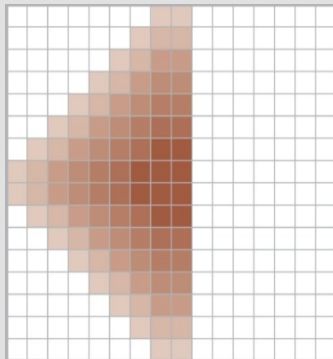
Direct Laser Engraving



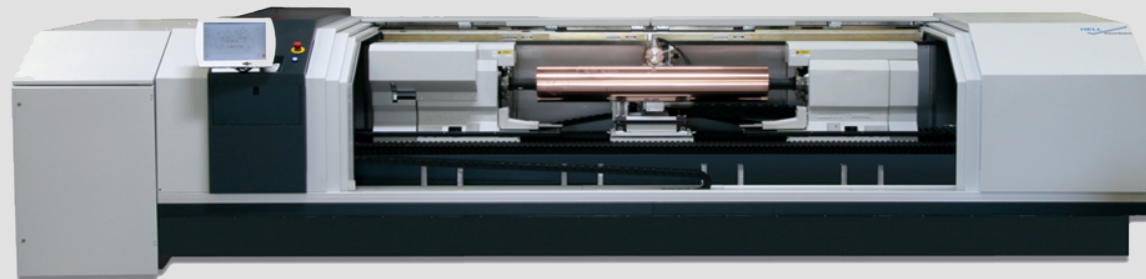
Variable area and
variable depth
(flexible)

Laser engraving | Hell Cellaxy

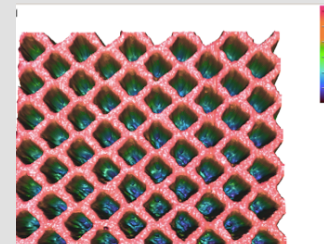
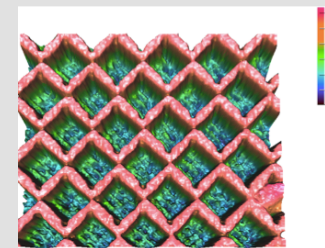
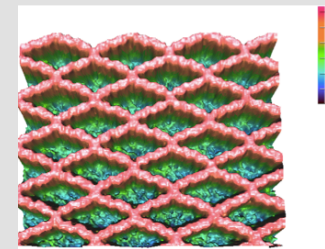
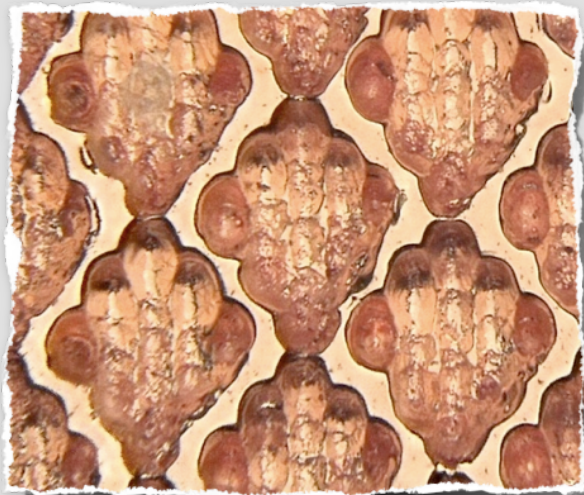
- Direct laser engraving
- Similar to Offset ImageSetter (Cells are created by multiple exposing lines)
- Engraving in copper
- Beta test



HELL *Cellaxy*



Hell Cellaxy | engraving in copper



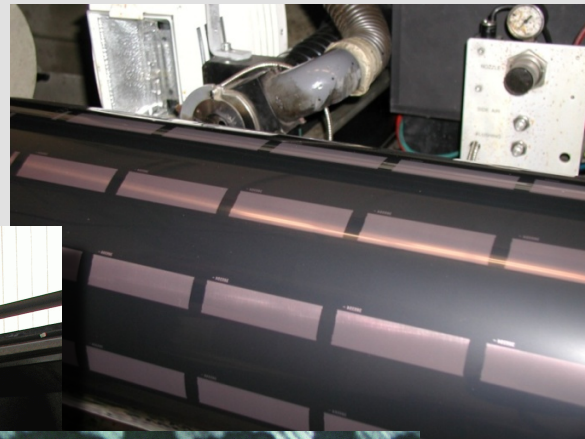
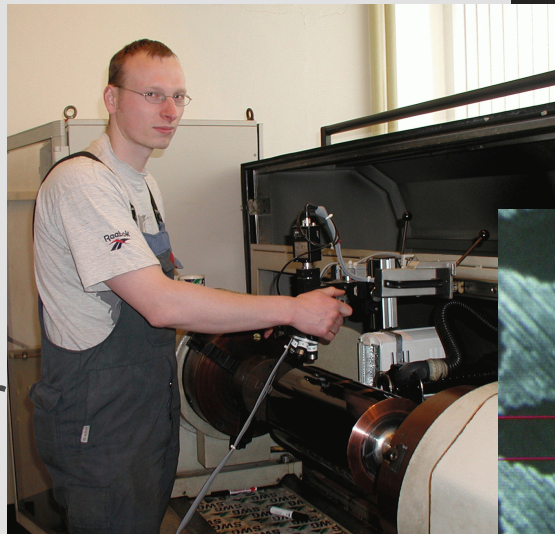
DIGILAS | Exposition Laser

- Fiber laser in a one beam- or multiple beam configuration or imaging specially coated gravure cylinders.
- Dot size and resolution $< 10 \mu\text{m}$
- Provides special screens, razor-sharp lines at very high quality level

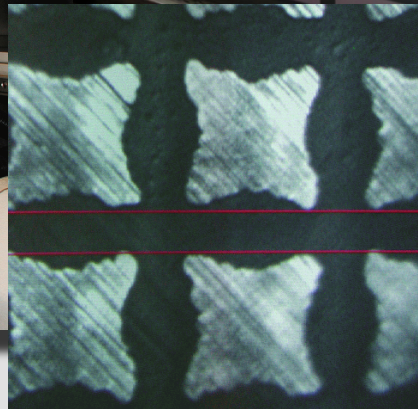


DIGILAS | Laser-engraving with YAG-laser

Cylinder
check



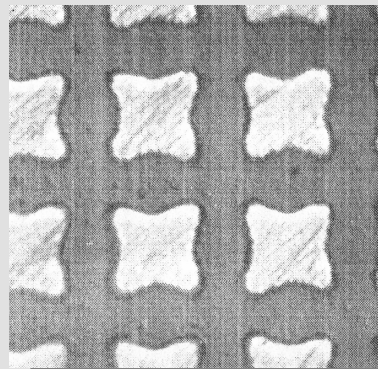
Laser
Cylinder



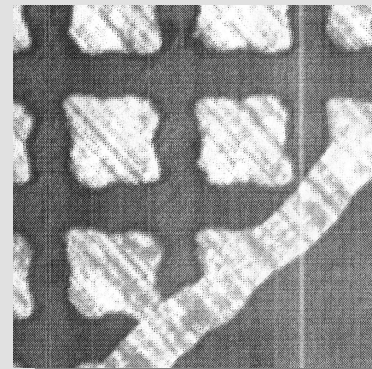
„pillow-shaped“
cell

DIGILAS | special screens

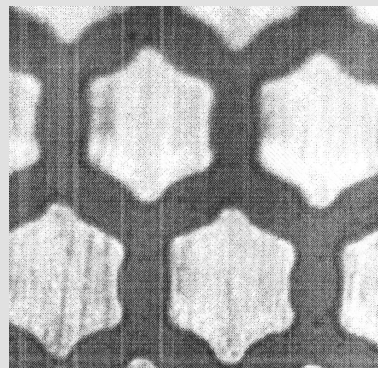
„Pillow“
shaped
cells



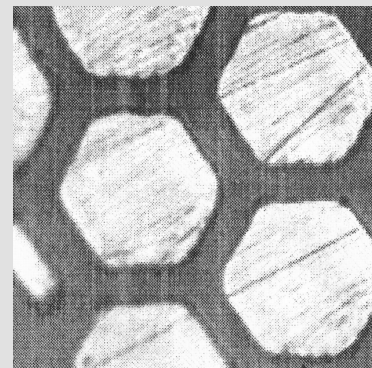
„Pillow“
shaped
cells
with outline



Hexagonal
shaped
cells



Hexagonal
shaped cells
(Honeycomb)



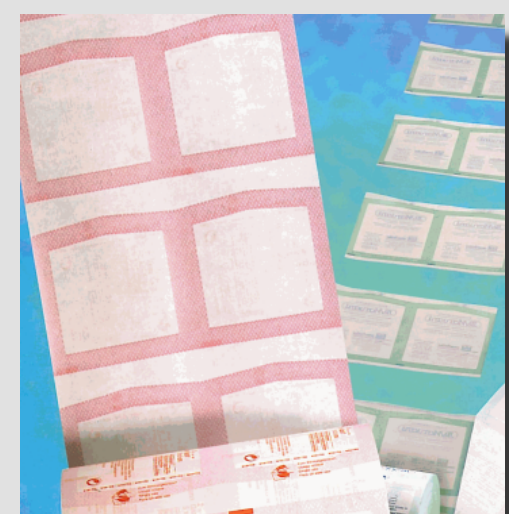
DIGILAS | "high resolution" applications

Labels (with fine gold images)



DIGILAS | “Heavy volume” applications

- Hotmelt/ Wax
- Coldseal
- Laquer
- Primer
exemple: Medical packaging
- Embossing cylinders:
for example: Acrylic cylinders
for foam transfer (for wall paper)



Think-Lab

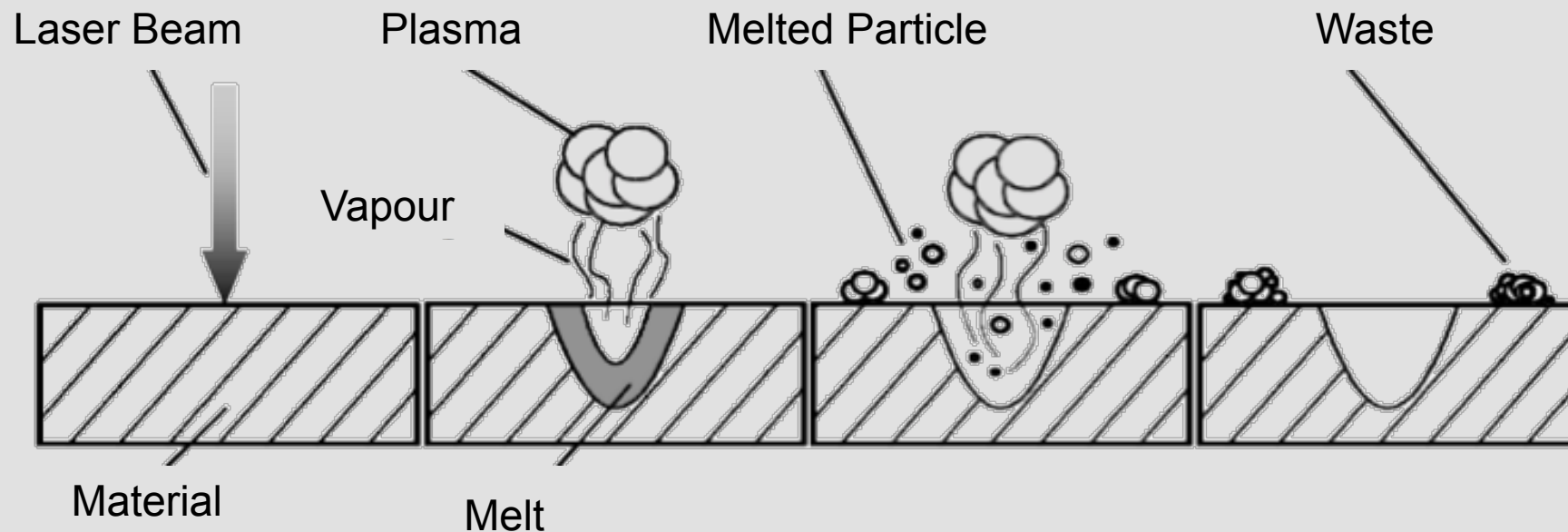
Similar results can be achieved by using
the Think-Lab technology
- Blue Coating



Direct Laser System – Daetwyler DLS

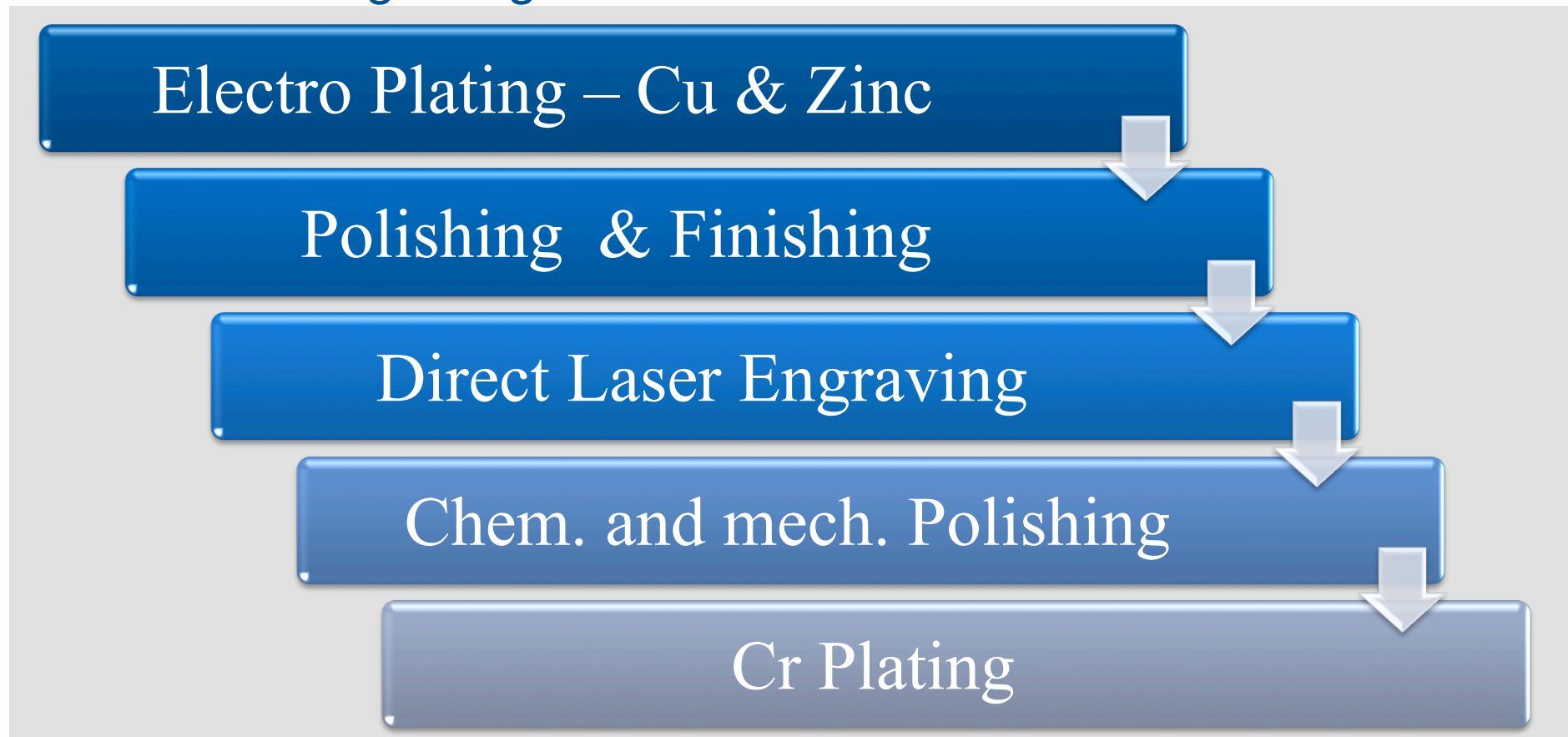


Laser Material Interaction (Zinc)



Fritz Klocke, Wilfried König: „Fertigungsverfahren 3 – Abtragen, Generieren, Lasermaterialbearbeitung“, 2007, Aachen, Springer Verlag Berlin

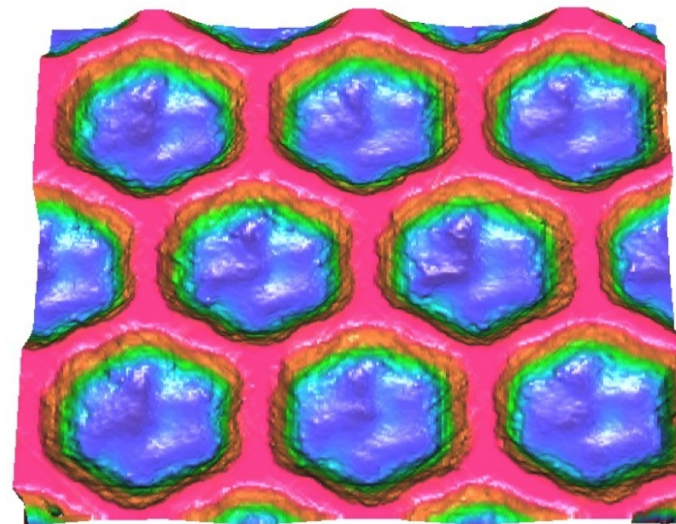
Direct Laser Engraving • Workflow



Laser System – Daetwyler DLS



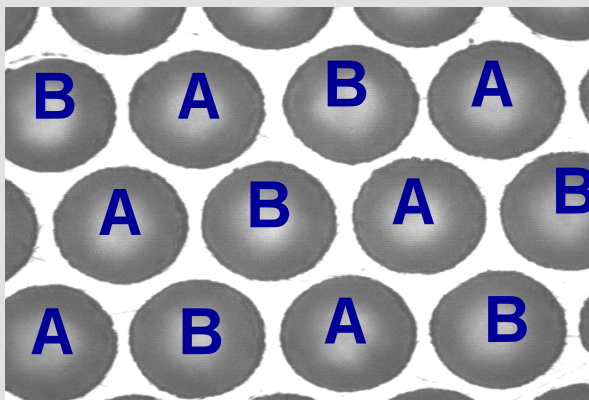
Single Shot



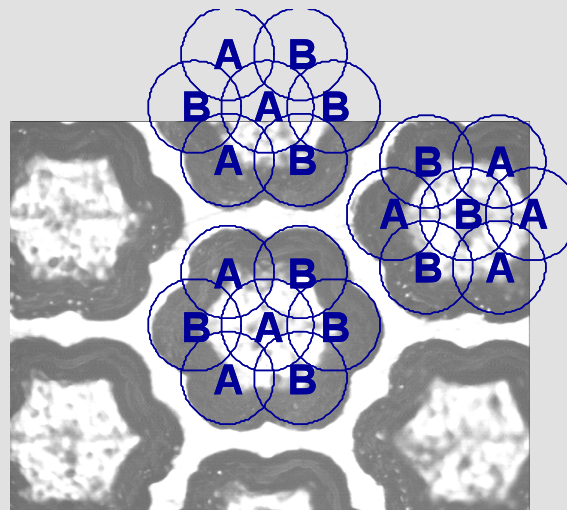
Master Screen

Performance

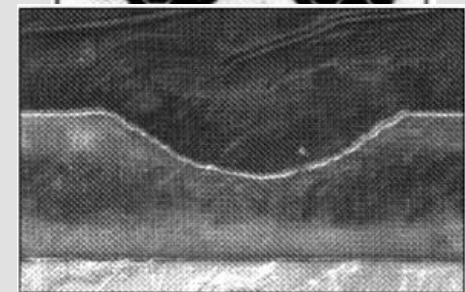
- Engraving Speed: **35,000 or 70,000 cells/s**
- Effective Range of Screen: **30-160L/cm**
(Single Shot and Master Screen)
- Effective Resolution used: **100-400L/cm**



Single Shot



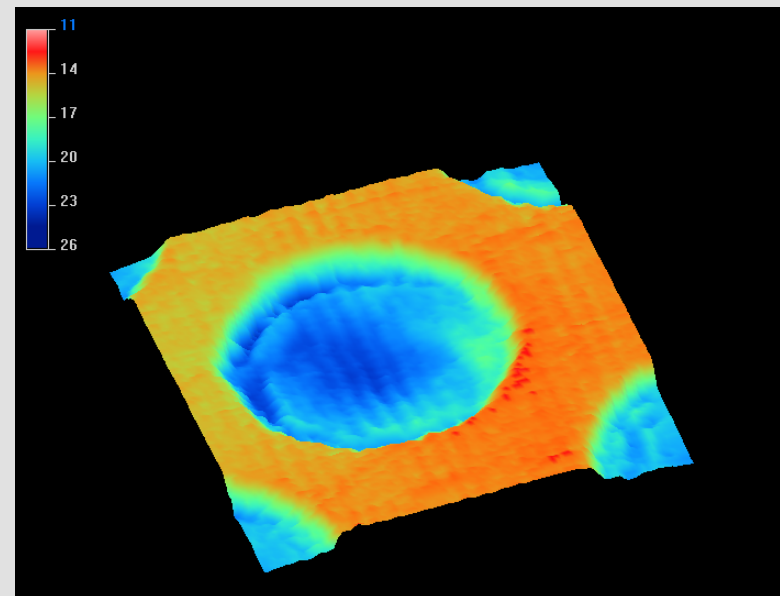
Master Screen



Cell Geometry • Single Shot vs Master Screen

Single Shot

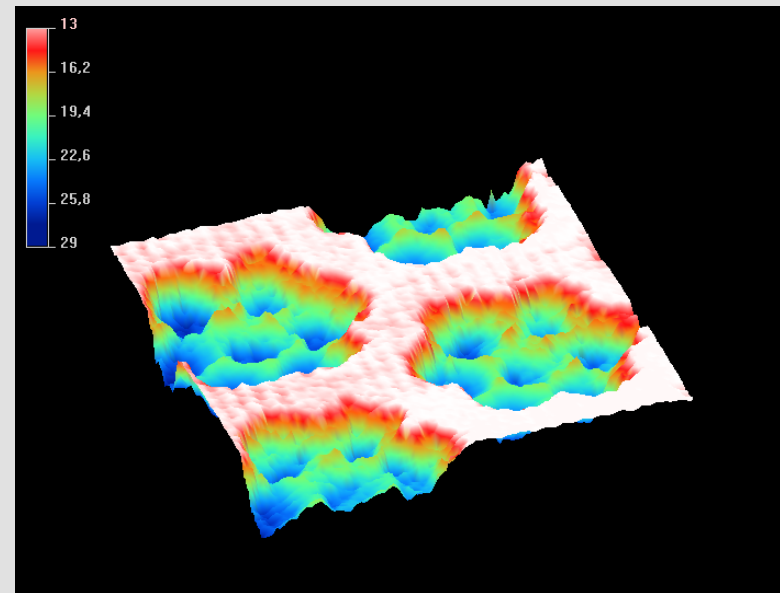
- Screen equals resolution
- Very fast engraving
- Only round cells possible
- Variation in cell types conventional, halfautotypical and superhalfautotypical
- Cell depth up to $35\mu\text{m}$ (in one pass)
(Multi passes possible)



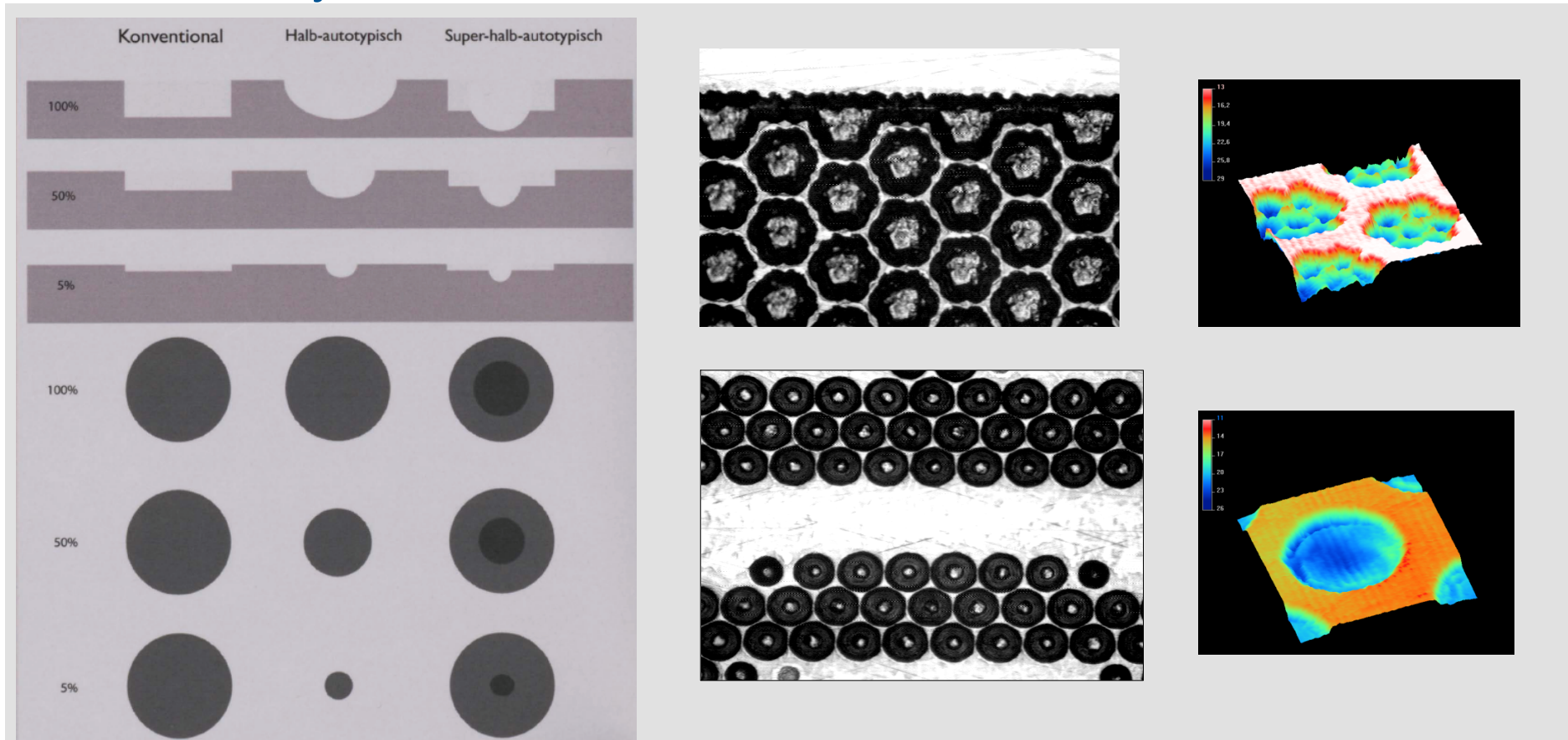
Cell Geometry • Single Shot vs Master Screen

Master Screen

- Resolution higher than screen (similar to image setter)
- Hexagonal cell
- Variation in cell types conventional, halfautotypical
- Outline possible
- Cell depth up to $35\mu\text{m}$ (in one pass)
(Multi passes possible)



Cell Geometry



Advantages of Cell Geometry (round)

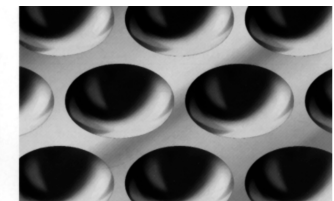
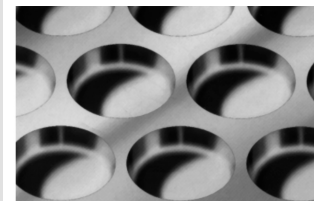
→ Excellent printing results in half-tones and vignettes

→ especially on rough substrates which are difficult to print

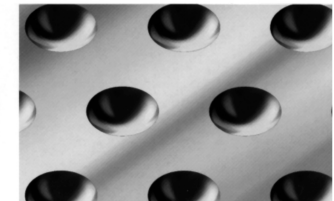
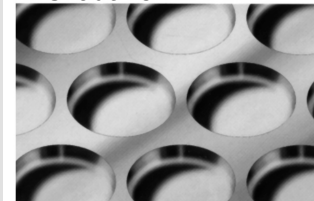


Conventional

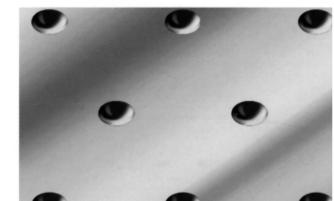
Halfautotypical



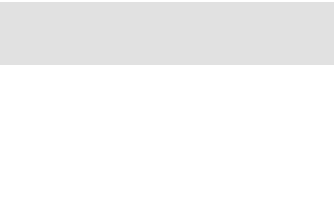
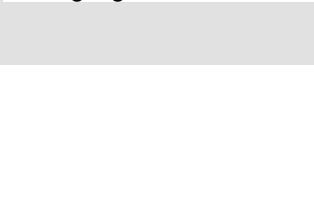
Shadows



Midtones



Highlights

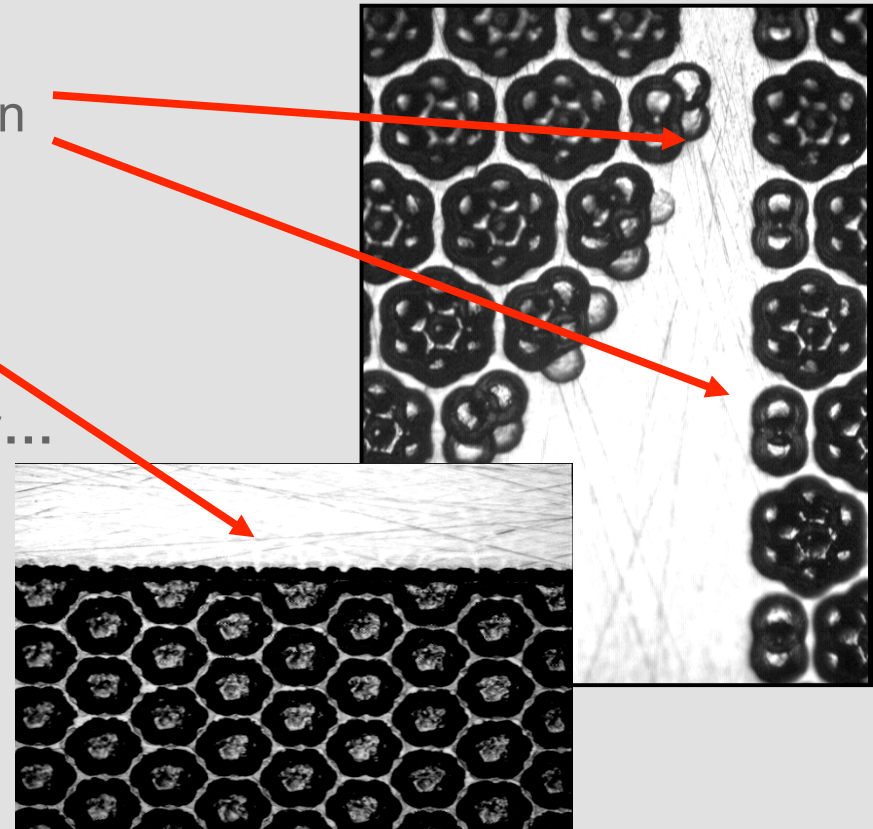


Advantages of Cell Shapes

→ Text, Forms and designs can be reproduced without limits and will print in excellent quality.

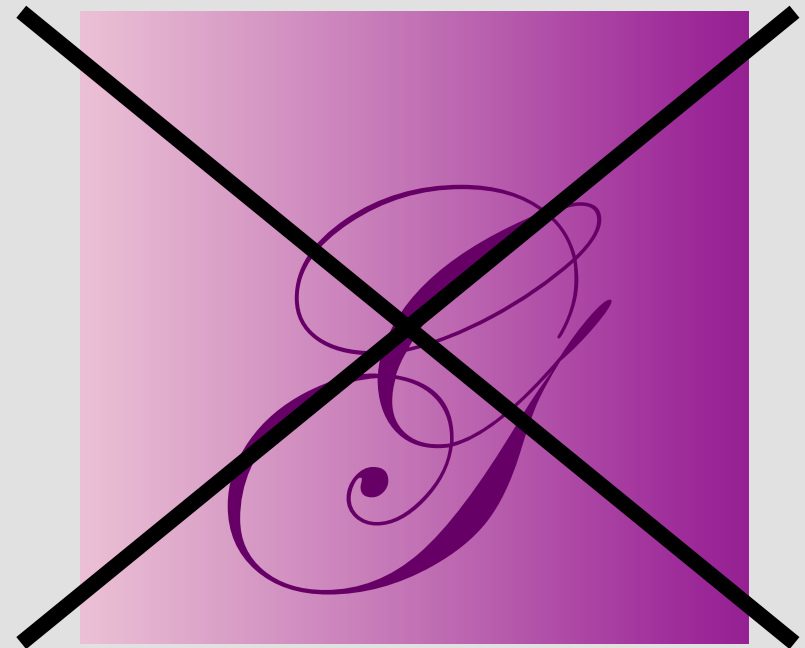
→ „Outlines“ can be produced as well, although they are not really needed...

→ Offset-Quality with **Gravure Density**...



Advantages of Cell Shapes / Cell Geometry

→ In the past, combinations of half-tones and fine text on same cylinder was only possible under very limited conditions.



Advantages of Cell Shapes / Cell Geometry

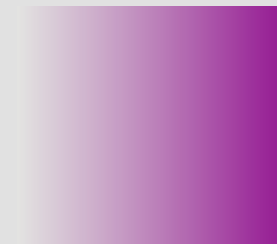
3 cylinders needed to be engraved for best result:

1. Full-tone (background color)
2. half-tone vignette using electromechanically engraved cylinders
3. line-work (fine type) using Laser exposed and chemically etched cylinders

Cylinder 1
- full-tone



Cylinder 2
- Half-tone



Cylinder 3
- Fine-type

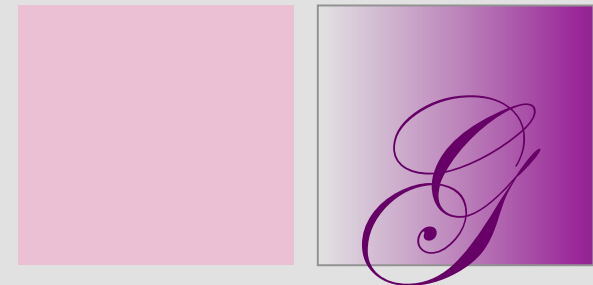


Advantages of Cell Shapes / Cell Geometry

→ with DLS we can mix today half-tones and fine elements without any limit, and they can be combined on the same cylinder.



with DLS: 2 cylinders



with former technology: 3 cylinders



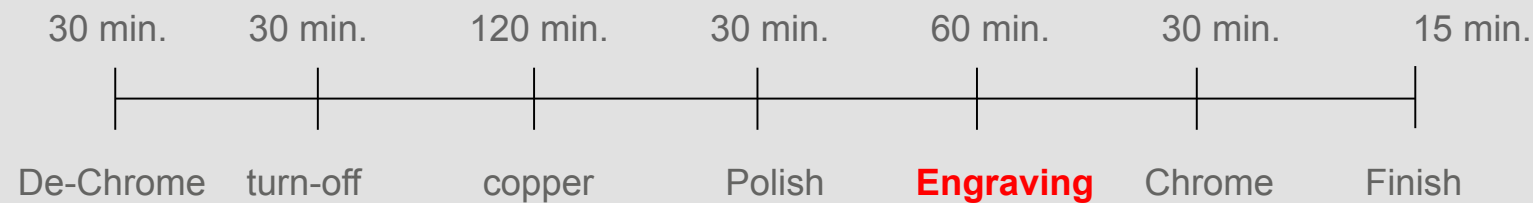
DLS – significant reduction of production time...



DLS – less productions time

■ Electromechanical Engraving

Production steps



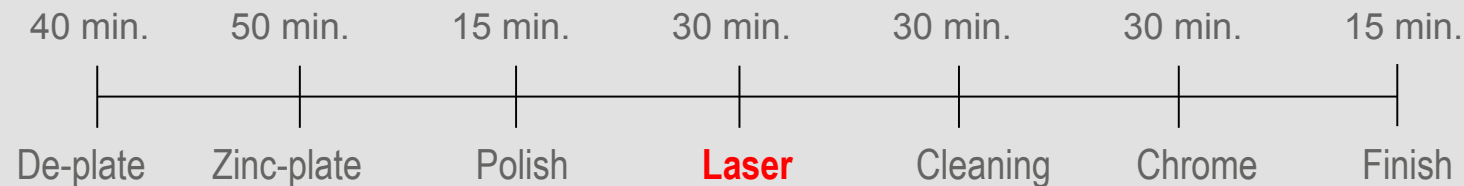
Total time needed: 5 h 15 min.

Engraving Speed: 8.000 cells/sec.

DLS – less productions time

■ Direct-Laser-System

Production steps



Total time needed: 3 h 10 min.

Engraving Speed: 70.000 cells/sec.

DLS – less productions time

- **Electromecanical Engraving**

Total time needed: 5 h 15 min.

Engraving Speed: 8.000 cells/sec.

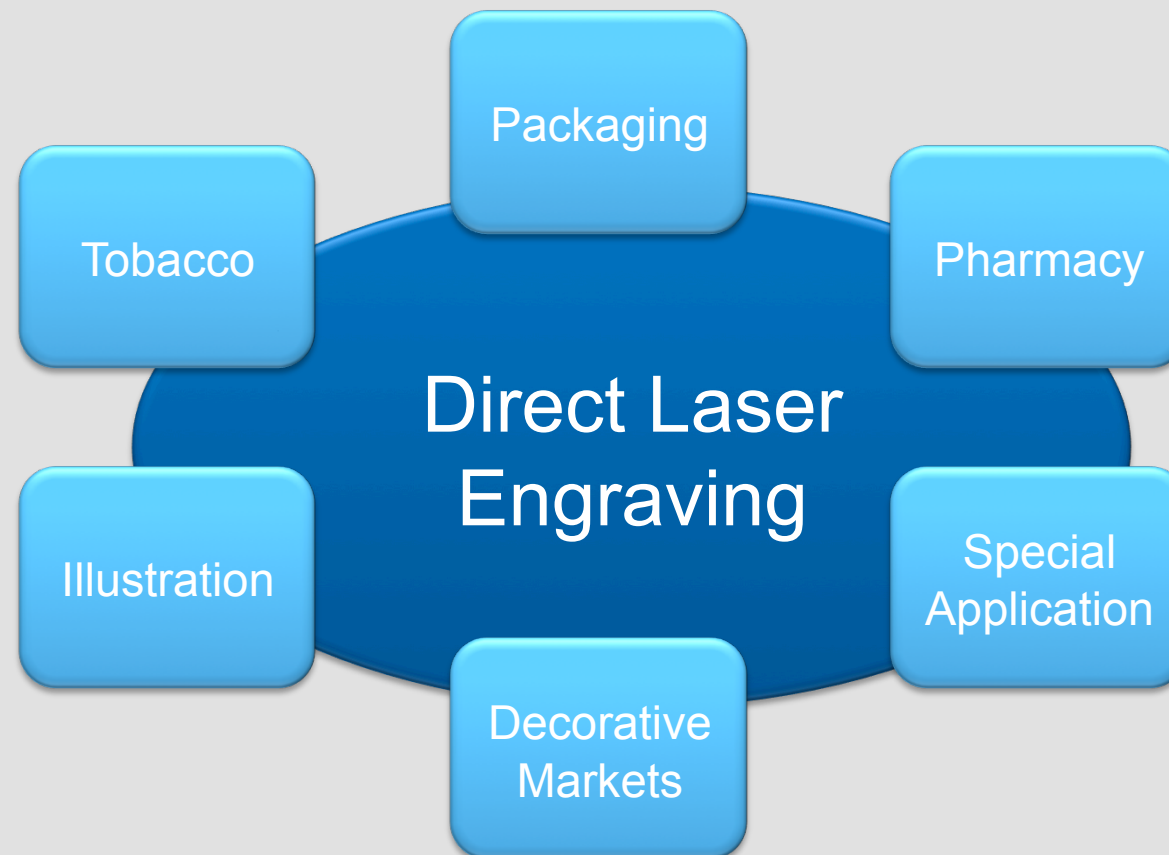
- **Direct-Laser-System**

Total time needed: 3 h 10 min.

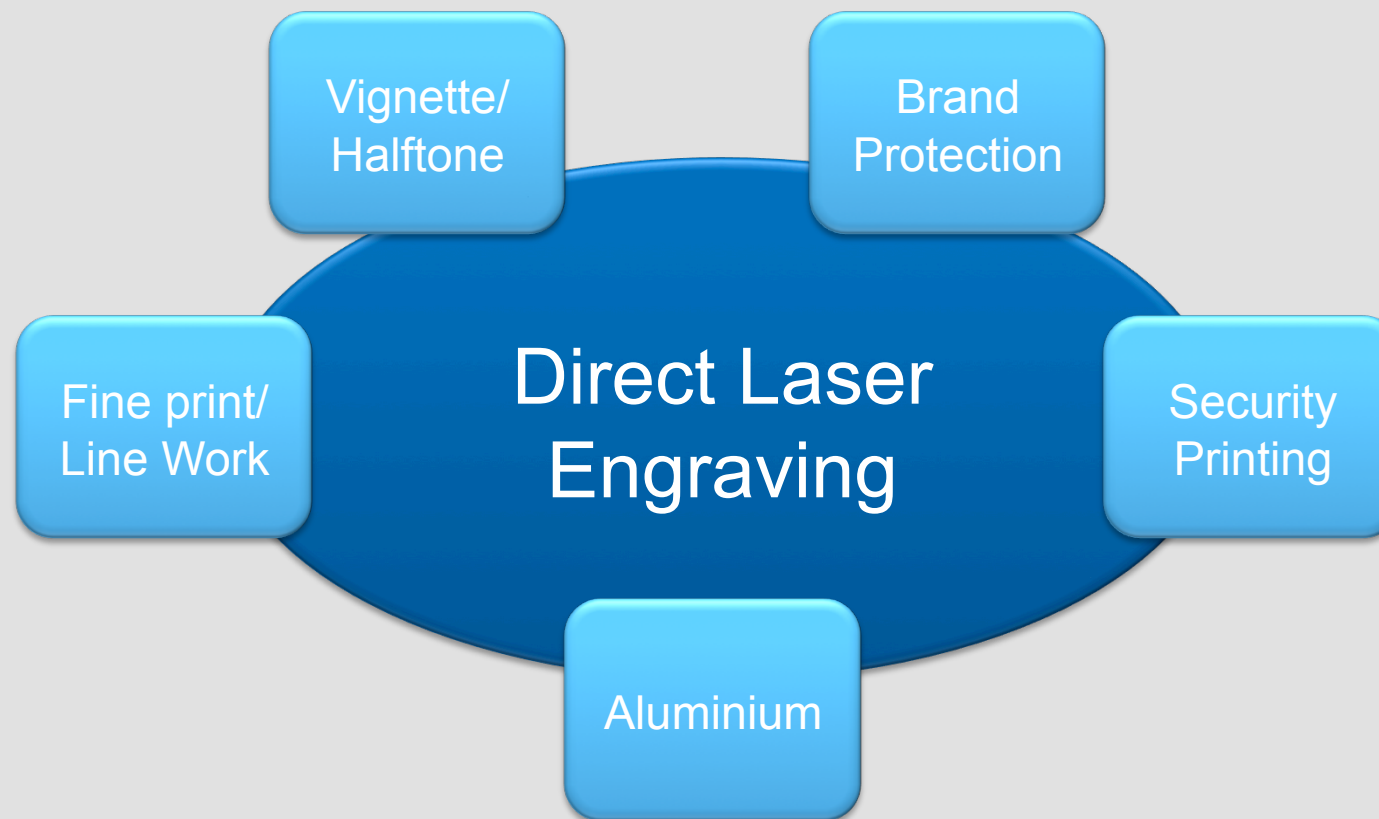
Engraving Speed: 70.000 cells/sec.

→ 2 h 5 min. less / or **40% reduction in production time!**

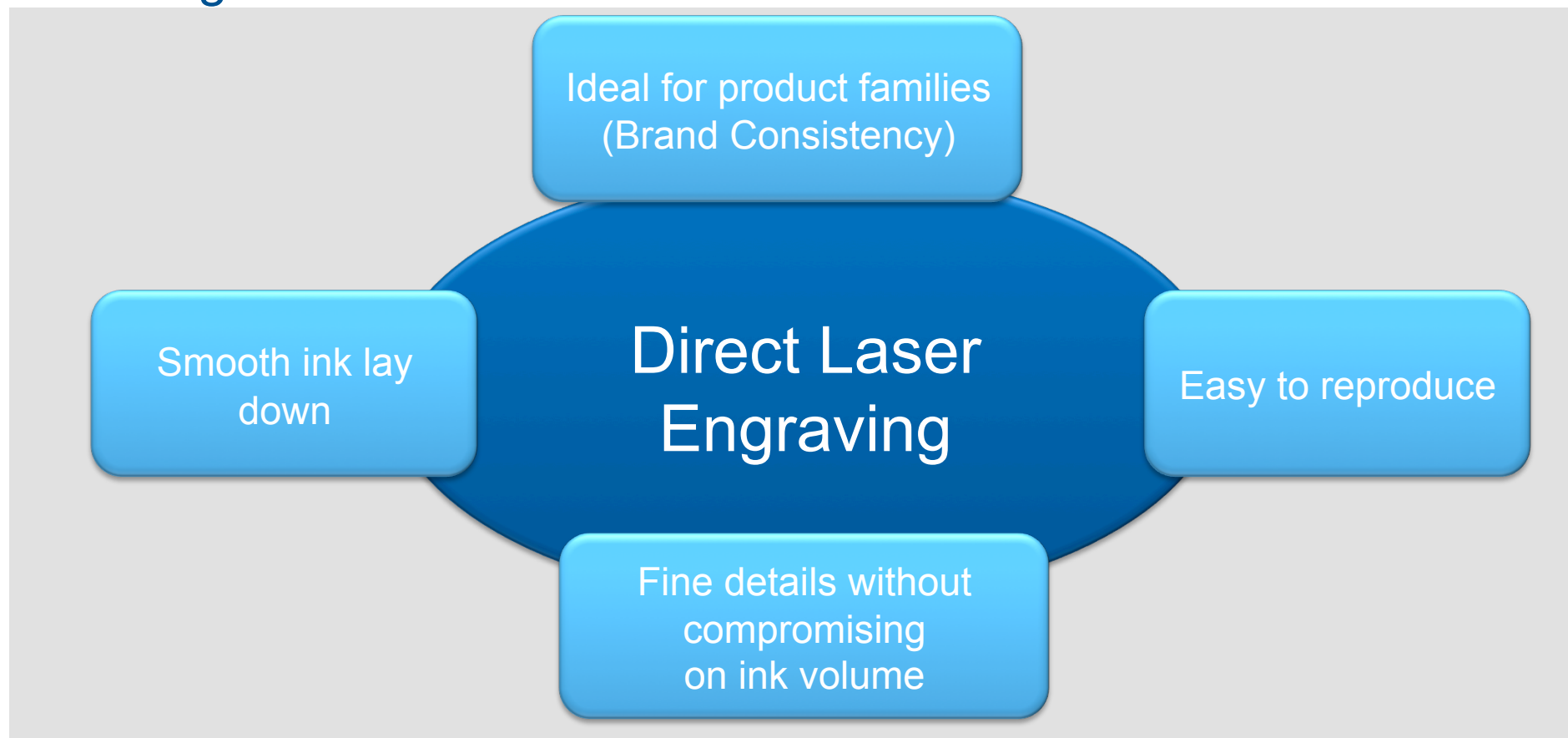
Markets



Fields of Application

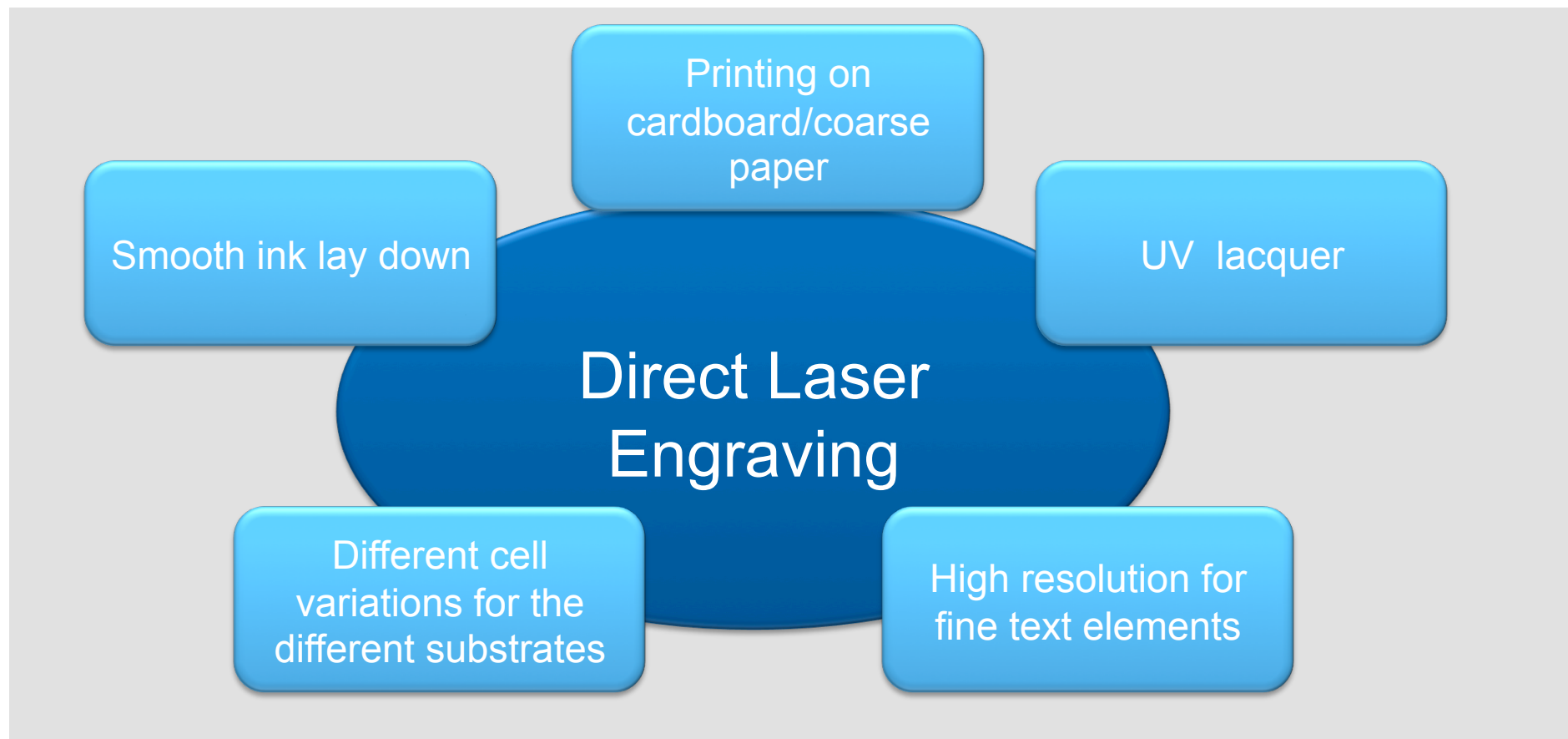


Advantages



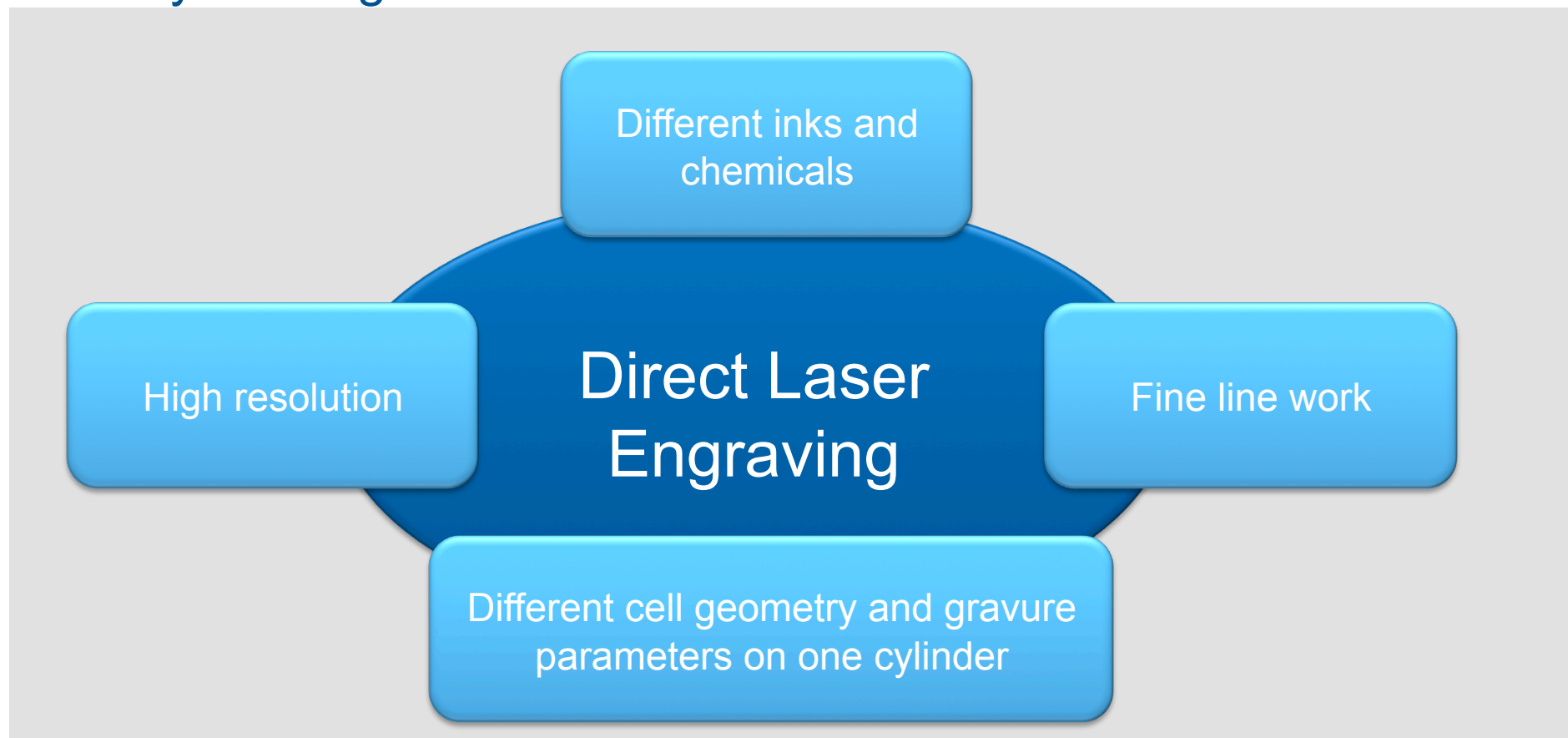
Demands

Tobacco



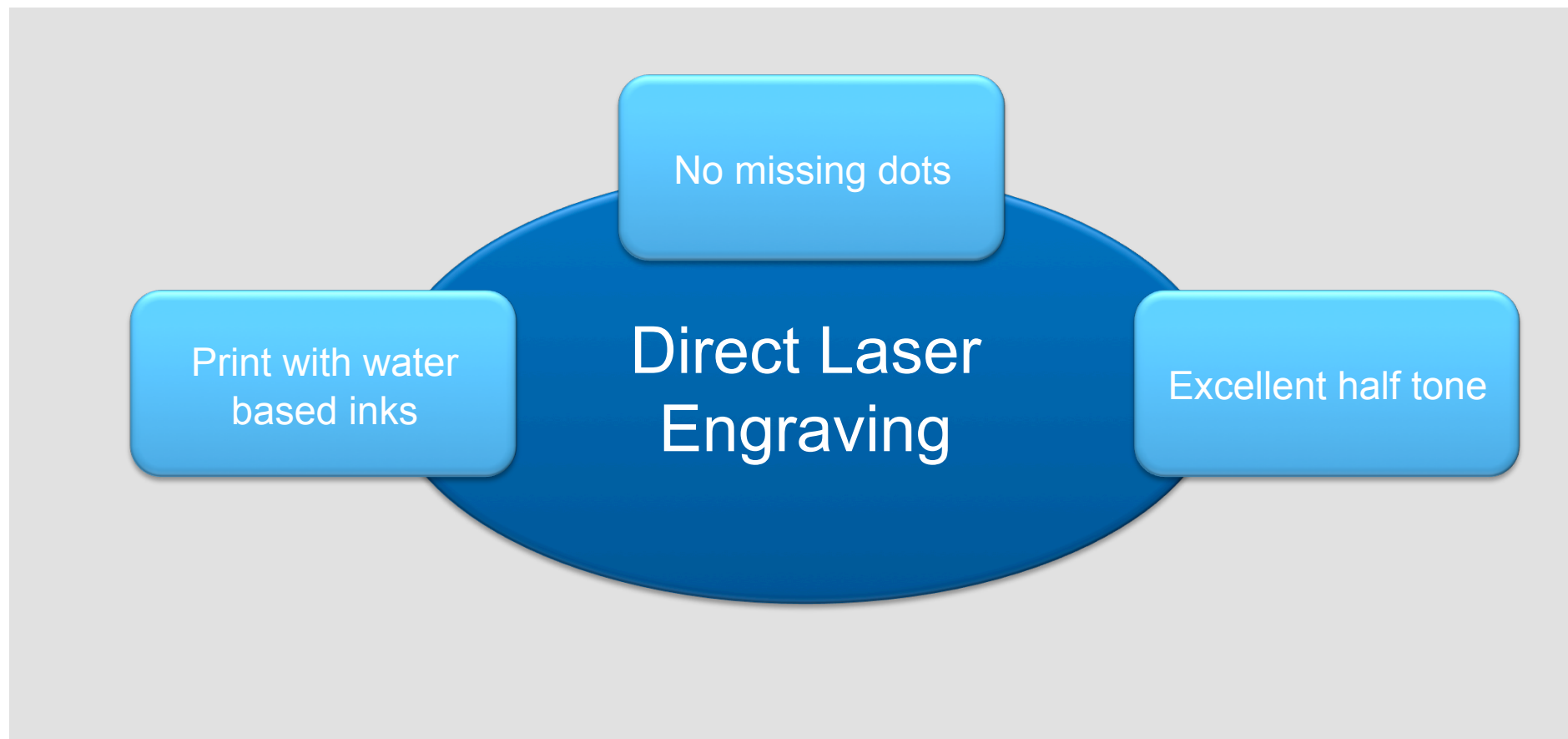
Demands

Security Printing



Demands

Decor



Direct Laser Engraving – Summary of benefits

- **High Quality / High Resolution**
- **Excellent in Ink transfer and ink lay**
- **Tailored made gravure structures for different applications**
- **Fast & consistence**
- **Great potential - new and innovative applications (Infant stage)**

DLS Development at Janoschka

The Year 2000:

- Installation of the first Direct Laser Line (DLS) at Janoschka in Germany. Beginning of the DLS development
- R&D team of Janoschka worked hand-in-hand with the suppliers team.
- The technology was established and accepted quickly in the high quality markets.



DLS Development at Janoschka

The Year 2003:

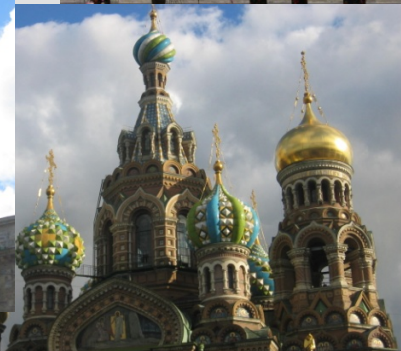
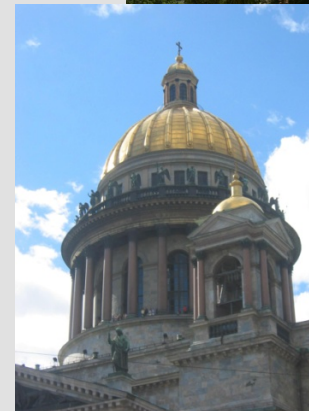
- Installation of the second DLS line at Janoschka in Germany

The Year 2006:

- Installation of the first DLS line at Janoschka APE in Malaysia

The Year 2006:

- Installation of the first DLS line at Janoschka Pavlovsk in Russia



Laser Development at Janoschka

The Year 2009:

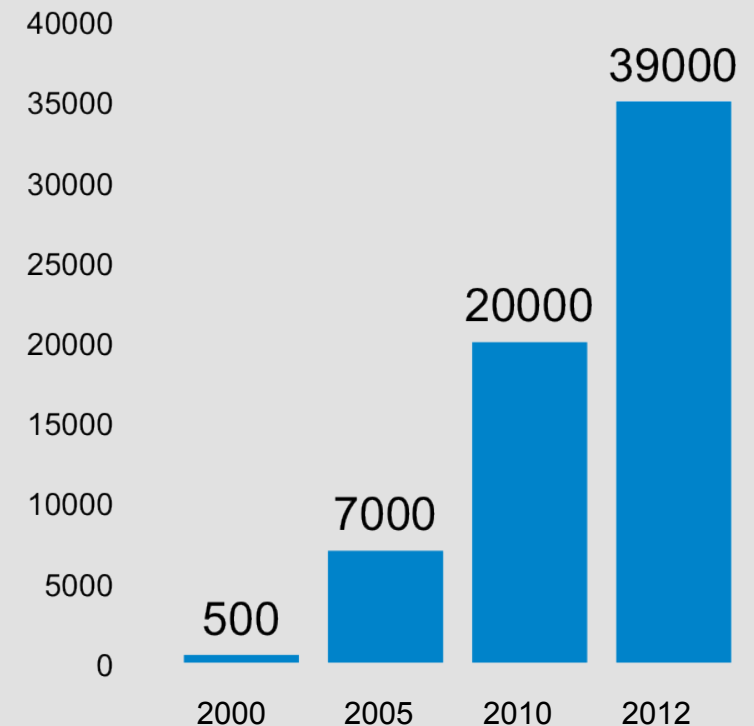
- Janoschka produces more than 20.000 Laser cylinders per year

The Year 2010:

- Installation of the first DLS line in South America at Janoschka Bosisio

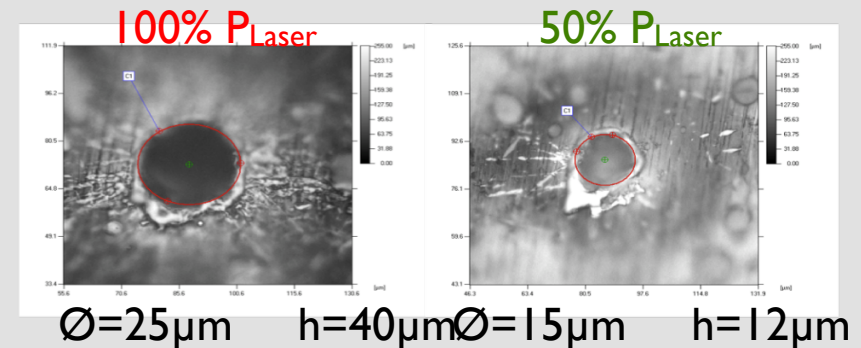
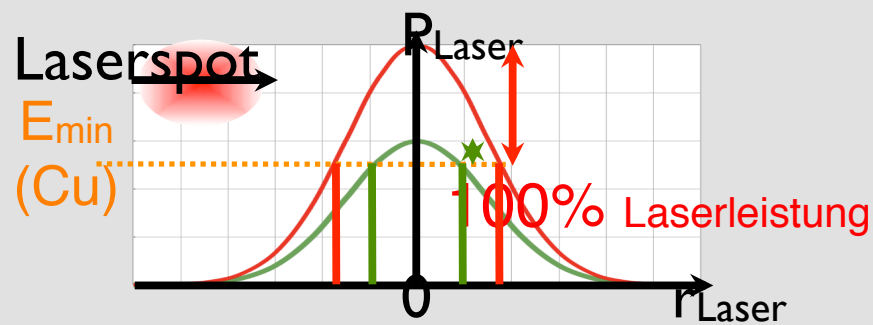
The year 2011:

- Janoschka joins up with Grupo Gondi in Mexico and will strive to become a leader in the packaging printing market in Mexico in terms of quality & service.

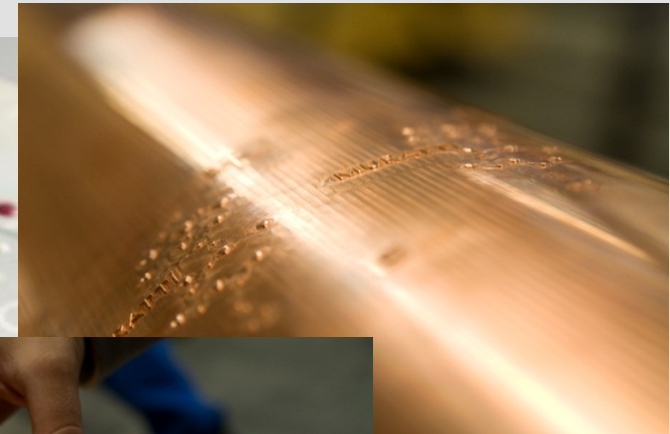


Continued development of Laser technology

- New Laser technology (Pulsfaser-Laser)
- Higher speed (120.000 cells per second)
- Less energy
- New screens
- New Materials
- .../



Laser Technology for Embossing



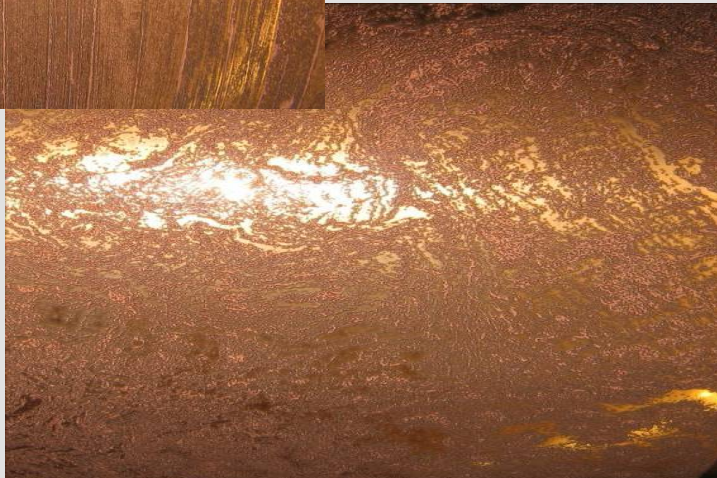
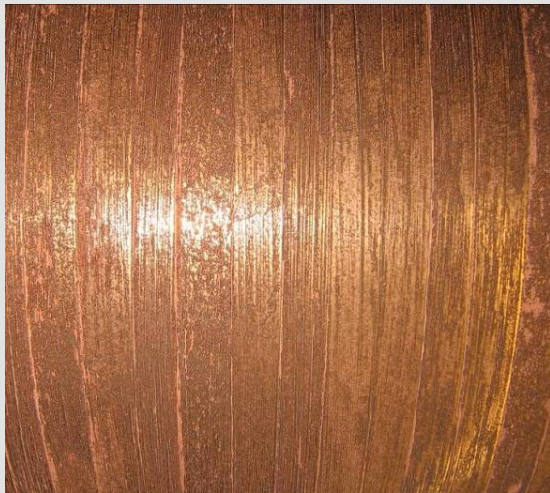
3D Embossing



3D Embossing



Structures: Wood



Structures: Leather



Structures: Pictures



Structures: Pictures



Micro Embossing, Anti Counterfeiting



Line Thickness 0,04mm

New Challenges

1. Bring these worlds together



Laser Technology becomes a global reference for quality

- Especially in the tobacco market, the Laser technology becomes the ultimate reference for quality
- Janoschka is the first service house to provide this technology in a global Network



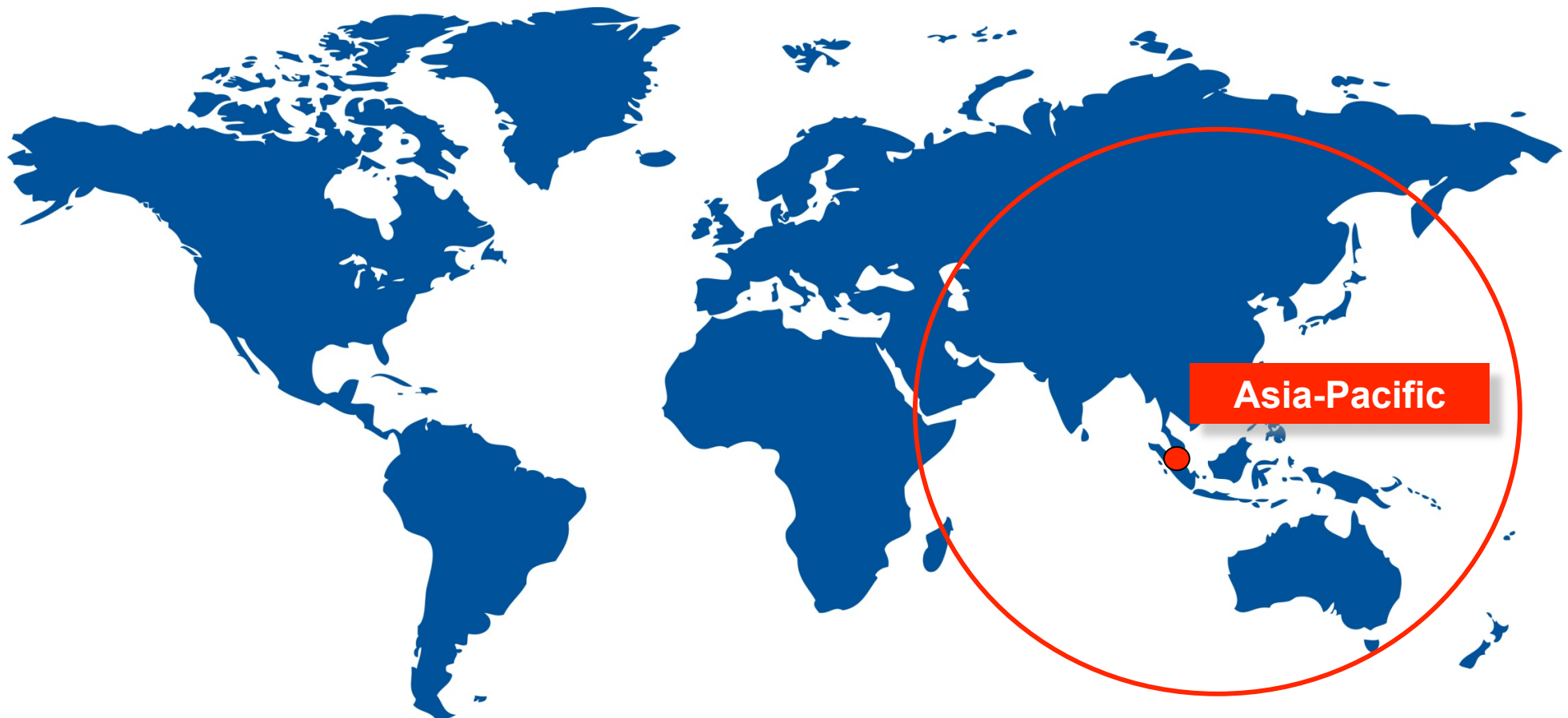
Janoschka's Global Network with DLS Technology



janoschka

APE
asiapacific
engravers

Laser Technologies in Asia



janoschka

APE
asiapacific
engravers

DLS line in APE Malaysia



janoschka

APE
asiapacific
engravers

DLS line in APE Malaysia



Think laser lines in APE Vietnam





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